

Post-syntactic Operations and Spellout of Nominals

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Abstract

The paper investigates the derivational mechanism of complex nominal expressions in Georgian, a language of Kartvelian (South Caucasian) family. It argues that these structures are derived through syntactic Head-to-head movement as well as post-syntactic operations like Fusion and Merger Under Adjacency which apply after syntactic computation of these structures is completed. By applying three basic word building mechanisms along with the morpheme specific information to be either prefix or suffix, the paper accounts for an array of Mirror Principle violating morpheme orders in the final form of these expressions.

Keywords: Head-to-Head Movement, Merger Under Adjacency, Fusion, PF

1. Introduction

Nominalizations in various languages may sometimes include a substantial verbal functional layer which may not be limited to Tense, Voice, Aspect, little v^0 head, and etc. This is what is present in Georgian nominals and the derivation of these nominals in the light of Distributed Morphology (DM, Halle and Marantz 1993, 1994) is the main topic of this paper. In the syntactico-centric approach like DM where word-building is considered to be the output of syntactic computation, the Mirror Principle (Baker 1985) is expected to hold quite generally assuming the morpheme order to follow the hierarchy of syntactic projections by and large. However, this type of default situation is not always a case, and this paper illustrates the ways how complex nominals can be derived given both syntactic and post-syntactic word-building mechanisms such as Head-to-Head movement (HtH, Travis 1986) and Merger Under Adjacency (MUA). This paper goes beyond these mechanisms and enriches them with post-syntactic Fusion of the two terminals like the category-defining n and T^0 heads and argues that in a very parsimonious account of derivation at least three basic operations HtH, post-syntactic MUA, and Fusion are necessary to invoke for the explanation of the complex word formation in this language.

1.1 Framework and Word-building Mechanisms

The DM framework assumes the following structure building based on Harris & Halle (2005) and others' works:

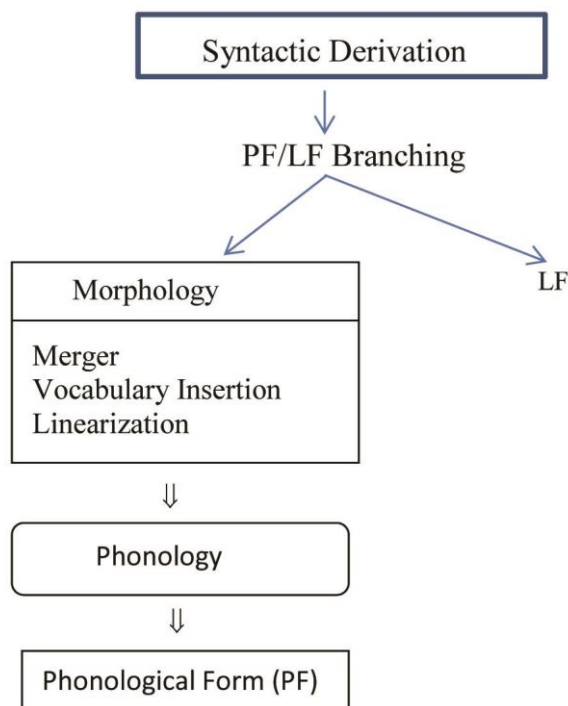


Figure 1. Architecture of Grammar in DM

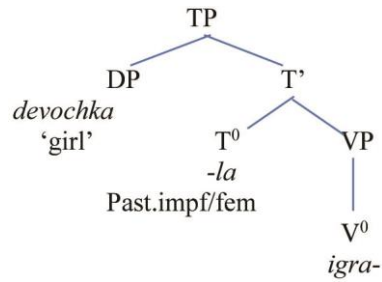
This syntactico-centric approach recognizes non-hierarchical ordering of abstract syntactic features as an input to syntactic computation but the output of syntax is hierarchically organized bundles of features that are input to another branch of grammar, PF (Phonological Form) where they are supplied with the phonological features at the stage of Vocabulary Insertion. The main question posed in the paper is what type of post-syntactic operations that are already posited in DM will be necessary to account for the final shape of multi-morphemic nominal-words in which both verbal and nominal functional layers are interleaved in complex ways so that it is always puzzling how the order of linearized exponents reflects the hierarchy of syntactic embedding created by the HtH movement and other post-syntactic operations.

DM often makes reference to the derivational word-building mechanisms applying both in syntax (HtH) and post-syntactically such as MUA and Local Dislocation (Embick & Noyer 2001), etc. This paper utilizes only two operations: HtH and MUA for the two main types of nominal expressions. In this case, the nominals that include the temporal meaning and pretend-states are particularly interesting given the interaction of syntax and post-syntactic PF (Phonological Form) processes applying after syntactic derivation is complete.

1.2 Head-to-Head Movement as Derivational Mechanism

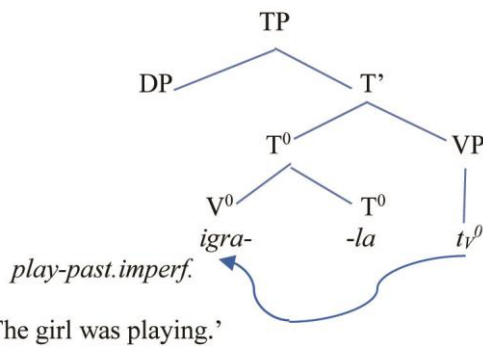
Before analyzing the derivation of nominals itself, several key assumptions are in order: left-adjoining head movement typically assembles the right-headed word structures which are so familiar from the literature on English, French, Russian, etc. For example, in the following simplified version of Russian verbal expression of Present Imperfect, the morphological word (M-Word) is formed by HtH movement:

(1)a. Structure before head movement



b. Devochk-a igra-la.
 girl-nom/fem play-Past.impf./fem
 'The girl was playing.'

