Two kinds of verbal roots in Latin: evidence from thematic vowels and word-formation processes

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ABSTRACT

This paper aims at tackling under a new perspective a crucial asymmetry of Latin verb morphology, that is the distinction between stem and root in different kind of word formations. We do not concentrate here on the inflectional domain directly, but we address the issue taking in consideration two different ways of encoding agentivity in nominalizations, namely we will compare the *-tor* formations with the so called synthetic or root-compounds, in order to identify which rules select either the bare root (*ponti-fek-s*) or the perfect participle stem (*cap-tor*, *lauda-tor*) in different morphological environments. The theoretical framework we adopt is the Nanosyntactic one, which will allow us to account for the morphological operations according to a constrained set of principled rules. In § 2 we present the crucial properties of agentive nominalizations realized with *-tor* as well as those of root compounds, focusing on the different conditions which trigger the use of the root morpheme or the perfect participle stem; in § 3 we introduce the basic tenets of the Nanosyntactic framework; in § 4 the morphological properties of Latin roots and thematic stems are accounted for under the nanosyntactic principles; finally in § 5 we draw the general conclusions and point to the open issues.

1. INTRODUCTION

The focus of this presentation is on agentive nominalizations in Latin, both simple nominalizations and compounds:

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(1) a. *laud-ā-s* “you praise” > *laud-ā-**tor*** “the one who praises”

b. *cap-i-s* “you catch” > *cap-**tor*** “the one who catches”

c. *duc-i-s* “you lead” > *duc-**Ø**-s* “the one who leads”

d. *fac-i-s* “you do” + *pont-i-* “path” > *pont-i-fec-**Ø**-s* “the one who makes the path”

The point at stake is the morphological realization of the agentive nominalizing function, the function turning a verbal structure into an agentive nominal one. In (1a) and (1b), the function is realized overtly, by means of the morpheme *-tōr*, while in (1c) and (1d) it is realized covertly, by means of what is descriptively called ‘zero derivation’[1]; Looking at the form of the basic morpheme to which the two processes apply, we notice an asymmetry: while the ‘zero derivation’ always requires the bare root – (1c) and (1d) – the *-tor* derivation seems to pose different constraints depending on the verb: whereas in (1a) the suffix *-tor* follows the thematic stem formed by the root with the thematic vowel *-ā*, in (1b) *-tor* seems to require the root itself.

In this contribution we show that the distribution of the overt morpheme *-tor* and of the ‘zero’ one is predictable and that the constraints on their presence/absence are related to the morphological properties of the lexical morpheme (usually called root in the literature, see Harley 2014). The basic observation is that there is a direct relation between the so-called thematic class of the lexical morpheme and the constraints on the morphological derivation of agentive nominals. Our claim is that these constraints can be directly captured assuming that thematic classes correspond to differences in the functional layer realized by lexical roots. This follows once we adopt the idea that the morpho-phonological strings corresponding to the different lexical roots (*laud-*/*duc-*/*fac-* in 1) are not inert and acategorial but lexicalize different functional features (in the sense of Caha *et al.* 2019, Starke

[1] Zero derivation: when the same morpho-phonological string realizes two different lexical items without any overt marker intervening and signaling the derivation (e.g. It. *vecchio* “old” adj. and *vecchio* “old man” noun).

2014). This point is relevant from a theoretical perspective (see below), but it is also meaningful for Latin morphology: it provides a way of capturing the distinction between 'weak' and 'strong' morphology without claiming for lexical lists, but simply on the ground of structural and predictable principles.

2. DATA

2.1. Agentive -tor *nominalizations*

We analyze firstly the *-tor*/*tōris* (fem. *-tr-īk-s*) formations, which are the most productive Latin agentive nominalizers[2]. Most of the literature agree in tracing this element back to the PIE suffixes **-tor* and **-ter*: some IE languages display two classes of *-tVr* nouns, usually reconstructed as **R(é)-tor-m*, gen. **R(é)-tor-(e/o)s* and **R(z)-tér-m*, gen. **R(z)-tr̥-és*, perhaps associated with different aspectual functions. However, both the formal and the functional distinctions look blurred in Latin (Pultrová 2007). In what follows we briefly recap the most relevant morpho-syntactic properties of these formations.

As to the word-formation rules involved, *-tor* and *-trix* apply to verbs: in particular, they select for transitive and unergative verbs, namely those that can license an external argument (usually an Agent, but not necessarily) like in (2) and (3):

(2) *ar-ā-s* "you plow" > *ar-ā-tor* "the one who plows".

(3) *dorm-ī-s* "you sleep" > *dorm-ī-tor* "the one who sleeps".

Conversely, stative verbs do not form *-tor* nouns[3], nor do it unaccusative ones; some apparent exceptions are reported, like *praetor*

[2] Magni (2016), Watmough (1995).

[3] *Mansor* "guest, the one who stays", *sessor* "spectator, the one who sits" (Di Gennaro 2009: 110) are not from proper stative verbs.

< *prae-itor*, *cursor* "runner", or *fugĭtor* "the one who runs away", *cubĭtor* "the one who lays down", but it is easy to remark that *currō* and *eō* can also have an activity reading; as to *fugitor*, we quote Di Gennaro (2009: 110) according to whom a referral to *-tus* formations with active meaning like *fugĭtus* is possible. A very limited set of *-tor* formations from nouns exist (10 out of more than 1300). In all of them, however, an association with habitual activities is present likewise.

(4) *salinātor* "salter", *senātor* "member of the senate", *āleātor* "dice-player", *gladiātor* "swordsman", *portĭtor* "seaport officier", *iānĭtor* "doorkeeper".

The morphological constraints on the specific form of the verb look more interesting. The form preceding *-tor* seems variable, at first sight. Most of I and IV conjugation verbs select a thematized stem, that is the verbal root must be followed by the thematic vowels *-ā* or *-ī* (5). The verbs of the III conjugation and some of the II, instead, apply *-tor* to the bare root (6), or to an allomorph coincident with the form of the root which surfaces in the past participle stem (7). The problem is quite puzzling, indeed: in forms like *cultor* or *captor* it seems that the suffix *-tor* needs the roots at its left, but if we consider forms like *lā-tor*, *āc-tor* or *monĭ-tor* it is not the root itself to enter in the derivation, but an allomorph coinciding with that of the past participle (*lāt-us*, *monĭt-us*, *āct-us*)[4].

