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Remarks on the Role of the Perfect Participle in Italian Morphology and on its History

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Abstract: Since (Aronoff, Mark. 1994. *Morphology by itself*. Cambridge, MA: The MIT Press), the disparate morphosyntactic roles that past participle forms have in Latin (and Italian) morphology have played a central role in arguing for morphomic approaches. In this article, I will propose an alternative analysis of the special behavior of these participle forms in Distributed Morphology (DM, Halle Morris, & Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In Kenneth Hale & Samuel Jay Keyser (eds.), *The view from building 20: Essays in linguistics in honor of Sylvain Bromberger*, 111–176. Cambridge, MA: MIT Press.). In particular, I will propose that morphological spell-out, as a first stage of the PF derivation, includes morphological repairs triggered by abstract "morphomic" constraints. These repairs can insert "ornamental" pieces – structures that are not motivated syntactically or semantically but only morphologically – to mediate the interface between abstract syntactico-semantic structures and surface PF construction. I will demonstrate the role that these repairs play in accounting for the surface convergence between perfect and passive participle forms, and adjectival stative ones, and for the appearance of past participles in nominalizations. The article ends with an analysis of Latin past participle morphology focusing on its historical development. The first part of this analysis deals with the development of Latin verbal structure from Proto-Indo-European (PIE) and in particular with the development of "ornamental" thematic vowels. It then turns to a brief investigation of the historical development of the Latin past participle exponent /*-t-*/ from PIE adjectival suffix **-tó-*, and of the PIE agentive and action/result nominal suffixes **-tér/tor*, **-ti-*, **-tu*, **-men-(to)-*. This will lead to a discussion of Latin nominalizations, the supine and the future participle and a possible explanation of why they contain participial morphology.

Keywords: Distributed Morphology, perfect participles, passive participles, adjectival stative participles, nominalizations, Italian, Latin, morphome

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1 Introduction[1]

A word piece that appears to have the shape of the (verbal) active perfect participle has disparate morpho-syntactic roles in Italian morphology: not only does it appear as the base for many nominal and adjectival forms but it can also be used as a stative adjective and passive participle, as illustrated in the following sample forms.[2,3]

(1)

Infinitive	*lavor-a-re*	*ammal-a-re*	*batt-e-re*	*pun-i-re*
Perf. part.	*lavor-a-t-o*	*ammal-a-t-o*	*batt-u-t-o*	*pun-i-t-o*
Pass. Part.	*lavor-a-t-o*	–	*batt-u-t-o*	*pun-i-t-o*
Stative Adj.	*lavor-a-t-o*	*ammal-a-t-o*	–	–
Event N	*lavor-a-z-ion-e*	–	–	*pun-i-z-ion-e*
Agent N	*lavor-a-t-or-e*	–	*batt-i-t-or-e*	*pun-i-t-or-e*
Result N	*lavor-a-t-ur-a*	*ammal-a-t-ur-a*	*batt-i-t-ur-a*	–
Result N	*lavor-a-t-a*	–	*batt-u-t-a*	–
Adj	*lavor-a-t-iv-o*	–	–	*pun-i-t-iv-o*
	‘work’	‘be sick’	‘beat’	‘punish’
apr-i-re	*scriv-e-re*	*divid-e-re*		
aper-t-o	*scrit-t-o*	*divi-s-o*		
aper-t-o	*scri-t-to*	*divi-s-o*		
aper-t-o	–	–		
–	*(de)scri-z-ion-e*	*divi-s-ione*		
–	*scrit-t-or-e*	*divi-s-or-e*		
aper-t-ur-a	*scrit-t-ur-a*	–		
–	*scrit-t-a*	–		
–	–	*divi-s-iv-o*		
‘open’	‘write’	‘divide’		

1 An earlier version of this article was presented at the Workshop: Distributed Morphology from Latin to Romance, (Institut für Romanistik. Universität Wien, October 30–31, 2019). I am very grateful to the organizers Eva-Maria Remberger and Natasha Pomino for their hospitality and valuable feedback. I would also like to thank Pietro Cerrone, Christos Christopoulos, Paula Fenger, Isabel Oltra-Massuet, Adrian Stegovec and Susi Wurmbrand for helpful discussion and fruitful comments. I am finally deeply indebted to Adam Ledgeway and Ian Roberts whose insightful comments and suggestions were of great help to me. All remaining faults are mine alone.

2 A number of synchronic (morpho-)phonological processes are needed to account for the surface shape of the forms: a. consonantal assimilation: e.g., *scri/v/-t-o→ scri[t]-to*; b. coronal deletion: e. g. *divi/d/-s-o→ divi-s-o*; c. affrication: e.g. *pun-i-/t/-ion-e → pun-i-[z]-ion-e, descri-[t]-ion-e→ de) scri-[z]-ion*-e (see Calabrese 2015, 2019 for a detailed discussion of these synchronic (morpho-) phonological processes).

3 TV /*-e-*/ and /*–u-*/ are replaced by –i- in nominalizations (e.g. *batt-i-t-or-e*, cf. pp. *batt-u-t-o*); participial result nouns such as *batt-u-t-a* are an exception. See Calabrese (2019) for detailed discussion.

According to traditional morphological models, the simplest rule for constructing a form such as *cacciatore* 'hunter' in a sentence such as that in (2) involves adding the agentive suffix *-ore* to the participle stem *cacciat-* (e.g. perfect participle *cacciat-o* 'hunted').

(2) *Carlo diventera' un bravo cacciatore di orsi*
'Carlo will become a good bear hunter.'

The problem is that the stem *cacciat-* in (2) does not have the passive or perfect meaning usually associated with the verbal participle.

Thus, Vogel (1993), extending to Italian Aronoff's (1994) classical analysis of the similar patterns found in the case of the Latin perfect participle, points out that there is no semantic connection at all between these nominal and adjectival word-formation patterns: the seemingly participial /*–t-*/ (or /*-s-*/) which characterizes all of these cases has no meaning common to them both. In Vogel and Aronoff's view, it is simply an "empty morph". On this view, the participial stem has no inherent features but is simply a memorized stem-form made available by the verb; it is this stem that happens to be the input to rules deriving the participles and the nominalizations in (1). Aronoff (1994) concludes that cases like this require morpho-syntactic and morpho-phonological derivations to be separated and for there to be entities called morphomes which mediate between the two, in particular, morphomic stem forms where stem is "a [listed] sound form to which a given affix is attached or upon which a given non-affixal realization rule operates." (Aronoff 2012)

According to Aronoff, stems do not have functional meaning: they are just "part of the abstract and unmotivated morphological machinery of the language." They are independent parts of the morphological system of the language (Aronoff 1994:57f.). Crucially, in Aronoff's view, and especially in the morphomic approach developed by Maiden (2005, 2016, 2018), the stems are memorized forms. The majority of morphologists have liked this solution, and adopted the idea that the pieces of morphology can, when required, operate autonomously and without regard to the semantic material they signify, and that complex morphological forms are therefore not necessarily constructed according to strict semantic compositionality (Vincent 2011).

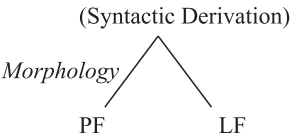
However, Embick and Halle (2005) point out that listed stems render opaque the relation between syntactico-semantic structures and phonological forms. An approach that introduces suppletive stems, in fact, makes the weakest possible predictions concerning sound/meaning relationships. Consider the role that morphosyntactic derivations play in the construction of phonological forms: syntactico-semantically, there is a clear sense in which one object can be said to be 'derived from' another: if structure S contains structure S' as a subcomponent,

(i.e. is built additively on S'), then S is derived from S'. It would be desirable for the connection in form to be as motivated as possible. This is the strongest hypothesis because it grounds the similarities in forms in the syntactico-semantic structure. But this is incompatible with the notion of listed stem where all internal stem structure is opaque and arbitrary.

This article shares Embick and Halle's rejection of listed stems and attempts to provide an account of the special role that "participial" forms play in Italian morphology in cases such as those illustrated in (1). Assuming just rote memorization of lists of idiosyncratic stems means giving up an explanation of why it is precisely a "participial" form that appears in those constructions. The specific objective here is to unpack all the information contained in word forms and to derive them morpho-syntactically and phonologically as far as possible. If this is the objective, then stem allomorphy must be accounted for differently. Specifically, then, it must be accounted for in terms of simple and motivated morpho-syntactic structures, standard morphological segmentation, morphemes (vocabulary items), morphophonological and phonological rules. Such an analysis is possible in Distributed Morphology (DM, Halle and Marantz (1993), the model adopted here.

