

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

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*Abstract.* This paper explores the claim that a particular domain—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 various examples in which a morphological (i.e. postsyntactic) process feeds a later narrow syntactic one. Main evidence for this argument 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 way around (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). Another option is 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 has been proposed by Calabrese and Pescarini (2014) to account for the ordering of subject and object clitics and the verb

in a Northern Italian dialect, and is implied in Radkevich (2010) to explain non-constituent movement in Extraordinary Left Branch Extraction (Bošković 2005) in Slavic. Much earlier, Bresnan (1972) has argued that some phonological processes, specifically stress assignment, occur within syntax. She discusses the interaction of sentence stress and syntactic movement, showing 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. If this is correct, it would suggest that even phonological operations can apply to a spelled-out 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 is the case in cliticization in Northern Italian and Extraordinary Left Branch Extraction in Slavic, 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, it is the only element suffixed onto the verb, and *oon* is stranded below C.

- (1) *oon is suffixed to the verb in C*<sup>1</sup>  
 Xale yi      lekk-**oon**-na=ñu      jën.  
 child the.PL eat-PST-C=SCL.3PL fish  
*"The children had eaten fish."*

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<sup>1</sup>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<sup>2</sup>*  
 Xale yi      lekk-**u**(**l**)-∅=ñu      **woon** jën.  
 child the.PL eat-NEG-C=SCL.3PL PST    fish  
*"The children hadn't eaten 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; if it is higher (as I shall argue is the case in the presence of negation), it does not. 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.<sup>3</sup> 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 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. These two options are summarized in Table 1.

The purpose of this paper is to give morphological evidence for the existence of the ordering in the very right column in Table 1 (postsyntax > syntax), and to argue that this view of the syntax-postsyntax interaction at phase boundaries is superior to proposals which complicate a particular process, by splitting it between syntax and postsyntax, and to proposals which move a process traditionally considered to be either syntactic or postsyntactic into the

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<sup>2</sup>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.

<sup>3</sup>I use the terms Spell-out and postsyntax interchangeably, to refer to a set of operations that can occur in the morphological component to affect the structure and featural composition of terminal nodes. 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 concerns Linearization, processes that may happen after that (e.g. Local Dislocation according to Embick and Noyer (2001), and Enclitic Metathesis and Doubling in Basque according to Arregi and Nevins (2012)), Vocabulary Insertion, and phonological processes. 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.

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

Table 1: Possible orderings of syntactic subcomponents

non-conventional module. 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 two operations triggered by phase heads.

The paper is organized as follows. In section 2 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 these examples show only the feeding relation between post-syntactic merger and head-movement. The main part of the paper is section 3, which explores the affixation of the past tense morpheme in Wolof in detail, and shows that the prediction of the analysis to also encounter examples of postsyntactic operations being bled, leading to opacity effects, is correct. Section 4 concludes.

## 2 Postsyntactic m-merger feeds head movement

In this section, I discuss three examples in which a postsyntactic process feeds a subsequent syntactic one. The first one is 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, in certain configurations, must occur before further syntactic movement. The second is Extraordinary Left Branch Extraction in Slavic, in which a non-constituent containing a preposition and a head is extracted, discussed as cliticization in Radkevich 2010. The third example is a new analysis of person feature prefixation in Classical Hebrew, which Harbour (2007) presents as an argument against the PersonP Hypothesis. I show how my analysis can easily account for his data and rescue the PersonP Hypothesis.

### 2.1 Object cliticization in Northern Italian

Calabrese and Pescarini (2014) (henceforth C&P) directly propose that syntactic and post-syntactic 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 (3). Since there is evidence that both OCL and SCL are cliticized,

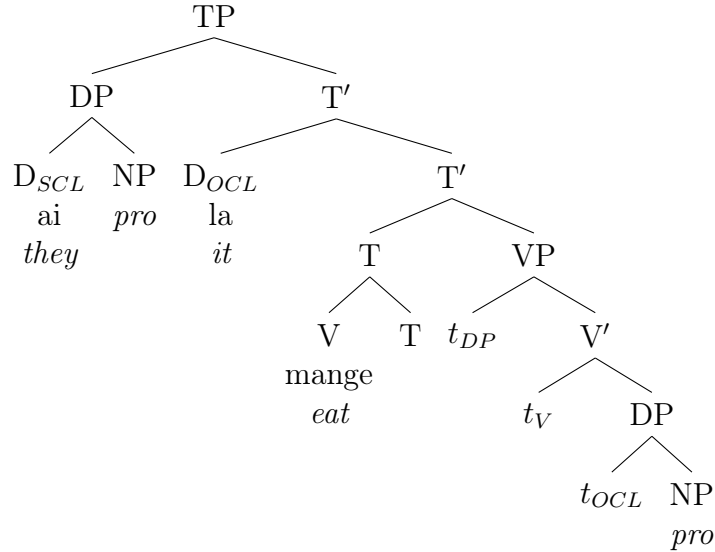
movement of the verb over SCL must interrupt the two cliticization processes.

(3) Subject and object clitics in Friulian

- a. Ai=        **la**=        mange.  
       SCL.3PL= OCL.F= eat.3PL  
       *"They eat it."*
- b. **La**=        mangi    =ai?  
       OCL.F= eat.3PL =SCL.3PL  
       *"Do they eat it?"*

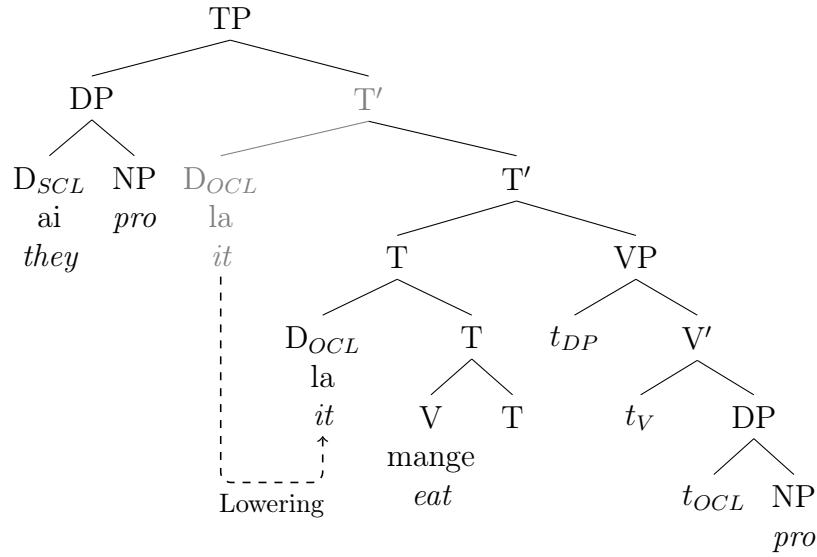
C&P's analysis of the difference between (3a) and (3b) proceeds in the following manner. In a declarative clause, as in (3a), the verb head-moves to T, and OCL also moves to adjoin to T.<sup>4</sup> SCL on the other hand moves together with its big-DP to Spec,TP. This is represented in (4a). Then, the OCL m-merges with T, as in (4b). I represent this merger as Lowering.

(4) a.



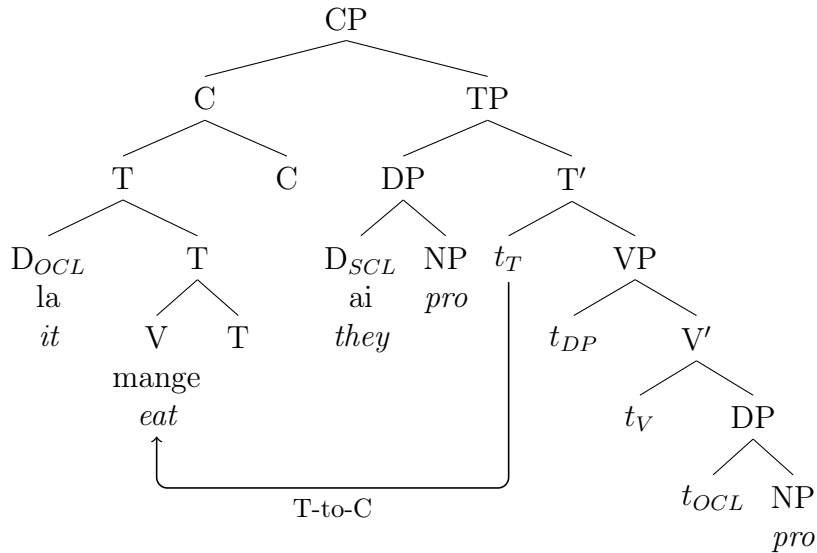
<sup>4</sup>C&P assume a *big-DP* analysis of clitics, where the clitic is the head of a DP, generated in an argument position. D takes a *pro* NP as a complement and, in case of clitic doubling, the double DP as its specifier.

b.



The evidence that the m-merger of OCL precedes syntactic processes in a higher domain comes from interrogative clauses. 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 T-to-C movement. This means that the first two steps in the derivation of a yes-no question in (3b) are equivalent to the first two steps in the derivation of a declarative clause. After the postsyntactic process of m-merger of OCL and the verb (shown in (4b)), however, a syntactic process takes place – movement of the OCL-V complex to C, as in (5).

