Interleaving syntax and postsyntax: Spell-out before syntactic movement*

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Abstract

This paper explores the proposal that a phase can be at least partially spelled out, and then subsequently accessed by heads from a higher phase. I provide morphological evidence for this claim, by looking at examples in which a morphological (i.e. postsyntactic) process feeds a later narrow syntactic one. Main evidence comes from the interaction between syntactic head movement and postsyntactic affixation in the Niger-Congo language Wolof, which confirms an important prediction of this analysis. Namely, if a postsyntactic process can feed a syntactic one, we also expect the postsyntactic process to be bled if the structural conditions for its application are not met, resulting in surface opacity effects. This is precisely what we find in Wolof, where the past tense morpheme *oon* is postsyntactically affixed onto the verb in a particular structural configuration and carried along with it to C, but stranded by the verb below C if the structural requirements for its affixation are not met.

1   Introduction

A fairly widely adopted view of the syntax-PF interface is that narrow syntactic processes (Merge, Move, Agree) precede any PF processes (Spell-out), meaning that, once a particular domain (*phase*) is spelled out, it is no longer accessible to syntax (Chomsky 2000, 2001, 2004, etc.). There are, however, cases in which an operation commonly assumed to be of morphological provenance (therefore taking place in the postsyntax, under a realizational view of morphology) influences a syntactic operation, suggesting that it precedes it. One solution to this puzzle is to move either the syntactic operation to postsyntax, or the other

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way around (e.g. Bobaljik (2008) argues that Agree is a postsyntactic operation, Keine (2010) that Impoverishment and Agree need to be part of the same module, whichever one it is), or to complicate the operations in question (Arregi and Nevins (2012) split up Agree into a syntactic and a postsyntactic component). An alternative approach would be to change the order of syntactic and postsyntactic operations, so that (at least some) morphological processes can precede syntactic ones at particular points in the derivation. This is proposed by Calabrese and Pescarini (2014) to account for the ordering of subject and object clitics and the verb in a Northern Italian dialect. Much earlier, Bresnan (1972) has shown that there are cases in which main sentence stress is assigned before movement, so that moved elements can have a level of stress that was assigned to them in a different position. This suggests that even phonological operations may be able to apply to a domain before further syntactic processes access it. Travis et al. (In press) similarly argue that a head may move out of its phase either before or after Spell-out, having consequences on phonological repair operations which, they argue, differ inside a phase and across a phase boundary. Finally, Fox and Pesetsky (2005) have proposed the two key properties of movement—that it is cyclic, and that it proceeds from the edges of phases—to be the result of movement from a spelled out (for them this means *linearized*) domain that is constrained by Order Preservation, which requires that the linear order of constituents established through linearization be preserved in the derivation. This derives successive-cyclicity in that it is only phase-initial elements that can move out of the phase without violating Order Preservation.

The goal of this paper is to offer more morphosyntactic evidence supporting the view that at least some Spell-out operations can precede movement out of the spelled out domain, by showing that a particular prediction of this analysis is correct. Namely, if a post-syntactic process can feed a later syntactic operation, as Calabrese and Pescarini (2014) argue is the case in cliticization in Northern Italian, we also expect that a post-syntactic process can be bled if the structural conditions for its application are not met because of a syntactic operation inside the Spell-out domain. The main part of this paper examines precisely such a case, concerning feeding and bleeding relations between syntactic head movement and postsyntactic affixation/cliticization in the verbal inflectional domain of the Niger-Congo language Wolof. I investigate clauses in which the main verb raises to C, showing variation in when it carries the past tense morpheme *oon* with it. The key data are given in (1) and (2). When only the past tense morpheme is present in the clause, it is suffixed onto the verb in C. When, however, the negative suffix -*ul* is in the structure as well, *oon* is stranded below C.

(1)   <u>oon *is suffixed to the verb in C*[1]</u>
         Lekk-**oon**-na=ñu   jën.
         eat-PST-C=SCL.3PL fish
         "They ate fish."

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[1]Abbreviations: ACC = accusative, AOR = aorist, ASP = aspect, DIST = distal, F = feminine, HAB = habitual, IPFV = imperfective, LCL = locative clitic, NEG = negation, OCL = object clitic, PFV = perfective, PST = past tense, PL = plural, PROX = proximal, SCL = subject clitic, SG = singular

(2)   oon *is not suffixed to the verb in C^2*
      Lekk-**u(l)**-$\emptyset$=ñu   **woon** jën.
      eat-NEG-C=SCL.3PL PST   fish
      "They didn't eat fish."

I show that the affixation of *oon* is best analyzed as occurring postsyntactically, via a mechanism of Lowering (Embick and Noyer 2001), and that it is either fed by head movement (in the case when it is affixed onto the verb), or bled by head movement (when it is not affixed onto the verb). Specifically, I argue that the difference between (1) and (2) is the result of the position of the verb at the moment of Spell-out – if the verb is below the past tense morpheme, then affixation occurs via postsyntactic Lowering; if it moves higher in the syntax (as I shall argue is the case in the presence of negation), then Lowering is bled. The analysis depends on two assumptions: (i) that Spell-out happens at a particular moment in the derivation, triggered by the phase head C, and (ii) that movement of the verb to C proceeds out of a spelled-out domain, where postsyntactic affixation of *oon* already took place. This analysis additionally gives evidence that at least some instances of head movement must take place in the syntax, or we would not be able to explain the inconsistent behavior of *oon*.

The core of my proposal is as follows. Structure-building processes include narrow syntactic operations, such as Merge, Move, and Agree, and certain postsyntactic operations.[3] In this paper I am specifically concerned with postsyntactic affixation via a type of M-merger that Embick and Noyer (2001) call Lowering. I have nothing to say here about the part of Spell-out that concernes Linearization and processes that may happen after that (e.g. Local Dislocation according to Embick and Noyer (2001), and Enclitic Methatesis and Doubling in Basque according to Arregi and Nevins (2012)). Therefore the issue of what it means to allow syntax to see into a *fully* spelled out domain, in which syntactic structure has, according to some views, been flattened (Uriagereka 1999), is not a concern here and is left for future research. In other words, the part of Spell-out I argue can be interleaved with syntax does not involve rendering the structure syntactically inert by, for example removing it from narrow syntax and shipping it off to PF.

This analysis assumes the now widely accepted cyclic Spell-out, according to which syntactic structures are sent off to PF in successive stages (commonly thought to be phases) rather than at a single point (Uriagereka 1999; Chomsky 2000, 2001, 2004, etc.). Narrow syntactic operations are triggered by Probe-features on heads, which must be checked by one or more narrow syntactic operations. Postsyntactic processes are triggered by a phase-head, which initiates Spell-out of its complement (Chomsky 2001). The phase head, however, also has Probe-features which must be checked, and therefore it also triggers narrow syntactic processes. If we do not impose a pre-determined order on these two operations, we predict

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[2]The glide *w* is inserted between two vowels in Wolof, as hiatus is not allowed. *Oon* therefore always surfaces as *woon* when the preceding element ends in a vowel.

[3]I use the terms Spell-out and postsyntax interchangeably in this paper, to refer to that set of operations that can occur in the morphological component to affect the structure and featural composition of terminal nodes.

two orderings between the syntactic and the postsyntactic component: either the phase head first checks its functional features (narrow syntax), and then triggers Spell-out (postsyntax), or it first triggers Spell-out, and then checks its functional features. The two options are summarized in Table 1.

Trigger	Structure-building component	
Non-phase heads	narrow syntax	
Phase heads	1 narrow syntax 2 postsyntax	1 postsyntax 2 narrow syntax

Table 1: Possible orderings of syntactic subcomponents

My proposal is similar to the one in Calabrese and Pescarini (2014), who argue that morphology and syntax in the Northern Italian Friulian dialect are interleaved, so that morphological cliticization of the object and the subject clitic onto the verb is interrupted by syntactic movement of the verb. The purpose of this paper is to give more morphological evidence for the existence of this ordering of operations, shown in the right column in Table 1 (postsyntax > syntax), and to argue that this view of the syntax-postsyntax interaction is superior to proposals which invoke idiosyncratic syntactic operations in specific structures to derive the correct morpheme order. I do not discuss the ordering in the left column of the table, where all narrow syntactic processes triggered by a phase head precede Spell-out of that head's complement. At this point, I assume that both orderings are possible and are a matter of parametric variation. Further research will determine whether this is in fact the case. Manipulating the ordering of narrow syntax and Spell-out allows us to maintain the cross-linguistic uniformity of the two components of the grammar, and to capture any existing variation by reordering the operations triggered by phase heads.

The paper is organized as follows. Section 2 constitutes the main part of the paper. It explores the affixation of the past tense morpheme in Wolof, showing that postsyntactic affixation in one structure feeds syntactic movement, and in another structure is bled by earlier syntactic processes, leading to opacity effects. In section 3 I briefly discuss the two cases already mentioned in the literature, in which this analysis best explains the data: Calabrese and Pescarini's analysis of Friulian, and Extraordinary Left Branch Extraction in Slavic. I then show how this analysis can also be applied to the data from Classical Hebrew, which, according to Harbour (2007), challenge the PersonP Hypothesis. All examples in section 3 show only the feeding relation between postsyntactic merger and head-movement. Section 4 concludes.

2 Feeding and bleeding between head movement and Lowering in Wolof

This section discusses the interaction between head movement of the verb up the clausal structure and the affixation of functional morphology—the past tense morpheme *oon* and the negative suffix *-ul*—in the Niger-Congo language Wolof. I show how the puzzling behavior of *oon*, which is in one clause-type carried to C with the verb, but in the presence of the negative suffix stranded below C, can be explained by adopting the proposal that C first triggers the Spell-out of its complement, and only then the syntactic processes to check its functional features, one of which involves raising the verb out of the spelled out domain. Crucially, the case of Wolof confirms an important prediction of the syntax/postsyntax interleaving that is advocated in this paper – that a postsyntactic process can be bled if a syntactic operation inside the Spell-out domain destroys the structural environment for its application.

This section is structured as follows. In §2.1, I introduce the basics of Wolof clause structure, the data that need to be to accounted for, and the properties of the two functional morphemes at the center of the analysis, the past tense morpheme *oon*, and the negative morpheme *-ul*. In §2.2 I give the details of the analysis that accounts for the pattern. Subsection 2.3 is concerned with additional data from clauses in which the imperfective auxiliary *di* and the past habitual *daan* raise to C, subsection 2.4 discusses alternative analyses and argues against them, and §2.5 concludes.

2.1 Wolof clause structure

I here introduce the relevant parts and the analysis of the Wolof clausal structure pursued in this paper. We look at the structural position of sentence particles and subject clitics in Wolof, as they help us determine the structural position of other constituents in the clause. I then discuss the syntactic behavior of the past tense morpheme *oon* and negation *-ul*, and finally the data that this paper aims to account for.

2.1.1 Sentence particles and subject clitics

Wolof has a rich inventory of clause-types, commonly assumed to encode various information-structural properties. Wolof finite indicative clauses obligatorily contain complementizer-like elements called *sentence particles*, which Dunigan (1994) and I (Martinović 2015a) consider to be all contained in one high head. For the purposes of this paper, I assume this to be a COMP (C) position. More specifically, I adopt the proposal made in Martinović 2015a, 2017a and assume that the head hosting the sentence particle, C, and the head that usually hosts the subject in its specifier, here I,[4] start out as a unified head, and in some clause-types remain compact, while splitting into two heads and yielding the traditional C-I separation
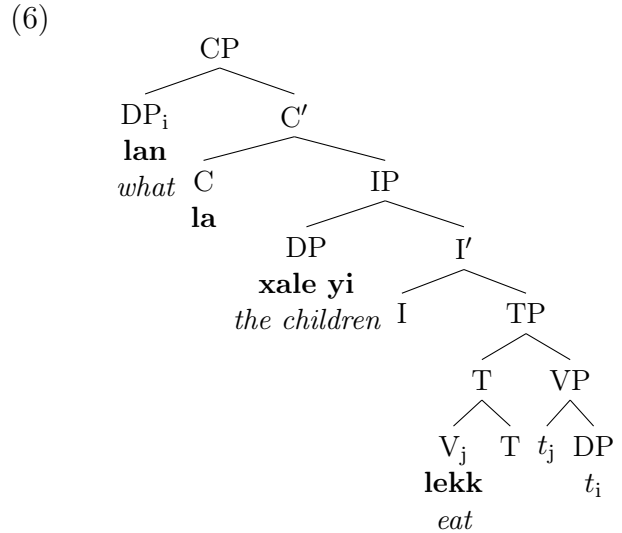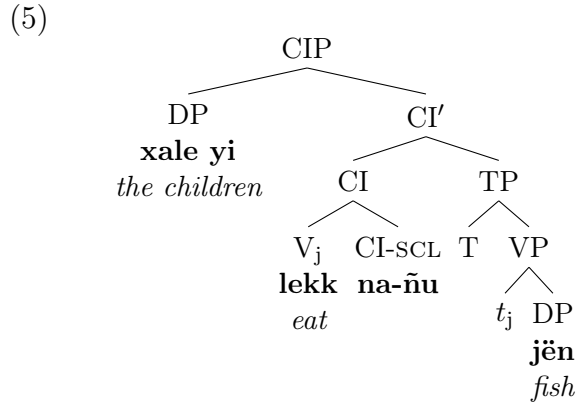
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[4]In Martinović 2015a, 2017a, I call this unified head CT, as that work is not concerned with the details of verbal morphology. I here make the distinction between the head that hosts the subject in its specifier, labeled I for convenience (following a Cinque/Rizzi-style hierarchy, this could also be Subj), and the head that hosts the tense morpheme, T.

in other clause-types. The main motivation for this analysis is the fact that the clause-type with a non-split CI does not have a position for a non-pronominal subject below (to the right of) the complementizer, whereas the clause-type with a split CI (i.e. a higher, C-like, and a lower, I-like head) does. For extensive motivation and details of the proposal, see Martinović 2015a, 2017a. The only element of the account important for the topic of this paper is that Spec,TP is not the structural subject position in any clause-type in Wolof, which is crucial for the analysis of the past tense morpheme *oon* argued for here.