The key feature of DM is the presence of a postsyntactic morphological component where syntactic representations – thought of as the hierarchical organization of morphosyntactic feature bundles – may undergo manipulation involving head-raising/lowering, feature deletion/insertion, morpheme addition, etc. before being spelled out phonologically through vocabulary insertion, and other morpho-phonological and phonological operations. The derivation of all morphological forms then takes place in accordance with the architecture given in (3).

(3) The Grammar:



A characterizing feature of DM is its separation between exponence and their morphosyntactic feature sets so that exponents can be inserted late in the derivation after the syntactic computation, and in particular after the application of morphological operations that manipulate and change the feature bundles produced by syntax.

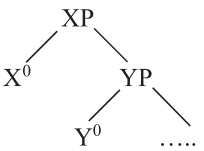
An important morphological operation especially in the approach to DM adopted here, where word units are of fundamental importance in mediating between syntactico-semantic representations and their surface morpho-phonological

realization, is m-word formation which creates complex X^0 units (i.e., m-words, cf. Embick and Noyer 2001). It is implemented through head movement, which following Harizanov and Gribanova (2018) can involve both head raising and head lowering (for the sake of simplicity, head lowering is put aside in this paper since it is not directly relevant to the analysis developed here. For discussion, see Calabrese 2019).[4]

(4) A syntactic complementation relation $[X^0 [_{YP} \dots Y^0 [_{ZP} \dots]]$ may be realized in the morphology as a complex head by:
Head Raising:
$[_{XP} \dots X^0 \dots [_{YP} \dots Y^0 [_{ZP} \dots]]] \rightarrow [_{XP} \dots [_{X0} Y^0 X^0] [_{YP} \dots [_{ZP} \dots]]]$
(where Y^0 and X^0 are heads, X^0 c-commands Y^0, and there is no head Z^0 that c-commands Y^0 and is c-commanded by X^0)

Given the syntactic structure in (5), head raising generates the structure in (6):

(5)



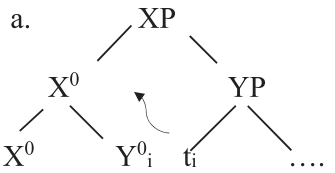
4 In Calabrese (2019), it is proposed that head movement is triggered by the morphological requirement in (i).

(i) *Synthetic morphology principle*:
A functional head Y^0 must be adjoined to a root or to a X^0 complex including a root.

(i) accounts for the affixal status of functional categories in synthetic languages, and can be easily extended to root incorporation in polysynthetic languages. Under this approach, a single mechanism – the synthetic morphology principle (i) – with head-raising (and head-lowering) as the associated repair implements word formation. Such an approach is simpler, and more parsimonious, than other approaches like Bjorkmann (2011) where m-word formation (head movement in her theory) is associated with Infl-agreement or Pietraszko (2017) where word-formation can be implemented by the mechanism of c-selection with m-word formation (head-movement in her theory) as an additional strategy, and it is closer to what proposed by Arregi and Pietraszko (2018a, 2018b) with a head movement single operation (Generalized Head raising).
A possible problem for the principle in (i) is that while accounting for the affixal behavior of most functional heads in the extended projection of the verb, it fails to explain why a functional head such as C tends not to be affixal but an independent particle even if often cliticized to a verb or to another adjacent word. This problem is not exclusive to the model adopting (i) but faced also by the other models mentioned above. There are various ways of dealing with it, some of which are investigated in Calabrese (2019). The issue is not of relevance here, and will not be discussed further. See also Calabrese (2019) for discussion of periphrastic morphology.

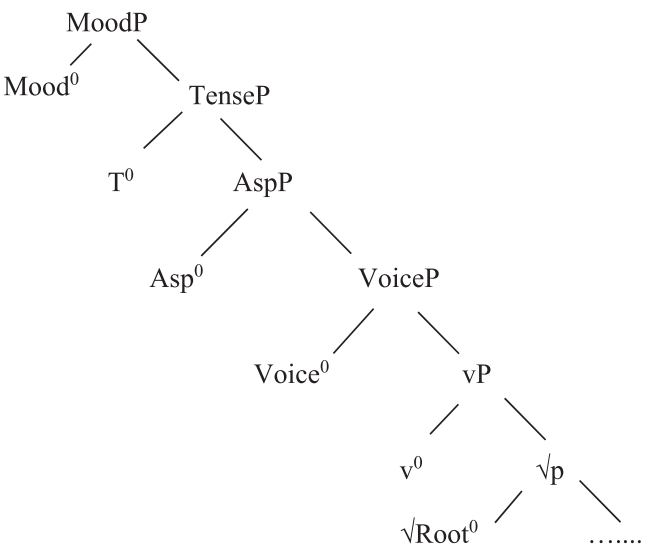
(6) A word-generated by head raising:

a.



Thus in the case of verbal forms, head raising applies to Cinque's (1999) clausal functional structure[5] which is assumed here in a simplified form as in (7) and converts it into a verbal m-word as in (8) by moving constituent heads upward cyclically:[6]

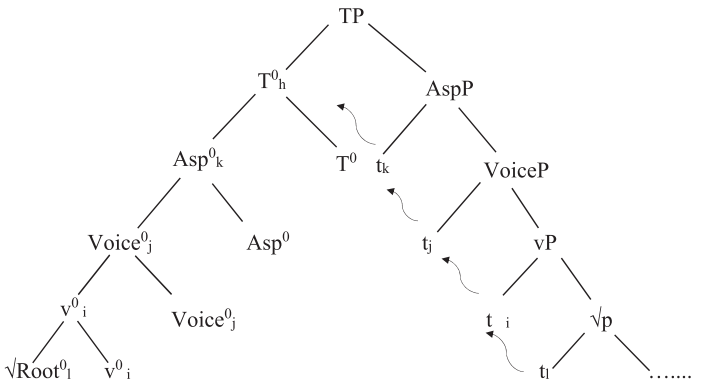
(7)



5 Cinque's original functional structure contains many different nodes dominating essentially privative features insofar as they are characterized by the presence vs absence of a given featural property. Following a more traditional approach in Generative Phonology, and subsequently in Distributed Morphology, instead of privative features, here I use binary features here. This allows a simplification of Cinque's original functional skeleton, in so far as different functional contrasts can be realized in terms of combination of feature specifications under the same node, as in (7) (for the sake of expository simplicity, only sample nodes among those present in Cinque's full model of clausal functional nodes are mentioned).

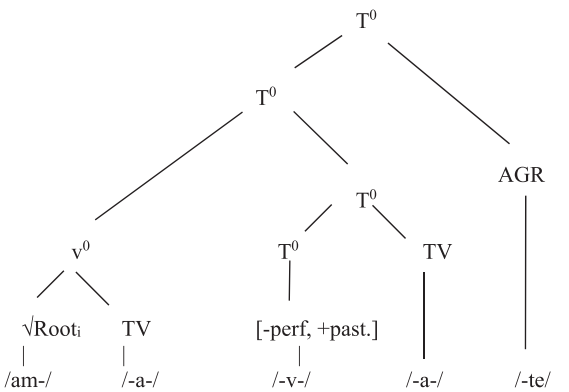
6 The further positioning of the exponent of the head as a suffix/prefix is due to information associated with the exponent and not a morphosyntactic property (for details, see Calabrese 2019).

(8)



Further morphological operations manipulating the complex X^0 in the left branch in (8) may insert ornamental[7] morphological pieces such AGR (Bobaljik 2008; Halle and Marantz 1993) and Thematic Vowels (Oltra-Massuet and Arregi 2005) or prune nodes, thus eventually deriving the verbal surface structure of a language. For example, operations such as these derive the Italian verbal form *amavat*e 'love-IMPERF-2pl' as in (9). They are discussed in the text below.