(5)



The final step in the derivation is the m-merger of SCL with the preceding OCL=V complex, which it now follows. For C&P, evidence that SCL m-merges with the verb in this case as well 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. This is taken as an argument that the two morphological processes must be interrupted by syntactic head movement. This raises the question of why both OCL and SCL do not immediately m-merge with the verb, but seem to do so at different points in the derivation. If C&P’s analysis is correct, it would mean that OCL cliticization and SCL cliticization are two different postsyntactic processes, occurring at different times in the derivation. The TP is first partly spelled out, during which OCL m-merger happens. Then further syntactic processes take place, including T-to-C movement. Then, there is another Spell-out cycle, during which later postsyntactic processes occur, SCL cliticization amongst them. Such interleaving seems fairly complex, and further research is required to determine the properties of processes that can apply early during Spell-out and be followed by syntactic operations, and those that follow all of narrow syntax.

## 2.2 Non-constituent movement

Another phenomenon that readily lends itself to the same analysis, also noted by C&P, is the *Extraordinary Left Branch Extraction* (E-LBE), discussed in Bošković (2005) and analyzed as cliticization in Radkevich (2010), though not directly as an example of syntax/post-syntax interleaving. 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. Examples from Serbo-Croatian are given in (6):<sup>5</sup>

(6) *Extraordinary Left Branch Extraction in Serbo-Croatian*

- a. Uđoše                    [PP u    veliku sobu].  
     enter.AOR.3PL [PP into big    room].  
     “*They entered the big room.*”
- b. U    veliku uđoše                    [PP t sobu].  
     into big    enter.AOR.3PL [PP t room].  
     “*They entered the big room.*”

A common approach to LBE, seemingly supported by these data, is a remnant movement analysis (e.g. Franks and Progovac 1994) along the following lines. The element left behind by LBE first moves out of the PP, either scrambling to some position on the left, as in (7a), or undergoing rightward movement and adjoining to the top of the clause, shown in (7b). This is then followed by the movement of the remnant PP to the front of the clause.

(7) *Extraordinary Left Branch Extraction as Remnant Movement*

- a. [PP U    veliku t<sub>i</sub> ] uđoše                    sobu<sub>i</sub> t<sub>PP</sub>.  
     [PP into big    t<sub>i</sub> ] enter.AOR.3PL room<sub>i</sub> t<sub>PP</sub>

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<sup>5</sup>The judgments here are my own, for the variety of SC which I am a native speaker of.

- b.  $\begin{bmatrix}_{PP} \text{U} & \text{veliku } t_i \end{bmatrix} \text{ uđoše} & t_{PP} \text{ sobu}_i.$   
 $\begin{bmatrix}_{PP} \text{into big} & t_i \end{bmatrix} \text{ enter.AOR.3PL } t_{PP} \text{ room}_i$

The pied-piping of the preposition with the extracted element comes for free in a Remnant Movement analysis. There is, however, a strong argument against this approach, concerning the first step, one that necessarily precedes the movement of the remnant, given in Bošković (2005). If scrambling of the nominal to the left out of the PP were possible, one would expect the outcome of this step to be grammatical without the movement of the remnant. (8) shows that this is not the case.

- (8) Scrambling of an NP out of a PP is not possible in SC  
 $\begin{array}{l} * \text{Uđoše} & \text{sobu}_i & \begin{bmatrix}_{PP} \text{u} & \text{veliku } t_i \end{bmatrix}. \\ \text{enter.AOR.3PL room}_i & \begin{bmatrix}_{PP} \text{into big} & t_i \end{bmatrix} \end{array}$

In order to maintain the remnant movement analysis, one would have to make additional stipulations which tie the fronting of the PP to the scrambling of the NP, making the scrambling obligatory if the PP is to be fronted, and also only allowed in this case. It is unclear to me how such a connection can be made without a serious look-ahead mechanism.

The rightward movement analysis does not fare much better. As Bošković (2005) notes, if the NP *sobu* right adjoins to the TP/IP, we would expect it to always follow adjuncts, which it does not, as shown in (9).

- (9) Rightward movement is not involved in LBE in SC  
a.  $\begin{array}{l} \text{U} & \text{veliku} & \text{uđoše} & & \text{sobu} & \text{prije} & \text{pola sata.} \\ \text{into big} & & \text{enter.AOR.3PL} & \text{room} & \text{before half} & \text{hour} \\ & & & & \text{“They entered the big room half an hour ago.”} \end{array}$   
b.  $\begin{array}{l} * \text{U} & \text{veliku} & \text{uđoše} & & \text{prije} & \text{pola sata} & \text{sobu.} \\ \text{into big} & & \text{enter.AOR.3PL} & \text{before half} & \text{hour} & \text{room} \end{array}$

Another argument for the postsyntactic m-merger analysis of P and the extracted element 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 (10), are degraded.

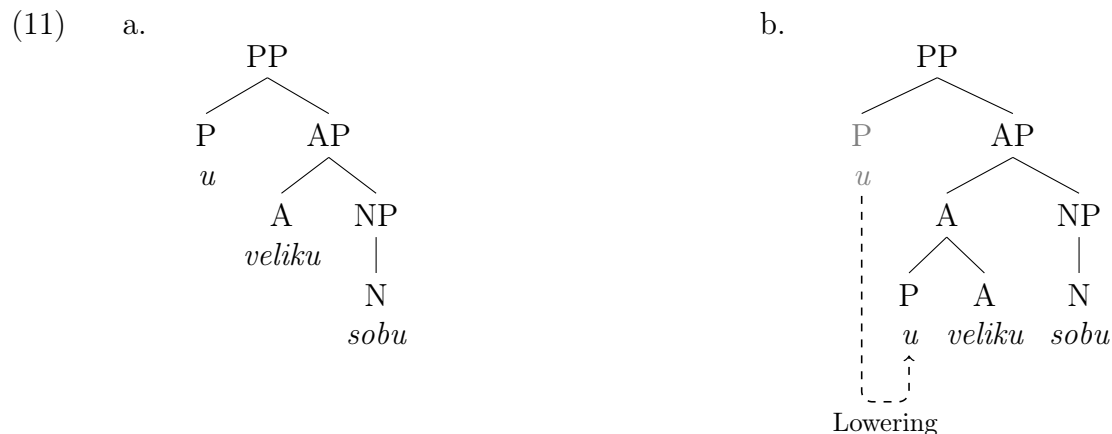
- (10) E-LBE not possible with non-clitic prepositions (Radkevich 2010, 146-147)  
a.  $\begin{array}{l} \text{Ivan vylez} & \begin{bmatrix}_{PP} \text{iz-pod} & \text{novoj mašyny} \end{bmatrix}. \\ \text{Ivan got.out} & \begin{bmatrix}_{PP} \text{from-under new} & \text{car} \end{bmatrix} \\ & \text{“Ivan got out from under a new car.”} \end{array}$   
b.  $\begin{array}{l} ?? \text{Iz-pod} & \text{novoj Ivan vylez} & \begin{bmatrix}_{PP} t & \text{mašyny} \end{bmatrix} \\ & \text{from-under new} & \text{Ivan got.out} & \begin{bmatrix}_{PP} t & \text{car} \end{bmatrix} \end{array}$   
c.  $\begin{array}{l} ??? \text{Iz-pod} & \text{mašyny Ivan vylez} & \begin{bmatrix}_{PP} \text{novoj} & t \end{bmatrix} \\ & \text{from-under car} & \text{Ivan got.out} & \begin{bmatrix}_{PP} \text{new} & t \end{bmatrix} \end{array}$

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 morphological process that happens before they undergo LBE



(also noted by Calabrese and Pescarini (2014)). It also speaks against a possible alternative analysis in which E-LBE is actually remnant movement, where first the element that is not fronted to the very beginning undergoes scrambling, and then the whole PP-remnant moves, as this should not be affected by the type of preposition.<sup>6</sup>

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.<sup>7</sup>



## 2.3 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  $\varphi$ -features. Shlonsky (1989) proposed 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 (12) appearing as a prefix on the verb, and the present participial (*benoni*) is inflected only for gender and number, showing up as a suffix in (13).

- (12) Subject-verb agreement in Hebrew future tense (Shlonsky 1989, p.4)  
 Ata ti-šmor            ?al ha-xacilim.  
 you 2.M.SG-guard on the-eggplants  
 “You will guard the eggplants.”

<sup>6</sup>In my dialect of SC, it is my intuition that preposition type does not play a role in the acceptability of E-LBE, but it seems that certain SC dialects behave just as Russian (Bobaljik, p.c.).