I propose that CI is a phase head, and that it triggers Spell-out (i.e. the postsyntactic process discussed in this paper) of its complement as soon as it is merged in the derivation, before it checks its features.[5] We are mainly concerned with a clause that has a unified CI head, where the verb raises to it, as the phenomenon discussed in the paper occurs only in this clause-type. For simplicity, I refer to this head as C, and call these sentences *V-raising clauses*. I also illustrate how the proposed analysis works in structures with a split CI—the *Wh-movement clauses*—in which the verb does not raise out of the Spell-out domain, and show that they support a unified analysis of *oon* in all Wolof clauses. Examples and basic clause structure of the two Wolof clause-types is given in (3)-(5) and (4)-(6).[6]

(3) *V-raising clause*
Xale yi   lekk-na=ñu   jën.
child the.PL eat-C=3PL.SCL fish
"The children ate fish."

(4) *Wh-movement clause*
Lan la xale yi   lekk?
what C child the.PL eat
"What did the children eat?"

(5)

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                    CIP
          ┌──────────┴──────────┐
        DP                    CI′
     xale yi           ┌───────┴───────┐
   the children      CI              TP
                ┌─────┴─────┐     ┌────┴────┐
               V_j      CI-SCL   T        VP
              lekk      na-ñu         ┌────┴────┐
               eat                   t_j       DP
                                             jën
                                             fish
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(6)

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                  CP
          ┌────────┴────────┐
        DP_i              C′
        lan         ┌──────┴──────┐
       what        C            IP
                   la      ┌─────┴─────┐
                          DP          I′
                        xale yi   ┌────┴────┐
                      the children I        TP
                                        ┌────┴────┐
                                       T         VP
                                   ┌───┴───┐  ┌───┴───┐
                                  V_j   T  t_j      DP
                                 lekk                t_i
                                  eat
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In V-raising clauses, the highest verbal head in the structure raises to C. This can either be the main verb, as in (3), repeated in (7), the imperfective auxiliary *di*, as in (8). Alternatively,

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[5]Adopting CI-splitting is not crucial. If we assume that all clauses have a CP and an IP layer, in order for the analysis to go through, I would need to be the head that triggers Spell-out. CI-splitting is employed here to stay consistent with the analysis of Wolof clause structure in Martinović 2015a, 2017a, and to keep the phase-head status with C.

[6]The verb in (5) of course also raises through T and carries it on to CI. I leave this out for sake of simplicity.

the dummy verb *def* 'do' can be inserted in C, in which case other verbal elements stay clause-internal, as in (9).

(7)   *Main verb in C*
        Xale yi   **lekk**-na=ñu   jën.
        child the.PL eat-C=SCL.3PL fish
        "The children ate fish."

(8)   *Auxiliary 'di' in C*
        Xale yi   **di**-na=ñu   lekk jën.
        child the.PL IPFV-C=SCL.3PL eat   fish
        "The children will eat fish."

(9)   *Dummy 'def' in C*
        Xale yi   **d(ef)**-a=ñu (>dañu) lekk jën.
        child the.PL do-C=SCL.3PL   eat   fish
        "The children ATE fish."

Aside from having a verb in C, these clauses have another important property, as mentioned above: a non-pronominal subject (*xale yi* in (7)-(9)) can only be located to the left of the sentence particle, in the left periphery, and is doubled by a weak subject pronoun (*ñu* in (7)-(9)) to the right of the particle.[7] The subject weak pronoun, the object weak pronoun and the locative weak pronoun are special clitics in the sense of Zwicky (1977) (Dunigan 1994; Russell 2006; Martinović 2015a). Wolof clitics are important for the present discussion because of the position they occupy, which is fixed in all finite indicative clauses, immediately following C, regardless of clause-type. The clitic cluster is in a position higher than the clause-internal lexical subject (in Wh-movement clauses with a split C-I), as noted by Russell (2006). Dunigan (1994), who treats Wolof clitics as heads, proposes that they move to the highest functional head in the extended projection of the verb; in Martinović 2015a, I similarly propose that weak pronouns are adjoined to the sister of the highest functional projection in its phase (following Kayne (1975), I treat clitics as phrases, as Russell (2006)). A similar analysis is proposed by Ouhalla (1989) (p.178, 190) to account for clitic placement in Berber, where they seem to universally appear on the highest affixal head in any given construction. As has been argued for clitics in various language, I propose that Wolof clitics move by a special type of *Clitic Movement*, which does not interfere with other head or phrasal movement in the clause.[8]

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[7]In Martinović (2015a), I argue that there is no syntactic positon for the lexical subject to the right of the sentence particle in this clause-type (as IP is not a separate projection), and that the doubling occurs for case reasons. In short, Spec,CP is not a position in which nominative case can be assigned due to structural requirements on nominative case assignment in Wolof, therefore a subject clitic (which has nominative case either because pronouns have inherent case (Platzack and Holmberg 1995), or because it is in a structural position to receive case) is the only possible clause-internal subject in such clauses.

[8]Special properties of movement often have to be proposed for clitics – see, e.g. Arregi and Nevins 2012

The syntactic position and syntactic status of clitics are relevant also because they form a phonological unit with the elements in C (the verb and the complementizer), and with the past tense morpheme when it follows them. We therefore want to be explicit in their treatment in this paper. The position of all Wolof clitics with respect to their corresponding arguments is shown in (10) for clauses in which the main verb is in C, and in (11) for clauses in which the main verb with the verbal morphology is below C. These examples illustrate that clitic placement is independent of the position of other inflectional morphology, and can be used to determine the position of C.

(10)   *Pronominal clitics in clauses with the main verb in C*
    a.   Xale yi   lekk-oon-na=ñu   jën ci waañ bi.
        child the.PL eat-PST-C=SCL.3PL fish in kitchen the.SG
        "The children ate fish in the kitchen."
    b.   Xale yi   lekk-oon-na=**ñu**=**ko**=**fa**.
        child the.PL eat-PST-C=SCL.3PL=OCL.3SG=LCL.DIST
        "The children ate it there."

(11)   *Pronominal clitics in clauses with the verb below C*
    a.   Lan la xale yi   lekk-oon ci waañ bi?
        what C child the.PL eat-PST in kitchen the.SG
        "What did the children eat in the kitchen?"
    b.   Lan la=**ñu**=**fa**   lekk-oon?
        what C=SCL.3PL=LCL eat-PST
        "What did they eat there?"

There is good evidence that subject clitics are indeed pronominal elements, and not agreement morphology. For an extensive discussion, see Martinović 2015a. Here I only give one piece of data in support of this claim: the complementary distribution of subject clitics and non-pronominal subjects to the right of C, in Wh-movement clauses, where a non-pronominal subject can be clause-internal. (12) shows a V-raising clause, in which the non-pronominal subject, when present, is in the left periphery. It can never be to the right of C, as shown in (12c), even if we attempt to leave out the subject clitic.

(12)   *Only pronominal subjects are allowed to the right of C in V-raising clauses*
    a.   Xale yi   lekk-na=ñu   jën.
        child the.PL eat-C=SCL.3PL fish
        "The children ate fish."
    b.   Lekk-na=ñu   jën.
        eat-C=SCL.3PL fish
        "They ate fish."

(p.58) on cliticization in Basque.

    c.   Lekk-na=(ñu) (*xale yi) jën.
          eat-C=SCL.3PL (*child the.PL) fish
          intended: *"The children ate fish."*

Examples in (13) illustrate a Wh-movement clause, in which either a subject clitic or a non-pronominal subject can be clause-internal, to the right of C. Crucially, they are in complementary distribution. These examples involve A′-movement of an exhaustively focused DP to Spec,CP.

(13)   <u>*Pronominal and non-pronominal subjects in complementary distribution to C's right*</u>
    a.   Jën la(=*ñu) xale yi lekk.
          fish C(=*SCL.3PL) child the.PL eat
          "It's fish that the children ate."
    b.   Jën la=ñu (*xale yi) lekk.
          fish C=SCL.3PL (*child the.PL) eat
          "It's fish that they ate."

Subject clitics are therefore not compatible with an analysis in which they are considered to be agreement, as they are obligatory only in cases in which a non-pronominal subject cannot occur clause-internally, but is restricted to the left periphery. I treat this as a case of clitic doubling, triggered by a requirement for a nominative-bearing element to the right of C (for details, see Martinović 2015a).

2.1.2 Tense and negation

We are interested in the behavior of two inflectional morphemes: the past tense morpheme *oon*[9] and the negative morpheme *-ul*. When occurring in the clause independently, both immediately follow the verb, affixed to it and moving with it to C in V-raising clauses, as in (14a) and (14b), respectively.

(14)   <u>oon *and* -ul *are suffixed onto the verb in C*</u>
    a.   Xale yi lekk-**oon**-na=ñu=ko=fa.
          child the.PL eat-PST-C=SCL.3PL=OCL.3SG=LCL.DIST
          "The children ate it there."
    b.   Xale yi lekk-**u(l)**-∅=ñu=ko=fa.
          child the.PL eat-NEG-C=SCL.3PL=OCL.3SG=LCL.DIST fish
          "The children didn't eat it there."

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[9]As the reader may have noticed from the translations thus far, Wolof eventive verbs with no overt tense/aspect morphology are interpreted as past tense (and stative verbs as present tense); see, for example, (7). The morpheme *oon* is analyzed by Bochnak & Martinović (2017) as optional past tense, following Bochnak (2016) on Washo.

Notice that the phonological shape of the sentence particle differs in clauses without negation (where it is *na*), and those with negation (where it is ∅).[10] In the latter case, it is the pronominal clitics that pinpoint C's position, as explained above, and give evidence for verb-raising to C and the syntactic equivalence of affirmative clauses (14a), and negative clauses in (14b).

In Wh-movement clauses *oon* and negation also immediately follow the verb, except that the verb stays below C, shown in (15a) and (15b).

(15)   oon *and* -ul *are suffixed onto the verb below C*
      a. Jën la xale yi   lekk-**oon**.
          fish C child the.PL eat   PST
          "It's fish that the children ate."
      b. Jën la xale yi   lekk-**ul**.
          fish C child the.PL eat-NEG
          "It's fish that the children didn't eat."

When both negation and *oon* are present in Wh-movement clauses, they follow the verb, with the negation closer to the verb.

(16)   *Wh-movement clause with* oon *and* -ul
        Jën la xale yi   lekk-**ul** oon.
        fish C child the.PL eat-NEG PST
        "It's fish that the children didn't eat."

The pattern we are interested in arises when *oon* and *-ul* co-occur in V-raising clauses. In that case, only negation raises with the verb, and *oon* is stranded below C.

(17)   *V-raising clause with* oon *and* -ul
        Xale yi   lekk-**u(l)**-∅=ñu=ko=fa   **woon**.
        child the.PL eat-NEG-C=SCL.3PL=OCL.3SG=LCL.DIST PST
        "The children didn't eat it there."

The elements that separate the verb+negation complex and *oon* in (17) are, as we saw in the previous section, pronominal clitics, which move to the position to the immediate right of C. They also mark the right edge of the CP-layer; nothing can occur between C and the lower part of the clause in Wolof. For example, I have not found any high adverbs in Wolof – they are expressed by verbs which take finite clauses as complements.[11] Since nothing else can intervene between the complex in C and the TP aside from clitics, they give us the only evidence for the right edge of the CP-layer in this clause-type.

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[10]This could be either a matter of contextual allomorphy or phonological processes. The details of the alternation are not relevant for our purposes.

[11]The sentence in (i) expresses the meaning *"He will certainly come."*

Before we continue, we should exclude one obvious possibility – that there is a restriction on the number of affixes that can attach to a verb (i.e., that there can be no more than one), preventing the affixation of *oon* when negation is present. The data in (18) show that this is not the case. Here the verb carries the iterative affix *ati* and the past tense affix *oon*, and raises with both to C. It is possible to combine various verbal affixes with past tense in Wolof.

(18)   *Multiple affixes are possible on the verb*
Lekk-**ati-woon**-na=ñu   ceeb.
eat-again-PST-C=SCL.3PL rice
"They ate rice again."

The table in 2 schematizes the structure and affixation patterns of negation and *oon* in the two clause-types, with the puzzling pattern shaded.

	V-raising		**Wh-movement**
oon	SBJ V-oon	-C=CL	DP_Wh C=CL SBJ V-oon
-ul	SBJ V-ul	-C=CL	DP_Wh C=CL SBJ V-ul
-ul + oon	SBJ V-ul	-C=CL oon	DP_Wh C=CL SBJ V-ul-oon

Table 2: The position of negation and *oon* in V-raising and Wh-movement clauses (SBJ = non-pronominal subject, CL = clitics)

The goal of this section is to explain why *oon* is suffixed onto the verb in V-raising clauses in the absence of negation, but stranded below C when negation is also in the structure. (17) shows that *oon* can be skipped over by a moving verb, which seemingly violates the Head Movement Constraint (Travis 1984). The verb carries with it the suffixed negation, and precedes the clitic complex (in this example the subject and the locative clitic), which are adjoined to C's sister (see previous section), marking the boundary between C and the lower part of the clause. I here argue that *oon* is not affixed onto the verb when negation is present because of (i) the syntactic status of *oon*, (ii) the nature of its affixation, and, crucially, (iii) the ordering of the Spell-out of a phase and syntactic processes triggered by the phase head.