(9)



Note that the operation of TV insertion is syntactically void. The presence of these syntactically void morphological operations is fundamental in the model of DM adopted here. These operations manipulate syntactic structures and may generate "arbitrary" morphological structures. These structures are not motivated syntactically or semantically but only morphologically. Thus, these operations may lead to the insertion of "ornamental" nodes or features, morphological elements that do

7 Ornamental in the sense that they do not have syntactico-semantic functions or content.

not have a functional syntactico-semantic motivation; they can be not only thematic vowels but also other morphosyntactic nodes not required by the syntactico-semantic component (see below for discussion of the insertion of v^0 and Asp^0 nodes in the morphosyntactic structures involved in stative adjectives and nominalizations in Italian (and Latin)). The mapping between syntax and surface exponence is, then, mediated by operations like these, which are part of what I called morphological spell-out in Calabrese (2019).[8,9]

Mismatches between syntactico-semantic structures and their surface realizations, and what I will call abstract "morphomic" effects, can be generated during morphological spell-out. Therefore, as in Aronoff (1994), the operations in morphological spell-out have the function of mediating between the syntactico-semantic and morphophonological derivations and account for the fact that complex morphological forms are not necessarily constructed according to strict semantic compositionality. This, however, is obtained without assuming listing of memorized stems, as in Aronoff's approach. Stems are always derived in the approach adopted here.[10]

Another independent component of PF, as argued in Calabrese (2019), is phonological spell-out where the morphosyntactic structures that are generated by morphological spell-out are converted into surface strings of sounds.[11] Phonological spell-out applies cyclically bottom up node by node, and accounts for the word surface allomorphy. It involves the cyclic application of rule of exponence: 1) vocabulary insertion rules –Vocabulary Items – that add phonological material (exponents) to the morphosyntactic structure that are generated by morphological spell-out;[12] 2) morphophonological rules; 3) phonological rules. In this model of phonological spell-out, the surface form of a word in a given language can be predicted by knowing the constituent pieces of that word; their morphological arrangement in a hierarchical structure and the morphophonology of the language.

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8 A consequence of the postulation of a level where such operations are implemented is that a direct mapping between syntax and surface exponence as in Nanosyntax (Caha 2009, a. o.; Starke 2010, 2014) and in some DM models (Kilbourn-Ceron et al. 2016; Newell 2008; Newell and Piggott 2014 a.o) is not possible.

9 Calabrese (2019) discusses the possibility that morphological spell-out applies phasally where a phase is the highest phrase in the extended projection of a phasal head (Boskovic 2014, 2018).

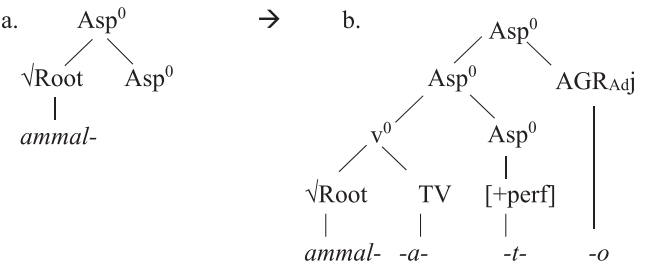
10 In the approach adopted here, listing is limited to the exponents of roots, functional or ornamental nodes, and to lexical diacritics. There are no listed suppletive stems.

11 During phonological spell-out, additional restructuring of the exponence (for example, the pruning of nonovert exponents and the insertion of some extra thematic vowels) may occur.

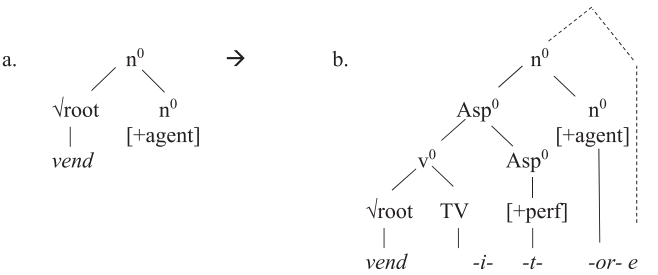
12 During Vocabulary Insertion, individual *Vocabulary Items (VI)* – rules that pair a phonological *exponent* with a morphosyntactic context – are consulted, and the most specific VI that can apply to an abstract morpheme applies (in the so-called Elsewhere (Subset, Paninian) ordering).

Morphological spell-out, as already mentioned above, plays a key role in this article. In fact, I will argue that the multifunction "participial" stem we observe in (1) is derived by morphological operations during this morphological stage. I will also propose that these operations can be actually thought of as repairs triggered by morphological structure conditions (for a similar model including morphotactic repairs, see Arregi and Nevins 2012). A crucial idea in the analysis is then that the presence of morphological repairs triggered by abstract "morphomic" constraints can insert "ornamental" pieces accounting for the interface between abstract syntactico-semantic structures and surface PF constructions. Thus, as shown below, these repairs convert the basic syntactic structures in (10a) and (11a) into the surface morphosyntactic ones in in (10b) and (11b), respectively.

(10) Adjectival (stative) participles: *ammalato* 'sick'



(11) Nominalizations: *venditore* "seller"



The article is organized as follows. The first part will focus on Italian, and begins with a critical assessment of Embick and Halle (2005) and Remberger (2012) based on the perfect and participial system of this language (§2). Section 3 shows how the surface morphology of Italian perfect participles is derived and also accounts for the surface convergence among perfect and passive participle forms. It illustrates how morphological repairs triggered by abstract "morphomic" constraints can insert "ornamental" pieces to mediate the interface between abstract syntactico-semantic structures and surface PF construction. The role that ornamental morphology plays in accounting for the surface convergence between adjectival stative participles and

the other participles, and for the appearance of perfect participles in nominalizations is dealt with in §§4–5. The article ends with an analysis of Latin perfect participle morphology focusing on its historical development (§6). The first part of this analysis deals with the development of Latin verbal structure from Proto-Indo-European (PIE) and in particular with the development of "ornamental" thematic vowels. It then turns to a brief investigation of the historical development of the Latin perfect participle exponent /*-t-*/ from PIE adjectival suffix **-tó-*, and of the PIE agentive and action/result nominal suffixes **-tér/tor, *-ti-, *-tu, *-men-(to)-*. This will allow me to discuss Latin nominalizations, the supine and the future participle and explain why they may contain participial morphology.

2 Embick (2000), Embick and Halle (2005)

In their critique of Aronoff's (1994) proposal that the Latin participial stem is just a memorized stem-form with no inherent features, Embick and Halle (2005), following Embick (2000), submit that all of the constructions characterizing participial stems in Latin share the presence of an Asp^0 node (see Marantz 1997, Alexiadou 2001, and related work on nominalizations).

The presence of this node is, however, not enough to account for the disparate syntactico-semantic distribution of the participial stem in this language. To deal with this, they also assume featural underspecification of the relevant Asp^0 vocabulary items. In particular, they propose the following underspecified vocabulary items for the Asp^0 node of participial forms:

(12) /s/ <–> $[\ ]_{Asp^0}$ in the context of $root^{\surd}$
/t/ <–> $[\ ]_{Asp^0}$

Given their underspecified nature, the participial exponents /-s-/ and /-t-/ can appear in a great variety of aspectual contexts as required by Latin morphology.

Embick and Halle's (2005) theoretical choice of resorting to the radical underspecification of vocabulary items is however problematic. Putting aside the fact that any resort to radical underspecification, as in this case, is always characteristically stipulative and opportunistic (see Calabrese 2005), the proposal that the exponent /-s-/ is underspecified is empirically inadequate especially when seen in the context of Italian verbal perfect and participial morphology, to which I now briefly turn (see §6 on Latin).

First, one needs to look at the important distinction between thematic and athematic verbal forms in Italian verbal morphology. Regular verbal forms systematically include a vowel – the thematic vowel – after the root. Irregular ones do not. In (13), I contrast a case of irregular morphology with a case of regular

morphology. On the one hand, we have the Italian imperfect marker, which is regular in being always the same across verbs. On the other hand, we have the Italian perfect marker /s/ which appears only with certain verbal roots. In the case of this marker, we need a special vocabulary item that includes reference to root information in the structural description. No such contextual restrictions are needed for regular morphology.

(13)

Regular morphology	*Irregular morphology*
Italian imperfect marker	Italian perfect marker /s/
amavo/battevo/partivo	*Persi*
/-v-/ <–> [-perfect]	/-s-/ <–> [+perfect]/ $root^{s}$ ___ ($root^{s}$ =perd, etc.)