(5) *ar-ā-tor* "plowman", *cur-ā-tor* "curator", *aud-ī-tor* "hearer", *larg-ī-itor* "dispenser".

[4] The perfect participle and the agentive noun related to *ferō* select for the suppletive form *lā-* from **tl̥h₂-*; the *-ĭ* of *monĭtus* does not belong to the root **men-* but it could come from a kind of ancient expansion (Leumann 1977: 541); as to the long vowels in *āctor* and *invīsor* are the expected outcome of the Lachmann's Law (Leumann 1977: 114).

(6) *cap-tor* "hunter", *cul-tor* "cultivator", *auc-tor* "he who increases, promotes", *dă-tor* "giver", *genĭ-tor* "creator", *cubĭ-tor* "he who lies down", *molĭ-tor* "attempter".

(7) *invīsor* "envier", *lā-tor* "mover", *pas-tor* "shepherd", *monĭ-tor* "suggester".

Given this, one could doubt whether it is correct at all to analyze these forms as involving a suffix *-tor*, since, at least synchronically, it would be easier to reconstruct a derivation which applies a suffix *-or* to the perfect participle stem, *à la* Aronoff (1994). This claim would fit to the I conjugation verbs too, like *amāre*:

(8) $[[amā\text{-}t]_{PP}\ \text{-}or]_{N}$

The point is complex, since the comparative evidence for a proper *-tor* suffix is massive, and it is unexpected that a derivation takes as a base an inflected form (the perfect participle); furthermore, the semantics reason for the choice of the perfect participle are quite opaque. However, one could also imagine that it is not the perfect participle itself to be involved, rather, a form in some way coinciding with it, maybe after some kind of de-semanticization (cf. Calabrese 2019b). This would be coherent with the fact that Latin *-tor* formations largely blur the Indo-European morphological constraints, as said above. Thus, we leave at the moment the two hypotheses open, and simply state that *-tor*, whatever it is, selects the allomorph of the lexical item which also appeares in the perfect participle. This accounts for both the condition of I-IV conjugation verbs, and for II-III conjugation ones. The advantage of this formulation, in turn, is that it makes it even more evident the asymmetry in the affixal agentive formations: some require the bare root (or an allomorph), some the thematized root.

2.2. Agentive Root Nouns

A second group of agentive nouns in Latin are root nouns like *duk-s*. This strategy is unproductive, since the possibility of having couples of verbs and nouns (agentive or not) in which there is no overt nominalizer or verbalizer, although comparatively well attested, in Latin seems limited to action or abstract nouns like *lēx*, *nex*, *-dic-*, *pāx* (Leumann 1977: 274), all of which inherited and belonging to ancient lexical domains as the institutional one:

(9) *rēx*/*rēgis* "ruler, king"; *dux*/*ducis* "the one who leads"; *vōx*/*vōcis* "voice"; *cleps* (Gloss. V 349, 51); *coquus*/*coqui* "cook" (thematic); *scriba*/*scribae* "public writer"; perhaps *fūr*/*furis* "thief".

The only ones which are both transparently related to synchronically attested verbs and have an agentive semantics are the following:

(10) a. *clepĕre* > *cleps*
b. *ducĕre* > *dux*
c. *regĕre* > *rēx*

What is relevant for our topic, is that all of them are connected to verbs belonging to the III conjugation; i.e., there are no cases of, e.g., ***clam-s*/***clama-s* "the one who calls" in relation to *clam-ā-re*[5]. The asymmetry highlighted above for *-tor* formations holds likewise: only verbs belonging to the III conjugation admit agentive nouns which involve the bare root in their derivation.

[5] *Fūr* can be related to a verb belonging to I conjugation, but it is probably a borrowing from Greek (de Vaan 2008: 251).

2.3. Root Compounds

The third strategy we consider are the so-called synthetic compounds, or R(oot)C(compound)s, which share with agentive root nouns the property of being a non-productive category. They belong mostly to a very ancient stratum of the Latin lexicon and are considered as remnants of a far common option of the PIE language, due to the fact that many of them have *comparanda* in other IE languages (Benedetti 1988)[6]. As such, the lexical domain involved are the institutional lexicon and that of technical activities, e.g. *ponti-fex* "pontiff", *au-spex* "auspex", *iu-dex* "judge", *sacer-dos* "priest", *prin-ceps* "first", *arti-fex* "master in an art", *tibi-cen* "flutist", *feni-sex* "mower", *au-ceps* "bird-catcher", *opi-fex* "fabricator" ecc. Beside this, RCs have been a model for poetical language and its parody[7].

RCs exhibit two morphological patterns: both are exocentric and are characterized by the presence of the bare form of the root as second member of the compound, but whereas in the first one – (11a) – the first member is a nominal element, in the second one – (11b) – it is a preposition. In this paper, we focus only on the N+V compounds, in which the noun is governed by the verbal lexeme, as the bracketed representations in (11a) indicate.

(11) a. N+V *pontifex*: [[[*pont-i*]$_{N}$-[*fak*]$_{ROOT}$]$_{COMP}$ -*s*]$_{NOM.S}$

b. P+V *coniux*: [[[*con*]$_{P}$-[*iuk*]$_{ROOT}$]$_{COMP}$ -*s*]$_{NOM.S}$

The verbal element, in turn, surfaces with two representations: it can be realized as a radical, like in *remex*: here, the bare root *ăg-* of *agĕre*

[6] For instance, *navigium* entails an unattested RC ***nav-ex* (*navem* + *agĕre*), which corresponds to the Sanskrit phrase *nāvam aj-* "to pilot a ship", cf. *nāvājá-* "pilot of ships" (Benedetti 1988: 41-45).

[7] For a more complete overview see Benedetti (1988), Brucale (2012), Oniga (1988: 84-96; 1992; 2020).

is selected, without changes but phonological[8]. A second option admits the presence of a vocalic element *-ā-* after the root, like in *hosti-cap-ā(s)* "he who captures the enemy"[9].