First, since *oon* can be skipped by head movement of the verb, I propose that it is a phrasal morpheme and not a head. I situate it in the specifier of TP, which is in affirmative clauses C's complement.[12] If *oon* is a phrasal morpheme, when it does affix to the verb, this cannot be due to head movement. I propose that its affixation is the result of a postsyntactic process,[13]
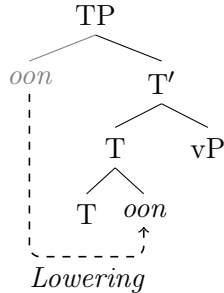

(i)   Xam na=a   ni di-na=∅   ñëw.
know C-SCL.1SG that IMPF-C-SCL.3SG come
"I know that he will come." (intended: "He will certainly come.")

[12]See §2.1.1 on why Spec,TP is not a subject position in Wolof.

[13]In the final part of §2.4, I discuss what syntactic accounts of the affixation of *oon* might look like and point out the advantages of a postsyntactic analysis.

specifically that it affixes to T via Lowering during Spell-out. Following Embick and Noyer (2001), I define Lowering as a morphological operation which unites syntactic terminals that are "phonologically spelled together but not joined in overt syntax (by Raising)" (p.561). Via this operation, the syntactically higher terminal node is lowered onto the syntactically lower terminal node, as shown for *oon* in (19).

(19)   <u>*Lowering of* oon *during Spell-out*</u>

```
              TP
          ╱       ╲
     oon          T′
      ┊        ╱      ╲
      ┊       T        vP
      ┊     ╱   ╲
      ┊    T   oon
      ┊          ↑
      └ ─ ─ ─ ─ ─┘
          Lowering
```

Next, we need to determine the position of negation in Wolof clausal structure. If we look at the ordering of negation and *oon* in cases in which the inflected verb does not raise to C, but remains clause internal, as in Wh-movement clauses, we see that *-ul* precedes past tense, shown in (16) and repeated here in (20). This is always the case when the verbal head stays below C.

(20)   <u>*Wh-movement clause with* oon *and* -ul</u>
         Jën la xale yi   lekk-**ul oon**.
         fish C child the.PL eat-NEG PST
         "It's fish that the children didn't eat."

If both *oon* and *-ul* were affixed via head movement, this ordering would tell us that negation is lower in the structure than past tense, as it is closer to the verb and therefore would be picked up by the verb first. However, we have seen that we have good reason to believe that *oon* is not affixed via head movement but postsyntactically, so the ordering of *oon* and *-ul* with respect to each other does not help us determine the position of negation. I argue here that negation is higher than Tense. A very high position of negation has been proposed for some other languages, e.g. Malayalam, Mongolian (Cinque 1999) and some dialects of Arabic (Soltan 2007). Torrence (2003, 2005, 2012) also places NegP in Wolof above the TP. This assumption is crucial in my analysis, accounting for the role of negation in the stranding of *oon* in negative clauses.

Since negation is always affixed onto the verb, I treat it as a head. A piece of evidence in support of the claim that negation is obligatorily a verbal affix, whereas *oon* is not, comes from verbless clauses with nominal predicates, which can contain *oon*, but not negation (in any of the three positions indicated):

(21)   *Verbless clauses can contain* oon *but not* -ul

    a.   Xale yi   ndongo la=ñu.
         child the.PL student C=SCL.3PL
         "The children are students."

    b.   Xale yi   ndongo   la=ñu **woon**.
         child the.PL student-C=SCL.3PL PST
         "The children were students."

    c.   *Xale yi   ndongo(**-ul**) la(**-ul**)=ñu(**-ul**).
         child the.PL student(NEG) C(-NEG)=SCL.3PL(-NEG)
         Intended: "The children aren't students."

Affirmative clauses with nominal predicates are Wh-raising structures (Martinović 2013b, 2015b,a; Klecha and Martinović forthcoming), in which the nominal predicate A′-moves to Spec,CP.[14] The fact that *oon* is in situ in (21b) is therefore not surprising – regardless of its syntactic status, it would not be affected by A′-movement of the predicate NP. The fact that it can occur independently of the presence of a verb shows that it is morphosyntactically not a verbal affix. The same is not true of negation, which is why (21c) is ungrammatical. In order to negate a sentence with an NP predicate, a different clause-type must be used, one with a copular verb (which makes this a V-raising clause) that negation affixes onto:

(22)   *Clauses with NP predicates and negation must have a verbal copula*
    Xale yi   d(i)-**u(l)**-∅=ñu (>duñu) ndongo.
    child the.PL COP-NEG-C=SCL.3PL   student
    "The children aren't students."

    Given the described properties of *oon* and *-ul*, I propose that Wolof clauses have the basic structure in (23). I capture the fact that the verb raises through the functional layer all the way to C by positing a [V*] feature on each head, which must be checked by a verbal element.[15]

---

[14]There is a lot of evidence that this is A′-movement of an NP predicate to Spec,CP and not head-movement of N to C, as one reviewer suggests. The complementizer *la* found in these constructions only occurs in Wh-raising clauses. The predicate is a phrase – in (21) it can contain the indefinite determiner *ay* (*Xale yi **ay ndongo** la=ñu*), which is usually omitted in Wolof. Finally, extraction in Wolof is only possible from Wh-raising clauses (Dunigan 1994; Martinović 2013a, 2015a, 2017b).

(i)   Lan$_i$ la Màgatt xam ni   moom t_i la=ñu?
    what$_i$ C Magatte know that they t_i C=SCL.3PL
    "What does Magatte know that they are?"

The fact that the predicate NP can be extracted out of (21), as in (i), is strong evidence that *la* is a *wh*-movement complementizer, and that the nominal predicate was in Spec,CP.

[15]Another difference between V-raising and Wh-raising clauses is that C in V-raising has the [V*] feature, whereas in Wh-raising it does not. See Martinović 2015a for details on the apparent complementary distribution of verb movement to C and *wh*-movement.

(23)   *Wolof clause structure*

```
                    CP
                  /    \
                 C      NegP
                [V*]   /    \
                     Neg      TP
                    [V*]    /    \
                    -ul   oon     T′
                               /     \
                              T       vP
                            [V*]    /    \
                                 DP_Sbj   v′
                                        /    \
                                       v      VP
                                      [V*]     |
                                               V
```
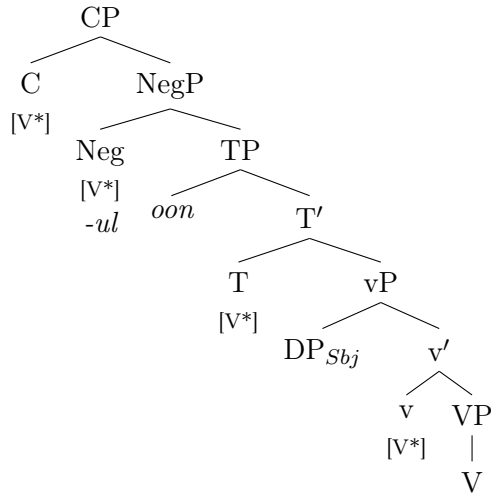
In the following subsection, I show how this syntactic structure, together with the assumption that *oon* affixes postsyntactically, and that the Spell-out of the complement of C precedes verb movement to C, accounts for the affixation of *oon* to the verb in affirmative clauses, and its stranding in the presence of negation.

Before continuing, I briefly discuss a piece of data from Torrence (2003), in (24), which suggests that another verbal affix, *-agum*, causes the stranding of *oon*.

(24)   *Affix* -agum *stranding past tense* (Torrence 2003, p.21-22)
    a.   Lekk-**agum**-na=a.
         eat-already-C-SCL.1SG
         "I have already eaten."
    b.   Lekk-**agum**-na=a   **woon**.
         eat-already-C=SCL.1SG PST
         "I had already eaten."

Diouf (2009) lists *-agum* as a complex affix, consisting of *-ag-*, marking accomplishment, and negation, as shown in (25). The final consonant or vowel is part of the subject clitic (therefore, *-m* in *-agum* indicates 1SG). The meaning of the affix in Diouf 2009 is "not already accomplished" (original translation is in French).

(25)   -agum *is a complex affix* (Diouf 2009, p.145)
    a.   Gis-**ag-ul**-oo=ko?
         see-ACCOMPL-NEG-C.SCL.2SG=OCL.3SG
         "Haven't you already seen him/her/it?"
         "Tu ne l'as pas encore vu?"
    b.   Lekk-**ag-u**-∅-ma.
         eat-ACCOMPL-NEG-C-SCL.1SG

"I haven't eaten yet."
"Je n'ai pas encore mangé."

I have found the same to be true of my speakers. First, none of them allowed the form in (24a), in which the verb with the suffix *agum* was followed by the sentence particle *na* (the C that surfaces in affirmative V-raising clauses). The only allowed form in 1SG was the one always found when the negative suffix occurs with a 1SG verb: the negation and the 1SG person subject clitic surface as *-uma*, and C is null. This is shown in (26).

(26)   <u>-ag-u-m *cannot cooccur with the sentence particle* na</u>
    a.   Lekk-ag-u-∅-ma   woon.
          eat-ACCOMPL-NEG-C-SCL.1SG PST
          "I hadn't eaten yet."
    b. *Lekk-ag-um-na=a   woon.
          eat-ACCOMPL-NEG-C-SCL.1SG PST

There also exists a morpheme *agum*, which Diouf (2003) (p.46) classifies as an adverb, meaning 'for now', 'for the moment'. The adverb appears to attach to the verb, which would be consistent with Torrence's examples above, although the meaning is somewhat different. For my speakers, the adverbial *agum* cannot attach to the verb that raises to C, as examples as in (24) are ungrammatical for them. I therefore do not have more to say about this at the moment; further study is required to fully understand the distribution and meaning of *agum*, and its relationship to the affix *-ag*. Since my speakers do not allow it to suffix onto a verb that is in C, it is not a counterexample to the generalization that only *-ul* causes the stranding of *oon* in the dialect under investigation in this paper.

    I now turn to the details of the derivation of affirmative and negative clauses with verb movement to C.
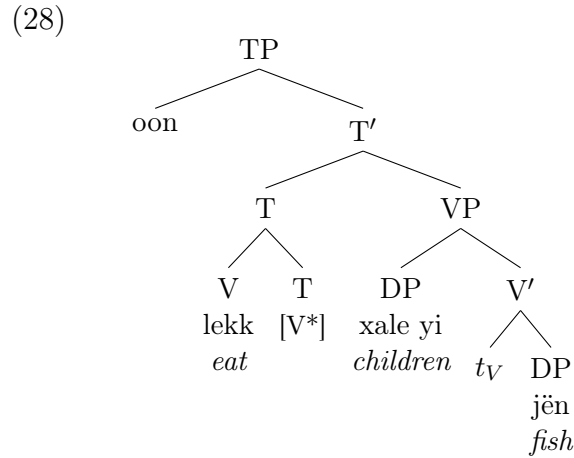
2.2 The interaction of syntactic movement and postsyntactic Lowering

In this section, I show how the three proposals I have made thus far—the clause structure in (23), the postsyntactic affixation of *oon* via Lowering, and the Spell-out of C's complement preceding the checking of C's features—derive the position of *oon*. Specifically, I propose that the difference in affixation of the past tense morpheme *oon* between affirmative and negative clauses results from the verb raising through each functional head in the clausal spine, and from Spell-out occurring before the verb's final movement to C. Just in case the verb is not in a higher position at the moment of Spell-out, *oon* affixes onto it and is carried with it to C. If, however, negation is present in the structure, above TP, the verb raises to it and can therefore no longer be the target of *oon*'s Lowering. As a result, *oon* is stranded when the verb moves to C. This allows us to account for the violation of the Mirror Principle (Baker 1985) without invoking idiosyncratic operations that reorder the morphemes in only one construction.

In the remainder of the section I illustrate how my analysis derives the variation in affixation of *oon* in V-raising clauses, and demonstrate that it also accounts for the patterns in Wh-clauses, in which the position of *oon* appears not to be affected by negation. We start with the neutral affirmative clause in (27), in which *oon* is affixed onto the verb, and raises with it to C.

(27)   oon *is affixed to the verb*
        Xale yi   lekk-**oon**-na=ñu   jën.
        child the.PL eat-PST-C=SCL.3PL fish
        "The children ate fish."

As the structure is built, the verb moves up the inflectional layer through each functional head, attracted by the [V*] feature. After T is merged and the verb moves to it, *oon* is merged into Spec,TP. The derivation up to this point is shown in (28) (projections irrelevant for the analysis are omitted).

(28)

```
                    TP
            _____|_____
           |                 |
          oon               T′
                     _____|_____
                    |                 |
                    T                VP
                 ___|___         _____|_____
                |       |       |           |
                V       T       DP          V′
               lekk   [V*]   xale yi      __|__
                eat           children   |     |
                                        t_V    DP
                                               jën
                                               fish
```

Then C is merged, and it first triggers Spell-out of its complement, the TP, during which *oon* lowers onto the complex head in T, which contains the verb, as in (29).