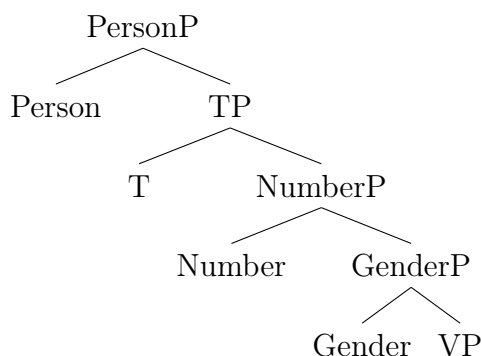
<sup>7</sup>Another interesting application of m-merger preceding syntactic movement can be used to solve a problem in Collins’ (2005) smuggling approach to English passives. I will not discuss the details of the analysis, but only point out one unsolved problem. Collins (2005) suggests that the preposition *by* in the by-phrase is not the head of a PP, but the head of the VoiceP, which takes *v*P as its complement, where the external argument DP is merged. An immediate problem is that the entire by-phrase can be *wh*-moved (“*By whom was the car fixed?*”), which Collins acknowledges but does not explain. This can easily be handled by the same analysis as for E-LBE – *by* m-merges with the DP before subsequent *wh*-movement.

- (13) Subject-verb agreement in benoni (Shlonsky 1989, p.5)

Ata šomer            ʔal 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 (14), 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.

- (14)



Additional support for the structure in (14) comes from the difference in the position of the person feature in perfective and imperfective forms. In perfective verbal forms, all  $\phi$ -features are a suffix on the verb, as in (15). In imperfective forms, they are split into a person prefix, and a gender+number suffix, shown in (16). The following examples are from Harbour (2007), p.223, who cites Halle (1997), p.432.

- (15) Person+number+gender are a suffix on perfective verbs

Zraaq-**tem**.  
 throw.PFV-2.M.PL  
*“You all threw.”*

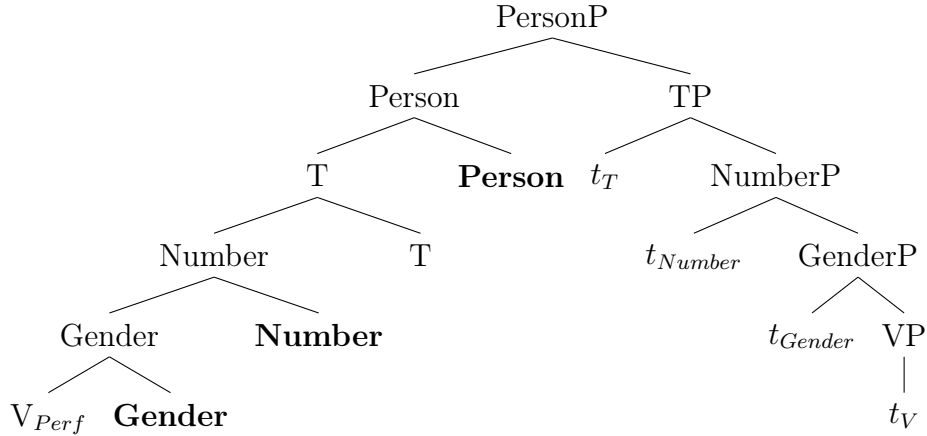
- (16) Person is a prefix, number+gender are a suffix on imperfective verbs

**Ti**-zrq-uu.  
 2-throw.IPFV-M.PL  
*“You all will throw.”*

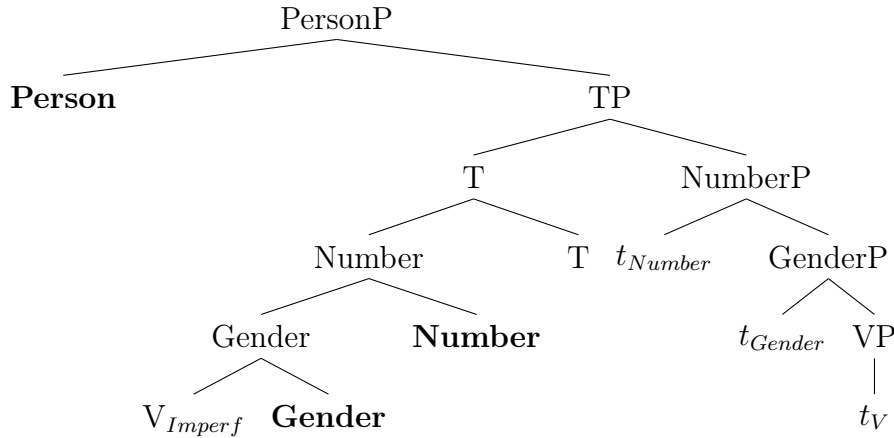
Nevins (2002) explains the position of agreement morphology with respect to the verb in imperfectives and perfectives in Classical Hebrew along similar lines. The perfective verb

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 (17) and (18).

(17) Perfective verbs in Classical Hebrew raise to Person



(18) Imperfective verbs in Classical Hebrew raise to T



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.

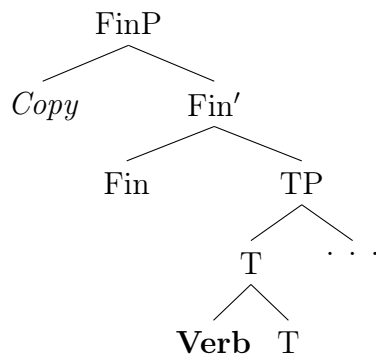
At this point, my proposal, that Spell-out of the complement of a phase head occurs before further verb movement to that head, and the traditional view that it occurs after, make different predictions for structures in which the verb would continue raising to a position in the C-domain. My analysis predicts 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 (19). The inflected verb is in bold face, and the copied verb in italic.

- (19) Verb emphasis in Classical Hebrew  
 uu-baḥuur-iim      kaašool yi-**k**kaašeel-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.

- (20) Verb emphasis in Classical Hebrew



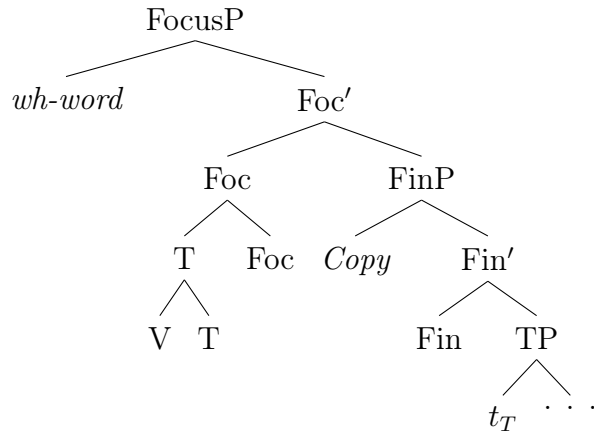
The order of the verb and the copy is inverted in several constructions: narrative forms, interrogatives, imperatives and injunctives. Most of these are structures in which cross-linguistically the verb is believed to move to the C-domain, which also explains the inversion. (21) shows this in a narrative form and a *wh*-question (from Harbour 2007, p.229 & 232).

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

- a. way-y-baarek      baarook 'et-kem  
 and.ASP-3-bless.IPFV bless      ACC-2.M.PL  
*“Therefore he blessed you still.”* (Josh. 24:10)
- b. uu-mahy-y-**ook**iīḥ      hookeeḥ 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 (22).

(22) Verb emphasis in wh-questions



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. Harbour 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 (21). 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.

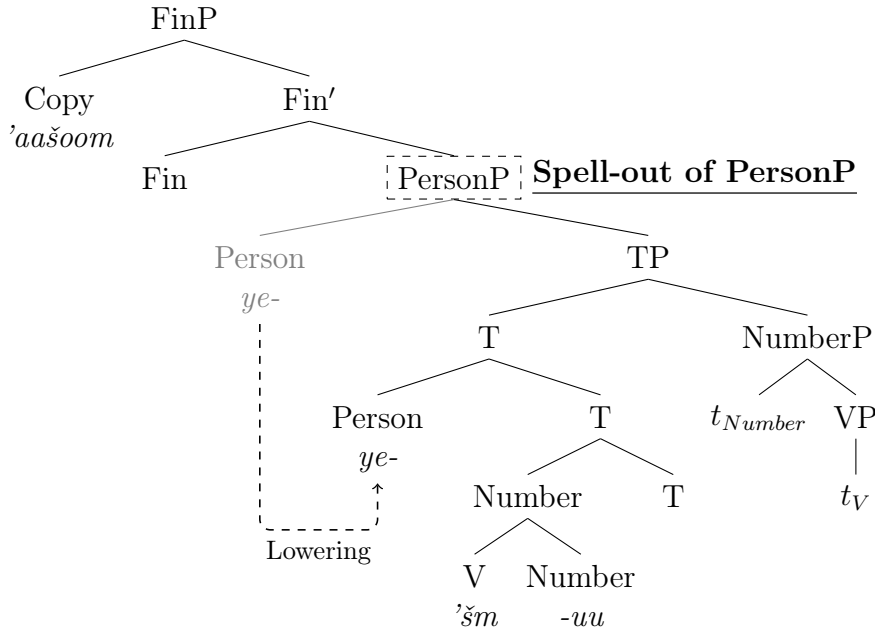
It is immediately obvious how the PersonP hypothesis can be rescued under the analysis proposed in this paper. If the phase containing PersonP and the verb is spelled out before the verb moves to C, person will always be prefixed onto the verb. Consider the derivation of a narrative clause with verb emphasis in (23).

(23) 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.