The crucial point is that RCs are admitted only with verbs belonging to the III conjugation: only roots forming III conjugation verbs can be present in RCs. That is, forms like ***agri-ar-s* or ***agri-ar-ā-s* from *ager* "field" and *ar-ā-re* "to plow" are not attested[10].

[8] With the familiar change of *-ă* to *-ĕ* in closed syllable; please note that compounds like *rem-ex*, *frugi-fer* demonstrate that it is the bare root to be involved, and not its allomorph which takes part in the perfect participle stem (***remāx*, ***frugi-lāt-s*). We will return on this below.

[9] Cf. *legirupā*, *par(r)īcidā(s)*, *fenisecā*, *noctilucā* (but with a different argument structure). This structure has two possible analyses:

- [[[*host-i-*]$_{N}$ [[*cap-*]$_{ROOT}$ *ā-*]$_{TV}$]$_{COMP}$ *-s*]$_{NOM.S}$
- [[[[*host-i-*]$_{N}$ [*cap-*]$_{ROOT}$]$_{COMP}$ *ā-*]$_{?}$ *-s*]$_{NOM.S}$

We explain *-ā* as an over-application of the 'verbalizer' TV *-ā*. The productivity of *-ā-* as a morph related to agentivity is shown by the deverbal adjectives of the type *ed-āx/-ācem* (mostly from III class verbs), if *-āk-* can be derived from the same **-eh$_2$-* of *-ā-* (cf. Prosdocimi 1991). Alternatively, *-ā* can be treated as an 'individualizing' suffix, that is applied to a pre-existing compound (Fellner – Grestenberger 2017).

[10] There is an apparent exception: *fenisex* (alternative to *fenisecā*) with the root of *secāre* (I conj.). However, this is one of the very few verbs of the I conj. In which the thematic element *-ā* disappears at the perfect and past participle (*sec-u-i*, *sec-t-um*). Etymologically, in addition, the root was **sekh$_1$-*. This points to an analysis of *secāre* as an athematic verb in which the apparent thematic vowel *-ā-* reflects a phonological process (**sekh$_1$-i̯e-si* > **sekă-i̯e-si* > *sek-ā-s*). We thank Renato Oniga for having drown our attention to the term *domiportā* "she that carries her house on her back", which also seems to go against our generalization. Similar forms are known: Leumann (1977: 294) mentions *carnivorus* and *velivolus* among others. As far as we know, the term appears firstly in Lucilius (fr. 1377 Marx) and it designates the snail in a line with two other epic-like compounds (*terrigenam herbigradam domiportam*) which means that it could be a kind of poetic creation, with feminine inflection.

A second relevant point is that, quite unexpectedly, the type ***avi-cap-tor* does not exist.[11] This comes as a surprise, since, as we showed above, *-tor* is able to select for roots like *cap-*; roots like *cap-*, in turn, can compound with a noun, as RCs like (*au-cep-s*) demonstrate. On the other hand, it would be incorrect to state that this holds on a generic restriction against compounds with derivational suffix, since words formed with a similar derivation actually exist (consider for instance *bene-vol-ens*). These points are relevant, since they indicate that despite their antiquity RCs are not bare lexical relics: they show structural properties as well as consistent constraints, which lead us to analyze their morphological structure deeply.

2.4. The relevant data and the problems they raise

Concluding this section, let us recap the main points that we want to address. The crucial point is that there is a striking asymmetry between verbs traditionally assigned to the III conjugation and the other verbs: only the former admit nominal agentive derivations in which there is no overt nominalizer, may these agentive nominals be compound (RCs) or root derivations without compounding (agentive RNs). Outside this perimeter, an overt nominalizer is always required. In the theoretical literature, class-belonging is regarded as an inherent lexical feature of the different verbal roots, which forces the selection of a certain morphological paradigm (Aronoff 1994) or the presence/absence of a specific thematic element, taken as 'ornamental' and adjoined to the functional morphemes (Calabrese 2019a, Oltra-Massuet 1999). From

[11] Exceptions are attested: *nomenclator*, *vitisator*, *agricultor*, *imbricitor*. These compounds, however, can be treated as N+N compounds according to Leumann (1977: 395). N+V-*tor* structures are scarcely attested also in Greek and Vedic, except if the first member of the compound is a P. Also, the fact the *-t* of the PP triggers allomorphy of the root indicates that the derivation firstly creates the agentive nominal and then puts it together with a second nominal [*viti*-[[[*sa*]-*t*]-*or*]].

this perspective, the observed class-related block on agentive nominalizations must be stipulated.

A further point to be addressed regards the interaction of composition and *-tor* derivations. If no composition takes place, both the overt morpheme *-tor* and the derivation with the bare root can realize the agentive nominalizing function. In other words, a root can host an agentive derivation with a zero strategy or with the suffix *-tor* (both *laudā-tor* and *duc-s* are allowed). Conversely, when composition is involved, *-tor* is banned and only the zero derivation can realize the agentive nominalizing function (***avi-cap-tor* unattested, contrary to En. *truck-driv-er*).

Apparently, then, agentive constructions are two-way conditioned, since they are constrained not only by the kind of morphological construction (root nouns vs. *-tor* nouns vs. RCs), but also by the lexical properties of the verb (long-vowel thematic verbs, that is I and IV classes, vs. II and III classes). In what follows we show that both these distinctions are just the consequence of the morphological properties of the different roots and of the way they interact with the word structure.

3. Framework: nanosyntax

We approach these issues form a specific point of view on the morpho-syntax interface: Nanosyntax (Starke 2009). Nanosyntax shares with other approaches, like Distributed Morphology (DM, Halle – Marantz 1993), a basic idea: the only combinatorial module we have in natural languages is syntax, which allows for sequential binary merge of functional features. This means that there is no autonomous pre-syntactic morphological module in which complex elements are created[12]. The idea that syntax operates on functional features directly

[12] As a consequence, no special status is given to the notion of *word* in syntax, the only relevant pieces are the smallest 'unbreakable' items which carry a meaning, i.e., the minimal pairing of syntacticosemantic content and a phonological string. In other terms, if there is no pre-syntactic module in which we can create complex

leads to the main characteristic shared by Nanosyntax and DM: both intend the morphophonological units of a specific language (called Vocabulary Items, VIs) as the *realizations* of syntactic features. The language-specific morphophonological units (VIs), in other words, are not the input of syntax but its output, its *realization*. Syntax deals with functional features, not with overt morphs.