16

(29)

CP
- C [V*] na
- TP — **Spell-out of TP**
  - oon
  - T′
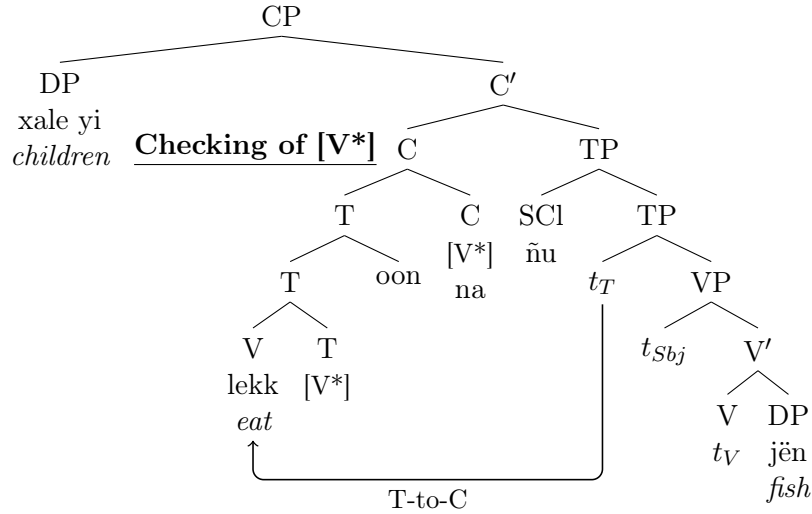   - T
      - T
        - V lekk *eat*
        - T [V*]
      - oon
    - VP
      - DP xale yi *children*
      - V′
        - t_V
        - DP jën *fish*

Lowering
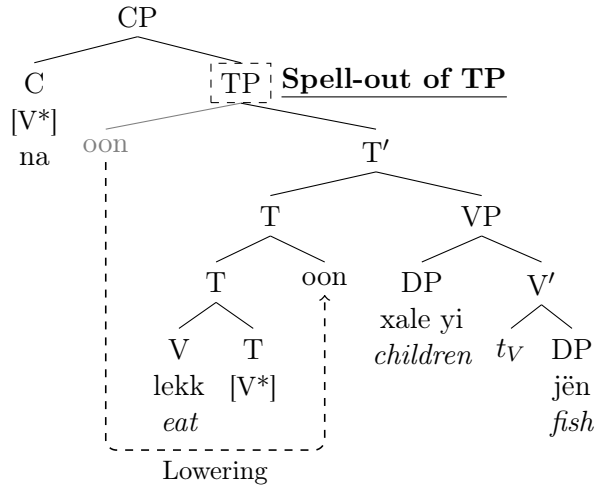
Now C goes on to check its functional features, one of which is [V*], and attracts the complex head in T, resulting in *oon* being carried along with it, shown in (30). The subject also moves to Spec,CP (by hypothesis to check an [EPP*] feature on C), and is doubled by a subject clitic clause-internally, which ends up adjoined to C's sister. The details of the doubling process are not relevant for our purposes, but see Dunigan (1994), Russell (2006) and Martinović 2015a for different proposals.

(30)

CP
- DP xale yi *children*
- C′ — **Checking of [V*]**
  - C
    - T
      - T
        - V lekk *eat*
        - T [V*]
      - oon
    - C [V*] na
  - TP
    - SCl ñu
    - TP
      - t_T
      - VP
        - t_{Sbj}
        - V′
          - V t_V
          - DP jën *fish*

T-to-C

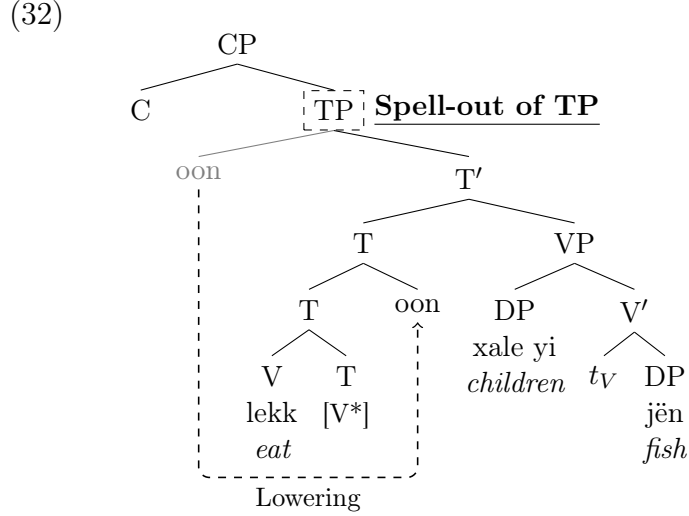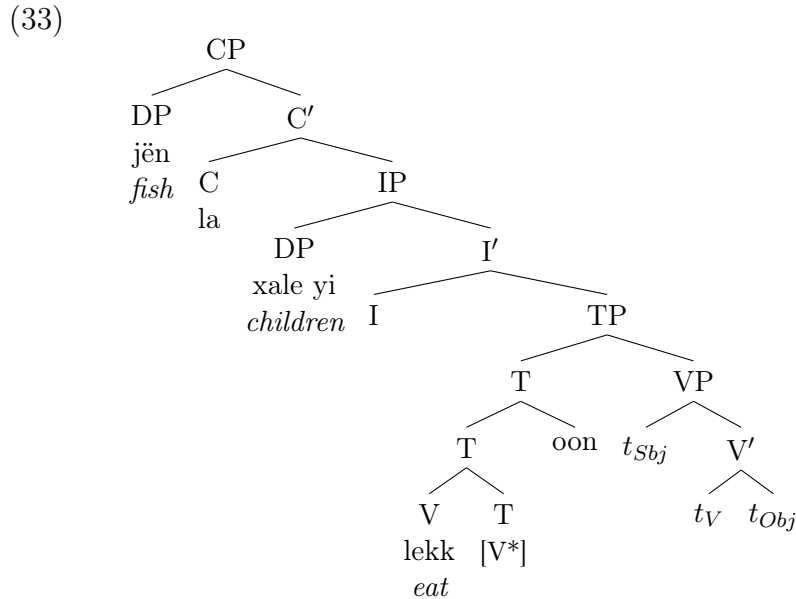This derives the correct position of the past tense morpheme in affirmative clauses, where it is affixed onto the verb in C.

My analysis also accounts for the morpheme order in Wh-movement clauses, where there is no verb movement to C. In affirmative sentences, as in (31), the clause is built and when C is merged, it first triggers Spell-out of the TP. *Oon* lowers to T, which contains the verb, as in (32).

(31) oon *in an Object Focus sentence*
Jën la xale yi   lekk-oon.
fish C child the.PL eat-PST
"It's the fish that the children ate."

(32)

```
                      CP
          ┌───────────┴──────────┐
          C                     [TP]  **Spell-out of TP**
                        ┌────────┴────────┐
                       oon               T'
                            ┌────────────┴────────┐
                            T                     VP
                     ┌──────┴──────┐        ┌──────┴──────┐
                     T            oon       DP            V'
               ┌─────┴─────┐              xale yi    ┌────┴────┐
               V           T             children   t_V      DP
              lekk       [V*]                                 jën
              eat                                            fish
                    └─── Lowering ───┘
```

Unlike in V-raising clauses, this C head does not contain [V*], so the verb does not raise any further. In my approach C splits into C and I, the subject moves to Spec,IP and the focused DP *jën* A'-moves to Spec,CP (see §2.1.1 and Martinović 2015a for details). Given that Head-Splitting is a syntactic process, it occurs after the Spell-out of TP. The final structure is shown in (33).

(33)

```
                  CP
        ┌──────────┴──────────┐
        DP                   C'
       jën           ┌────────┴────────┐
       fish          C                IP
                     la       ┌────────┴────────┐
                             DP                 I'
                           xale yi       ┌──────┴──────┐
                           children      I            TP
                                             ┌─────────┴─────────┐
                                             T                   VP
                                       ┌─────┴─────┐       ┌──────┴──────┐
                                       T          oon    t_Sbj          V'
                                 ┌─────┴─────┐                      ┌────┴────┐
                                 V           T                     t_V      t_Obj
                                lekk       [V*]
                                eat
```

Postsyntactic Lowering derives the affixation of *oon* in both clause-types.

Going back to V-raising clauses, we now turn to negative sentences, in which only negation

raises with the verb to C, and *oon* is stranded inside the TP. I propose this to be due to the position of NegP above TP in the Spell-out domain. Given that the verb moves to Neg before Spell-out, Lowering does not result in the affixation of *oon* to the complex head containing the verb. The clause we need to derive is in (34).
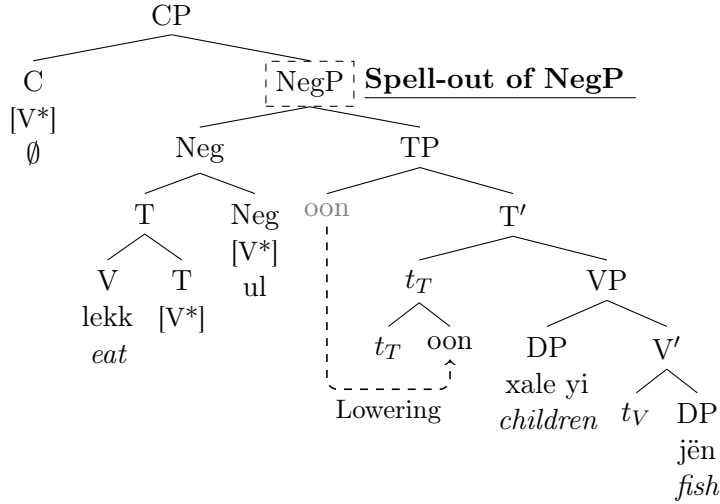
(34)   oon *is not affixed to the verb*
        Xale yi   lekk-**u(l)**-∅=ñu   **woon** jën.
        child the.PL eat-NEG-C=SCL.3PL PST   fish
        "The children didn't eat fish."

The verb again moves through each head, but this time it does not stop in T inside its phase, because there is a higher head in the same Spell-out domain that attracts it, Neg. Before the merger of C, the structure is as in (35).
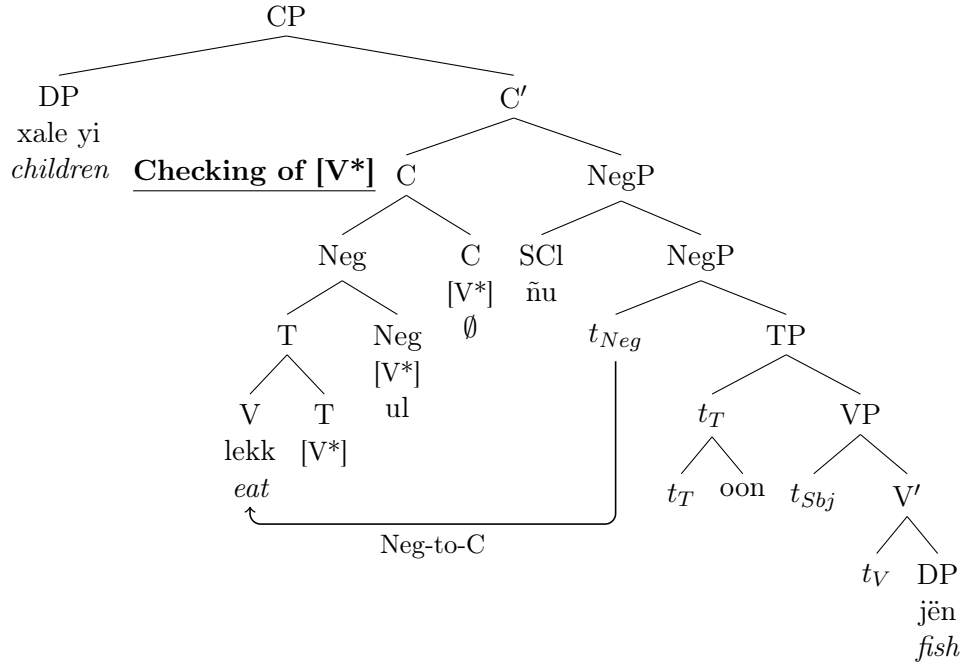
(35)
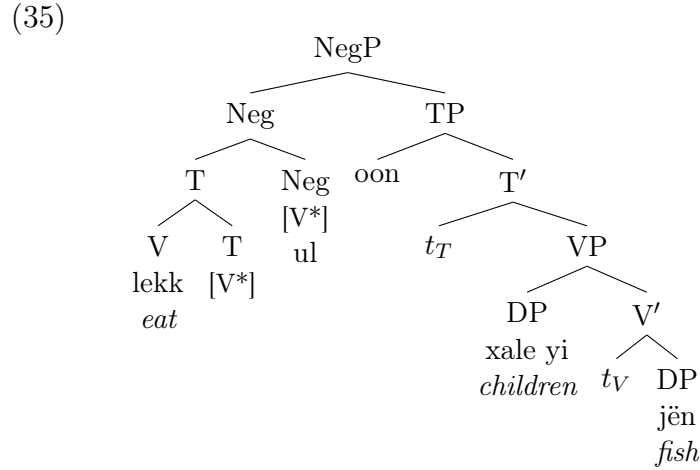
Then C is merged and it first triggers Spell-out of NegP, shown in (36). Now the complex head with the verb is not in T, so the Lowering of *oon* does not result in its affixation onto the verb. I assume that Lowering still takes place, and that *oon* m-merges with the trace of head movement in T (under the hypothesis that head movement leaves traces).

(36)

CP
- C
  - [V*]
  - ∅
- NegP **Spell-out of NegP**
  - Neg
    - T
      - V
        - lekk
        - *eat*
      - T
        - [V*]
    - Neg
      - [V*]
      - ul
  - TP
    - oon
    - T′
      - t_T
        - t_T
        - oon
        - Lowering
      - VP
        - DP
          - xale yi
          - *children*
        - V′
          - t_V
          - DP
            - jën
            - *fish*

In the next step, C goes on to check [V*], attracting the complex head from Neg. Since *oon* has not been lowered onto the verb, it is not carried along to C. As in affirmative clauses, subject movement to Spec,CP and clitic doubling also take place.

(37)

CP
- DP
  - xale yi
  - *children* **Checking of [V*]**
- C′
  - C
    - Neg
      - T
        - V
          - lekk
          - *eat*
        - T
          - [V*]
      - Neg
        - [V*]
        - ul
    - C
      - [V*]
      - ∅
  - NegP
    - SCl
      - ñu
    - NegP
      - t_{Neg}
      - NegP
        - t_{Neg}
        - TP
          - t_T
            - t_T
            - oon
          - VP
            - t_{Sbj}
            - V′
              - t_V
              - DP
                - jën
   - *fish*

Neg-to-C

We have now derived the stranding of *oon* in the presence of negation as a result of the position of the verb at the moment of Spell-out in Neg, which is above TP, the timing of Spell-out, and the mechanism of affixation of *oon*, which lowers during Spell-out to the head in T.