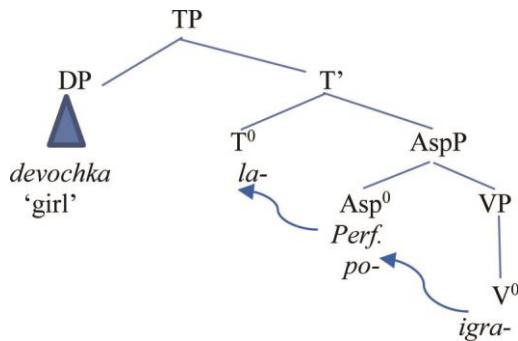
(2)a. Structure after HtH movement with left-adjunction



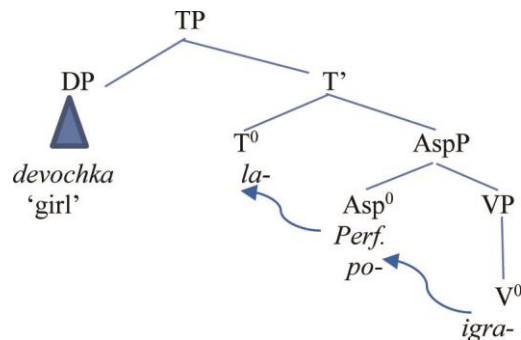
'The girl was playing.'

If it is a Past Perfective form of the same verb, then we would need to expand the left- adjunction with the affix-driven right-adjunction in order to account for the prefixation of the aspectual morpheme to the lexical Root in the extended projection of the Russian Past-Perfect M-word (Note 1):

(3)a. Structure before head movement:



b. Structure after HtH movement with right adjunction



In languages where some functional heads are prefixes and others suffixes like the aspectual and Tense⁰ heads in Russian, the morpheme order can be derived through the right adjunction of the verb to the aspectual head and then further movement of that complex head to the Tense⁰ where this complex head would left-adjoin to the suffix *-la* as shown in (3).

Thus, at the very basic level, the complex form like in (3) can be derived through HtH movement by morpheme-driven specification to be either prefix or suffix to the verbal Root. In general, affix-driven adjunction is a driving force behind the HtH movement which will operate based on the language-specific headedness of various functional material merged above Roots. Ideally a language can be entirely consistent with respect to the Headedness Parameter which constrains the sequence of heads with respect to complements within syntactic phrases in the language. The same parameter regulates the precedence of heads with respect to their sisters in X-bar constituents. In English, right-hand headedness is a norm as argued in Harley (2011, p.170) but other languages including Russian may not be entirely consistent in this regard some phrases being left-headed like the aspectual one while others right-headed. Georgian is mainly head-final at the phrasal level but some functional projections involved in the derivation of nominal expressions may be left-headed resulting in some morphemes being prefixes while others suffixes in the extended projections. The detailed account of the derivation of nominals with variable head-adjunction positions will be shown in Sections 2 and 3 of this paper.

1.3 Affixation of Functional Heads in Verbal Expressions

This section shows how some functional material can be prefixed and linearized as preverbal affixes in complex verbal words consisting of four or more morphemes in Georgian. The expressions illustrated in this section show how the variation on the Headedness Parameter allows prefixation or suffixation of functional material in verbs which may contain three or more functional morphemes such as Asp⁰, TAM (tense-aspect-mood) marker, the transitivizing morpheme and person agreement of verbal arguments in a verb word. In general, Georgian is right-headed language for VPs but in verb words the prefixal material can grow up to three morphemes including the viewpoint aspectual marker also expressing the directionality in motion verbs coming at the very beginning of a verbal template, and followed by either subject or object person agreement, argument structure changing morpheme such as a transitivizing, voice, or a version morpheme as shown in (3) (following Aronson 1990, McGinnis 1997, 2016 among others). It is notable that the affix ordering in the pre-base positions is fixed resulting in the rigid ordering of the functional material while in the post-base component a variety of functional material may be added with right adjunction including but not limited to the thematic markers in Present and Perfective series verbs, causative markers where relevant, voice markers, and TAM (Tense-Aspect-Mood) marker fused with the non-participant argument agreement morpheme at the very end. The example from Aronson (1990) shows the derivation of a relatively simple verbal form with the aspectual, version, thematic and non-participant argument agreement morpheme appending on both sides of the Root resulting in the aspect and version markers as prefixes while thematic and agreement markers as suffixes to Roots:

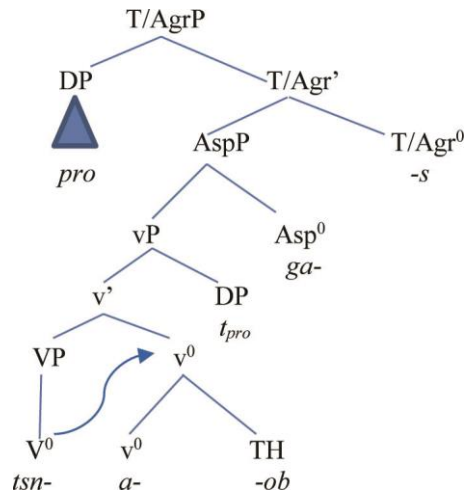
(4) ga=a-tsn-ob-s

Asp-trans-introduce-TH-3S.sg

‘He/she will introduce him/her to X...’ (Aronson, 1990, p.192)

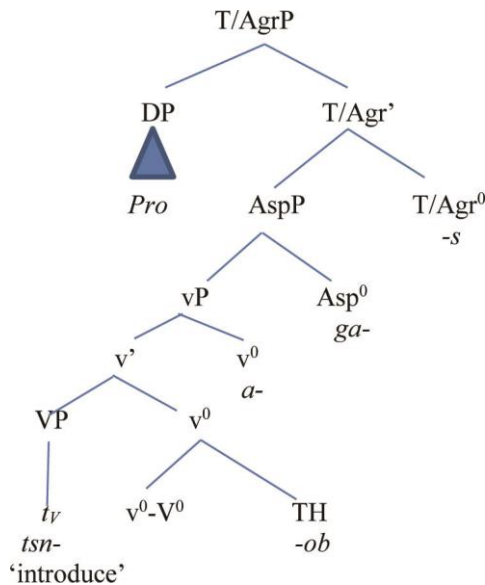
The assumption here is that when deriving the verb of this complexity the aspectual and transitivizing morpheme will be specified as prefixes, and this will drive the right adjunction of the already complex head consisting of the Root and suffixal material such as the TH marker to the v⁰ head. We assume that the external argument of the verb in (3) is projected as a specifier of the vP and then it A-moves to the spec TP to check case and other relevant features. The following three examples will illustrate the structure before HtH movement and the derivation of the complex word in (4):