Syntax puts together functional features in a binary fashion (merge). Functional features, as in cartographic approaches (Cinque 1999, Rizzi 1997) come one by one and in a rigid universal sequence (functional sequence, *fseq*)[13].

(12) $\left[\text{F4}\ \left[\text{F3}\ \left[\text{F2}\ [\text{F1}]\right]\right]\right]$

This point differentiates Nanosyntax from DM, in which, on the contrary, functional features can come in pre-syntactic (and language specific) feature bundles, on which syntax then operates (see, for example, the typology of valued-unvalued/interpretable-uninterpretable features for number and gender in the nominal domain proposed in Picallo 2008). This point is highly relevant. It is a fact that the minimal units of the lexicon of a specific language (morphs/VIs) may mark more than one feature (e.g., the nominal plural morph in the Italian carries both gender-related and number-related information: *cas-e* "house-f.pl"[14]). The lack of feature bundles, then, requires another

elements to be fed into syntax, syntax can only operate on minimal elements. Operationally, the definition is equal to the one of *morph* given in Haspelmath (2019).

[13] For argumentations in defense of the heuristic value of the *fseq* see Rizzi (1997), Cinque (1999), Starke (2001). Clearly, universal order does not mean that every feature must be always present in any case, it means that if two features are present, they will come in a fixed sequence.

[14] But see Faust *et al.* (2018) for a different analysis, in which they split the morph in two.

mechanism allowing for 'one form-many features' correspondences[15]. This mechanism is given for free by syntax itself: constituency. A constituent is, by definition, a unit composed of different sub-units: if we merge together [YP] (which contains the feature [Y]) and the feature [X], we create a new syntactic object, [XP]. A morph lexicalizing [XP], then, will automatically lexicalize both [Y] and [X].

Phrasal Spell-out:
Overt morphs (Vocabulary Items, VIs) lexicalize phrases.

(13) /*xyz*/ ⇔ [XP [YP]]

The morphophonological units are paired with a phrase, a constituent, as in (13). A constituent is a set of phrases, one included in the other. It follows that a morphophonological unit paired with a specific set (constituent) is paired with all the subsets (sub constituents) included in it too: a VI can lexicalize any constituent of which it is a superset (*The Superset Principle*, Starke 2009: 3).

The Superset Principle:
A lexically stored tree L matches a syntactic node S iff L contains the syntactic tree dominated by S as a subtree.

Given this definition, the VI in (13) qualifies as a lexicalization of both [XP [YP]] and [YP], but not of [XP] by itself, of which it is not a superset: without [YP] in it, [XP] is not contained in the VI in (13).

Spell-out (lexicalization) happens at the phrasal level and each time a new syntactic object is created. Each time a new syntacticosemantic feature is merged in the derivation, the lexicon is searched for lexicalizing the newly derived constituent (*cyclic spell-out*).

[15] DM makes use of additional mechanisms, beyond pre-syntactic feature bundles, for putting features together (or separating them): fusion, merge, fission. All these operations happen during a specific post-syntactic and pre-phonological module: Morphological Structure (see Halle – Marantz 1993). All these mechanisms are absent in Nanosyntax.

Let us exemplify the procedure. Assume that our language has the lexicon in (13) and syntax (bottom-up sequential merge of functional features) derives the following phrase:

(14) $\underbrace{[\text{YP}]}_{xyz}$

In this situation, the VI in (13) is a match for our syntactic object, and the form /*xyz*/ is used to lexicalize it, even if it has a 'spare' feature (namely [XP]). If, in a next cycle, the syntax goes on and merges [X], we derive the following object:

(15) $\underbrace{[\text{XP } [\text{YP}]]}_{xyz}$

In this situation too, /*xyz*/ qualifies for lexicalizing (15), being it a perfect match. This kind of arrangement creates a pattern often called *syncretism*, in which a single VI lexicalizes more than one feature without any noticeable phonological difference (e.g., Ger. *Lehrer* "teacher" has the same exponent both for singular and plural environments). This clearly does not exhaust the possible patterns. It is possible that different VIs qualify at the same time for the lexicalization of a specific syntactic object. When more than one VI qualifies for lexicalizing a specific constituent, the most specific wins (*The Elsewhere Condition*, Kiparsky 1973).

> *The Elsewhere Condition:*
> When two VIs can spell-out a given node, the more specific VI wins. Under the Superset Principle governed insertion, the more specific VI is the one which has fewer unused features.

Let us assume that the lexicon of our language has both the VI in (13) and the following one:

(16) /*abc*/ ⇔ [YP]

In this case, the VI in (16) would win the competition for the insertion at the [YP] cycle, since it is more specific than (13). Even if both would qualify, (16) has an unused feature less.

(17) $\underbrace{[\text{YP}]}_{abc}$

If we go on as before, however, and derive [XP [YP]], no competition arises: (16) is not a competitor (it does not contain [XP]) and, given the *Superset Principle*, (13) wins. In this configuration, when the new feature is added, the previous spell-out (/*abc*/) is overwritten by the insertion of the new VI /*xyz*/.

(18) $\underbrace{[\text{XP } [\text{YP}]]}_{xyz}$

This kind of arrangement creates a pattern in which one form substitutes for another form when a specific feature is present (e.g., En. sg. *mouse* vs. pl. *mice*). We can label this pattern *functionally conditioned suppletivism*[16].

If the language specific set of VIs changes, other patterns emerge. Assume our lexicon contains these VIs:

(19) a. /*abc*/⇔[YP]

b. /*post*/ ⇔ [XP]

[16] In this contribution, we will only deal with cases of suppletivism which have a functional basis, i.e., in which the suppletive form is specified for the lexicalization of a specific function, as *mice* is specialized for the plural function and substitutes the regular morphology -*s*. We will not deal with cases in which the suppletive form of the lexical item and the triggering morph coexist syntagmatically (e.g., It. *vad-o* vs. *and-iamo*, in which the form /and/ does not seem to replace the triggering agreement/tense morph).