(24)



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, it is crucial for the 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. In all these cases, m-merger occurred in a particular syntactic configuration – specifically, the clitic/affix is in a structurally higher position than the head it m-merges with. One can therefore imagine that, if we can find a case in which there is more syntactic structure above the clitic/affix, and if the verb moves higher within the Spell-out domain, that m-merger would be bled by verb movement, and the clitic/affix might be stranded by the verb. This is exactly the situation that occurs in Wolof and is discussed in detail in the remainder of the paper.

### 3 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 in Wolof, and shows how the puzzling behavior of the past tense morpheme *oon*, which is in affirmative clauses carried to C with the

verb, and in negative clauses stranded below C, can be explained by adopting the proposal that C first triggers the Spell-out of its complement, and then triggers syntactic processes to check its functional features, one of which involves raising the verb out of the spelled out domain. Crucially, this case confirms an important prediction of the syntax/postsyntax interleaving that is advocated in this paper – the 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 §3.1, I introduce the data that need to be accounted for. Subsection 3.2 discusses the properties of the two functional morphemes at the center of the analysis, the past tense morpheme *oon*, and the negative morpheme *-ul*, and gives the basic background on Wolof clause structure. In §3.3 I give the details of the analysis that accounts for the pattern. Subsection 3.4 is concerned with additional data from clauses in which the imperfective auxiliary *di* raises to C, and subsection 3.5 discusses alternative analyses and concludes this section.

### 3.1 The data

Wolof is a Niger-Congo language with 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 2015) consider to be all contained in one high head. For the purposes of this paper, I assume this to be a COMP position. More specifically, I adopt the proposal made in Martinović 2015, forthcoming and assume that the head hosting the sentence particle, C, and the head that usually hosts the subject in its specifier, here I,<sup>8</sup> 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 in other clause-types. I assume that CI is the phase head, and that it triggers Spell-out as soon as it is merged in the derivation, before it checks its features. We will be mainly concerned with a clause that has a unified CI head, where the verb raises to it. For simplicity, I will henceforth refer to this head just as C. In Appendix A, I also illustrate how the proposed analysis works in the clause-type with a split CI, in which the verb does not raise out of the Spell-out domain.<sup>9</sup>

At the center of our interest is an information-structurally neutral, declarative clause, in which a verbal head is located in C. This can either be the main verb, as in (25), an auxiliary, as in (26), or the dummy verb *def* 'do', as in (27).

- (25) Main verb in C  
 Xale yi        **lekk**-na=ñu    jën.  
 child the.PL eat-C=SCL.3PL fish

---

<sup>8</sup>In Martinović 2015, forthcoming, 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.

<sup>9</sup>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 analysis, see Martinović 2015, forthcoming.

*"The children ate fish."*

- (26) 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."*

- (27) 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: a non-pronominal subject (*xale yi*) can only be located to the left of the sentence particle, and is doubled by a subject clitic (*ñu*) to the right of the particle. In Martinović (2015, forthcoming), I argue that there is no syntactic position for the lexical subject to the right of the sentence particle in this clause-type (as IP is not a separate projection), and that clitic doubling occurs for case reasons.<sup>10</sup> The subject clitic, together with the other two pronominal clitics, the object and the locative clitic, raises to the position immediately following the sentence particle. The position of all clitics with respect to their corresponding arguments is given in (28) for clauses in which the main verb is in C, and in (29) for clauses with *do*-support, in which the main verb with verbal morphology is below C, to show that their position is independent of the position of other inflectional morphology, and can be used to determine the position of C, which will be relevant in clauses with negation.

- (28) 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 had eaten 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 had eaten it there."*

- (29) Pronominal clitics in clauses with do-support  
 a. Xale yi      d(ef)-a=ñu      lekk-oon jën ci waañ bi.  
     child the.SG do-C=SCL.3PL eat-PST fish in kitchen the.SG  
     *"The children had EATEN fish in the kitchen."*  
 b. Xale yi      d(ef)-a=**ñu=ko=fa**      lekk-oon.  
     child the.SG do-C=SCL.3PL=OCL.3SG=LCL.DIST eat-PST

<sup>10</sup>In short, Spec,CP is not a position in which nominative case can be assigned due to the structural requirement that it be assigned by C to a DP it locally c-commands (i.e. without there being an intervener), 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, as Wolof clitics are special clitics in the sense of Zwicky 1977 and move to adjoin to the sister of the highest functional projection) is obligatory.



*“The children had EATEN it there.”*

In clauses with *do*-support, all inflectional morphology is found on the main verb, so the interaction of verb raising and affixation cannot be observed (see (29)). The data on clauses in which the auxiliary *di* raises to C and which also contain inflectional morphology are more complex, and I address them in §3.4. Therefore, the focus of this section are clauses as in (25), in which the main verb is located in C.

We are interested in the behavior of two inflectional morphemes: the past tense morpheme *oon*<sup>11</sup> and the negative morpheme *-ul*. When occurring in the clause independently, both immediately follow the verb, affixed to it, as in (30) and (31), respectively.

- (30) *oon is suffixed onto the verb in C*  
 Xale yi      lekk-**oon**-na=ñu      jën.  
 child the.PL eat-PST-C=SCL.3PL fish  
*"The children had eaten fish."*

- (31) *-ul is suffixed onto the verb in C*  
 Xale yi      lekk-**u(l)**-∅=ñu      jën.  
 child the.PL eat-NEG-C=SCL.3PL fish  
*"The children didn't eat fish."*

Notice that the surface shape of the sentence particle differs in clauses without negation (when it is *na*), and those with negation (in which it is ∅).<sup>12</sup> In this case, it is the position of the subject clitic that pinpoints C's position, as explained above, and gives evidence for verb raising to C and the syntactic equivalence of affirmative clauses, in (25) and (30), and negative clauses, in (31).

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

- (32) *Neutral clause with oon and -ul*  
 Xale yi      lekk-**u(l)**-∅=ñu      **woon** jën.  
 child the.PL eat-NEG-C=SCL.3PL PST fish  
*"The children hadn't eaten fish."*

The goal of this section is to explain why *oon* is suffixed onto the verb in (30), but stranded below C in (32). The following subsection discusses the syntactic status of *oon* and *-ul*.

### 3.2 Syntactic status of *oon* and *-ul*

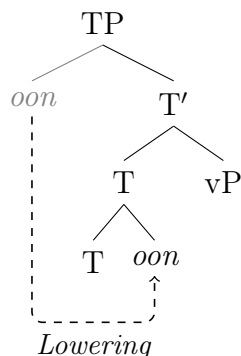
The example in (32) shows that the past tense morpheme *oon* can be skipped over by a moving verb, thus violating the Head Movement Constraint (Travis 1984). I therefore

<sup>11</sup>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, (25). The morpheme *oon* seems to be similar to what Bochnak (2016) calls optional past tense.

<sup>12</sup>This could be either a matter of contextual allomorphy or phonological processes. The details of the alternation are not relevant for our purposes.

propose that *oon* is a phrasal morpheme and not a head. I situate it in the specifier of TP, which is in affirmative clauses C's complement. This means that affixation cannot be the result of Head Movement, so it must be due to a postsyntactic process.<sup>13</sup> I propose that *oon* affixes to T via Lowering, as in the examples in the previous section. This happens during Spell-out and is shown in (33).

(33) Lowering of *oon* during Spell-out



The next question to answer is the position of negation in the 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 *do*-support clauses, we see that *-ul* precedes negation, shown in (34):

(34) The ordering of *-ul* and *oon* in *do*-support clauses

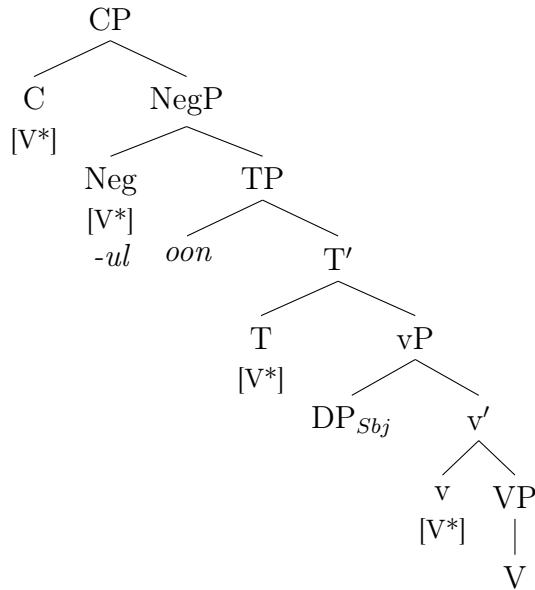
Xale yi      d(ef)-a=ñu (>dañu) lekk-**ul-oon** jën.  
 child the.PL do-C=SCL.3PL      eat-NEG-PST fish  
 "The children hadn't EATEN fish."

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 is 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, in the head of NegP.<sup>14</sup> This assumption will be crucial in accounting for the role of negation in the stranding of *oon* in negative clauses. I propose that Wolof clauses have the basic structure in (35).

<sup>13</sup>In the final subsection of this section (3.5), I briefly discuss what a syntactic account of the affixation of *oon* might look like and point out the advantages of a postsyntactic analysis.

<sup>14</sup>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 above the TP.