(5)a. Structure before HtH movement



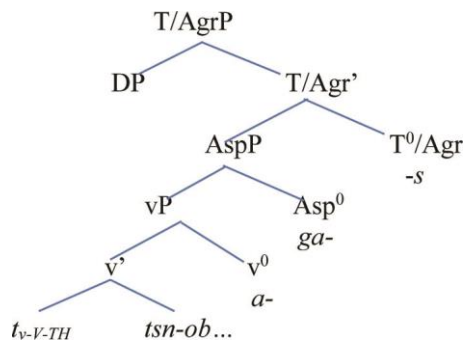
In this right-headed structure, assuming that T/Agr⁰ and thematic marker added to the little v⁰ head are suffixes in Georgian after the first step head movement V⁰ will attach to the left of TH resulting in the *tsn-ob* string under the v⁰ head:

(5)b.



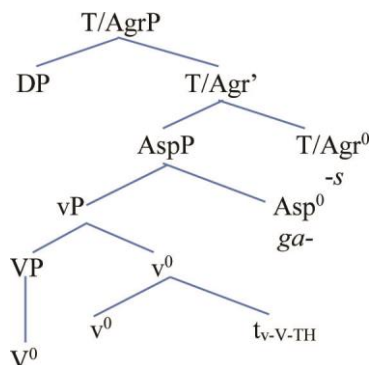
After the second step of head movement, the transitivity *a-* attaches to the left of its sister V⁰-v⁰-TH complex head resulting in the prefix *a-* added to the *tsn-ob* ‘introduce’ string:

(5)c.



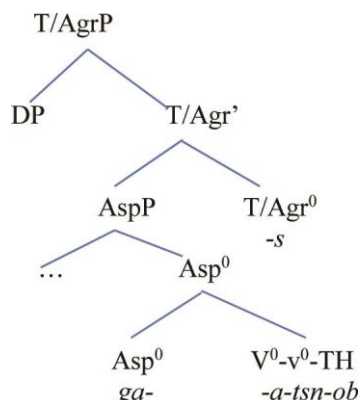
At the next step, the complex head containing the transitivizing morpheme along with the V⁰-TH moves to the aspectual head which is always specified as the prefix in this language and therefore, the complex head will attach to the right of the Asp⁰ resulting in the right-branching structure:

(5)d.



After right-attaching the complex head to its sister aspectual node, the final step in the derivation of this word will be to further move this complex head to the T⁰/Agr⁰ head attaching the former to the left of the fused Tense⁰-Agr⁰ morpheme -s as shown in the tree (Note 2):

(5)e.



As shown in (5a-e), the morpheme-specific information whether it will be a suffix or prefix will drive the directionality of head adjunction in more complex heads while moving the Root and other functional heads ajoined to it upward in the tree. The final form is primarily the result of such HtH movement but in more complex cases of nominal words where the Mirror Principle seems to be violated the derivation should be enriched with the post-syntactic processes in order to account for the final shape of these complex units.

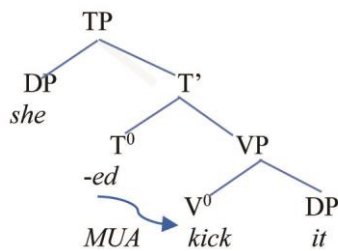
1.4 Merger Under Adjacency: Post-syntactic Mechanism of Word-building

If the HtH movement is the only option available for word-building, then it would be impossible to derive left-headed structures involving the violation of the Mirror Principle by linearizing the heads typically occurring lower in the derivation at the beginning of the multi-morphemic words. We assume that the derivation proceeds bottom-up, and in a language which only has suffixes for inflections like English the lower projections typically occur at the beginning of the derived words while the higher functional heads appear towards the end of the complex units. In order to account for the intractable situations when the Tense⁰ head interferes between Asp⁰ and the v-V⁰ complex head as in Georgian nominals, it is necessary to resort to the post-syntactic lowering operation which was initially dubbed as Merger Under Adjacency or Morphological Merger (Halle & Marantz 1993, Bobaljik 1994) and was used to account for the English Tense affixation due to the inability of the verb to move to the Tense⁰ in the declarative statements like this happens in French or Russian. So the verb stem in French and Russian head-moves to Tense⁰ to pick up the Past Tense morpheme as illustrated in (2) for Russian, while in English only the auxiliary moves into the Tense⁰ stranding the main verb in *in-situ*, i.e. base position. Chomsky’s affix-hopping proposal (1957)

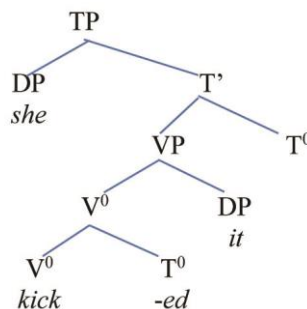
was initially meant to account for the suffixation of *-ed* to the verb stem in past contexts, and it was further developed in Halle & Marantz's Morphological Merger which applies only to the adjacent terminal nodes and not only structural adjacency is a key restriction on this operation, but also linear adjacency is also a requirement in order this operation to apply at PF. It is evident that the operation can only occur after the linearization of the terminal nodes is complete according to the Headedness Parameter, and it is possible for some syntactic structures to undergo the changes before the Vocabulary Insertion applies to these terminal nodes at a later stage of the PF.