Negative Wh-movement clauses are also straightforwardly derived in this analysis, illustrated with an object focus sentence in (38). The verb raises through all functional

projections up to Neg. Then C is merged and triggers Spell-out of NegP. Since *oon* is in a head below the complex head containing the verb and negation, it cannot lower onto it.
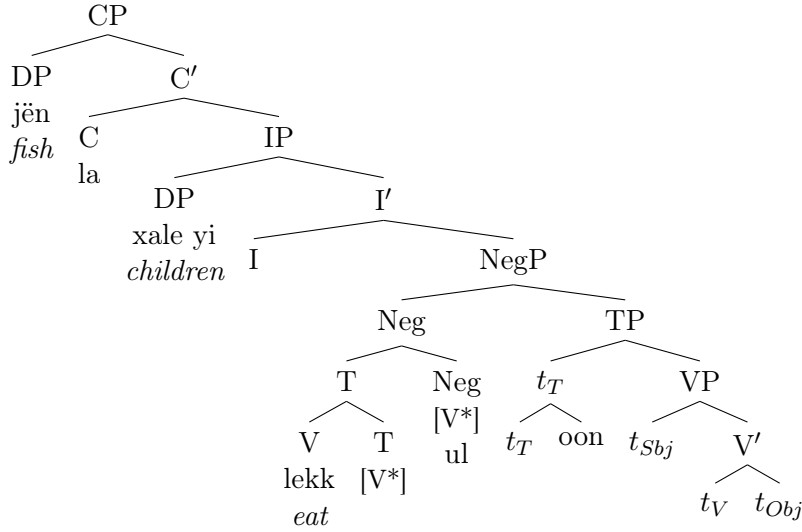
(38)   *Negation and* oon *in Object Focus*

Jën la xale yi   lekk-ul oon.

fish C child the.PL eat-NEG PST

"It's fish that the children didn't eat."

(39)
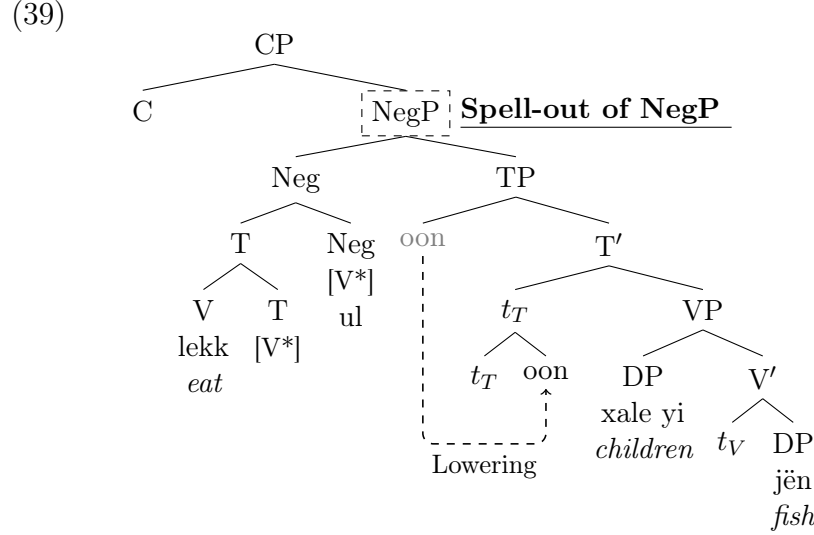
Unlike in clauses in which the verb raises to C, however, here the verbs stays in T. The V+Neg complex does not get linearly separated from *oon*, since nothing can intervene between NegP and TP. As *oon* is always pronounced as a phonological word with the material that precedes it, the final form in (39), [_NegP_ lekk-ul [_TP_ oon]], is indistinguishable from the one in which *oon* would form a syntactic constituent with the verb and negation.

    In the next step, as in affirmative clauses, the C head splits into two projections, and the subject and the focused object move to their respective specifiers. The final structure of a negative Wh-movement clause is given in (40).

(40)

```
                    CP
                  /    \
                DP      C′
                jën    /  \
                fish  C    IP
                      la  /  \
                        DP     I′
                     xale yi  /  \
                     children I    NegP
                             /      \
                          Neg        TP
                         /   \      /   \
                        T    Neg  t_T    VP
                       / \   [V*]  /\    /  \
                      V   T   ul  t_T oon t_Sbj  V′
                    lekk [V*]                    /  \
                     eat                        t_V  t_Obj
```

One of the advantages of the analysis advocated here is that it accounts for the behavior of *oon* in all clause-types, without having to posit special processes only in V-raising negative clauses. We shall see that this is not the case with some existing or possible alternative accounts.

A reviewer points out that a possible issue with allowing syntactic movement to proceed from a spelled out domain is the consequence it would have on the *Phase Impenetrability Condition.* As I state in the Introduction, I here only consider one postsyntactic process, a type of m-merger referred to as Lowering. I do not make any claims about other morphological processes, and have nothing to say about movement out of a fully spelled out domain, which has presumably also been flattened. Under the assumption that the postsyntactic module has ordered operations, as Embick and Noyer (2001) and Arregi and Nevins (2012) claim, I consider, in line with Embick and Noyer (2001), that Lowering is an early process which operates on syntactic structure. The structure is therefore still present after this part of Spell-out and can be acted upon by syntactic processes. I therefore also do not have anything to say about the PIC here.

In this section I showed how the claim that a phase head first triggers the Spell-out of its complement and then proceeds to check its own features, establishing relations with elements in the spelled out domain, can explain the puzzling behavior of the clitic-like past tense morpheme *oon*, which is sometimes pied-piped by the verb and other times stranded below the verb. In section 3, I show similarities between this phenomenon and object cliticization in The Northern Italian Friulian dialect analyzed in a similar way in Calabrese and Pescarini (2014), Extraordinary Left Branch Extraction in Slavic, in which a preposition is cliticized onto the extracted element, accounting for non-constituent movement, and person prefixation in Classical Hebrew. All these cases can be argued to involve postsyntactic affixation with subsequent movement from the Spell-out domain, in other words situations in which a postsyntactic process **feeds** a syntactic one. The novel contribution of the Wolof data is the structure in which *oon* is stranded below C, as it confirms the prediction of the syntax-postsyntax interaction advocated in this paper: if a postsyntactic process is **bled** in

some constructions, because the structural conditions for its application are not met, we observe surface variation in the placement of some morphemes, apparently violating the Mirror Principle.

I next turn to more complex cases in Wolof, in which *oon* and *-ul* affix onto the imperfective auxiliary *di* and the past habitual *daan*, as the data found in some of the literature cannot be accounted for by my analysis. I show that the discrepancy is only apparent, and that a closer look at the data can explain them as a result of dialectal variation in the phonological form of aspectual morphology, and restrictions on which tense-aspect morpheme combinations are allowed to surface in C.

2.3   Clauses with auxiliary movement to C

In this section I discuss constructions which contain auxiliary verbs that express aspectual meaning and, when present in the structure, take on functional morphology (negation and *oon*) instead of the main verb. These structures are important for the present discussion, as examples reported in some of the literature cannot be accounted for by my analysis. I show here that the data are more complex than they seem at first glance. I first present my data, and then compare them to the data in the literature and show where the discrepancy comes from.

Wolof has two aspect morphemes, the imperfective *di*, and the past habitual *daan*.[16] Just like the main verb, *di* and *daan* also raise to C. I consider them to be aspect heads, contained in AspP below T. *Daan* behaves just as main verbs. It contributes the same meaning when it raises to C or stays below C, as in (41).

(41)   *Past habitual morpheme 'daan' in V-raising and Wh-movement clauses*
    a. Xale yi   **daan**-na=ñu   lekk jën.
        child the.PL PST.HAB-C=SCL.3PL eat   fish
        "The children used to eat fish."
    b. Jën la xale yi   **daan**   lekk.
        fish C chile the.PL PST.HAB eat
        "It's fish that the children used to eat."

Negation is suffixed onto *daan*, shown in (42). Note that when followed by negation, the final *-n* in *daan* is dropped.[17]

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[16]*Daan* is probably bimorphemic, consisting of the imperfective morpheme *di* and *-aan*, but it is very rare to find *-aan* suffixed onto the main verb, and I have not yet determined the conditions under which this is possible (thus far, I have found that only some speakers allow *-aan* to be suffixed to the main verb, and only in subordinate temporal and conditional clauses). In addition, no other morphemes, such as negation, can intervene between *di* and *-aan*, which, as we shall see, is not the case with the combination of *di* and *oon*. *Daan* therefore behaves as a single head in clauses we are concerned with in this paper. I therefore treat it as a single morpheme, and leave a detailed investigation of its status for future research.

[17]The hiatus is repaired by inserting the glide *w*, as is always the case in Wolof.

(42)   *Negation is a suffix on* daan
     a.   Xale yi   **daa-wu(l)**-∅=ñu   lekk jën.
         child the.PL PST.HAB-NEG-C=SCL.3PL eat   fish
         "The children didn't use to eat fish."
     b.   Jën la xale yi   **daa-wul**   lekk.
         fish C child the.PL PST.HAB-NEG eat
         "It's fish that the children didn't use to eat."

The morpheme *oon* can cooccur with *daan*, and when negation is present, *oon* is, as is the case with main verbs, stranded below C, as in (43).[18]

(43)   *The past habitual aspect* daan *is compatible with past tense* oon
      Xale yi   daa-**wu(l)**-∅=ñu   **woon** lekk jën.
      child the.PL PST.HAB-NEG-C=SCL.3PL PST   eat   fish
      "The children didn't use to eat fish."

Turning now to the imperfective morpheme *di*, we shall see that its meaning and distribution are more complex. When *di* stays below C, it results in present (progressive), future, or habitual reading. When it raises to C, the present and habitual readings are not available, and it is interpreted only as future (Bochnak and Martinović forthcoming) illustrated in (44). We saw that *daan* has past habitual meaning irrespective of its position (see (41)).

(44)   *Imperfective auxiliary 'di' in V-raising and Wh-movement clauses*
     a.   Xale yi   **di**-na=ñu   lekk jën.
         child the.PL IPFV-C=SCL.3PL eat   fish
         "The children will eat fish."
     b.   Jën la xale yi   **di**   lekk.
         fish C child the.PL IPFV eat
         "It's fish that the children are eating/eat (habitually)/will eat."

Negation is a suffix on *di*, both in C and below C, shown in (45). The meanings of *di* are the same as when negation is not present.

(45)   *Negation is a suffix on* di
     a.   Xale yi   d(i)-**u(l)**-∅=ñu (>duñu) lekk jën.
         child the.PL IPFV-NEG-C=SCL.3PL   eat   fish

---

[18]It is not clear to me what the meaning difference is with and without *oon* in examples like (43). In Bochnak and Martinović Forthcoming show that *oon* is an optional past tense marker, meaning that structures without *oon* can also be interpreted as past tense. The use of *oon* is accompanied by a cessation inference, which can be canceled, suggesting it is a conversational implicature, and not a part of the meaning of *oon*. It is therefore possible that using *oon* in past habitual structures strengthens the inference that the proposition expressed by the structure does not hold at present anymore.

"The children won't eat fish."

b. Jën la xale yi   d(i)-**ul**   lekk.
fish C child the.PL IPFV-NEG eat
"It's fish that the children aren't eating/don't eat/won't eat."

Interestingly, *oon* can only co-occur with *di* when *di* is below C, at least in the varieties discussed in this paper. The resulting meaning is past progressive, as shown in the Wh-movement clause in (46).

(46)   Oon *suffixes onto* di *below C*
—————————————————
Jën la xale yi   d(i)-**oon**   lekk.
fish C child the.PL IMPF-PST eat
"It's fish that the children were eating."

For many speakers, the raising of *di+oon* to C, as in (47), is ungrammatical. The most salient meaning for speakers who do allow this structure is past habitual, usually expressed with *daan*; the past progressive meaning is either not allowed or is significantly degraded in acceptability.

(47)   Di *and* oon *raising to C*
———————————————
%Xale yi   **d(i)-oon**-na=ñu   lekk jën.
child the.PL IPFV-PST-C=SCL.3PL eat   fish
"The children used to eat fish."/???"The children were eating fish."

In order to understand how a past habitual meaning appears here, it is important to know that in many varieties of Wolof, particularly in urban environments, *d(i)-oon* and *daan* have been neutralized to *doon*. Speakers who do not have this neutralization do not accept (47) as grammatical and they often correct it to a structure with *daan* instead of *doon*. Speakers for whom (47) is grammatical strongly favor the habitual reading.

To sum up, there is a problem with raising *d(i)-oon* to C. It is possible that this is due to a semantic constraint. As mentioned above, *di* can have a variety of readings when it is below C (present, progressive, future), but only a future reading if it is in C. It may be that it is therefore impossible to obtain a past progressive reading with *d(i)-oon* in C, and given that this is the meaning that *d(i)-oon* carries, it cannot raise to C. Preliminary research on the semantics of *di* in its various positions is conducted in Bochnak and Martinović forthcoming; future work will address this issue as well.

A potential conflict between the analysis and data presented thus far comes from examples of affixation of negation and *oon* onto *di* when it raises to C, reported in some of the literature (48) shows examples of *di* in combination with *oon* and *-ul* from Torrence (2003).

(48)   Di *with* oon *and* -ul, *Torrence 2003*

    a.   D(i)-**oon**-na=a   dem.
         IPFV-PST-C=SCL.1SG leave
         "I was leaving."

    b.   D(i)-**oon-u(l)**-∅=ma   dem.
         IPFV-PST-NEG-C=SCL.1SG leave
         "I was not leaving."