(35) Wolof clause structure



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):<sup>15</sup>

(36) 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.”

Finally, 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 (see (35)).

<sup>15</sup>In order to negate a sentence with an NP predicate, a different clause-type must be used, one with a copular verb, to which negation is then affixed:

- (i) Xale yi d(i)-u(l)-∅=ñu (>duñu) ndongo.  
child the.PL COP-NEG-C=SCL.3PL student  
“The children aren’t students.”

In the following subsection, I show how the three proposals I have made thus far—the Spell-out of C’s complement preceding the checking of C’s features, postsyntactic affixation of *oon*, and the clause structure in (35)—derive the difference in the position of *oon* between affirmative and negative clauses.

### 3.3 The interaction of syntactic movement and postsyntactic m-merger

We start with the affirmative clause, repeated in (37), in which *oon* is affixed onto the verb, and raises with it to C.

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

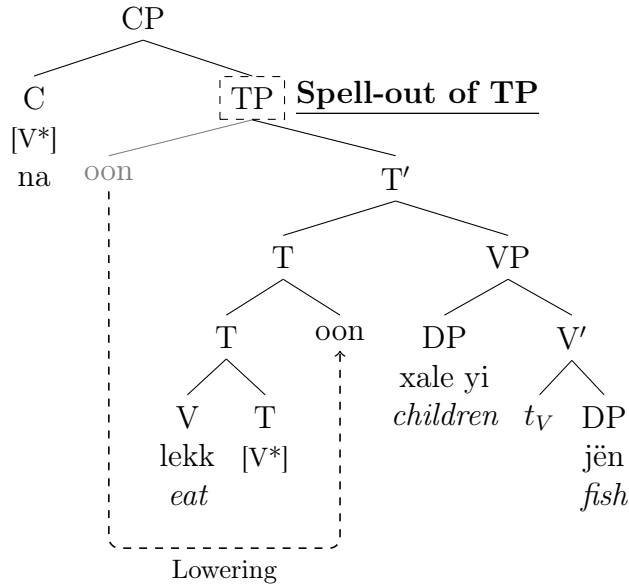
As the structure is built, the verb moves up the inflectional layer through each functional head, attracted by the [V\*] feature. When it reaches T, *oon* is merged into Spec,TP. The derivation up to this point is shown in (38) (projections irrelevant for the analysis are omitted).

- (38)
- 
- ```

graph TD
    TP --> oon
    TP --> T_prime[T']
    T_prime --> T
    T_prime --> VP
    T --> V["lekk<br/>eat"]
    T --> T_bar[T [V*]]
    VP --> DP1["xale yi<br/>children"]
    VP --> V_bar[V']
    V_bar --> tV[tV]
    V_bar --> DP2["jën<br/>fish"]
  
```

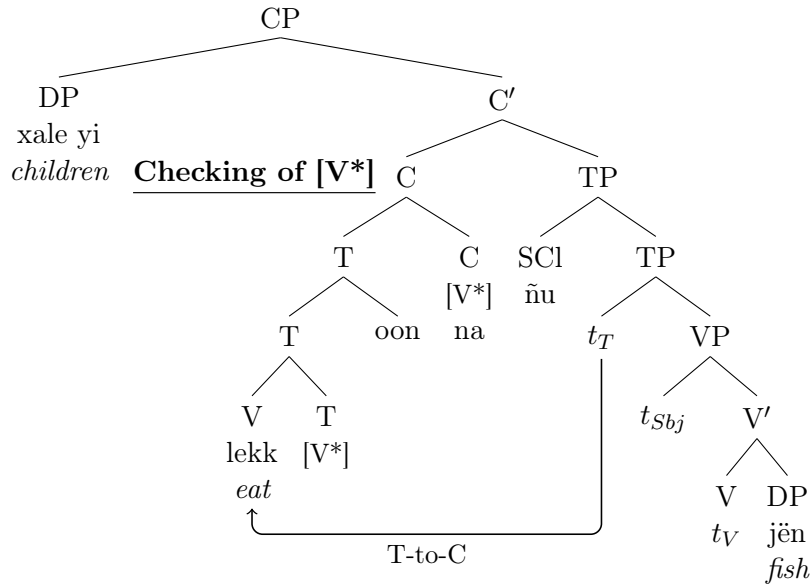
Then C is merged, and it first triggers Spell-out of its complement, the TP, during which *oon* lowers onto the complex head in T, which contains the verb, as in (39).

(39)



Now C goes on to check its functional features, one of which is  $[V^*]$ , and attracts the complex head in T, which results in *oon* being carried along with it, shown in (40). 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 (2015) for different proposals.

(40)



Let us 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 presence of a higher projection in the Spell-out domain to which the verb moves. Consequently, Lowering does not result in the affixation of *oon* to the complex head containing the verb. The clause we

need to derive is repeated in (41).

- (41) 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 hadn't eaten fish."*

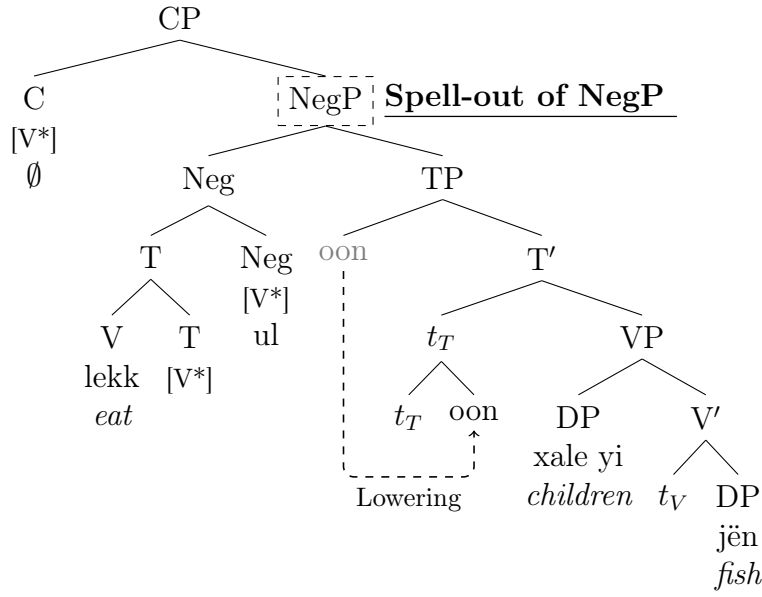
The verb again moves through each head, but this time it does not stop in T, because there is a higher head to which it moves, Neg. Before the merger of C, the structure is as in (42).

- (42)
- 
- ```

graph TD
    NegP --> Neg
    NegP --> TP
    Neg --> T1[T]
    Neg --> Neg1[Neg]
    T1 --> V1[V]
    T1 --> T2[T]
    V1 --> lekk[lekk]
    V1 --> eat[eat]
    T2 --> Vstar1[V*]
    Neg1 --> Vstar2[V*]
    Vstar2 --> ul[ul]
    TP --> oon[oon]
    TP --> Tprime[T']
    Tprime --> tT[t_T]
    Tprime --> VP[VP]
    VP --> DP1[DP]
    DP1 --> xale[xale]
    DP1 --> yi[yi]
    DP1 --> children[children]
    VP --> Vprime[V']
    Vprime --> tV[t_V]
    Vprime --> DP2[DP]
    DP2 --> jën[jën]
    DP2 --> fish[fish]
  
```

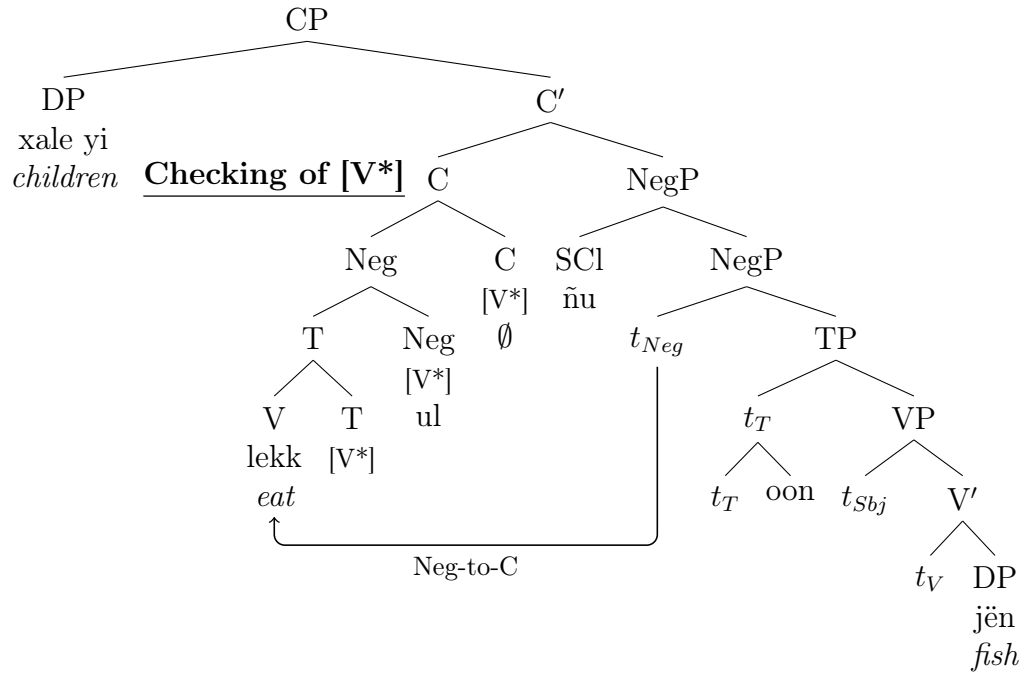
Then C is merged and it first triggers Spell-out of NegP, shown in (43). Now the complex head with the verb is not in T, so the Lowering of *oon* does not result in its affixation onto the verb. I assume that it still takes place, and that *oon* m-merges with the trace of head movement in T (under the hypothesis that head movement leaves traces).