It follows that root-based contextual allomorphy (namely, vocabulary items that include reference to root information) occurs only when the thematic vowel is absent, therefore only in athematic morphology. As Calabrese (2015, 2019), along the lines of Embick (2010), argues, this is a consequence of the fact that morpheme-to-morpheme interactions, such as those involving morphological operations dependent on root specific information as in this case, are local, and in particular require adjacency. Specifically, in the cases discussed above, adjacency is required between the root and the tense morpheme when this has an irregular exponent. The presence of the thematic vowel interferes with the relevant morphological interaction, and therefore only regular morphology can appear. Thus, as expected, regular perfect forms are thematic, and irregular ones are athematic. The exponent of regular perfect is Ø (see (14)). The irregular exponents are a) /-s-/ (see (15)) and b) /-X-/ (X= and abstract skeletal position triggering gemination and rounding) (see (16)), and also Ø for a few verbs (see (17)).

(14) Regular perfect forms

a. $[[[\ ]_{Root}$ TV -Ø-$]_{T^0}$ AGR] where Italian T^0 includes also an Asp^0 feature (as discussed below)

b.

Perfect	*(cf. Imperfect forms, which are always regular)*	
am-a-Ø-i	*am-a-v-o*	'love-PERF/IMP-1SG'
batt-e-Ø-i	*batt-e-v-o*	'beat- PERF/IMP-1SG'
part-i-Ø-i	*part-i-v-o*	'leave- PERF/IMP-1SG''

(15) Irregular perfect forms in /-s-/.

a. $[[[\ ]_{Root}$ -s-$]_{T^0}$ AGR]

b.

Perfect	*Imperfect*	*Gloss*
val-s-i	*val-e-v-o*	'be worth- PERF/IMP-1SG''
eccel-s-i	*eccell-e-v-o*	'excel- PERF/IMP-1SG'
cor-s-i	*corr-e-v-o*	'run- PERF/IMP-1SG'g′

(16) Irregular perfect forms in /- X^w -/. (X^w triggers gemination and rounding, rounding is deleted if the consonant is coronal)

a. $[[[\ ]_{Root}$ -X^w-$]_{T^0}$ AGR]

b.

Imperfect	*Imperfect*	*Gloss*
nocqu-i (cqu=[kk^w])	*noc-e-v-a*	'harm- PERF/IMP-1SG'
tacqu-i	*tac-e-v-a*	'be silent- PERF/IMP-1SG'
vɛnn-i	*ven-i-v-a*	'come- PERF/IMP-1SG'

(17) Irregular perfect forms in /-Ø-/ (Root vowel undergoes ablaut: a→e, e→i)

a. $[[[\ ]_{Root}$ -Ø-$]_{T^0}$ AGR]

b.

Perfect	*Imperfect*	*Gloss*
fec-i	*fac-e-va*	'do-PERF/IMP-1SG'
vid-i	*ved-e-va*	'see-PERF/IMP-1SG'

The regular thematic perfect forms have the structure in (18); irregular athematic perfects have the structure in (19). As proposed by Oltra-Massuet and Arregi (2005), thematic vowels are inserted as ornamental morphemes attached to functional

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13 The relevant VI is the one below:

(i) /-X- / <–> [+perfect]$_T$ / Root^L ____(Root^L = *nok, tak, dʒak*, etc.)

| +cons

Labial

| [+round]

It involves an empty skeletal position X including, however, a floating nondesignated labial [+round] articulator, a secondary articulation (see Halle (1995) for the notion of designated articulator). The skeletal position is filled in by the preceding consonant. The secondary labial articulation is attached to the place node only when the designated articulator of the first consonant is dorsal, otherwise its attachment is blocked because of an active Marking Statement disallowing labial secondary articulation with nondorsal consonants. In this case the secondary articulation is deleted:

(ii)

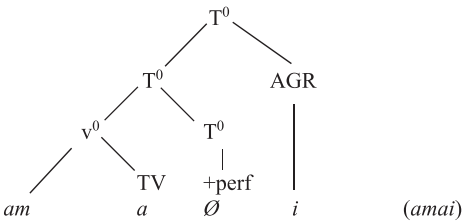
v	*e*	*n*		*i*			*v*	*e*	*n*	*n*	*i*	
X	X	X-	X-	X-	–>		X	X	X-	X-	X	
		|							|	/		
		[+cons]							[+cons]			
		|	Labial							Labial	→	Ø
		[+coronal]	[+round]						[+coronal]	[+round]		

(iii)

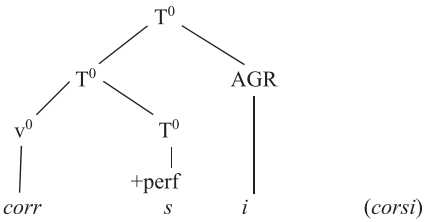
t	*a*	*k*		*i*		*t*	*a*	*k*	*k^w*	*i*
X	X	X-	X-	X	—>	X	X	X-	X-	X
	|						|	/	
	[+cons]							[+cons]		
	|	Labial						|	\	Labial
	[+dorsal]	[+round]						[+Dorsal]		[+round]

heads (see rule (40) below) in this case applying to v^0. In athematic structures, this rule fails to apply to v^0 in perfect forms due to a root diacritic. (See Calabrese (2019) for an analysis of the failure of application of TV insertion in this case).[14]

(18) Thematic



(19) Athematic



Let us consider the Italian perfect participle. Its regular exponent is /-t-/. Regular perfect forms, as expected, are thematic:

(20)

Perfect Participle		*Imperfect/perfect*
am-a-t-o	'love-PP'	*amavo/amai*
batt-u-t-o	'keep-PP'	*battevo/battei* (special TV for II conj. PP is -u-)
part-i-t-o	'leave-PP'	*partivo/partii*

Irregular perfect participle forms can display either /-t-/ or /-s-/. Irregular perfect forms are athematic:

(21)

Perfect Participle			*Imperfect/perfect*
spor-t-o	*/spordʒ-t-o/*	'lean out-PP'	*sporgevo/sporsi*
spen-t-o	*/speɲɲ-t-o/*	'turn off-PP'	*spegnevo/spensi* [gn=*ɲɲ]*
tol-t-o	*/toʎʎ-t-o/*	'take away-PP'	*toglievo/tolsi*

14 The T^0 is actually a fused node containing features from functional nodes such as $Voice^0$, $Aspect^0$, $Tense^0$ and $Mood^0$. In Calabrese (2019), I propose that this fused node is the result of a postsyntactic pruning, or better delinking, operation that frees features form their terminal nodes (see also below). The delinked features then dock on to an adjacent node if available. The presence of a single functional node for this case must be accounted for in any theory. This holds also for the node TV which contains both the TV and v^0 (see below for discussion).

(22)

val-s-o	'be worth-PP'	*valevo/valsi*
eccel-s-o	'excel-PP'	*eccellevo/eccelsi*
cor-s-o	'run-PP'	*correvo/corsi*

The distribution of the two exponents of the irregular participle cannot be predicted in phonological terms since both exponents can occur in the same phonological environment:

(23)

/t/		*vs*	/s/	
afflitto	'afflict-PP' (cf. *affliggevo*)		*affisso*	'affix-PP' (cf. *affiggevo*)
sporto	'lean-PP' (cf. *sporgevo*)		*sparso*	'spread-PP' (cf. *spargevo*)

However, as discussed in Calabrese (2019), there are clear morphological generalizations governing this distribution. First of all, all roots that are athematic in the perfect participle are also athematic in the perfect. The reverse does not hold. Thus, there are roots that are athematic in the perfect but not in the perfect participle. For example, all the athematic roots that take the geminating exponent in (16) are systematically thematic in the perfect participle. The thematic vowel in this case is /-u-/ as in the regular forms of the /-e-/ conjugation:

(24)

cadevo	*caddi*	*caduto*	'fall'
venivo	*venni*	*venuto*	'come'
tacevo	*tacqui*	*taciuto*	'be silent'
nuocevo	*nocqui*	*nociuto*	'harm'