Our syntactic derivation, as before, starts with (20). In this case, the only candidate for the spell-out of this syntactic object is (19a). No competition arises, since (19b) does not contain [YP].

(20) $\underbrace{[\text{YP}]}_{abc}$

In the next step of the derivation, as before, we add the feature [X], creating the following syntactic object.

(21) $\underbrace{[\text{XP } [\text{YP}]]}_{???}$

This syntactic object cannot be directly lexicalized by any of the VIs in our lexicon in (19). There is no VI containing all the features that are present in the syntactic object in (21): (19a) lacks [XP], while (19b) lacks [YP]. Our lexicon still contains a VI for each feature in the syntactic object in (21), but no VI for that specific arrangement. The way out of this problem is movement: in order to have a spell-out, [YP] moves over [XP], as in (22). This new syntactic object contains two constituents, [YP] and [XP], which can be autonomously spelled-out by the VIs in (19). This arrangement of VIs, then, gives rise to *suffixation* (e.g. Lat. *can-em*).

(22) $[\ \underbrace{[\text{YP}]}_{abc}\ \underbrace{\text{XP } [\cancel{\text{YP}}]}_{post}\ ]$

This kind of movements, whose target is to reach a possible spell-out for the syntactic object, are called *spell-out driven movements* (see Starke 2018) and are similar to the typology of ordering movements proposed in Cinque (2005) for deriving the possible/impossible orders of the elements of the nominal domain.

Finally, *prefixation* arises when the VI which is specified for a specific feature in *fseq* carries along a 'complex bottom', that is, it

carries along additional features that do not fit with the main *fseq*. Let us assume the following VIs in the lexicon of our language:

(23) a. /*abc*/ ⇔ [YP]
b. /*pre*/ ⇔ [XP [ZP]]

(24) $\underbrace{[\text{XP } [\text{YP}]]}_{???}$

Taking the same steps taken before leads us to lexicalize [YP] with /*abc*/. The subsequent merge of [X], however, would lead to a lexicalization problem: none of the VIs in (23). can directly lexicalize the structure in (24). The last resort option in these cases is to create two different workspaces, i.e., to create a complex constituent whose last feature – [X] – complies with the main *fseq* and merge it in the required position.

(25) $[\text{XP } \underbrace{[\text{XP } [\text{ZP}]]}_{pre} \underbrace{[\text{YP}]}_{abc}$

This kind of arrangement of VIs gives rise to a prefixal marker, e.g., the preposition *de* in Lat. *de natura*. For further details and different possible implementations see Starke (2018) and Caha (2019).

From the derivations above, it is clear that in a nanosyntactic approach the VIs/morphs defined as roots and the VIs/morphs defined as affixes do not differ with respect to the capability of lexicalizing functional structure. Descriptively, the only difference between the two types of elements is that 'roots', while lexicalizing linguistic functions exactly like affixes, carry along an additional lexical semantics (i.e., the referential difference between *apple* and *pear*). This parallel between roots and affixes is at the core of our proposal and, as we will show, allows for a predictive categorization of verbal roots[17].

[17] See Caha *et al.* (2019) for a more complete overview on this issue.

4. Analysis

4.1. Where is the verb?

The observed differences in the morphological realization of agentive nominals are tied to the morphological class to which the different verbs belong. The verbal bases which take *-ā*/*-ī* do not allow for the formation of root compounds / root agentive nominals, while *some* verbal bases which do not take *-ā*/*-ī* allow for this kind of formations. Our primary focus is to explain why the verbal bases taking *-ā* and *-ī* do not allow for such formations. We claim that this constraint comes from the function that *-ā* and *-ī* fulfill in the verbal derivation. This means, first of all, that we will not treat the so-called thematic vowels as empty or 'ornamental' morphs, given their relevance for the subsequent choices in the derivation. Our proposal, which is in line with the proposal about Spanish thematic vowels put forward in Fabregas (2018) and follows Bertocci (2017) and Bertocci and Pinzin (2019), is that *-ā* and *-ī* fulfill a verbalizing function. In other words, *-ā* and *-ī* do not *attach* to a verb, they *are* the real verb, to which non-verbal XPs attach[18]. On the other hand, the verbal roots which do not include these verbalizing thematic

[18] We underline that, even if our claim is in line with Fabregas (2018), we make no explicit claim with respect to thematic vowels in Romance languages, especially because of the different distribution and constraints on their appearance (e.g., among other differences, TVs in Romance interact with agreement morphology, while this does not happen in Latin, except for the 1st sg of the present indicative, in which *-ā* does not surface: *laud-*(*ā*)*-o*).
We will not deal further with *-ī*. Synchronically, this element has a dual behavior, both with respect to the bases which it can take and with respect to its distribution in the paradigm. Some verbs in *-ī* are clearly related to a nominal/adjectival ecc. basis (e.g., *finio* "I limit" – *finis* "limit"), but many others are not (e.g., *dormio* "I sleep"). Paradigmatically, moreover, some verbs show *-ī* in the same positions we find *-ā* in the verbs of the I conjugation (e.g., all the denominal/deadjectival verbs and some others, like *dormio*), other verbs (e.g., *venio* "I come") show *-ī* only in the present stem. This indicates that, synchronically, the verbs in *-ī* have to be split in different categories, something we reserve for further studies.

vowels in their derivation are 'born' as verbs, meaning that the root lexical item itself is capable of realizing the verbal functions.

Let us label the basic verbal function VP. The VP in Latin can be realized directly by a root element, as in the verbal derivations in which there is no -*ā* or -*ī*, or by the VIs -*ā* / -*ī*.

(26) a. /*duk*/ ⇔ [VP]
b. /*ā*/ ⇔ [VP]
c. /*ī*/ ⇔ [VP]

The other morph which is involved in a verb in -*ā* (e.g. *laud*-) is not verbal by itself and is inserted as a modifier of the thematic vowel, the real verbal element. In the case of *laud*-*ā*, the modifier is the morph *laud*. Taking the *ā* as the real verb, the *laud* morph has to be analyzed as 'pre' marker in the sense depicted before, i.e., a complex constituent which fulfills a function of modification and specification of the VP realized by *ā*. Let us call this function mdfP.