(43)



In the next step, C goes on to check  $[V^*]$ , attracting the complex head from Neg. As in affirmative clauses, subject movement to Spec,CP and clitic doubling also take place.

(44)



We have now derived the difference in the affixation of the past tense morpheme *oon* between affirmative and negative clauses as a result of the fact that the verb raises through each functional head in the clausal spine, but that Spell-out occurs before its final movement to C, resulting in the affixation of *oon* onto the verb just in case the verb is not in a higher projection at the moment of Spell-out. This allows us to account for the violation of the Mirror Principle (Baker 1985) without invoking complicated syntactic operations whose sole

purpose is to reorder the morphemes. In the final subsection of this section, I review some of the possible alternative analyses and point out the advantages of the proposal I advocate in this paper.

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. We also saw that there are similarities between this phenomenon and Extraordinary Left Branch Extraction in Slavic, in which a preposition is cliticized onto the extracted element, accounting for non-constituent movement, object cliticization in The Northern Italian Friulian dialect, and person prefixation in Classical Hebrew. The novel contribution of the Wolof data is precisely the situation in which *oon* is stranded below C, as it confirms the prediction that a postsyntactic process can be blocked if the structural conditions for its application are not met.

Before concluding this section, we need to take a look at another example from Wolof, in which *oon* and *-ul* affix onto the imperfective auxiliary *di*, 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.

### 3.4 Clauses with auxiliary movement to C

At first glance, clauses in which the imperfective auxiliary *di* raises to C appear to be incompatible with the proposed analysis, as they exhibit a different pattern than clauses in which a main verb raises to C. I start with examples of *di* in combination with *oon* and *-ul* reported in the literature; for example, Torrence (2003) gives the following clauses as grammatical:

- (45) 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 (45) problematic for the analysis presented thus far. First, in (b) both *oon* and *-ul* raise with the auxiliary to C. Second, they are not in the expected order – *oon* precedes *-ul*. We would therefore have to posit a violation of the Mirror Principle for either the clauses with the main verb, or the ones with the auxiliary. In this subsection, I present more detailed data from my own fieldwork which, for my speakers, explain away the apparent inconsistencies.

First, if it does not raise to C, as in *do*-support clauses, *di* can combine with *oon*, in (46a), and with both *oon* and *-ul*, as in (46b). In such cases, *d(i)-oon* results in a past progressive meaning. Note that the ordering of *-ul* and *oon* corresponds to the one in which they affix



to the main verb—*ul* precedes *oon*—contrary to the order in Torrence’s example (45b).

(46) Di and inflectional morphology in do-support clauses

- a. Xale yi      d(ef)-a=ñu (>dañu) d(i)-oon (>doon) lekk jën.  
 child the.PL do-C=SCL.3PL      IPFV-PST      eat fish.  
*“The children were EATING fish.”*
- b. Xale yi      d(ef)-a=ñu (>dañu) d(i)-u(l)-oon (>duloon) jën.  
 child the.PL do-C=SCL.3PL      IPFV-NEG-PST      fish  
*“The children weren’t EATING fish.”*

The imperfective auxiliary can also raise to C, as in (47). When *di* is below C, it results in present (progressive), future, or habitual reading. When it raises to C, the present tense reading is not available, and it is most commonly interpreted as the future, with some of my speakers also allowing the habitual reading.

(47) Imperfective 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.”/“The children eat fish (habitually).”*

*Di* can normally combine with negation, which raises with it to C, as with main verbs:

(48) Negation is a suffix on di

- Xale yi      d(i)-**u(l)**-∅=ñu (>duñu) lekk jën.  
 child the.PL IPFV-NEG-C=SCL.3PL eat fish  
*“The children won’t eat fish.”/“The children don’t eat fish (habitually).”*

Complications arise when *di* moves to C and both *-ul* and *oon* are present in the structure, as we would expect *oon* to be stranded by *d(i)-ul*, as it is 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

Combining this with the data in (45), it appears that *oon* behaves differently depending on the type of verb that raises to C. This would be an unwelcome conclusion, but, luckily, there is evidence that shows it be an incorrect one. First, the structure with *d(i)-oon* raising to C, shown in (50), has varying degrees of acceptability amongst my speakers.

(50) 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.”*

As the translation indicates, the meaning for most speakers who allow this structure is ambiguous between a past progressive and a past habitual, with the past progressive meaning usually degraded. Now, crucially, Wolof also has a special morpheme to express past habitual meaning – *daan*,<sup>16</sup> which raises to C with no issues.

(51) Past habitual morpheme daan

- a. Xale yi d(ef)-a=ñu **daan** lekk jën.  
 child the.PL do-C=SCL.3PL PST.HAB eat fish  
*"The children used to EAT fish."*
- b. Xale yi **daan**-na=ñu lekk jën.  
 child the.PL PST.HAB-C=SCL.3PL eat fish  
*"The children used to eat fish."*

In many varieties of Wolof, particularly in urban environments, *d(i)-oon* and *daan* have been neutralized to *doon*; crucially, for those speakers, the sentence in (50) is grammatical, favoring the habitual reading. Speakers who reject (50) usually correct it to (51b).

To sum up this set of data: 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, the ordering of *oon* and negation in C is reversed from what we would expect in Torrence's example (45b). I therefore believe that the data from Torrence 2003 from the beginning of this section, repeated here in (52), can be explained as the result of neutralization of *daan* to *doon*.

(52) 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."*

For my speakers that clearly maintain the difference between *d(i)-oon* and *daan*, in no variant in which *di*, *oon* and *-ul* are found in the structure, can *di* raise to C, neither carrying both morphemes with it, or stranding *oon* below C, as shown in (53).

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<sup>16</sup>*Daan* is probably also bimorphemic, but it is very rare to find it suffixed onto the main verb. I have found that to be possible only in subordinate temporal and conditional clauses:

(i) -aan in a conditional clause

- Su=ma am-ul-aan mburu, mbiskit l-a=a daan lekk.  
 if=SCL.1SG have-NEG-HAB bread cookie l-C=SCL.1SG PST.HAB eat  
*"If I wouldn't have bread, it's cookies that I would eat."*

In clauses we are concerned with in this paper, *-aan* cannot be suffixed onto the main verb. I therefore treat it as a single morpheme, and leave a detailed investigation of its status for future research.

(53) When *oon* and *-ul* are present, *di* cannot raise to *C*

- a. \*Xale yi      d(i)-oon-ul- $\emptyset$ =ñu      lekk jën.  
      child the.PL IPFV-PST-NEG-C=SCL.3PL eat rice
- b. \*Xale yi      d(i)-ul- $\emptyset$ =3PL.SBJ      woon lekk jën  
      child the.PL IPFV-NEG-C=SCL.3PL PST eat fish

I therefore believe that there is no discrepancy in the ordering of morphemes and the behavior of *oon* between the structures in which a main verb raises to C and those in which the imperfective auxiliary raises to C; the difference is that, for whatever reason, when *di* is present in the structure and thus raises to C, *oon* is not possible. Structures appearing to have *d(i)oon* in C, actually have neutralized *daan* to *doon*.<sup>17</sup>

### 3.5 Discussion and conclusions

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 clauses, but stranded below C in the presence of negation. I here summarize the proposal and then briefly consider alternative analyses.

First, the verb in the clause-type discussed in this section 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.

This analysis allows us to treat both *oon* and the verb’s movement to C uniformly across the two constructions, keeping the derivation of every clause identical. Any alternative to the analysis proposed here would have 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

<sup>17</sup>With the neutralization in form it appears that other changes are occurring as well (semantic and morphological changes which lead to a difference in *doon* below C and *doon* in C), or the past progressive meaning would be ungrammatical for all speakers. I have found there to be a great amount of variation in the data and therefore leave this issue aside until further study.

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.

For example, we could 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 a stipulative, ad hoc solution and amounts to being no more than a trick to describe 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 this set of data, I briefly review it here.