The few athematic roots that have the exponent Ø in the perfect such as *feci, vidi* have an athematic perfect participle with /-t-/ (the /s/ of *visto* is due to a special MP rule)

(25)

facevo	*feci*	*fatto*	'do, make'
vedevo	*vidi*	*visto* (but also regular *veduto*)	'see'

Secondly, if we exclude the roots in (24) and (25), we can postulate that if a root is athematic in the perfect participle, regardless of whether the exponent of the PP is /–t-/ or /–s-/, then it will have /-s- /as the exponent of the perfect (cf. Vogel 1994, Calabrese 2015):

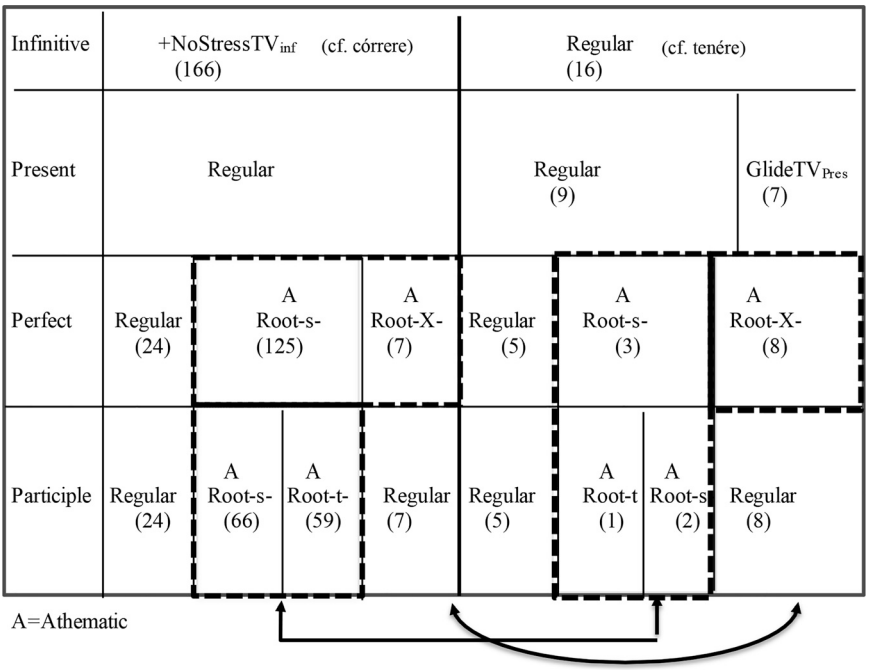
(26)

valere	'to be worth'	PP: *valso* /Perf. *valsi*	'I was worth,
scuotere	'shake'	PP: *scosso*/Perf. *scossi*	'I shook

Specifically, if a root takes /s/ in the perfect participle, we predict that it will take /s/ also in the perfect. Simply, the roots that take /-s-/ in the perfect participle are a subset of those taking /-s-/ in the perfect.

The correlation between perfect and participle exponent distribution in Italian is illustrated in the following diagram[15] (from Calabrese (2019):

(27)



We can now consider the problems of Embick's (2000) and Embick and Halle's (2004) theory as applied to Italian. They appear to assume, although they do not state it explicitly, that the presence of the same exponent in both perfect and perfect participle forms in Latin is a simple issue of accidental homonymy. In their analysis, in

15 Only the verb of the e-conjugation are considered here. The numbers of the different verbs are included in the parentheses and include only unprefixed verbal bases, i.e., *tenere* 'hold', not *mantenere* 'maintain', *detenere* 'detain', *ottenere* 'obtain', *ritenere* 'retain', *trattenere* 'hold back', etc, *giungere* 'arrive, join', not *aggiungere* 'add', *congiungere* 'conjoin', *disgiungere* 'disjoin', etc. Prefixed verbs behave morphologically like their unprefixed counterparts: *tenne* 'hold-PERF-3sg' *ottenne*'obtain-PERF-3sg', *ritenne* 'retain-Perf-3sg', etc., *giunse* 'arrive-PERF-3sg', *congiunse* 'conjoin-PEF-3sg', *disgiunse* 'disjoin-PERF-3sg', etc.

The present forms of the verbs with infinitival root stress (NoStressTVInf in the diagram) may have regular alternations involving palatalization (cf. vinco/vincete 'win-PREs-1sg/2pl'). The present forms of the verbs with regular stress on the TV in the infinitive may have special alternations involving both gemination and palatalization (cf. piaccio/piacete 'please-PRES-1sg/2pl'), which were analyzed as involving a special glide realization of the TV by Calabrese (2019) (GlideTVpres in the diagram). Allomorphic alternations in present forms are not relevant here but mentioned simply for completeness (see Calabrese (2019) for further discussion of present forms).

fact, /s/ is on the one hand the elsewhere realization of the participial aspect node (see the representation of the participle below) as in (28), and at the same time the realization of [+perfect] here represented as included in T^0 (see Footnote 14) as in (29):

(28) a. /s/ <–> $[\ ]_{Asp^0}$ in the context of root^s
b. /t/ <–> $[\ ]_{Asp^0}$

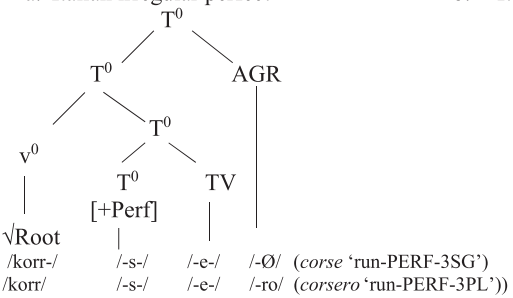
(29) a. /s/ <–> $[+perf]_{T^0}$ in the context of root^s
b. /v/ <–> $[+perf]_{T^0}$

However, this cannot be correct for Italian (and essentially the same holds for Latin) given the striking overlap in the insertion context of the perfect and the participle /s/ before the same designated set of roots. The presence of /-s-/ as an exponent of perfect participle aspect predicts that /s/ will be the exponent of the perfect. This generalization requires an essential unity between the perfect and the participial /-s-/.

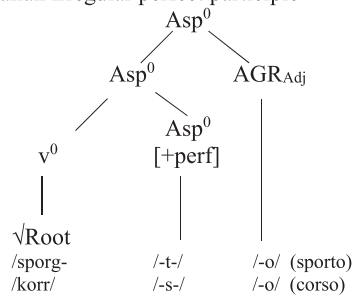
A solution simply adopting underspecification is untenable for Italian. Consider the morphosyntactic structures in (30) (see below for the derivation of the structure of the participle).

(30)

a. Italian irregular perfect



b. Italian irregular perfect participle



First of all, there is reason to believe that the elsewhere exponent of T^0 is actually /Ø/. This exponent is found not only in the present but also as exponent of regular perfect forms and some irregular ones as shown above (cf. (17)).

(31) /-Ø-/ <–> $[\ ]_{T^0}$

Secondly, there is an issue with the environment governing the insertion of the VIs in (28a) and (29b), insofar as /-s-/ appears both in T^0 and in Asp^0 (cf.(30)). Because of the logic of underspecification, the categorial specification of this VI should be underspecified as follows:

(32) /-s-/ <–> [ ] in the context of root^s

But then in the case of the participle, this VI would always be overridden by that inserting /t/ since this must be specified as applying only in the participle forms:

(33) /t/ <–> [ ]$_{Asp^0}$

To account for the distribution of /s/, this item must compete at the same time with the other exponent of the perfect and the /t/ of the participle (both the passive and perfect ones). This can be achieved by assuming that /-s-/ insertion is triggered by the presence of a certain given feature regardless of whether or not it appears under Asp^0 or T^0 in (30). I assume that this feature is [+perfect] and formalize this by mentioning this feature in the VI rule but not Asp^0 or T^0 as in (34c). Thus, the VIs in (34) can be proposed for Italian (in addition to (31) and (i) of Footnote 13):[16]

(34) Additional vocabulary Items for perfect participle and perfect Tense:
a. /-t-/ <–> [ ]$_{Asp^0}$[17]
b. /-s-/ <–> [+perf] / Root^S ____ (Root^S= *scriv*, *muov*, etc.)