It is notable that the Morphological Merger is similar but not identical to Embick & Noyer's (2001) *Early Lowering* operation, which involves adjacent items and applies before the Linearization. (Note 3) This word-building mechanism is different from HtH movement which is a major syntactic mechanism applying uniformly to heads in syntax to derive a complex expression such as CP and vP. In the following example, the past tense marker *-ed* in English is affixed to V^0 via MUA according to Bobaljik (1994):

(6)a. before MUA



b. after MUA



MUA adjoins the terminals V^0 and T^0 under a single category node in this structure. (Note 4) The lowering movement right-adjoins T^0 to V^0 rather than left-adjoins which is expected for the head-initial language like English in HtH movement. Note also that this type of Lowering can skip constituents such as adverbials ("I often walked to the store earlier") since the latter are presumably merged as adjuncts (Sinque 1999, Harley 2011), and they cannot interfere with the head movement. Therefore, we argue that the Spellout component of the grammar is internally complex, but we will not be concerned how various modules of Spellout interact with each other during the derivation of the internally complex nominalizations. The MUA operation in this paper is primarily used to account for some morpheme ordering quirks as mentioned above and the Fusion as an exponence conversion mechanism is also added to show how complex the post-syntactic module of these expressions can be. It is notable that even though these operations may not be universal across languages, they are still of importance for understanding the parametric varieties of various languages in building complex expressions as well as understand how diverse languages like Georgian, Navajo, or Cupeño may have a quite similar arsenal of word-building mechanisms in stock.

The main question while positing MUA for certain morpheme-ordering facts is whether it is MUA or HtH movement that derives the given order of morphemes in the surface form. The paper will be resorting to various syntactic tests and evidence to show that in the environments where HtH movement is not an option the remaining mechanism can be a species MUA which allows the concatenation of complex heads when head movement is impossible due to the empty head or the phrasal boundary intervening between two higher heads. Harley (2011, p.177), for example, mentions that intractable situations like these arise when Asp^0 or T^0/Agr intervene between v^0 and V^0 ; or when T^0/Agr intervenes between v^0 and Asp^0 , between v^0 and V^0 or between Asp^0 and V^0 . In Georgian nominals, it is Tense morpheme that intervenes between $Aspect^0$ and V^0 (naturally, the same holds true for verbal expressions as well), and this type of Mirror Principle violations will be dealt in Sections 2 and 3 of the paper.

Harley following Barragan (2003) argues that the Mirror Principle violating orders in Navajo can be derived by applying the HtH movement and MUA to different parts of the same structure and then applying the Vocabulary Insertion *post factum* of these operations. In Parallel of Harley's derivations, now observe a simple example of the temporal nominal which combines the meanings of past and future reference within the nominalizing head:

(8)a. Past

mo-xn-ul-i
Asp=plow-Past-nom
'plowed land'

b. Future

mo-sa-xn-av-i
Asp=Fut-plow-TH-nom
'land that needs plowing'

These nominals are quite productive as shown in Section 2.1 below and syntactically can behave either as verbal arguments or their modifiers depending on the context, but their peculiar feature is that the aspectual and tense morphemes are concatenated in the pre-base position with the perfective marker always coming before the fused Tense⁰/*n* marker, which is a violation of the Mirror Principle since the latter is hierarchically higher cross-linguistically. If Tense⁰ is morphologically marked in a language, and it is specified as a prefix to the verbal Root, then it will be expected to occur at the beginning of a verb-word rather than after the aspectual morpheme as in (8b). This is one of the instances where post-syntactic MUA is necessary to derive the attested morpheme order in these nominals. The next section will provide a detail for the Fusion as a morpheme conversion operation occurring at the PF branch of grammar before we start elucidating the empirical data in support of word-building mechanisms already claimed in this paper.

1.5 Fusion of terminal Nodes as Post-syntactic Mechanism for Deriving Special Meanings

Halle and Marantz (1993) and Harris (1997) define Fusion as a post-syntactic operation combining two terminals into one with all of their features and this can only happen to the sister nodes under the same mother node created by the HtH movement. An example of such node is the single affix for number and case or case and gender in many Indo-European languages. However, Russian and Turkish have Number and case as separate morphemes so Fusion does not have to apply to these nodes at PF. In this paper, the Fusion is invoked in temporal nominals in which the Tense⁰ and the nominalizing markers are realized with the same exponent therefore suggesting that Fusion may apply to the *n* and Tense⁰ nodes creating the Fused node which is realized in the pre-base position while other allomorphs of the nominalizing morpheme can also be realized in post-base position as shown in (7a). The relevant question is where and how in the derivation this operation applies. It is argued that Fusion and MUA also interact in a way that the latter will apply to the output of the former so that the Tense/nominalizer morpheme will be linearized after the aspectual head as shown in (6).

The rest of paper is structured as follows: Section 2 will present the empirical data of productive derived nominalizations which combine the Tense⁰ head with the nominalizer morpheme in temporal nominals with the past and future tense meaning and the steps of the word-building mechanism; Section 3 will present the data of the pretend-state nominalizations and the steps of their derivation. Section 4 will conclude with the main mechanisms of word derivation and implications for the future research.

2. Derivation of Temporal Nominals and Post-syntactic Component

From two types of nominalizations that exist in Georgian in parallel of English gerunds and Present Participles, the ability to derive temporal meaning via the affixation of verbal stems is present in so called ‘derived nominals’ often referred to as ‘*mimgheoba*’ in the Kartvelological literature (Shanidze 1980, 1985, p. 567). It is only passive voice nominalizations that can have additional meaning of temporal reference with respect to the time of the event expressed by the main verb of the utterance in which this nominal appears. Therefore, this limited temporal interpretation of nominals can generate only past and future tense forms productively with the exception of one nominal derived from the medio-active verb ‘come’ which can generate a nominal with all three tenses: present, past and future. (9)-(13) illustrates the set of these nominals:

(9)a. Present	b. Future	c. Past
mo- ma -v- al -i	mo- sa -svl- el -i	mo-s- ul -i
Asp=Nom-come-Nom-nom (Note 5)	Asp=Nom/Fut-come-Nom-nom	Asp=came-Nom-nom
‘coming person’	‘one who will come’	‘one who came’
(10)a. Future	b. Past	
Da- sa -kl-av-i	da-kl- ul -i	
Asp=Nom/Fut-kill-TH-nom	Asp=kill-Nom/Past-nom	
‘one to be killed’ (animal)	‘killed’ (animal)	
(11)a. Future	b. Past	
ga- sa -tex-i	ga-tex- il -i	
Asp=Nom/Fut-break-nom	Asp=break-Nom/Past-nom	
‘one to be broken’	‘broken’	

(12)a. Future	b. Past
da- sa -ngr-ev-i	da-ngre- ul -i
Asp=Nom/Fut-destroy-TH-nom	Asp=destroy-Nom/Past-nom
‘one to be destroyed’	‘destroyed’
(13)a. Future	b. Past
mo- sa -xn-av-i	mo-xn- ul -i
Asp=Nom/Fut-plow-TH-nom	Asp=plow-Nom/Fut-nom
‘land that needs plowing’	‘plowed land’

This data show that the allomorph of the nominalizing head for the future tense nominals is *sa-* while for the past tense is the suffix *-il/ul*. Some Roots in (9)-(13) take the thematic markers in the future tense while in the past the invariable *-il/ul* suffix is present following the Root. We argue that the thematic suffix is the carry-over from the verbal morphology as they are characteristic to the Present Series verbal forms, and they are deleted in the Aorist Series (Past Perfective) screeves. (Note 6) Some of the verbal thematic markers are *-av* and *-ev* and like other verbal thematic affixes they are all suffixes to the verbal Root and are contextually conditioned. (Note 7) Shanidze (1985) lists 6-7 such markers in verbs which also include the verbs with zero thematic affix not listed in (14):

(14) Thematic affixes in Georgian verbs

-**i**: tl-i, ‘peel’

-**av**: ker-av ‘sew’

-**am**: vab-am ‘fasten’

-**eb/ep**: ashen-eb ‘build’

-**ob/op**: amaq’-ob ‘be proud of’

As illustrated with the above data, only a few of these markers occur in derived nominals. Of special importance though is the way the exponents of verbal functional heads concatenate with the Root and the nominalizer head as well. As (9)-(13) show, all nominals have viewpoint aspectual markers at the beginning followed by the nominalizer morpheme both of these occurring in the pre-base position. After the Root, in parallel with the verb, these nominals may have a variable number of morphemes depending on what needs to be expressed, but the most commonly occurring ones are shown to be the nominalizing morphemes and case markers which are suffixes. It’s particularly notable that the suffixal part of the nominalizer morpheme never shows future temporal meaning such as *-el* (9b) and *-ev* (12a) while the *sa-* prefix always does. In verbs, by contrast, Tense⁰/Agr markers are located at the very end of the templatic structure as illustrated in the following:

(15) Tense⁰/Agr in present in progressive verbs:

a. a-ngr-ev-s

Trans-destroy-TH-**T/Agr**

‘He/she is destroying something’

Going back to the nominals in (9)-(13), the nominalizer prefix suggests that the nominalizer category-defining head *n* should occur at the end of the derivation when all verbal functional material is already merged, and there is only one step left to finalize the derivation of a nominal-word with the head that would define the structure as a nominal (see Alexiadou (2001) for a similar proposal for European languages). However, there is another morpheme to the left of the T⁰/*n* morpheme. Based on the analysis of the morphological structure of the above nominals, it can be predicted that a handful of syntactic and post-syntactic word-building mechanisms can derive the morpheme order of the temporal nominals as shown in (7)-(11). The next section will explain its derivation.

2.1 Derivational Mechanism of Temporal Nominals

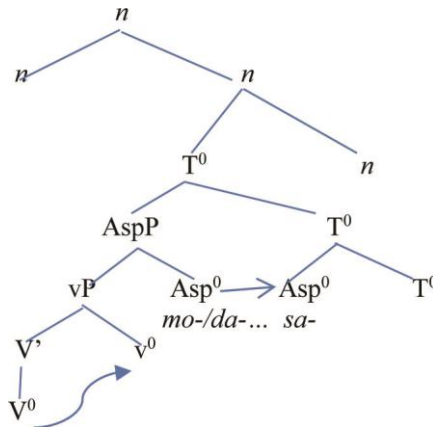
At a very general level, the linearized morphemes of nominal word shown in (9)-(13) can be represented with the following sequence:

(16) Linearization of morphemes in temporal nouns

Asp \frown Tense/*n* \frown Root \frown (TH) \frown (Tense/*n*)....

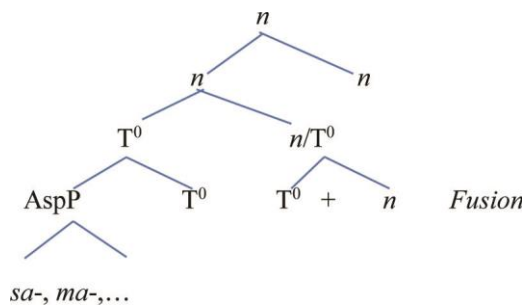
Here we propose some key assumptions about the word derivation mechanisms for these nominals: HtH movement applies taking the Root to the v^0 head which is null but the TH head is added at PF realized as a dissociated morpheme in the post-syntactic component (Embick 1997, McGinnis 2016) (Note 8). The Root adjoins to the left of the little v^0 head since the latter is specified as the suffix. The next step of movement is to the Asp^0 head which is specified as the prefix and the complex Root- v^0 head that after movement will adjoin to the right of the Asp^0 . When the latter moves to $Tense^0$, it is adjoined to the left in Future tense forms since the Asp^0 is specified as a prefix (Note 9):

(17) Step 1:



In the post-syntactic component, the Fusion applies to n and T^0 sister nodes due to the null n node and as a result one morpheme will be inserted into the fused n/T^0 node during Vocabulary Insertion:

(18)a. Step 2: Fusion of $Tense^0$ and n :