First, 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 an additional puzzle for him is to analyze 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 2015. Torrence (2003) addresses the following data.<sup>18</sup>

- (54) The ordering of V, di and oon in Torrence 2003
- a. Dem-oon-naa. (PST > SM)  
go-PST-1SG  
“*I had gone.*”
  - b. D-oon-naa dem. (PST > SM)  
IPFV-PST-1SG go  
“*I had been going.*”
  - c. Dem-u-ma woon. (NEG > SM > PST)  
go-NEG-1SG PST  
“*I had not gone.*”
  - d. D-oon-u(l)-ma dem. (PST > NEG > SM)  
IPFV-PST-NEG-1SG go  
“*I had not been going.*”

The main conundrum is the ordering of verbal heads, subject marking, past tense, and

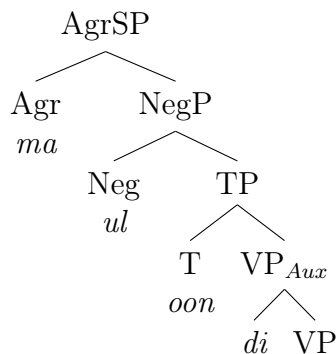
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<sup>18</sup>I have discussed examples in (54b) and (54d) and how they are accounted for under my analysis in the previous section.

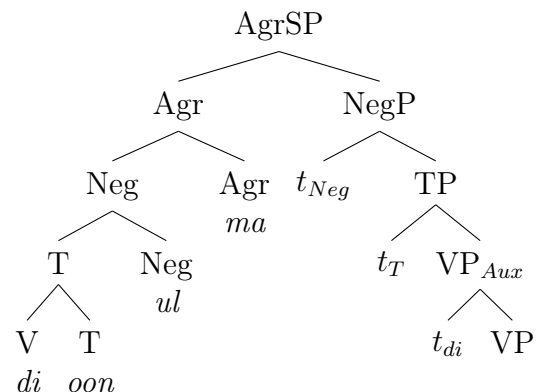
negation when only the main verb is present (which Torrence calls *the perfective aspect*), and when the imperfective auxiliary *di* is present (*the imperfective aspect*). In imperfective clauses, as in (54b) and (54d), the past tense always directly follows *di*, with negation following past tense, and subject marking following both. In the perfective aspect as in (54a) and (54c), *oon* follows the verb and precedes subject marking, but in the presence of negation follows all other elements – the verb, negation, and subject marking. Assuming that all elements—the subject marking/agreement, negation, and the past tense morpheme *oon*—are heads, Torrence has to explain how they are all skipped by the verb in just one case: negative perfective clauses.

The imperfective cases are fairly straightforward for Torrence. Assuming the order of projections as in (55), head movement of *di* through each projection, obeying the Head Movement Constraint, will yield the desired order of elements, as in (56). (I illustrate the clause with negation; in the absence of negation, the same order holds, the only difference being the form of subject agreement, which is *naa*).

(55)

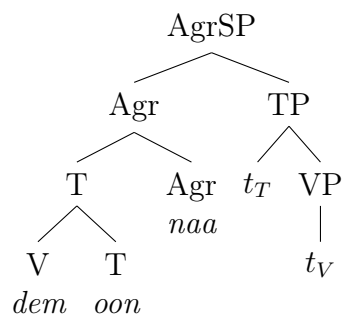


(56)



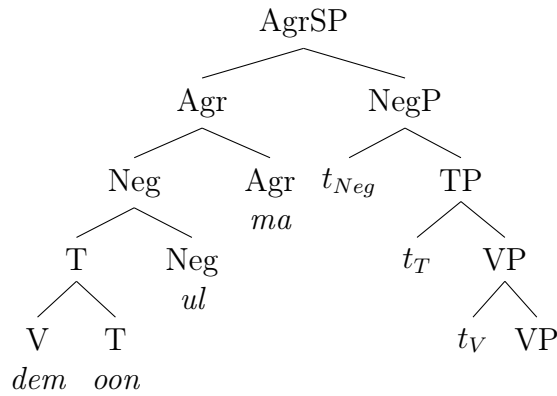
The affirmative perfective clauses are also straightforwardly derived for Torrence, as the past tense morpheme follows the main verb and precedes the subject marker, as it does in imperfective clauses. The derivation is shown in (57).

(57)



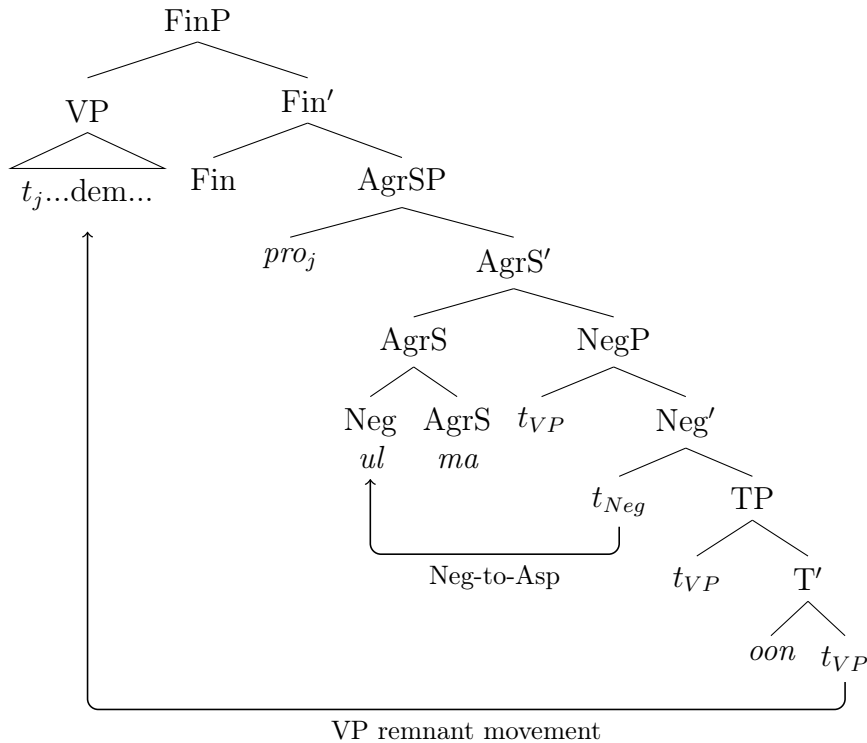
If, however, the same derivation were involved when negation is present, it would yield the wrong morpheme order, as in the ungrammatical example in (58).

(58) \*



In order to derive this clause, the verb has to be allowed to skip over past tense. Torrence proposes that in perfective clauses there is no head movement of the verb, but remnant movement of the VP, after it has been vacated of elements other than the verb. The VP goes through the specifiers of all functional projections, and ends up in some projection higher than AgrSP (since Spec,AgrSP must be occupied by a subject *pro*), as in (59). This, however, still does not give us the correct order, since negation follows subject agreement, and it needs to precede it. Torrence therefore needs to additionally posit separate head-movement of negation to AgrS.

(59)



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

(here T), the verb must be blocked from moving to it, something it does in all other clauses. This is necessary only in this sentence, when negation is present (and when an auxiliary is not merged above the VP with the main verb). Additionally, this only happens in this clause type, where a verbal element is found high in the clause (Torrence identifies this as Fin/SpecFinP in later work).<sup>19</sup> This would mean that, 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. It seems that we would need some sort of a look-ahead mechanism to implement this, and to block VP-remnant movement it in all the cases where it does not occur.

Another problem 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 *pro* moves to Spec,AgrSP, 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 either need look-ahead mechanisms, or ad hoc affixation rules that would allow *oon* to suffix onto the verb in one instance and be stranded in another. 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, as discussed in the first part of this paper.

## 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 processes crucially must apply at specific

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<sup>19</sup>There is another clause-type, in which a *wh*-phrase moves to Spec,CP, and the verb remains inside the TP. I discuss these clauses in Appendix A. In those cases, the order of functional morphemes on the verb or the imperfective auxiliary is always the same, regardless of the presence of negation, shown in (i) and (ii). VP remnant movement would therefore not apply in causes with negation and *wh*-movement.

- (60) (i) Jën la xale yi lekk-oon.  
 fish C child the.PL eat-PST  
*“It’s fish that the children are eating.”*  
 (ii) Jën la xale yi lekk-ul-oon.  
 fish C child the.PL eat-NEG-PST  
*“It’s fish that the children aren’t eating.”*

points in the derivation, in the examples presented here at the moment of the merger of a phase head, which argues against them being 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 to 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 2016), 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 should only be explainable 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, it would give further evidence (in addition to Bresnan 1972 and Travis et al. In press) that even phonological processes can apply to a domain that syntax can later still access.

Finally, this 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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## A Morpheme ordering in clauses without verb raising to C

As mentioned at the beginning of the discussion, there are two finite clause-types in Wolof: one in which C and I remain a compact head, and another one in which they form separate heads. The first type was discussed in section 3. In the second clause-type, which comprises all *wh*-movement structures, the verb stays lower in the structure, and a subject follows the sentence particle, with no resumption. I argue in Martinović 2015 that these clauses contain a split C head because there have a higher position hosting the sentence particle and the *wh*-word, and a lower one hosting the subject in its specifier. I briefly show how those clauses fit into the analysis advocated in this paper.