In this way, the problems of Embick's (2000) and Embick and Halle's (2005) analyses are avoided. However, one must again face the issue of accounting for the disparate syntactico-semantic uses of the participial forms, given that it is not possible to rely on VI underspecification as in their analysis. As already mentioned earlier, I propose that the solution to this problem is to be found not in the underspecified nature of the VIs but rather in the properties of the relevant morphosyntactic structures, and specifically in the possibility of inserting ornamental morphological pieces in them. This proposal will be developed in the next sections. Before turning to it, however, I would like to consider Remberger (2012) who proposes an alternative analysis to those proposed by Embick (2000) and Embick and Halle (2005), which, however, does not rely on underspecification. Under her analysis, the characterizing heads of the Latin third stem participial constructions can be unified into a kind of nominal aspect n/Asp with no specific tense value or temporal semantics, meaning something like "concerned/affected". In this sense,

16 Two impoverishment operations account for the further distribution of the exponents /-t-/ and /-s-/ in (27). As is well known, impoverishment accounts for the emergence of regular morphology, here involving participial /-t-/. Impoverishment of the diacritic preventing TV insertion in verbs selecting the VI in (16) accounts for the fact that these verbs are regularly thematic in the participle (and therefore take /t-/ since irregular VI requires local adjacency to apply; see Calabrese 2019). Impoverishment of the diacritic /^{s}/ in the participle accounts for the emergence of participial /-t-/ in verbs whose athematic perfect display /s/ (i.e., *spensi, spento*,'turn-off' *tolsi, tolto* 'take away', *vinsi, vinto* 'win').

17 This Asp node must properly be the highest functional node in the verbal extended projection in the Complex X^0. In Calabrese (2019), I express this by referring to it as AspX.

the Latin third stem constructions can be thought of as "deverbal nominal elements".

Assuming that adjectives can be characterized by the features [+N, +V], whereas nouns are specified as [+N, −V], Remberger proposes that participles can be characterized as having the feature [+N],[18] hence the VIs in (35):

(35) /-s-/ <–> $[+N]_{Asp^0}$ / $Root^{\sqrt{}}$ ____
/-t-/ <–> $[+N]_{Asp^0}$

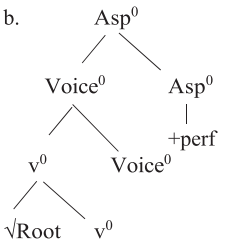
Remberger's analysis is successful in not relying on underspecification. However, it faces the same problem as the analysis of Embick (2000) and Embick and Halle (2005). It cannot account for the distribution of the exponent /-s-/ in perfect and participial forms in Italian (and Latin).

3 The Italian Perfect Participles

In this section I will show how the basic surface structure of perfect participles is derived in the model assumed here.[19] In Calabrese (2019), following Embick (2004), I proposed that the perfect participle in Italian periphrastic perfect constructions as in (36a) has the basic morphosyntactic structure in (36b). It is essentially a tenseless, moodless verbal form:

(36) a. *ho mangiato una mela*

b.

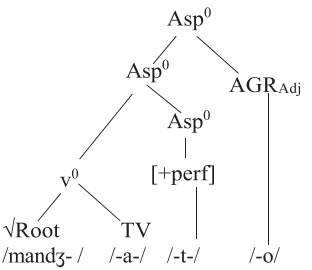


The surface structure as in (37) is derived by inserting ornamental morphological pieces (AGR and TV) and by the application of pruning operations which are discussed below:

18 Rouveret and Vergnaud (1980) and Chomsky (1981) suggested this for passive participles (see Roberts (1987) for a critique of this proposal),

19 As is to be expected when one deals with the derivation of surface morphophonological strings, there are analytical complexities: pieces must be inserted or removed. These complexities are in part due to the idiosyncracies of linguistic history, as will become clear later in this article: morphology is not minimalist.

(37)

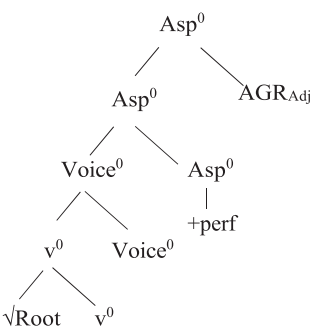


Let us consider AGR-insertion first. Characteristically, participial forms, especially in the Indo-European languages, have adjectival properties, specifically the agreement morphology typical of adjectives. One must account for the appearance of this adjectival morphology. I assume that this follows from the type of AGR that is inserted in the case of this verbal form. AGR is inserted in absence of inherent phi-features, which are found only in nouns: there are two types of AGR: AGR_V requires person and number features, AGR_{Adj} instead gender and number features (and case features in languages with overt morphological case). One can then hypothesize that AGR_V is inserted only when there is T^o in the same m-word (= a Complex X^o; Embick and Noyer 2000), otherwise AGR_{Adj} is inserted as the default:

(38) Given a Complex X^o U not including inherent phi-features,
a. Adjoin AGR_V to its highest X^o if U contains T^o
Otherwise
b. Adjoin AGR_{Adj} to its highest X^o.

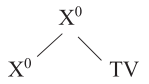
Therefore, in the case of the participle in (36b) where there is no T^o, AGR_{Adj} is inserted as in (39):

(39)

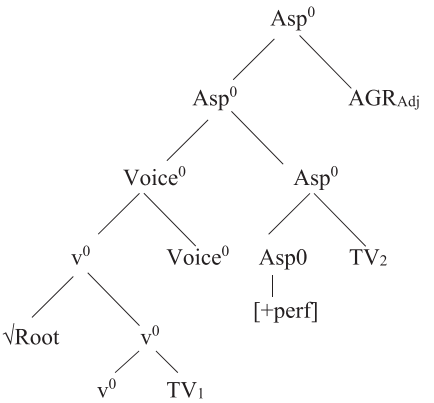


We can now turn to TV-Insertion. Cyclic application of the thematic vowel insertion rule (40) (Oltra-Massuet and Arregi 2005) to (39) generates (41):

(40) $X^0 \rightarrow$

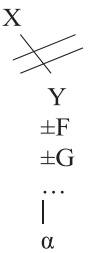


(41)



Finally, we need to deal with the surface shape of complex underlying syntactic structures, specifically for the surface absence of the v^0 and $voice^0$ nodes. To do that, Calabrese (2019) following Christopoulos (2018) and Christopoulos and Petrosino (2017), proposes that terminal nodes with phonologically nonovert exponents are pruned.

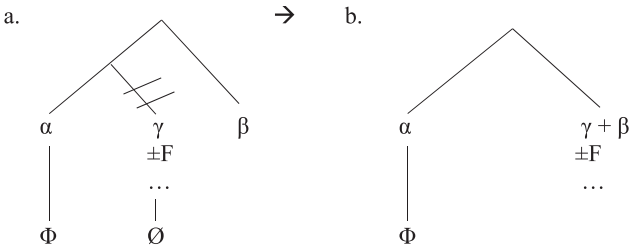
(42)



if Y is a terminal node containing the features [±F, ±G, …] and α is a null exponent

The pruned node is, however, not deleted; it becomes floating and is merged with an adjacent higher terminal node, if there is one. This results into the fusion of the two terminal nodes:

(43)

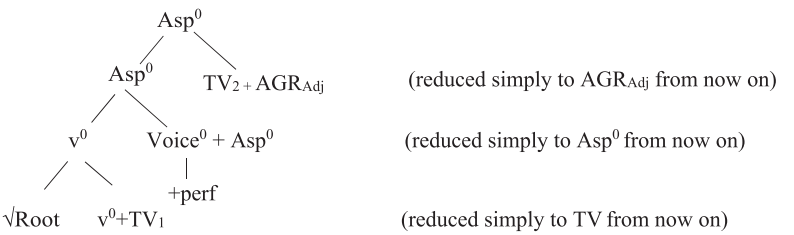


Where Φ, Ø are exponents, Ø is phonologically empty.