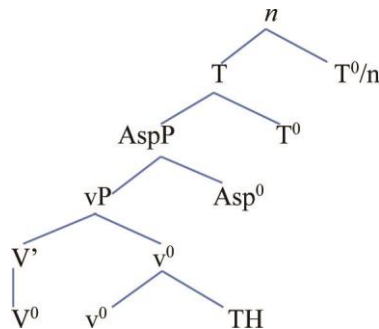


Besides this fused n/T^0 node, the TH morpheme added to the v^0 node at PF will be linearized as a suffix of the verbal Root due to its inherent specification as a suffix. All these steps come together in the derivation of the nominal word but there are some problems with the linearized morphemes in (16) since the aspectual morpheme precedes the Fused n/T^0 marker in the surface form of the nominal word. Although this word is not analyzed as a multi-partite structure like pretend-state nominals analyzed below in Section 3, and the HtH movement proceeds piecemeal in (17), it is still necessary to posit the post-syntactic operation like MUA to derive morpheme order in the final form. Thus, the final step in the derivation is necessary to derive the morpheme order shown in (14) with the aspectual morpheme linearized before the n/T^0 marker $sa-$. This step will be the lowering of the fused n/T^0 node on to the complex head under Asp^0 via MUA:

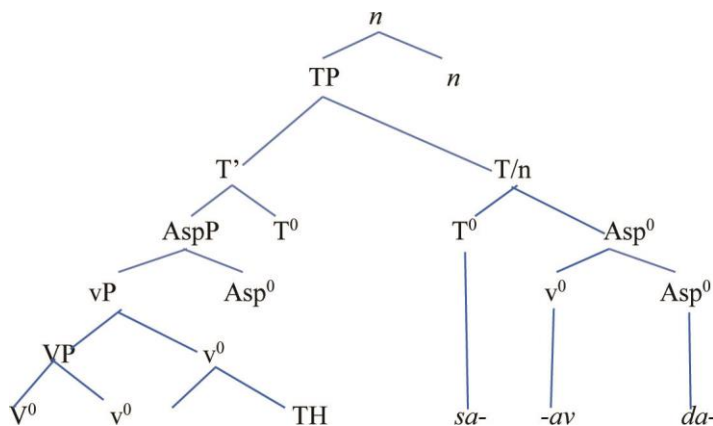
(19)a. The order of morphemes before MUA/Lowering

$n/T \sim \widehat{Asp} \ v-T-\sqrt{\quad}$

b. Structure before MUA



(20) Morpheme order in temporal nominals after Lowering:



After applying MUA the result would be the Asp^0 -Nom/ T^0 -Root-TH order that can still be derived with a few word-building and morpheme affecting mechanisms including HtH movement, Fusion, and MUA. These conclusions will be repeatedly tested on multi-partite nominal expressions with the pretend-state meanings in Section 3.

2.2 Interim Conclusion

This section showed that complex nominals are derived not only through HtH movement but Fusion and MUA as well. Although very different from each other, these word-building processes apply to structurally adjacent elements deriving complex heads in which some nodes may fuse, get fissioned or even obliterated in post-syntactic component before Linearization and Vocabulary Insertion apply to them as illustrated in the Figure 1. These processes apply to the structures which are already assembled in syntax by left- or right adjoining head movement, but post-syntactic operations like Fusion and MUA are still needed to derive the final order of morphemes in these multi-morphemic words. The following section provides more empirical support to these observations.

3. Derivational Mechanism of Complex Derived Nominals with Pretend-state Meanings

This section focuses on the linearization rules and constraints responsible for the linear order of morphemes in nominals incorporating the grammaticalized morpheme Pretend⁰ which is responsible to derive the meaning of an individual who is pretending to be in a condition expressed by the Root.

It is notable that other languages like Lillooet spoken in British Columbia also has a similar verbal structures including the grammaticalized Pretend⁰ head (Van Eijk 1997) and these also have the transitivity marker *-am* followed by the exponent of the Pretend⁰ head as illustrated in the following:

(21) Pretend-state predicates in Lillooet

a. kwukwpy'-**áz**-am

'to pretend to be a chief' (skwukwpəy]

b. ʔalsm-**áz**-am

'to pretend to be sick'

(Van Eijk, 1997, p. 104)

Van Eijk notes that -*áz* combines with nominal Roots to denote pretend states, and the same affix verbalizes the Root (p.123). In Georgian, the grammaticalized Pretend⁰ head combines with the nominal or adjectival stems formed with the category-neutral Root and the category-defining head *n/a*. First observe the set of the nominal-words that will be referred to for the Mirror Principle violation morpheme-order is the following: (Note 10)

(22) Pretend-state nominals in Georgian

a. tav-mo-m-k'vd-ar-**un**-eb-ul-i

self-Asp-Nom-dead-Nom-**Pretend**-TH-Nom-nom

'someone pretending to be dead'

b. tav-mo-m-dzin-ar-eb-ul-i

self-Asp-Nom-sleep-Adj-TH-Nom-nom

'someone pretending to be asleep'

c. tav-mo-k'at'-**un**-eb-ul-i

self-Asp-Nom-cat-**pretend**-TH-Nom-nom

'someone pretending to be like a cat'

d. tav-mo-gizh-ian-eb-ul-i

self-Asp-crazy-Adj-TH-Nom-nom

'someone pretending to be crazy'

f. tav-mo-sac'q'l-eb-ul-i

self-Asp-poor-TH-Nom-nom

'someone pretending to be poor/wretched'

g. tav-mo-nayvl-ian-eb-ul-i

self-Nom-sad-Adj-TH-Nom-nom

'someone pretending to be sad'

Like in other polysynthetic languages, Georgian Pretend-state nominals display the multi-partite structure due to both verbal and nominal functional layers present in these forms. Observe the corresponding verb in (23):

(23) mo-v-i-m-k'vd'-ar-**un**-e

Asp=1S-REFL-Nom-die-Nom-**Pretend**-Aor

'I pretended to be dead.' (Note 11)

Here are some of the assumptions for the derivation of the pretend-state nominal:

(24)a. The first part is a nominal domain consisting of a Root + *n* head., the *n* head being realized as *-ar* in (22)-(23).

b. The next domain is that of the Small Clause which is created by the movement of the Root+ *n/a* complex to the *v*⁰ head, which includes a pretend-state meaning; this can be considered as a small clause in its own right because of the lexical and functional material merged at this point;

c. The last domain is a verbal-nominalizer functional domain which consists of the light *v*⁰ head, Asp⁰, Tense⁰ realized with *-ul*, and category-defining nominalizer realized as *m-* prefix.