(27) [mdfP [$\underbrace{\text{mdfP}}_{laud}$] [$\underbrace{\text{VP}}_{\bar{a}}$]]

This proposal directly accounts for the fact that the vast majority of the bases of the verbs in -*ā* are nominal/adjectival/adverbial: their primary function is not verbal and are attached to a verbal derivation, whose core is *ā*. On the contrary, the picture is reversed for the verbs which belong to the II and III conjugation, in which the vast majority of the verbal bases does not have a parallel use as nouns/adjectives ecc[19].

[19] There are exceptions on both sides. Of the more than 1100 verbs taking -*ā* (this number does not take into consideration the prefixed variants), around 150 have a lexical basis which does not have other uses as a noun/adjective ecc. (e.g., *aro* "I plow"). Of the around 230 verbs of the III conjugation (taking into consideration the -*jo* verbs too), around 25 correlate with a direct nominal/adjectival ecc. use (e.g.,

Assuming that the verbal structure of the athematic verbs and the one of the thematic verbs is parallel, that is, it starts from a VP included in a mdfP, athematic bases like /*duk*/ are not only capable of realizing the VP, but also the subsequent mdfP[20].

(28) /*duk*/ ⇔ [mdfP [VP]]

(29) $\underbrace{\text{[mdfP [VP]]}}_{duk}$

Summing up, we propose that there are two main classes of lexical bases forming verbs in Latin:

- 'thematic' class: the lexical basis of the verb is a modifier of the basic verbal function, [VP], which is realized by an autonomous VI (*ā*/*ī*).
- 'athematic' class: the lexical basis of the verb directly realizes the basic verbal function (e.g., *duc*).

It has to be underlined that we treat only *ā* and *ī* as real verbalizers[21]. The other so-called thematic vowels, *ē* and *ĕ*, are higher elements, that is, they realize functional features related to the actional-aspectual domain (see Pinzin & Bertocci sub.). Both have a different synchronic distribution, being consistently absent with perfective aspect, as the following participle formations indicate: *cav-ē-re* > *cau-tum*; *aug-ē-re* > *auc-tum*; *ten-ē-re* > *ten-tum*, *cap-ĕ-re* > *cap-tum*; *ag-ĕ-re* > *āc-tum*; *iung-ĕ-re* > *iunc-tum*.

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the few root agentive nominals under analysis, like *duco* "I lead" vs. *duc*-s "leader", or *fugio* "I run" vs. *fuga* "run").

[20] Another possibility would be to treat mdfP as an unmarked feature, which can be absent from the structure. In this case there would be no need to project it at all for the athematic verbs and /*duk*/ would reduce to [VP]. As far as we can see, this has no relevant impact on the argumentation.

[21] For the sake of space, we do not address here the diachronic implications of our hypothesis, in particular with respect to the fact that the only inherited thematic element is the -*i/u* of the III class, from PIE *-*e/o*.

4.2. Root Compounds (RCs)

With the 'thematic-athematic' distinction in mind, let us go back to the main issue. What is the characteristic of the 'thematic' derivations that blocks the formation of Root Compounds? We take the difference between 'thematic' and 'athematic' derivations to be structural and not dependent on idiosyncratic lexical features. A 'thematic' derivation involves a basic morph (e.g., *laud*) which modifies the verbal layer – the VP – realized by *ā*. An 'athematic' derivation, on the other hand, involves a basic morph (e.g. *duc*) which realizes by itself the verbal layer, the VP (and possibly the subsequent [mdf]).

(30) a. /*laud*/ ⇔ [mdfP]
b. /*ā*/ ⇔ [VP]
c. /*duk*/ ⇔ [mdfP [VP]]

(31) [mdfP $\underbrace{[\text{mdfP}]}_{laud}$ $\underbrace{[\text{VP}]}_{\bar{a}}$]

(32) $\underbrace{[\text{mdfP [VP]}]}_{duk}$

The kind of Root Compounds we focus on are formed merging together a verbal basis (e.g., *făc*) and a nominal theme (e.g., *pont*), incorporated in one single element (linked by a vowel, usually *ĭ*[22]) and denote an agent, but with a *dispositional* meaning (i.e., *pontifex* does not denote the subject of an event of "making a path" but a 'profession'). This situation is generally interpreted as involving the incorporation of the theme argument of the verb (cf. Harley 2011). The projection of the theme function follows the mdfP in the *fseq*. For ease

[22] For a review of the different stands on the status of the linking element see Brucale (2012: 97-98).

of exposition and transparency let us call the phrase resulting from the addition of this function themeP.

(33) [themeP [mdfP [VP]]]

The data indicate that there is an incompatibility between 'thematic' derivations and theme-incorporation. Let us further specify this incompatibility, which is syntagmatic: the process of theme-incorporation and thematic derivations cannot coexist on the same syntagmatic level. It is straightforward to analyze this situation as a functional overlap: two formations are syntagmatically incompatible when they compete for the realization of the same function, so that the use of one excludes the use of the other. The next step, given that we analyze 'thematic' derivations as involving two parts, a lexical modifier and a verbalizer, is to look for the source of this overlap/competition: is it the *ā* or the lexical modifier (e.g., *laud*) which competes with theme-incorporation? The data point us to the latter, the lexical modifier. If theme-incorporation were competing with *ā* for the realization of the same function, we would expect it to be compatible with the lexical bases combining with *ā*; in other words, we would expect occurrences in which an incorporated theme substitutes for *ā* and directly combines with, e.g., the VI *laud*. We don't have this kind of formations: **avilaud(s)*. By exclusion, the process of theme-incorporation clashes with the presence of a lexical basis which combines with *-ā*. Theme-incorporation competes with the lexical basis of the 'thematic' derivations for the realization of same function.

We propose that the process of theme-incorporation starts from the mdfP level, this means that in order to incorporate a nominal element in a verbal derivation, the mdfP level must be free of other constituents.