Assuming the VIs in (44), cyclic application of pruning will then generate the structure in (45):[20]

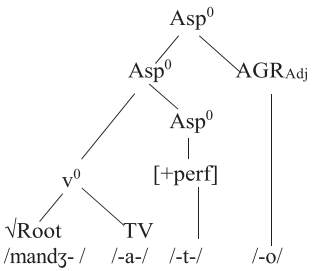
(44) a. Ø <–> v^0
b. Ø <–> $Voice^0$
c. Ø <–> TV_2 / __AGR_{Adj}

(45)



This structure accounts for the surface shape of the perfect participle; see (46) where full exponence is assigned to all pieces:

(46)

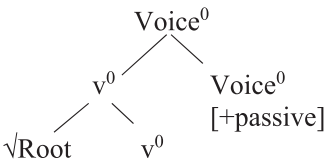


We can now turn to passive participles. Under any analysis of periphrastic passive constructions, passive participles should have the basic structure in (47) (see Calabrese 2019), insofar as both temporal and aspectual distinctions are marked on the auxiliary component of the periphrasis as shown in (48) where I put aside future and subjunctive contrasts (cf. the auxiliary in the active perfect participle constructions where only temporal distinctions are possible *ho/avevo mangiato la mela* 'I have/had eaten the apple'):[21]

20 The higher thematic vowel TV_2 is overt in a language such as Latin (cf. *am-a-t-o-* / *aud-i-t-o-*). However, it is systematically absent in the surface string in Italian. I assume that it is systematically assigned a null exponent (cf. (44c)) and therefore undergoes systematic pruning and upwards floating, as shown in (45).

21 There is also another set of perfect forms: the so-called *trapassato remoto* ('past anterior'): *ebbi amato* 'have-simple perfect+ perfect participle'. Bertinetto (1991) shows that the *trapassato remoto* is a special case of pluperfect: *avevo amato* 'I had loved'. Bertinetto refers to the property characterizing the *trapassato* as "terminativity".

(47)



(48)	Italian:	*Maria*	*e'*	*amata*	'Mary	is	loved'
			era			was being	
			fu			was	
			e' stata			has been	
			era stata			had been	

Given the structures in (36b) and (47), there should be two different morphological types of participle: the passive one and the perfect one. As a matter of fact, however, these two participles are always morphologically realized in the same way in Italian despite their obvious temporal and aspectual differences.[22] Consider the sentences in (49)–(50). In (49), the event occurred in the past, and is completed at the time of the utterance (perfective). In (50), it is occurring in the present, and it is not completed (imperfective) as also shown by the use of the auxiliary *venire* which indicates an ongoing event (Salvi and Vanelli 2004:70). However, in both sentences, the auxiliary is in present tense, so their temporal and aspectual differences must somehow reside in the participle forms, which however are morphologically identical.

(49) *Carlo ha mangiato il gelato* 'Carlo ate/has eaten the ice cream'

(50) *Il gelato viene mangiato proprio ora da Carlo* 'The ice cream is being eaten just now by C.'

22 Some southern Italian dialects and some Ibero-Romance varieties such as Portuguese have developed a specialization between thematic and athematic forms of the perfect participle where the thematic (regular) one is active perfect, and the athematic (irregular) one is passive cf. Sicilian *appisu* (passive)/*appinnutu* (active) 'hanged; hung' *ruttu* (passive)/*rumputu* (active) 'broken', Portuguese, *aceso* (passive)/*acendido* (active) 'lit; switched on', etc. (cf. Bentley and Ledgeway 2014, 2015; Bentley 2018, 2020). The major difference in this case is the absence vs presence of the thematic vowel. As expected, once the thematic vowel is missing, participial exponence in Asp⁰ may be irregular (e.g. /-s-/.) The presence vs absence of the thematic vowel can be accounted for in terms of an impoverishment operation targeting the diacritic preventing TV insertion (see also footnote 16). This impoverishment operation appears to occur in the perfect active forms – with the consequence that they are regularly thematic, i.e., there is morphological regularization in these forms – in the varieties mentioned above. Otherwise, there are no other relevant changes with respect to the analysis proposed in the text, insofar as the passive participles in these varieties must also be characterized by the configuration $[+\text{perfect}]_{\text{Asp}^0}$ (so that they can get the appropriate Asp⁰ exponents, e.g. /-s-/).

I assume that this surface convergence among perfect and passive participle forms is not due to trivial accidental homonymy, but that it has a principled (morphological) reason.

A brief historical digression into Latin participles is important at this point. Latin participles realized both perfective and passive morphology where the passive feature could be syntactically motivated as in the case of transitive verbs but also be assigned morphologically as in the case of the deponent verbs which were syntactically active (Ernout 1953; Embick 2000).[23]

(51)

Perfect passive (transitive verbs)	Perfect active (deponent verbs)
laudātus est 'he/she has been praised	*consectātus est* ''he/she hunted down
equi cūrāti (Liv.)	*confessus reus* (Fedro)
'Horses that were taken care of'	'the accused that has confessed'

Insofar as they were both perfect and passive, the auxiliary component of the passive perfect periphrasis realized only temporal distinctions (differently than in Italian, cf. the examples in (48), again putting aside future and subjunctive contrasts):

(52)

Latin:	*Maria*	*amata*	*est*	'Mary has been loved'
			erat	had been
			**fuit*	

The major change affecting these constructions in late Latin/early Romance[24] was a shift by which tense and aspect distinctions were realized in the auxiliary part of the periphrastic construction, as can be seen in the Italian cases in (48). When this happened, a transitive verb participle in the context of the auxiliary 'be' acquired only passive meaning (for a formal analysis of this change, see Calabrese 2019). Its "perfect" morphology which is seen in the Italian perfect participle forms discussed in the preceding section was however preserved historically. How can we model this preservation? One could propose that once the change described above occurred, the presence of a [+passive] voice node required a [+perfect] Asp node morphologically:

(53) if [+passive] voice^{0} is present in a complex X^{0}, then also [+perfect] Asp^{0} must be present.

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23 They could also have a resultative-stative (and also active interpretation, cf. Ernout and Thomas ([1951]: 277) as in (i), an interpretation parallel to that found in the regional southern Italian stative participles in sentences such (ii):

(i) *potus* 'that has drunk', *pransus, cenatus* 'that has eaten', *iuratus* 'that has sworn', *cretus* (< cresco) 'that has grown', *cautus* (< caveo) 'that pays attention, cautious', *scitus* 'that knows well', etc.

(ii) *è arrivato già mangiato* 'he arrived having already eaten'

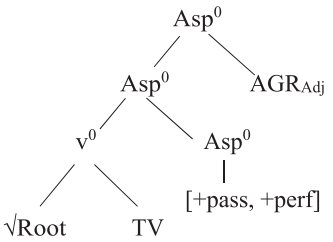
24 This change may have already affected earlier stages of Latin (cf. Haverling 2010).

The statement in (53) requires that a morphosyntactic structure such as that in (54a) must be converted into that in (54b) in the morphological component.

(54) a. → b.

Once the pruning operations (after TV and AGR insertion) apply,[25] as discussed in the preceding section, (54b) is changed into (55), which is identical to (46):

(55)



Hence the "passive" (54a) becomes a perfect participle in surface morphosyntax.

However, I believe that the statement in (53) can be made more general, and propose that the surface preservation of forms assumed earlier actually had a deeper motivation. First of all, I submit that the feature [+perfect] could be defined as a default prototypical property of Asp⁰. One could in fact assume that prototypical reference to an eventuality requires that it is temporally bound. The progressive, habitual or continuous interpretation of an eventuality are prototypically marked. A morphological structural condition stating that the default, unmarked specification for Asp⁰ is [+perf] as in (56) can be proposed.

(56) $\emptyset \rightarrow$ [+perf] / [___] $_{Asp^0}$

So, the inserted Asp⁰ in (54b) can be featureless and receive the feature [+perfect] by the default rule in (56).