It is notable that the notion of Tense⁰ merged in the derivation of these nominals is not entirely justified because this functional head can only express past tense reference excluding the possibility of the future interpretation even if the *sa-el/il* circumfix is added to the nominal stems as shown in the following:

(25)a. Future tense of pretend-state nominals impossible

a. *tav-mo-***sa**-kvd-in-eb-el-i*

SELF-Asp=Fut-kill-CAUS-TH-Nom-nom

b. *tav-mo-***sa**-gizh-ian-eb-el-i*

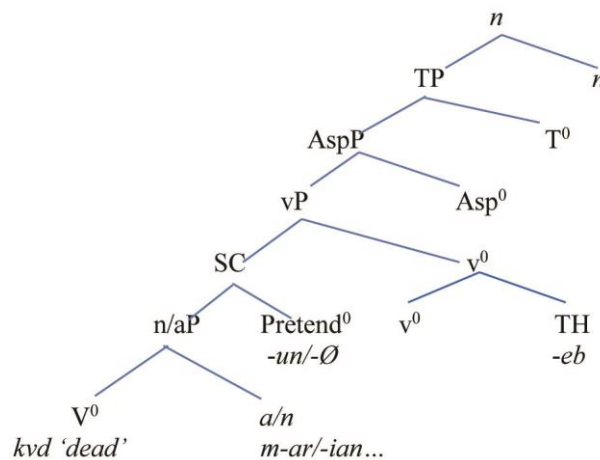
SELF-Asp=Fit-crazy-Nom-TH-Nom-nom

Although these forms look like a possible morphological derivations of pretend-states in the future in parallel to temporal nominals shown in Section 2, in fact they are nonsense and cannot be considered as the attested forms in the language. Therefore, the pretend-state nominals cannot be considered to have the same repertoire of meanings as temporal nominals which are morphologically much simpler than the latter. The main question about the pretend-state nominals is whether the multiple domains outlined in (24) are created with the Mirror Principle-respecting word-building operations or they are built with the post-syntactic mechanisms like MUA and other morpheme conversion operations as illustrated in Section 2. The next section will go into the details of the derivational steps that are needed to assemble and linearize these complex structures.

3.1 Derivational steps of pretend-state nominals

Like in Harley (2011), the derivation of complex nominal words in (22) will start out with the assumed base positions of various functional and lexical heads in the right-headed structure as shown below:

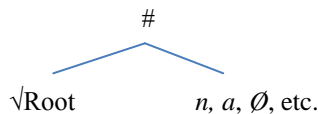
(26)



The job of linearization algorithm is to add precedence relations to these terminals in order to derive the precedence relations as in the following:

(27) $D_{REFL-Asp-\sqrt{a/n}-Pretend^0-v^0-TH-n-...}$

(28) Merger of the Root and a category-defining head

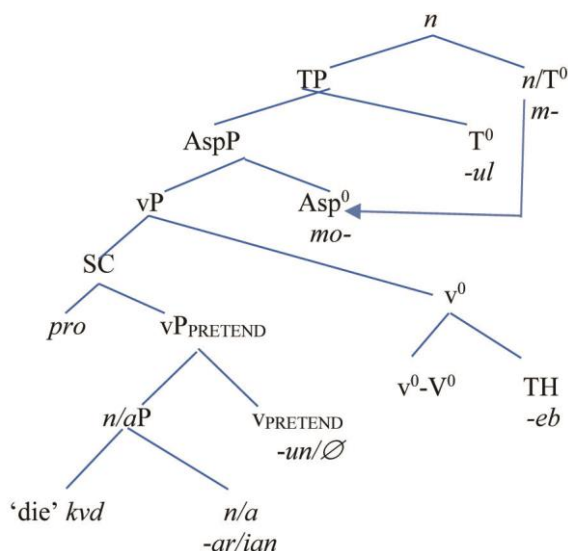


In the context where the Root-attached category-defining head is absent as in (22c) and the Root itself is a syllable, and the exponent *-un* is inserted to foot the Root syllable. As a side note for the allomorphic interaction between the Roots and local functional material, this evidence illustrates that the phonological interaction between the Roots and the heads on their right is apparent. (Note 12)

Like in Harley (2011), the derivation of this complex head will start with the creation of the small clause which includes the nominal or adjectival stem merged with the light v^0 head with the pretend state meaning as in the string $Root-a/n-Pretend^0$. The complex head will move up to another layer of verbal and nominal functional heads as shown in (30) creating complex heads with right and left adjunction which is determined by morpheme-specific information to be prefix or suffix. For example, the complex head created under $Pretend^0$ will move to another v^0 head higher that is added the TH node at PF realized as *-eb* in (22). As the result of these steps *kvdar-un-eb* is assembled for (22a).