(34) a. */pont(i)/* ⇔ [[themeP [mdfP]]
b. */făk/* ⇔ [VP]

(35) [themeP [themeP [mdfP]] [VP]]
pont(i) *făk*

This directly accounts for the absence of RCs with 'thematic' derivations, without stipulations that go beyond the independently supported proposal that 'thematic' derivations involve the verbalization of a non-verbal XP, which acts as a modifier of the verbal core, realized by the verbalizer *ā*. The 'athematic' derivations, on the other hand, are perfectly apt to host a nominal modifier which incorporates with the lexical base.

This proposal explains why being capable of hosting a nominal modifier is a general characteristic restricted to 'athematic' bases. However, it still does not explain (i) why, within the set of 'athematic' bases, only a small subset is used in agentive RCs, (ii) how and where the agentive nominalizing function is realized. In other words, if this were the only block on RCs, we would expect a greater productivity of RCs with 'athematic' bases and an equally widespread presence of theme-incorporating verbs (**pontifacio*). In both cases this is not what we observe in Latin, where theme-incorporation is lexically restricted and directly leads to the derivation of agentive nominals, without passing through an agentive verb with an incorporated theme (the same happens in English: *truck-driver* vs. **to truck-drive*, Harley 2011)[23]. We will return to this in section 4.3.

[23] There are two types of apparent verbal compounds with *facio*: (i) *cale-facio* type, (ii) *laet-i-fico* type. These cases, however, do not involve theme-incorporation within a verbal derivation. Type (i) is constrained to stative verbal bases (of the type *caleo* "I am hot"), which indicates a use of *facio* as a causativizing element applying to a stative vP, parallel to the use of inchoative *-sc* (see Bertocci – Pinzin 2019). Type (ii), on the other hand, is a verbalization of a non-verbal bases, exactly what we would expect given our proposal about the verbalizing thematic vowel *ā*: the non-verbal base *laetific* is merged with the verbalizer *ā* and derives a verb, as in *laudo*. Theme-incorporation is absent in type (i) and happens in a cycle preceding the verbalization in type (ii).

4.3. Agentive Root Nouns (agentive RNs)

As we showed above, agentive RNs are a small sub-set of agentive nominals in Latin. The set contains only *clepĕre* > *cleps*; *ducĕre* > *dux*; *regĕre* > *rēx*; all of them correspond to verbs belonging to the III conjugation, whose lexical basis, as proposed in Section 3, is a Vocabulary Item which directly realizes the VP layer. In this case too, the explanation has to take into consideration two factors: (i) the general restriction to 'athematic' bases, (ii) the null productivity of the phenomenon, even more lexically constrained than RCs. Let us start from the first issue, why do we have only 'athematic' bases in agentive RNs? In this case, clearly, theme incorporation cannot be taken as a factor influencing the general constraint. Let us approach the issue from a different point of view, taking /*duk*/ as a specimen. Given the clear phonological and semantic relationship, the VI /*duk*/ used in the agentive RN and the VI /*duk*/ used in the verb are one and the same. The problem is the relationship between the nominal and the verbal use. There are two possible approaches: (i) The Latin lexicon comprehends a phonologically null nominalizer/verbalizer which derives one use from the other, (ii) it is a case of syncretism, in which one form is capable of realizing multiple functions (the case of Ger. *Lehrer* in § 3). The first option is not adequate. First of all, the proposal of a null nominalizer/verbalizer would immediately overgenerate: both with a null nominalizer or verbalizer, we would expect a large amount of verb/noun couples with the same morphophonological form. This is clearly not the case in Latin[24]. On a second note, this would not help to explain the restriction of agentive RNs to a subtype of verbal bases, the 'athematic' ones: there is no evident reason why a null nominalizer should impose this kind of selectional restriction on the basis. Given

[24] The presence of phonologically null VIs is a priori plausible: Ramchand (2008), for example, proposes the existence of a null causativizer in English, while Caha (2019) proposes the existence of null nominative and accusative cases in Iron Ossetic. In both cases, as expected, the use of these null VIs is generalized to every case in which the specific feature is present in the syntax.

these issues, we pursue the second option: syncretism. A case of syncretism involves a single morphophonological unit which is specified for more features and is then capable of realizing all of them. The realization, given the Superset Principle (§ 3), starts from the basic feature and goes on to the next one, in the exact order in which they are specified in the VI. The issue, consequently, is the direction of the containment relation. This issue is not trivial when we take into consideration the noun-verb relation. We tentatively propose that in these cases the containment relation has at its core the verbal functions, included in the agentive nominalizing one, so that the verbal function is the basis from which the agentive nominal is built. The verbal functions in an 'athematic' verb like *duco* are realized by the lexical root itself. The lower functions (VP, mdfP and themeP) are followed by the so-called vP area, where *aktionsart* functions are projected (Kratzer 1996, Folli – Harley 2005, Cuervo 2015 a.o.). Both layers are realized by the lexical root. Our proposal is that in few lexically marked cases (e.g. /*duk*/) the root is capable of realizing the subsequent agentive nominalizing function too, in addition to the verbal ones. This possibility is not open for 'thematic' derivations, in which the lexical basis is a modifier of the verbalizing element *ā*. If the Vocabulary Item corresponding to the so-called root requires a verbalizing Thematic Vowel in order to realize the low verbal functions, it means that the same Vocabulary Item will not be capable of realizing by itself any function higher than VP, including a possible nominalizer. The presence of an overt nominalizer, as we will see in section 4.3, is needed. In other words, if we take the *duco-dux* cases as syncretisms, the immediate consequence is that 'thematic' verbal derivations will be automatically excluded, because in these cases the lexical root is stuck as a modifier of the VP.

This proposal explains both restrictions on agentive RNs, the constraint to 'athematic' lexical bases and the lexical restriction: being capable of syncretically realizing the nominalizing function and the verbal ones is a characteristic of a closed set of VIs and not a productive process.

4.4. The -tor *agentive morpheme*

As we have seen in the data, *-tor* is productively used to derive agentive nominals in Latin. It requires verbal bases that include an argumental slot for the external argument (may that argument be a proper Agent, the widespread pattern, or a Causer, ecc.) and has verbal-like behavior, being capable of hosting an internal argument usually marked with genitive (rare cases with accusative, Pl. *Pseud*. 1166):

(36) *Cupienti liberorum,* ***osori*** *mulierum.*

"The ones who want the sons and hate the women" (Pl. *Poen.* 76).