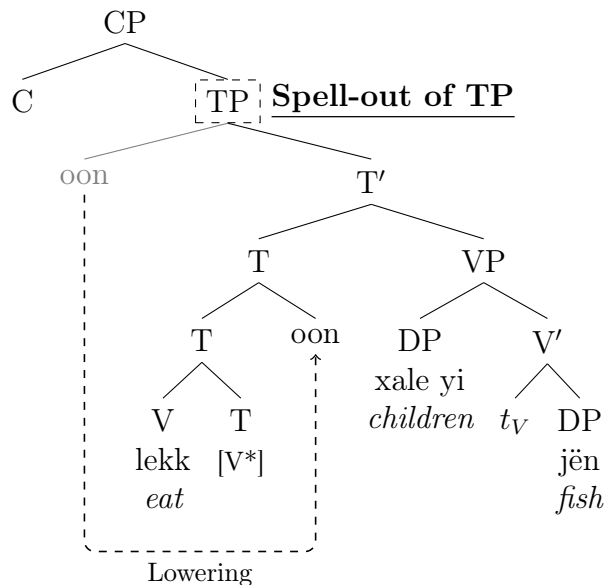
Examples in (61) show how the functional morphology combines with the verb in this clause type.

- (61) oon and -ul in an object focus sentence
- a. Jën la xale yi      **lekk-oon.**  
 fish C child the.PL eat-PST  
*“It’s fish that the children had eaten.”*
  - b. Jën la xale yi      **lekk-ul.**  
 fish C child the.PL eat-NEG  
*“It’s fish that the children didn’t eat.”*
  - c. Jën la xale yi      **lekk-ul-oon.**  
 fish C child the.PL eat-NEG-PST  
*“It’s fish that the children hadn’t eaten.”*

The morpheme order of the verbal morphology is as expected – the negation is closer to the verb than the past tense morpheme. The derivation therefore proceeds in the same way as in clauses in which the verb raises to C, save for the last step – the verb does not raise, but remains in T in affirmative clauses, and in Neg in negative clauses.

In affirmative clauses, everything proceeds in the same way as we have already seen; the clause is built and when C is merged, it first triggers Spell-out of the TP. *Oon* lowers onto the complex head in T, which contains the verb, as in (62).

(62)

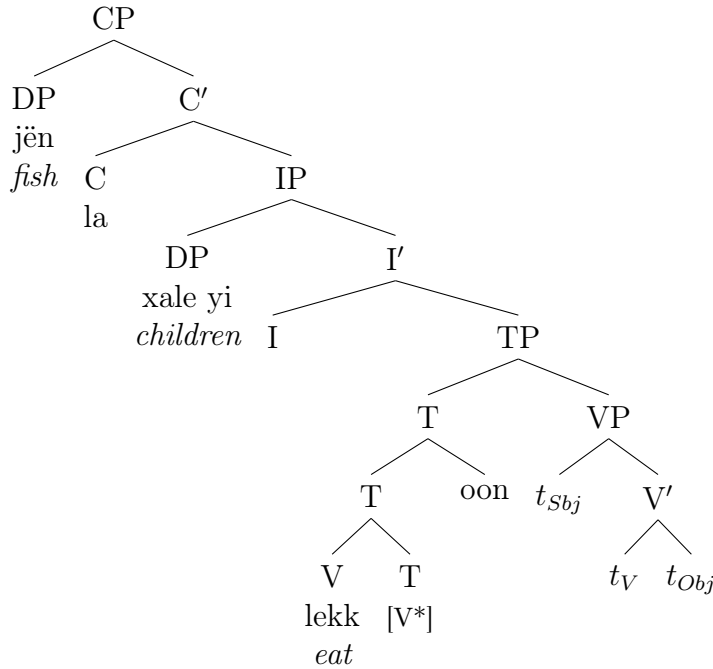


Unlike in the previous clause-type, this C head does not contain [V\*], so the verb will not raise any further.<sup>20</sup> Moreover, for reasons not relevant here, the head splits into two projections, a higher one, hosting the sentence particle, and the *wh*-word in its specifier, and the lower one, to which the subject raises.<sup>21</sup>

<sup>20</sup>Verb movement to C and *wh*-movement are in complementary distribution. For more on this, see Martinović 2015.

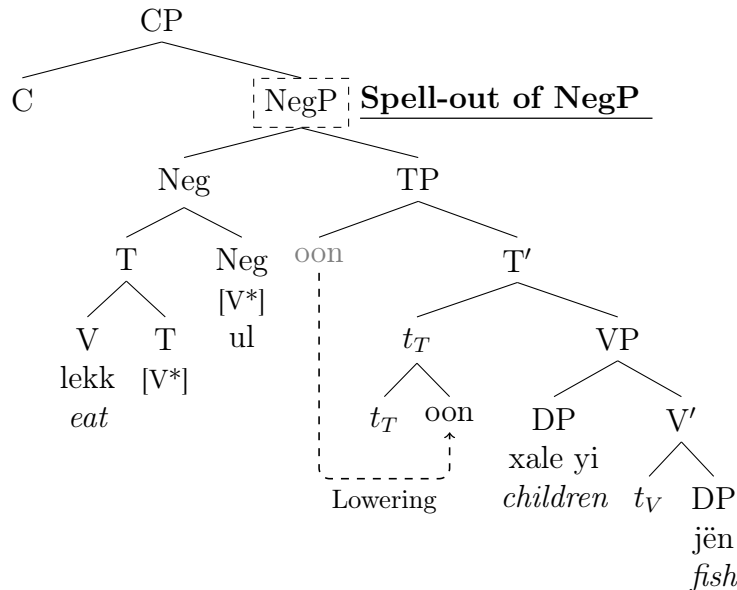
<sup>21</sup>A clause-internal subject (i.e. a subject following the sentence particle) is possible in all clauses which involve *wh*-movement, as the Head-splitting of C opens up a position for the subject, which can now receive nominative case from the c-commanding C head. This also explains why there is no clitic doubling in these clauses. For details, see Martinović 2015.

(63)



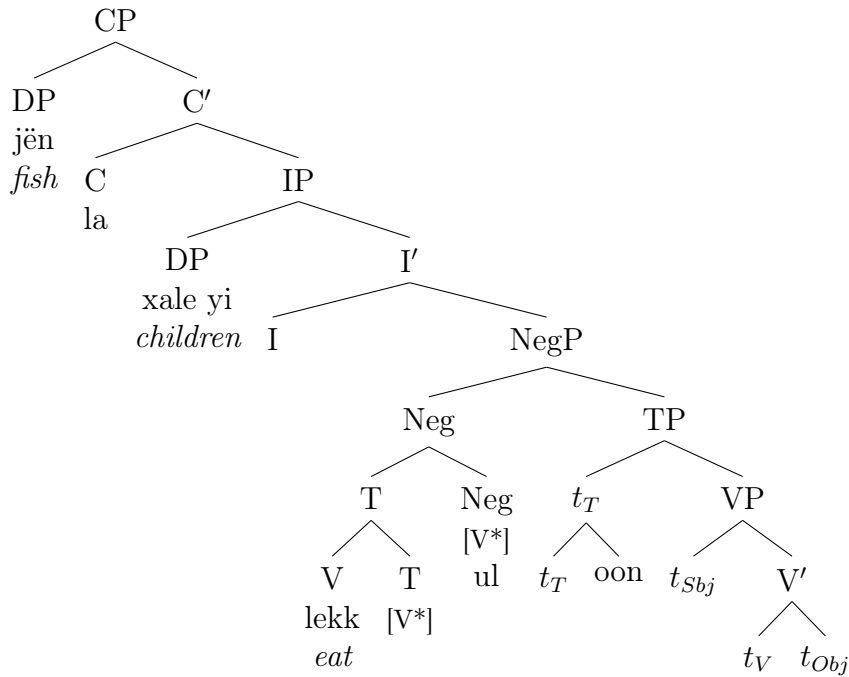
Negative clauses are also derived in the same way as clauses with an unsplit C head: the verb raises through all functional projections up to Neg. Then C is merged and triggers Spell-out of NegP. Since *oon* is in a head below the complex head containing the verb and negation, it cannot lower onto it.

(64)



Unlike in clauses in which the verb raises to C, however, here the V+Neg complex does not get linearly separated from *oon*, as nothing intervenes between NegP and AspP. 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.

(65)



The past tense morpheme *oon* is in the end pronounced as a prosodic unit with the verb and negation, as it is with anything that precedes it (when it is left behind in the clauses in which the verb with negation raises to C, it is also pronounced as a prosodic unit with the verb, negation, sentence particle, and any clitics present in the structure).

These sentences show us several things. First, any kind of an analysis that presupposes a difference in the syntactic type of *oon*, in the context in which *oon* affixed, or in how movement operations work in the presence and absence of negation in clauses with the main verb and no *wh*-movement (e.g. Torrence 2003, 2012) would have a hard time extending their analysis to clauses with *wh*-movement, since these clauses exhibit no peculiar properties and can be derived straightforwardly by head movement.<sup>22</sup> In my analysis all derivations are identical and internally consistent. The difference between clauses without and those with *wh*-movement is the result of the final movement of the verb to C in the former type, which puts clitics in between the verb in C and *oon* stranded lower, which does not happen in clauses where the verb does not raise to C.

<sup>22</sup>A particular problem for Torrence in these clauses would be the lack of agreement if there is an overt subject, and the presence of a subject clitic, which he would have to call agreement, following C in clauses when there is no subject. He would therefore need to assume yet another order of functional heads for these clauses.