There are two elements in (48) problematic not only for the analysis presented thus far, but also because they themselves contain another violation of the Mirror Principle. First, the example in (a) is in contradiction with what I have found my speakers to allow, as discussed above. Second, in (b) both *oon* and *-ul* raise with the auxiliary to C. If *di+oon* could raise to C, we would expect *oon* to be stranded by *d(i)-ul*, which is the case in clauses where the main verb raises to C. Such examples, however, are not grammatical:

(49)   Oon *cannot be stranded in clauses with* di
    *Xale yi   d(i)-**u(l)**-∅=ñu   **woon** lekk jën.
    child the.PL IPFV-NEG-C=SCL.3PL PST   eat fish
    Intended: *"The children weren't eating fish."*

Second, the two morphemes in Torrence's examples are not in the expected order, since in (48b) *oon* precedes *-ul*. Negation is always closer than *oon* to both the verb and the imperfective *di*, which can be seen when they remain below C, as in the Wh-movement sentence in (50).

(50)   *Negation is closer to the verb than* oon
    Jën la xale yi   d(i)-**ul**   **oon** lekk.
    fish C child the.PL IMPF-NEG PST eat
    "It's fish that the children weren't eating."

Torrence's data in (48) and the example (49) pose problems for any analysis. Comparing (48) and (50) suggests that the affixation of past tense and negation occurs in a different fashion when the auxiliary verb remains below C, as opposed to when it raises to C, resulting in a different ordering of affixes (*d(i)-ul-oon* when it does not raise, and *d(i)-oon-ul* when it does). As we have seen, this is not the case with main verbs or *daan*, where negation is always closer to the verb. In order to derive this, the syntax of clauses (specifically, the hierarchy of functional projections) in which the auxiliary raises to C and those in which it does not would need to differ. This would be an unwelcome situation, but, luckily, the data on the neutralization of *daan* and *d(i)-oon* help us understand this discrepancy. Given the fact that my speakers whose dialect maintains the distinction between *daan* and *d(i)-oon* do not allow the latter form to appear in C, it follows that they do not allow the form with negation in the structure either. This is indeed the case and only the past habitual *daan* can
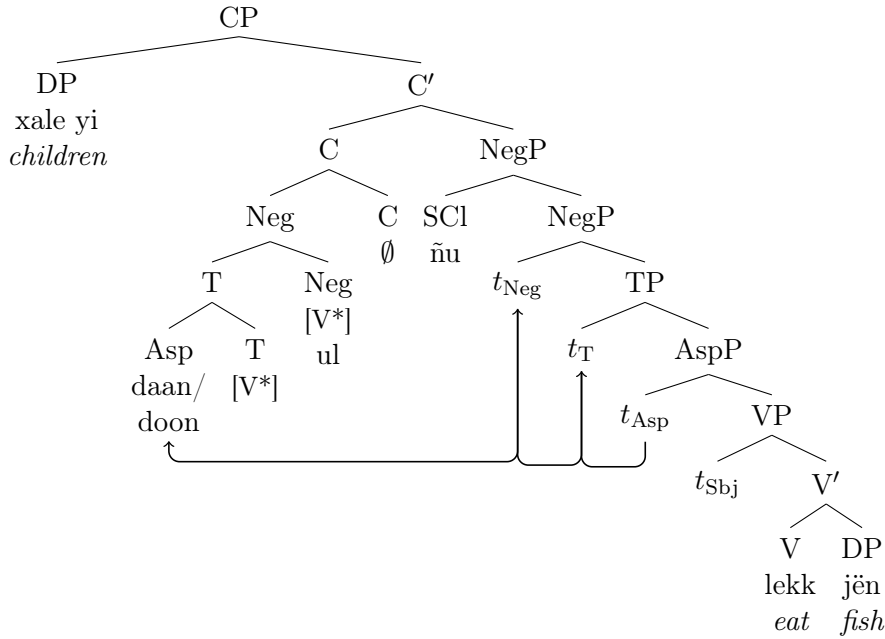
raise to C with *-ul* suffixed to it. For my speakers, examples such as (48b) do not contain *di + oon*, but *daan* that has been neutralized to *doon*. This straightforwardly explains the position of negation, which is here found at the end (*doonul*), since negation always follows the past habitual, be it below C or in C, as in (42). If a dialect has neutralized the distinction between *d(i)-oon* and *daan*, one finds two different forms when negation is present: *duloon* for the past progressive, as in (50), and *doonul* for the past habitual, in (51).

(51)   *Past habitual morpheme* daan *neutralized to* doon
    a.   Xale yi   **doon-ul**-∅=ñu   lekk jën.
        child the.PL PST.HAB-NEG-C=SCL.3PL eat   fish
        "The children didn't use to eat fish."
    b.   Jën la xale yi   **doon-ul**   lekk.
        fish C child the.DEF PST.HAB-NEG eat
        "It's fish that the children didn't use to eat."

I cannot explain the appearance of the past progressive meaning in (48) for Torrence's speakers. I can only speculate that it appears that other changes are occurring along the neutralization in form, such as semantic and morphological changes which lead to the elimination of the differences in *doon* below C and *doon* in C, or the past progressive meaning would be ungrammatical for all speakers. For example, a few speakers from Dakar that I interviewed have lost the *d(i)-oon/daan* distinction and allow both *duloon* and *doonul* below C to carry either the past progressive or the habitual meaning, with no preference for one or the other. I have found there to be a great amount of variation amongst such speakers and therefore leave this issue aside until further study and focus here on the dialects which maintain the morphosyntactic difference between *d(i)-oon* and *daan* (even if they are phonologically neutralized to *doon*). For clarity, I illustrate the derivation of a clause with the past habitual *daan/doon* with negation in (52) and (53). I assume that the past habitual aspect is generated in the same position as the imperfective *di* – in the head of Asp. Just as the main verb or the auxiliary *di*, it raises through all heads up to C. If negation is present in the structure, it is carried along with *daan/doon*.

(52)   *Past habitual* daan/doon *with negation in C*
    Xale yi   {**daan/doon**}-**u(l)**-∅=ñu lekk jën.
    child the.PL PST.HAB-NEG-C=SCL.3PL eat   fish
    "The children didn't used to eat fish."

(53)

```
                              CP
                ┌─────────────┴─────────────┐
               DP                          C′
             xale yi              ┌─────────┴─────────┐
             children            C                   NegP
                           ┌─────┴─────┐      ┌────────┴────────┐
                          Neg          C     SCl              NegP
                     ┌─────┴─────┐     ∅     ñu         ┌───────┴───────┐
                     T          Neg                   t_Neg           TP
                ┌────┴────┐     [V*]                           ┌───────┴───────┐
               Asp        T      ul                           t_T           AspP
              daan/      [V*]                                         ┌───────┴───────┐
              doon                                                  t_Asp           VP
                                                                            ┌────────┴────────┐
                                                                          t_Sbj             V′
                                                                                      ┌──────┴──────┐
                                                                                      V            DP
                                                                                    lekk          jën
                                                                                     eat          fish
```

To sum up: the raising of *d(i)-oon* to C is at best problematic, and outright impossible for people whose dialect maintains a difference between *d(i)-oon* used as a past progressive, and *daan* used as a past habitual. Furthermore, in Torrence's example (48b) the ordering of *oon* and negation in C is reversed from what we expect based on the ordering between the same elements when *di* is below C, and when the main verb raises to C. For speakers that clearly maintain the difference between *d(i)-oon* and *daan*, in no variant in which *di* and *oon* are found in the structure, can *di* raise to C, regardless of the presence of negation. There is therefore something which blocks the raising of *d(i)-oon* to C. Given that the only available meaning of *di* in C is future, whereas below C it can additionally be a habitual or a present (progressive), it is possible that this restriction is a semantic one.

Before concluding the discussion of Wolof, I address existing and possible alternative analyses, and argue that the proposal advocated for in this paper is preferable for the overall architecture of the grammar.

2.4   Alternative analyses

The proposed analysis allows us to treat both *oon* and the verb's movement to C uniformly across constructions, keeping the derivation of every clause identical. Any alternative has to make stipulations which in my view are more costly than my proposal, as they must invoke idiosyncracies either in the type of operation that occurs in a particular structure, or in the categorization of *oon* depending on the presence or absence of negation. I believe such approaches to take away from syntax an important component, requiring the derivational mechanism to be aware from the start of information that it should not have access to, such as clause-type, or whether a particular functional head will be merged somewhere higher in the structure or not. This complicates the syntactic module and forces us to give up on

attempts to maintain the simplicity and uniformity of syntax both within a language and cross-linguistically. Several such analyses are sketched below. Before looking at syntactic alternatives, I briefly look at a possible morphological explanation for the stranding of *oon*.

A reviewer raises the possibility that the post-clitic position of *oon* in clauses with negation is a result of morphological reordering. Harris and Halle (2005) develop a convincing analysis involving partial reduplication to account for the displacement of the plural suffix *-n* in Spanish imperatives from the verb to the pronominal clitic, as in (54).

(54)   *Plural displacement in Spanish*
      a.   Vénda**n**-lo.
            sell.PL-it
            "Sell it!"
      b.   Vénda-lo**n**.
            sell-it.PL
            "Sell it!"

Harris and Halle (2005) make use of the existing mechanism of reduplication, allowing parts of reduplicated elements to be deleted in the output, which results in the surface appearance of metathesis.[19] If we wished to derive the stranding of the past tense *oon* in the presence of negation using this approach, we would want to treat it as morphological metathesis along the lines of the plural suffix in Italian. The elements that need to change their order with respect to one another are the past tense *oon* and the complex containing the complementizer and all clitics that are present in a given structure. While we can certainly come up with a formalism that successfully derives the stranding of *oon*, there are several arguments against this approach. First, one reason why such an analysis is convincing in Harris and Halle 2005 is that there is cross-dialectal variation in whether the plural suffix on the verb is omitted or not, giving evidence for reduplication, as in the example in (55). We see no such evidence in Wolof.

(55)   *Plural displacement in Spanish with reduplication*
      a.   Vénda**n**-lo.
            sell.PL-it
            "Sell it!"
      b.   Vénda**n**-lo**n**.
            sell.PL-it.PL
            "Sell it!"

Since rules such as this one are always a repair triggered by a constraint (Arregi and Nevins 2012, To appear), cross-dialectal variation in how the violation is repaired is expected. There is no such variation in Wolof – *oon* is always stranded when the verb with negation is in

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[19] Arregi and Nevins (2012) also claim that metathesis often corresponds to reduplication in closely related dialects in Basque.

C. The much bigger problem is that there is no obvious constraint that is violated in the input structure in Wolof. For instance, one may be tempted to say that the trigger is a constraint that says that *oon* must be final, but this is clearly wrong, as *oon* is suffixed to the verb in C, followed by C and all the clitics, in the absence of negation. It is also not clear that negation can be somehow made a trigger, since *oon* can directly follow negation when the verb is below C. For these reasons, I reject the possibility that the Wolof case can be explained as partial reduplication.

Turning now to alternative syntactic analyses, we could, for example, say that *oon* is a head in affirmative clauses, but a phrase in negative clauses, as Dunigan (1994) suggests. This would require Neg to take as a complement a TP that has *oon* as a head, and C a TP that has *oon* as a specifier. It is unclear to me how this information would be encoded, as those two TP-types should not be featurally distinct.

Alternatively, we could make the affixation of *oon* dependent on the syntactic context, and say that it suffixes onto the verb in the context of C, which would block affixation when NegP interferes between C and T. This is, of course, what the my analysis captures, but to encode it in syntax would be a stipulative, ad hoc solution amounting to being no more than a description of the data, with no explanatory power.

Another option is to say that movement of the verb differs in the two cases. This is proposed by Torrence (2003, 2005, 2012), who argues that some structures involve head movement of V, and others VP-remnant movement, allowing for *oon* to be skipped over. As this is the most developed alternative proposal for these data, I briefly review it here.[20] The relevant data are again given in (56), from Torrence (2003).
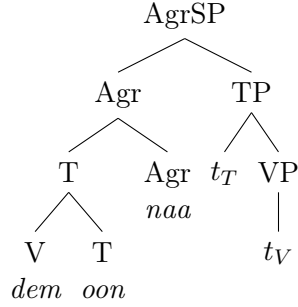
(56)   *The ordering of V,* negation *and* oon *in Torrence 2003*
    a.   Dem-oon-naa.
         go-PST-1SG
         "I had gone."
    b.   Dem-u-ma   woon.
         go-NEG-1SG PST
         "I had not gone."