The productivity and the possibility of consistently hosting the internal argument of the verb differentiates *-tor* agentive nominals from RCs and agentive RNs. From the morphological point of view, as already noted in Section 2.1, *-tor* can be split in two parts, the *-t* that can be found in the past participle and a subsequent *-or* (see Steriade 2016 for a different proposal)[25]. To see this, we can look at the verbs in which the past participle takes an allomorphic basis, in these cases the exact same allomorph appears in the agentive nominalization too (37). Moreover, when two possible past participles are attested, two agentive nominalizations are attested too (38).

(37) prs. *fer-re* / pp. *lā-t-um* > *lā-t-or*

[25] The *-or* nominalizing morpheme might be independently attested: e.g., *rub-or* "redness"/*rub-ē-re* "to be red". This needs further investigation, since the two *-or* are diachronically unrelated. The one in *rub-or* comes from the rhotacization of the final *-s* of an *-os* morph, still partially attested in the paradigm of *hon-os*/*hon-or* "honor", while the *-or* in *-tor* comes from IE **-tVr*. In diachronic terms, in fact, action nouns with *-tio* can be explained as the outcome of **-ti* adjectives (Leumann 1977: 366). This means that our analysis works in a strictly synchronic perspective, or provided that the Latin system underwent deep reanalysis.

(38) prs. *pot-ā-re* / pp. *pōt-um* vs. *pot-ā-t-um* > *pōt-or* vs. *pot-ā-t-or*

In order to explain this pattern, we propose that productive agentive nominalizations include a functional head which is shared with the past participle (and with other formations like supines, *-tio(n)* nominalizations, 'intensive' verbs in *-ā*, cf. Calabrese 2019b). In informal terms, the functional head realized by *-t* makes it possible for a verbal derivation to host a nominalizer (and the gender/number morphs of the past participle), i.e., it 'bridges' the verbal layers to the subsequent nominal ones. Another characteristic of the *-t* morph is its incompatibility with a set of morphs connected to *aktionsart* functions, like the 'nasal infix' (*frang-o* vs. *frac-t-um*) and the *ē* vowel of the II conjugation (*cavē-o* vs. *cau-t-um*)[26]. We propose, consequently, that *-t* realizes the aktionsart layer, vP (deleting these *aktionsart*-specific morphs) and the subsequent 'bridge' functional layer ([FP]) which makes the verbal derivation capable of hosting nominal functions, realized by *-or*:

(39) a. /*t*/ ⇔ [FP [vP]]

b. /*or*/ ⇔ [nP]

This proposal directly entails the verbal-like behavior of *-tor*: *-tor is* partially verbal, in the sense that a part of it, *-t*, realizes verbal functions.

With this proposal, we return to some issues we left open regarding RCs, (i) the lexical constraint to a small subset of athematic verbs and (ii) the realization and position of the nominalization function with respect to the verbal functions (i.e., the issue of the lack of verbal derivation incorporating a theme, ***pontifacio*). Let us put the second issue together with the fact that *-tor* is incompatible with RCs (***avicaptor*, see Section 2.4). Given our analysis, in which *-tor* contains a verbal part (*-t*), the absence of *-tor* with RCs and the

[26] See Pinzin – Bertocci (in press) for a more extensive discussion.

incapability of RCs to be verbal are two sides of the same problem: RCs cannot include the higher vP layer. Both the nominalization in *-tor* and the inflected form of the verb require the vP layer, if RCs cannot include it, both constraints follow. In *fseq* terms, the incorporation of the theme directly leads to the realization of the nominalizing function, without the projection of the vP.

(40) [themeP $\underbrace{\text{[themeP [mdfP]]}}_{\textit{pont(i)}}$ $\underbrace{\text{[VP]}}_{\textit{fāk}}$]

(41) $\underbrace{\Big[\text{nP } \Big[\text{themeP } \Big[\text{themeP [mdfP]}\Big]\text{[VP]}\Big]\Big]}_{\textit{pontifĕc}}$

This is furthermore compatible with the semantics of RCs, which cannot denote 'eventive' nominals but only 'dispositional' ones (see Alexiadou – Schäfer 2010). The eventive interpretation is possible only with *-tor* agentive nominalizations, in which the vP is present.

5. Conclusion and open questions

The possible/impossible patterns regarding the realization of Latin RCs and agentive RNs are straightforwardly explainable if we consider the so-called 'root' of the verb (or verbal lexical item) not as an empty element but as a normal Vocabulary Item stored as the realization of a set of functions, with the immediate consequence that not all roots are equal with respect to the functions they are capable of realizing.

This claim, coupled with the Nanosyntactic approach, enables us to offer a structural motivation for the different behavior of Latin verbal roots, which has consequences not only on the inflection system, but also on the derivation and the composition.

In particular, the constraints which follow from the structural properties of the two classes of roots can explain the reasons for the non-productivity in historical Latin of synthetic compounds. Since the

core of Latin verbs are 'thematic', that is they require a non-verbal modifier in their structure, it follows that the syntactic position for theme's incorporation is not available in the majority of verbs, this strategy being available only with verbal phrases in which the root itself can realize the entire span. Finally, our analysis has relevant consequences on the status of the elements which will give rise to the Romance thematic vowels: whereas most of the literature assumes a continuity between the structure of the Latin verb and its Romance outcomes, we have claimed that in Latin items like /ā/ and /ī/ have a functional value, since they have a specific role in the derivation and realize contextually-determined pieces of the syntactic structure.

Our study leaves some open issues, of course. In particular we are aware that our analysis for *-tor* will deserve a more careful study, aimed at discussing the whole issue of nominalization in Latin. In this paper we have hypothesized that the morphological structure of *-tor* is bimorphemic, which is consistent with the morpho-syntactic structures we claim for independently, but this leads us to focus on two further issues: (i) to investigate the relationship between the perfect participle and the lexical item to which -(*t*)*or* applies, that is, the so called 'third stem' of Latin morphology; (ii) to identify more clearly a syntactic function for the element /t/ we assume to be present in the derivation of non-syncretic agentive nominalizations.

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