The next step would be moving the latter head to Asp^0 which is specified as prefix. The result of the right-adjunction of the complex head under Asp^0 will be $Asp-V^0-n-v_{PRETEND}-v^0/TH$. Observe these steps in the following:

(30) Derivation of the pretend-state nominal



However, there is still the circumfix *m-ul* left to adjoin to the above complex unit. According to both Aronson and Shanidze, *m-* is a general nominalizer marker showing up in some forms of (22) while *-ul* is interpreted as passive voice marker in derived nominals but we will be simplifying its insertion context as T^0 as in the temporal nominals shown in (8a), (12b)-(13b) above. Thus the complex head under Asp^0 will head move to this T^0 which is specified as suffix and attach to its left as shown in (30). The highest head is the nominalizer *n* which has two allomorphs one being a null morpheme and another the formant *-ul* in (22a-b). This is the very morpheme which is to the right of the aspectual morpheme and creates the Mirror Principle violating order. At PF, first fusion will apply to n/T^0 nodes creating the n/T^0 head which will be realized as the *m-ul* (a very common nominalizer morpheme in this language). Following the Fusion, MUA will apply to the fused n/T^0 head lowering it on to the Asp^0 and the result would be the aspectual *mo-* coming at the beginning of the complex word which includes the following string:

(31) String of morphemes before and after MUA:

a. Before MUA:

n-Asp-V-n/a-Pretend-v-TH-T/n

b. After MUA:

Asp-n-V-n/a-Pretend-v-TH-T/n

Thus, by utilizing the three basic operations applying in syntax and after it, the complex nominals with pretend-state meaning can be derived. Another conclusion drawn from the above derivation is that morpheme conversion operations like Fusion apply earlier than MUA at PF, and they feed the latter so that the created structure can be linearized before Vocabulary Insertion applies to these complex constituents.

4 Conclusions

The paper presented the evidence that the spellout of nominal expressions includes several post-syntactic processes applying step-by-step to the output of syntactic computation. After HtH movement in syntax, MUA and Fusion apply to the computed nodes to derive the surface order of morphemes in M-words of temporal and pretend-state nominalizations. Although these processes may be language-specific to a certain extent, it is important to note that they may have some generality with respect to derivational mechanisms of complex expressions in languages with a higher level of morphological complexity like Georgian. The paper concludes that the PF branch of the grammar has a modular architecture as argued in more recent work of DM on various languages with some post-syntactic operations applying earlier than Vocabulary Insertion and Linearization realize the final morphological shape of derived material, and these processes affect allomorphic selection of various heads. Along with others' research (Harley 2011, Barragan 2003) the paper concurs with the assumption that only a handful of word-building

mechanisms are necessary with a few PF operations like Impoverishment, Fusion and Fission in DM to account for the final form of complex expressions. More research is needed for better understanding of the PF branch of the grammar and its modular architecture.

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Notes

Note 1. M-word is a convenient convention to refer to the morphological unit that equals a word in any given language. By contrast, a sub-word refers to the bound morpheme which is morphologically smaller unit than an entire word (Embick 1997).

Note 2. The fusion of Tense and Agreement is a very common process across languages and we will not go into the formal description of this rule since it is irrelevant here.

Note 3. The same work discusses another late movement operation taking place in the PF branch of grammar called *Local Dislocation (LD)* in Embick and Noyer' (2001)'s terms and applies after Vocabulary Insertion. We do not utilize this movement in this paper due to its highly restrictive conditions on its application only after the Vocabulary Insertion. This late application excludes the possibility of interaction with the allomorphic selection of the heads affected by the movement and with other rules applying after the Linearization.

Note 4. Besides MUA, Embick (2007) also defines the "typed" notion of Local Dislocation, which applies after Vocabulary Insertion in which two categories of objects, sub-Words and M-Words, can each move with respect to its own type:

(7) *Typing assumption of LD*: M-words only dislocate with adjacent M-words, and Subwords with Subwords (Embick, 2007, p.308). This operation is not utilized in this paper due to its restriction to apply only after the Vocabulary Insertion.

Note 5. Morpheme glosses stand for the following functional material: Nom- nominalizer head, nom- nominative case, Fut- for future tense, Asp- for aspectual marker denoting perfectivity,, etc.

Note 6. The three series represent the conjugation patterns of verbs with the distinct verbal inflection of either tense, or aspect and mood. The three series are: Present, Aorist and Perfect and there are 11 screeves each having a unique combination of the above three inflections; The Present series has 6 screeves, Aorist 2, and the Perfect 3. (Aronson 1990, Shanidze 1985)

Note 7. The evidence for contextual conditioning of the thematic affixes comes from Shanidze (1985), Aronson (1990), Kvach'adze (2006) and many others who illustrate how various classes of verb Roots that are syllable-defective select the thematic affixes like *-i* like in *tl-i* 'peel', *ch'r-i* 'cut', etc. while intransitive Roots select the nominal marker *-il* in forms like *kux-il-i* 'thundering', etc.

Note 8. See McGinnis (2016) for an alternative proposal on TH markers as spellout of the aspectual head.

Note 9. For simplicity, we represent the RootP as a VP in these trees, hence, V^0 is equivalent of Root ($\sqrt{\quad}$). Following Marantz (1997) and Arad (2003) we assume that Roots are acategorical elements that enter derivation without any specific information whether they will be noun, verb, adjective or any other category.

Note 10. When such multi-morphemic structures are analyzed, the assumption is that Linearization will derive a set of precedence relations between morphemes in M-words from the hierarchical relations in the tree. I assume that the set of precedence relations is defined in terms of the set of hierarchical relations which represent input to Linearization (Embick 2007 among others). These claims are supported by the analysis of these complex expressions that follows.

Note 11. All other forms in (22) have very similar verbal counterparts like in (22).

Note 12. The category-defining morpheme is followed by the Pretend⁰ head which shows contextually-determined allomorphy in different phonological contexts: the exponent *-un* shows up in (22a, c) and the null exponent in (22b, d, e). How exactly this contextual allomorphy is implemented is immaterial here for the discussion. We assume that local domains in syntax and PF constrain the interaction between various morphemes as defined in Embick (2010).

If Root+ n complex is one full syllable, then the exponent *-un* is inserted into the Pretend⁰ while when it exceeds a syllable then the null exponent matches Pretend⁰.¹ These contexts may be formalized with the following rule (See Lomashvili 2011 for further details of the insertion contexts for this morpheme):

(29) Insertion contexts for the exponent *-un*

a. [-un] ↔ Pretend⁰ / Root + n = <σ> ____

b. Ø ↔ Pretend⁰ / elsewhere