Torrence treats *oon* as a head in T and explains the difference in the ordering of past tense, negation and the subject marker by proposing that different types of movement occur in different constructions: when *oon* is affixed onto the verb, head movement occurred, and when it is not, VP-remnant movement occurred. Affirmative clauses are straightforwardly derived via head movement, as in (57). If, however, the same derivation were involved when negation is present, it would yield the wrong morpheme order, as in the ungrammatical
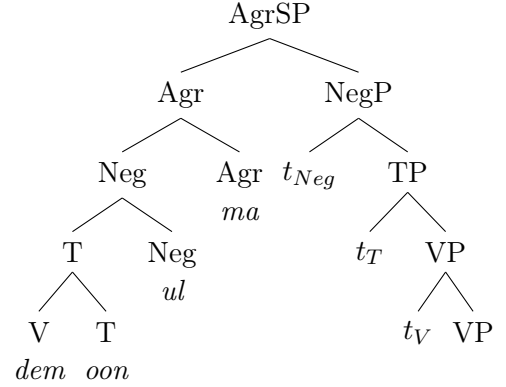
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[20]Torrence assumes a slightly different clause structure for Wolof than I do. For him, the sentence particle and the subject clitic together form subject agreement, so he additionally has to derive the different position of agreement morphology with respect to the verb and the past tense morpheme *oon*. Extensive evidence against considering subject markers to be agreement, and for a unified status of sentence particles as C-like elements is presented in Dunigan 1994 and Martinović 2015a. I keep Torrence's glosses to better illustrate his analysis.
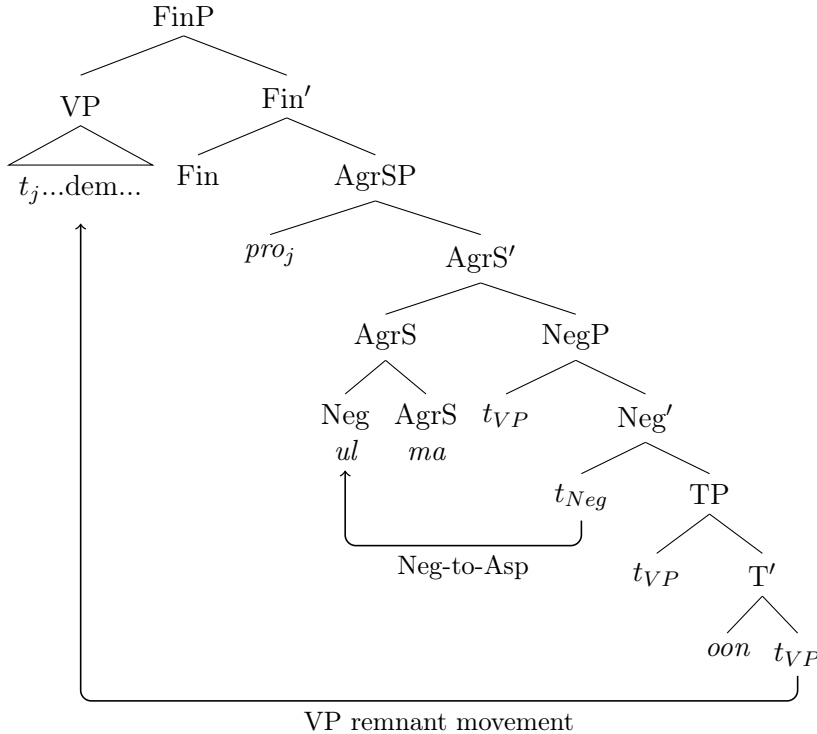
example in (58).

(57)

```
                    AgrSP
                   /     \
                 Agr      TP
                /   \    /  \
               T    Agr t_T  VP
              / \   naa      |
             V   T           t_V
            dem oon
```

(58) *

```
                         AgrSP
                        /     \
                      Agr      NegP
                     /   \    /    \
                   Neg   Agr t_Neg  TP
                  /  \   ma        /  \
                 T   Neg         t_T   VP
                / \   ul              /  \
               V   T                t_V  VP
              dem oon
```

In oder to derive (56b), the verb has to skip over past tense. Torrence handles this by employing remnant movement of the VP in such clauses, as in (59). This, however, still does not give us the correct order, since negation here follows the subject marker, and it needs to precede it. We must therefore additionally posit separate head-movement of negation to a position where it will precede the subject marker.[21]

(59)

```
                    FinP
                   /    \
                 VP      Fin'
                / \     /    \
        t_j...dem...  Fin    AgrSP
                            /     \
                         pro_j    AgrS'
                                 /     \
                              AgrS      NegP
                             /  \      /    \
                           Neg AgrS t_VP    Neg'
                           ul   ma         /    \
                                        t_Neg    TP
                                                /  \
                              Neg-to-Asp      t_VP  T'
                                                   /  \
                                                 oon  t_VP
                        VP remnant movement
```

In a purely derivational model of syntax, as is the one I advocate, there are several problematic steps in this derivation. First, when the VP is built and the higher head is merged

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(here T), the verb must be blocked from moving to it, something it does in all other clauses. This is necessary only when negation is present. In other words, in just this clause, in a derivational approach where clauses are built bottom up and operations apply as soon as they can, the verb must be blocked from moving up the clausal spine, because negation is eventually going to be merged above the TP. We need some sort of a look-ahead mechanism to implement this. We equally need to block VP-remnant movement in affirmative clauses. Wh-movement clauses are not addressed by Torrence at all, nor are other clauses in which the verb and the inflectional morphology stay below C. A head-movement analysis would predict that *oon* would be closer to the verb than *-ul* in such cases, so a VP-remnant movement analysis would probably need to be applied in all such clauses, irrespective of the presence or absence of negation.

Another problem in (59) from a derivational standpoint is that negation needs to head-move to AgrS, independent of the VP-remnant movement, to get the ordering of the morphemes right. If negation moves to AgrS first, it means that AgrS was successful in attracting the lower head, whereas the head that immediately dominates the VP, T, could not attract the verb. If head movement of negation takes place only after the derivation is complete, then we are looking at counter-cyclic movement.

It seems to me that an attempt to explain the puzzle exhibited by the past tense morpheme *oon* in Wolof by purely syntactic means is costly and endangers some of the assumptions on how syntax works. We can avoid that by assuming that affixation is a post-syntactic process, and that the interaction of syntax and post-syntax at phase boundaries proceeds in a way not standardly assumed. I believe this can be substantiated by phenomena strikingly similar to the one described in Wolof that we see in other languages, involving the ordering of clitics/clitic-like elements. I discuss several such cases in the following section.

2.5   Conclusion

In this section I offered an analysis of the puzzling behavior of the Wolof past tense morpheme *oon*, which is affixed onto the verb and raises with it to C in affirmative V-raising clauses, but stranded below C in the presence of negation. I here summarize the proposal.

First, the verb in V-raising clauses moves to C, and I proposed that this movement proceeds in a stepwise fashion, obeying the Head Movement Constraint. I capture this via a [V*] feature on each head in the functional spine. In the course of the derivation, there is a "pause" in head movement of the verb, when the phase head C is merged. This head has two duties: to check its own functional features (one of which is [V*]), and to trigger Spell-out of its complement. I proposed that C triggers Spell-out of its complement first, causing the aforementioned pause in the verb's movement, during which the past tense morpheme *oon* affixes onto the closest head that it c-commands via Lowering. If *oon* is in the highest projection in the Spell-out domain (TP), it Lowers onto the verb in T and is subsequently carried along with it to C. If there is another projection above TP, NegP, the verb will be in Neg at the moment of Spell-out, and Lowering of *oon* will not result in its affixation onto the verb. For the analysis to go through it is crucial that Spell-out happens at a particular point in the derivation, when a phase head is merged (for example, *oon* cannot lower as soon as it

is merged in Spec,TP, as the presence of negation would then not interfere with affixation). The difference between the two cases, one in which head movement feeds Lowering, and the other in which Lowering is bled by head movement to a higher position, are distinguished by the final step in the derivation – the movement of the verb to C. In the former case, the past tense morpheme *oon* raises with the verb to C, while in the latter case it is stranded below C.

3 Northern Italian, Slavic, and Classical Hebrew

The behavior of Wolof past tense is a good argument in favor of the proposal that Spell-out of a phase can precede syntactic movement out of that phase, because it shows two types of interactions between syntax and postsyntax. On the one hand, a postsyntactic operation feeds a subsequent syntactic operation, and this is where we can observe on the surface that morphological processes have occurred before syntactic processes. On the other hand, a postsyntactic process in a phase can also be bled if a syntactic operation *within* that phase destroyed the structural conditions for its application. In that case, we do not overtly see anything that would point to the fact that a postsyntactic process occurred before a syntactic one. The Wolof case is so special because one and the same elements are involved in both the feeding and the bleeding relationship between syntax and postsyntax. The analysis advocated here allows us to explain this violation of the Mirror Principle in a principled way, but it emerges only if we carefully examine both types of interaction, side by side.

There are cases, however, where a particular pattern in a language shows one of the two interactions, the feeding one, but there are still strong arguments to propose a derivation in which a morphological operation precedes subsequent syntactic operations. In this section I briefly discuss Calabrese and Pescarini's (2014) analysis of object cliticization in Northern Italian Friulian dialect, in which they specifically suggest that object cliticization is a morphological process which must occur before further syntactic movement. This case is important for the analysis advocated here, because it involves elements that are phonologically clitics, so to claim that cliticization occurs at PF is not controversial.

Finally in this section, I discuss a well established analysis of the order of person agreement with respect to the verb in Arabic and Hebrew, the PersonP Hypothesis proposed by Shlonsky (1989). Harbour (2007) presents data from Classical Hebrew which seem to challenge it, but I show that the analysis proposed here helps us understand the controversial pattern and preserves the otherwise well established PersonP Hypothesis. This final section illustrates some of the types of phenomena we should look for to test the claims presented in this paper.

3.1 Calabrese & Pescarini (2014)

Calabrese and Pescarini (2014) (henceforth C&P) directly propose that syntactic and postsyntactic processes can be interleaved. They discuss the position of subject and object clitics in the Northern Italian Friulian dialect of Forni di Sotto, where object clitics (OCL; bold

face) are pied-piped by the verb to C in interrogative clauses, skipping over the subject clitic (SCL; underlined), in contrast to declarative clauses, in which SCL precedes OCL and the verb, as illustrated in (60). Both OCL and SCL move to a position above T in the syntax. Since there is evidence that both OCL and SCL are cliticized, movement of the verb over SCL must interrupt the two cliticization processes.

(60)   *Subject and object clitics in Friulian*
  a.   <u>Ai</u>=   **la**=   mange.
        SCL.3PL= OCL.F= eat.3PL
        "They eat it."
  b.   **La**=   mangi   =<u>ai</u>?
        OCL.F= eat.3PL =SCL.3PL
        "Do they eat it?"'

C&P call this cliticization m-merger. Seeing how it also involves an element in a structurally higher position merging with the head below it, following Embick and Noyer (2001), this would also be an instance of Lowering. The difference is that the lowered element here becomes a prefix, whereas the cases discussed in Embick and Noyer 2001, and the Wolof *oon*, involve instances of suffixation.

The evidence that m-merger of OCL precedes syntactic processes in a higher domain comes from interrogative clauses as in (60b). Since in questions the verb inverts with the subject, by hypothesis via T-to-C movement, and in doing so pied-pipes OCL, skipping over SCL, the m-merger of OCL must precede the movement of T to C.[22] This is taken as an argument that the two morphological processes must be interrupted by syntactic head movement.

C&P note that another phenomenon readily lends itself to the same analysis: the *Extraordinary Left Branch Extraction* (E-LBE) in Slavic. In some Slavic languages, where Left Branch Extraction is possible, the preposition can also be extracted with the LBE-element with which it, crucially, does not form a syntactic constituent. A common approach to LBE is a remnant movement analysis (e.g. Franks and Progovac 1994). Bošković (2005) argues against this, since the first step of remnant movement, the scrambling of the nominal to the left out of the PP, is not independently possible. The alternative to Remnant Movement is to allow postsyntactic cliticization of the preposition to precede movement of the preposition and the adjective. Evidence that this analysis is on the right track comes from Russian and is given in Radkevich (2010). Interestingly, it seems that in this language only clitic-like prepositions can be extracted in E-LBE; examples with "big" prepositions, as in (61), are degraded.

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[22]Evidence that SCL cliticizes onto the verb in questions comes from the fact that subject clitics are expressed by different exponents depending on whether they are proclitics or enclitics, which cannot be explained via phonological processes, but seems to be a case of suppletion. This requires Vocabulary Insertion to take place after verb movement and m-merger of the subject clitic, since suppletion is argued to require linear (Embick 2010) or structural (Adger et al. 2003; Bobaljik 2012) adjacency.

(61) <u>*E-LBE not possible with non-clitic prepositions*</u> (Radkevich 2010, 146-147)

    a.   Ivan vylez   [$_{PP}$ iz-pod   novoj mašyny].
        Ivan got.out [$_{PP}$ from-under new   car]
        "Ivan got out from under a new car."

    b. ??Iz-pod   novoj Ivan vylez   [$_{PP}$ *t* mašyny]
        from-under new   Ivan got.out [$_{PP}$ *t* car]

    c.???Iz-pod   mašyny Ivan vylez   [$_{PP}$ novoj *t*]
        from-under car   Ivan got.out [$_{PP}$ new   *t*]

The fact that only "small" prepositions, which form a prosodic unit with the following noun or adjective, can be part of the LBE-element strongly suggests that their cliticization onto the element in question is a PF process. It is also additional evidence against the Remnant Movement analysis, as that should not be affected by the type of preposition.

    The E-LBE phenomenon in Slavic can thus receive an analysis identical to the one for object cliticization in Friulian, as noted by C&P – the preposition m-merges with the following head, feeding subsequent Left Branch Extraction.

3.2   PersonP in Classical Hebrew

In this subsection I show how the analysis of postsyntactic merger feeding head movement can also explain some interesting data from Classical Hebrew, having to do with the order of person agreement with respect to the verb. The PersonP hypothesis states that the person feature heads its own projection, independent of other φ-features. Shlonsky (1989) proposes this based on agreement patterns in Arabic and Hebrew, where in some cases the verb agrees with the subject in person, gender and number, and in other cases only in gender and number. The following examples are from Hebrew, in which the tensed verb forms fully agree with the subject, shown in (62) appearing as a prefix on the verb, and the present participal (*benoni*) is inflected only for gender and number, showing up as a suffix in (63).

(62)   <u>*Subject-verb agreement in Hebrew future tense*</u> (Shlonsky 1989, p.4)
        Ata ti-šmor   ?al ha-xacilim.
        you 2.M.SG-guard on the-eggplants
        "You will guard the eggplants."

(63)   <u>*Subject-verb agreement in*</u> benoni (Shlonsky 1989, p.5)
        Ata šomer   ?al ha-xacilim.
        you guard.M.SG on the-eggplants
        "You guard/are guarding the eggplants."

Shlonsky (1989) therefore proposes that each feature leads its own projection, and that their hierarchy is Person > Number > Gender, based on the cross-linguistic generalization that, if a verb is inflected for number, it is also inflected for gender, and if it is inflected for person, it is also inflected for number. Additionally, Shlonsky argues that Tense interferes between PersonP and the two other projections, illustrated in (64)

(64)   [$_{PersonP}$ Person [$_{TP}$ T [$_{NumberP}$ Number [$_{GenderP}$ Gender [$_{VP}$]]]]]

This proposal is based on the fact that the *benoni* does not agree in person. The *benoni*, which can be interpreted as a present tense form, a participle, or a gerundive complement of a perception verb, is argued to have no specification for Tense, which blocks the verb from raising to T, and therefore makes it impossible for it to raise on to Person (due to the Head Movement Constraint). This results in the lack of person agreement.

Additional support for the structure in (64) comes from the difference in the position of the person feature in perfective and imperfective forms. In perfective verbal forms, all φ-features are a suffix on the verb, as in (65). In imperfective forms, they are split into a person prefix, and a gender+number suffix, shown in (66). The following examples are from Harbour (2007), p.223, who cites Halle (1997), p.432.

(65)   *Suffixed Pers+Num+Gen*
        Zraaq-**tem**.
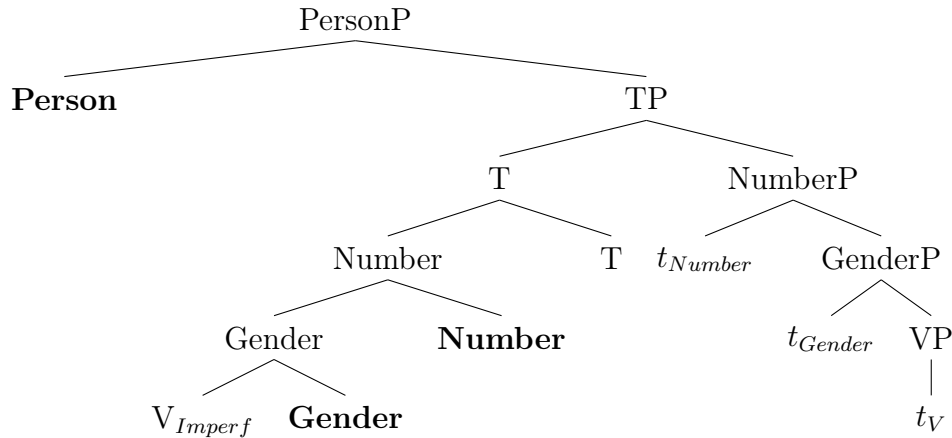   throw.PFV-2.M.PL
        "You all threw."

(66)   *Prefixed Pers, suffixed Num+Gen*
        Ti-zrq-**uu**.
        2-throw.IPFV-M.PL
        "You all will throw."

Nevins (2002) explains the position of agreement morphology with respect to the verb in imperfectives and perfectives in Classical Hebrew along similar lines. The perfective verb raises all the way to Person, resulting in person, number, and gender morphology being suffixal. The imperfective verb, however, raises only to T. Number and gender are therefore suffixal, but person, which remains higher than the verb, is then necessarily a prefix. This is illustrated in (67) and (68).

(67)   *Perfective verbs in Classical Hebrew raise to Person*

(68)   *Imperfective verbs in Classical Hebrew raise to T*

```
                              PersonP
                  _____
              Person                        TP
                                    _____
                                   T               NumberP
                              _____      _____
                          Number        T   t_Number      GenderP
                       _____                      _____
                   Gender    Number                 t_Gender    VP
                  _____                                        |
             V_Imperf  Gender                                    t_V
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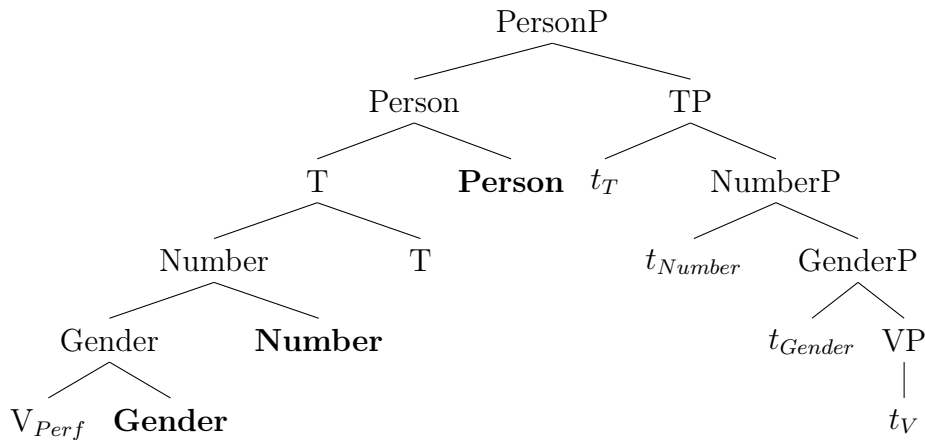
Presumably, the prefixation of Person to the verb in T occurs during Spell-out, via a process of m-merger. I will here assume that it is Lowering, just as in the case of the cliticization of the preposition in E-LBE in Slavic and object cliticization in Friulian.

At this point, my proposal, that Spell-out of the complement of a phase head occurs before further verb movement to that head, and the traditional view that it occurs after, make different predictions for structures in which the verb would continue raising to a position in the C-domain. My analysis predicts that Person would remain a prefix in such constructions as well. The traditional analysis would predict it to be a suffix, just as in perfectives. Luckily, there are exactly such structures, and the predictions of the proposal advocated in this paper are born out. Harbour (2007) examines verb emphasis in Classical Hebrew, a structure which contains a fully inflected verb, and a partial copy of the same verb. The order of the two in regular sentences is *copy* **verb**. An example of verb emphasis (from Harbour 2007, p.225) is given in (69). The inflected verb is in bold face, and the copied verb in italic.

(69)   *Verb emphasis in Classical Hebrew*
        uu-b̲aḥuur-iim   *kaašool* yi-**kkaašeel**-uu
        and-young.man-PL fall   3-fall.IPFV-PL
        "And the young men shall utterly fall." (Isa.40:30)

Harbour adopts the decomposition of the C-domain as in Rizzi (1997), and positions the copy of the inflected verb in Spec,FinP, as this construction is restricted to finite clauses, and topics and foci precede the copy.

(70)   *Verb emphasis in Classical Hebrew*
        [_FinP *Copy* [_TP Verb]]

The order of the verb and the copy is inverted in several constructions: narrative forms, interrogatives, imperatives and injunctives. Most of these are structures in which cross-linguistically the verb is believed to move to the C-domain, which also explains the inversion.

(71) shows this in a narrative form and a *wh*-question (from Harbour 2007, p.229 & 232).

(71)   *Verb emphasis in a narrative form and a* wh-*question*

    a.   way-y-**baarek**   *baaroḵ* ’et-ḵem
          and.ASP-3-bless.IPFV bless   ACC-2.M.PL
          "Therefore he blessed you still." (Josh. 24:10)

    b.   uu-mahy-y-**ooḵiiḥ**   *hooḵeeḥ* mikkem
          and-what-3-reprove-IPFV reprove from.2.M.PL
          "But what doth your arguing reprove?" (Job 6:25)

Harbour proposes that the inflected verb raises to Force in the narrative forms, and to Focus in *wh*-questions. The structure of a *wh*-question would be as in (72).

(72)   *Verb emphasis in* wh-*questions*
     [$_{FocP}$ Wh-word Verb [$_{FinP}$ *Copy* [$_{TP}$ . . .]]]

    Harbour shows that Classical Hebrew is in relevant respects identical to Modern Hebrew, and thus the prediction is that it should also have a PersonP. He, however, argues against this, since in the cases when the verb raises to the C-domain, person is still prefixed onto it, as can be seen in the examples in (71). The reasoning is that, if the verb raises above Person, it would pass through it and the person feature would be suffixed onto the verb, just as it is in perfective structures, in which the verb raises to Person.

    It is immediately obvious how the PersonP hypothesis can be rescued under the analysis proposed in this paper. If the phase containing PersonP and the verb is spelled out before the verb moves to C, person will always be prefixed onto the verb. Consider the derivation of a narrative clause with verb emphasis in (73).

(73)   *Narrative clause with verb emphasis*
    way-ye-**’šm**-uu   *’aašoom*
    and.ASP-3-offend.IPFV-PL offend
    "And [they] have greatly offended." (Ezek. 25:12)

The imperfective verb raises to T, picking up Number along the way. I assume here that Fin is the head that triggers Spell-out of PersonP at the moment of its merger, when Person lowers to T. Then the copy of the verb is merged in Spec,FinP.

(74)
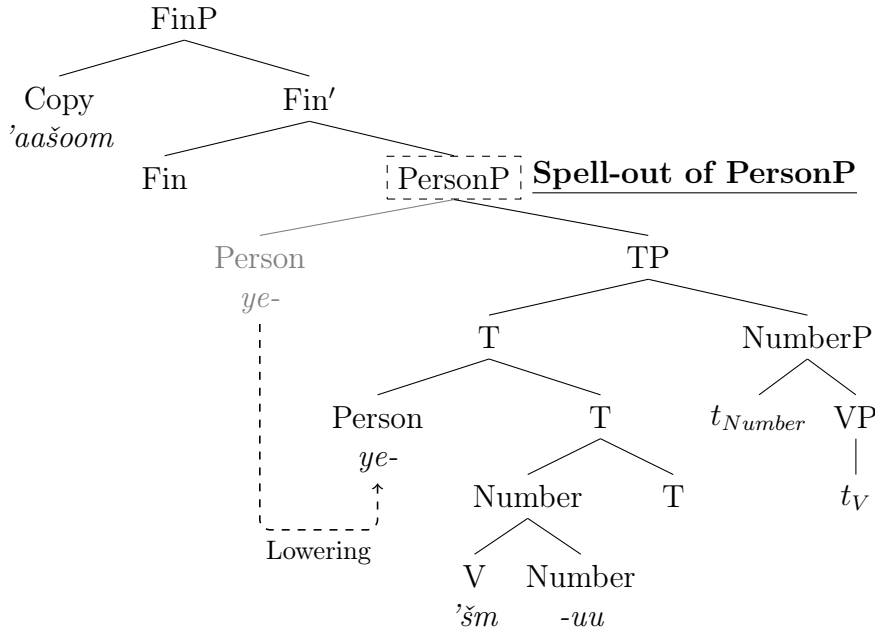
The verb will presumably also move to Fin in narrative verb emphasis structures in which it has to continue to Force. The crucial thing here is that the prefixed person, having lowered onto T, moves together with the verb. This readily explains why person is always prefixed onto the imperfective form and allows us to maintain the PersonP hypothesis, which is otherwise well motivated for Semitic languages.

Furthermore, as we have observed in Wolof, it is crucial for Lowering not to apply as soon as possible, i.e. at the moment of the merger of Person into the derivation, or it would result in person agreement always being prefixal, regardless of the final position of the verb. Give that this is not the case, Lowering must only apply after the verb has reached its final position in the Spell-out domain.

In this section we saw several phenomena which can reasonably be argued to involve postsyntactic cliticization/affixation inside a domain that is later involved in further syntactic computation. I have shown how this analysis can help us understand a puzzle from Hebrew agreement which appears to challenge the well-motivated PersonP Hypothesis, illustrating the type of interactions we need to be looking at in order to further test this proposal.

4   Conclusion

This article challenges the standard view in which all syntactic processes apply to a particular domain before all PF processes, by advocating that syntax and postsyntax are interleaved in such a way that at least some postsyntactic operations can be applied to a particular domain, which can then be fed back into syntax, with syntactic operations targeting elements in the (partially) spelled out domain. The postsyntactic operations crucially must apply at specific points in the derivation. I have argued this to be the moment of the merger of a phase head, which means that the operations under investigation cannot be equivalent to narrowly

syntactic processes such as Merge or Move.

I focused on one type of operation in this paper, postsyntactic affixation/cliticization via m-merger (specifically, Lowering), by looking at functional elements which occur in different positions with respect to the verb depending on the verb's structural position at the moment of the merger of a phase head. I have shown that, by allowing Lowering of a functional element onto the verb to precede movement of the verb out of the Spell-out domain, we can explain puzzling data in which syntactic movement and postsyntactic affixation feed or bleed each other.

The next step in this line of research is to investigate which postsyntactic processes can occur during this stage of Spell-out, and which cannot. Under the view that postsyntactic operations are ordered (Embick and Noyer 2001; Arregi and Nevins 2012), we may expect that only those processes which occur before Linearization and Vocabulary Insertion can feed further syntactic processes, as syntax should only be able operate on domains that maintain syntactic structure. We therefore may look for evidence that Impoverishment feeds or bleeds a syntactic process (as I already argued in Martinović 2017b), but that Local Dislocation does not.

In a more general sense, the type of interaction of syntax and postsyntax advocated here gets at a more fundamental question of derivational versus representational theories of syntax. If the proposal I argue for is on the right track, it predicts that we should find opacities that we can only explain in a derivational model. Imagine, for example, that some postsyntactic process, such as Impoverishment, is triggered in a particular Spell-out domain by syntactic adjacency of two elements. Suppose next that one of those elements subsequently syntactically moves to a higher domain. This should result in a case in which we would see a morphological or a phonological change, but not the environment for it (i.e. counterbleeding opacity). A promising potential example of such a process is found again in Wolof, and is termed in Sy (2005) *ultra-long-distance ATR agreement* – vowel harmony that appears to hold between elements that have been separated via syntactic movement. If the analysis of syntax/postsyntax interleaving proves to be applicable to such examples, if would give further evidence (in addition to Bresnan 1972 and Travis et al. In press) that even some processes traditionally thought to be phonological can apply to a domain that syntax can later still access.

Finally, this paper adds to the research that explores the mapping between syntax and morphology and identifies another point of their interaction which can lead to departures from a direct reflection of syntax in morphology, while maintaining the uniformity of syntax.

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