One could then also assume that whenever one has a verbal form, i.e., if there is a v⁰, one also needs the morphosyntactic presence of Asp⁰. A way of formalizing this is to postulate that, in the same way as there are filters governing combination

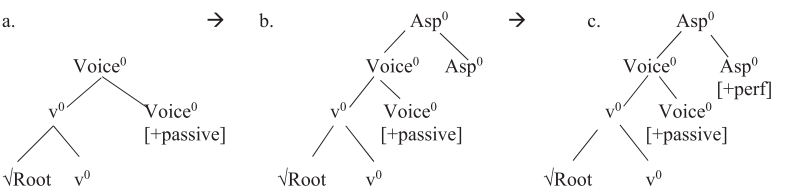
25 As stated in (44b), the voice head, even if [+passive], is always assigned a zero exponent, therefore null exponent pruning will apply to (54b) giving (55).

of morphosyntactic features (see Calabrese 2019), there are also principles governing relationships between nodes in morphosyntactic structures. In the case under discussion here, a morphosyntactic node not required by the syntactico-semantic component is inserted in morphological representations. One can assume that this is due to a generalization on word structure shape: the morphological structure characterizing verbal forms where both v^0 and Asp^0 are present is extended to all the words containing v^0. It is the purely formal "morphological" extension of the functional structure characterizing verbal morphology which is encoded in the functional skeleton proposed by Cinque (1999) in (7) to morphological situations in which either of them is absent in the syntactico-semantic representation. One can call it an instance of morphological stereotypization: a contingent correlation becomes formally categorical; the observation that the presence of Asp^0 is often correlated with the presence of v^0 becomes the categorial generalization that the presence of Asp^0 is always formally correlated with the presence of v^0 (a little like the statement: all Swedes have blue eyes).[26] It follows that it becomes a morphological structural generalization similar to the one requiring the presence of ornamental morphological pieces such as the thematic vowels. This generalization leads to the insertion of "ornamental" nodes or features, morphological elements that do not have a functional syntactico-semantic motivation. The relevant morphomic structural condition is given in (57).

(57) Given a Complex X^0 U, if v^0 is present in U, then also Asp^0 is present in U.

We can thus revise the derivation of the surface shape of passive participles as shown in (58): given (57), Asp^0 is required in this structure, and because of (56) it is assigned the feature [+perfect].

(58)

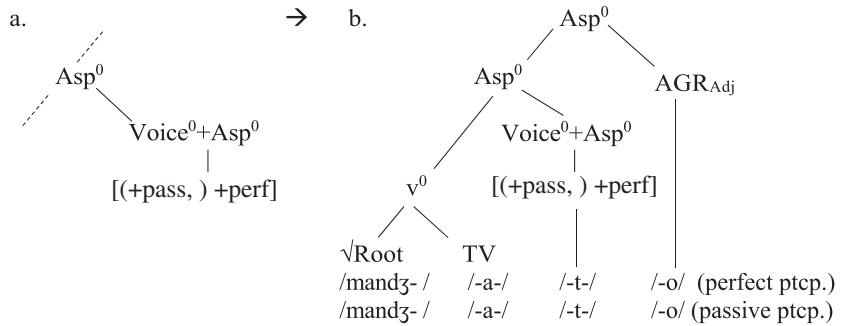


Given as proposed above in (44b) that the voice head, even if [+passive], is assigned a zero exponent, null exponent pruning will apply to (58c) yielding (59)

26 On the other hand, one could say that the syntactic presence of v^0 prototypically correlates with the syntactic presence of Asp^0: the presence of v^0 that functions as the inner aspectual node modulating the eventuality type of the verbal root correlates with the presence of Asp^0, that in acting as the outer aspectual node, modulates the total aspectual properties characterizing the situation identified by the complex eventuality root + v^0. This abstract prototypical correlation becomes morphologized as a surface structural property of verbal forms.

which also displays the independent application of AGR insertion. The independently needed VI in (34) will then insert the relevant participial morphology. It follows that passive and perfect participles converge morphologically:

(59)



4 Adjectival Participles

We can now turn to adjectival participles. As in other languages, Italian participle forms may share properties with adjectives as shown by the standard test for the adjectival status of participle forms (cf. Guasti 1991:330–2, Scalise 1995:507):

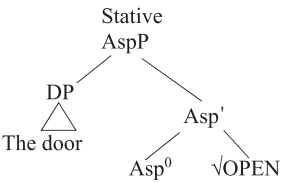
(60)
- a Adjectival negative prefixation: *la legge e' inosservata* 'the law is not observed' (cf. *felice* 'happy' *infelice* 'unhappy')
- b Selection of adjectival selecting verbs: *il suo orgoglio sembra ferito* 'his pride seems to be wounded' (cf. *Giorgio sembra buono* 'Giorgio seems good')
- c Possible use of adjectival degree modifiers and degree suffixes: *Giorgio è annoiatissimo* 'Giorgio is very annoyed' (cf. *alto* 'high' vs *altissimo*'very high');
- d Prenominal and postnominal position *la donna amata è ricomparsa/ L'amata cugina non scrive più* 'the beloved lady reappeared/the beloved cousin no longer writes' (cf. *il tavolo grande* vs *il grande tavolo* 'the big table')
- e Coordination with adjectives: *una casa pulita e bella* 'a clean(ed) and beautiful house', *un ragazzo buono ed educato* 'a good and polite boy', *un paese inquinato e sporco* 'a polluted and dirty country', *una nazione distrutta ed infelice* 'a destroyed and unhappy nation'

The first analyses of adjectival participles – or adjectival passives as they are often referred to – in the theoretical literature held the view that they are built by lexical operations converting participles into adjectival forms prior to entering the syntax (Wasow 1977; Levin and Rappaport 1986, a.o.). However, current approaches to derivational morphology contend that adjectival participles are not built in the lexicon, but in the syntax (Anagnostopoulou 2003; Embick 2004; McIntyre 2013; Bruening 2014, a.o.). The consensus among syntax-oriented approaches to adjectival participles is that they have minimally a structure where a verbal root, or another minimal verbal constituent, is selected for by an aspectual or adjectival head that creates a participial adjective out of the verbal element (Anagnostopoulou 2003; Embick 2004; McIntyre 2013; Bruening 2014, a.o.).

For example, Embick (2004) has argued that adjectival participles that have a pure stative interpretation as in (61) have the structure in (62) in which a functional head, labeled Asp here, is attached to the root. I will refer to this construction as a stative participle

(61) Stative: *La porta è **aperta*** =The door is in an open state.

(62)



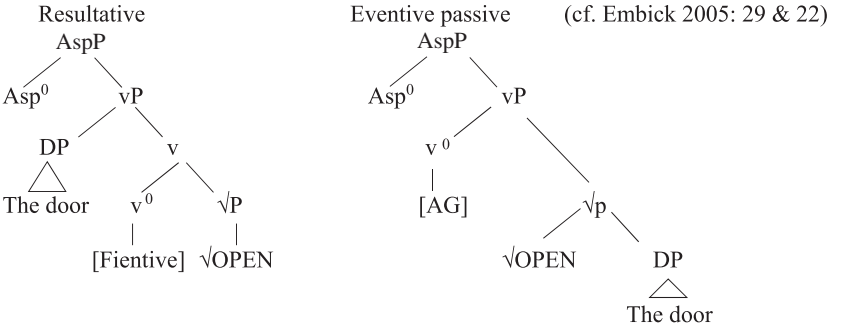
(cf. Embick 2005: 19)

The assumption is that eventive interpretation is associated with the presence of v^0, a verbalizing head (cf. Embick 2004, see also Travis 1994, Harley 1995, Kratzer 1996, a.o.). There is no *v* in this structure, encoding the fact that the interpretation of the stative does not have an eventive component.

In Embick's (2004) analysis, resultative and eventive participles with the interpretations in (63) have the structures in (64). In these structures, the Asp head attaches to a verbalizing structure, so that Asp^0 is not in a direct relationship to the root. In the resultative participle the v^0 is associated with "fientive" semantics (Embick 2004), that is, with a meaning like that associated with *become* or inchoative interpretation. In Embick's analysis, the feature [AG] (for AGentive) in the eventive passive is responsible for the licensing of agentive interpretations (Kratzer 1994, 1996):

(63) a. Resultative: *La porta è **aperta** (proprio ora)*
= The door is in a state of having
become open (state resulting from event)
b. Eventive passive: *La porta è **aperta** da Carlo*
= Carlo opened the door

(64)



Here I will not be able to deal with the syntactic and semantic detail of the analysis of these structures in Italian (in this regard, see Bosque 1990, 1999 on Spanish adjectival participles). What is of importance for me here is the absence of any surface morphological distinctions among these structures in Italian: they all display the same identical participial form.[27] In particular, participial forms can have a truly pure stative interpretation and still be morphologically undistinguishable from when they

27 Older stages of Italian display a special form of the perfect participle the so-called *participio accorciato* 'shortened participle', which display a /-Ø-/ exponent for Asp^0 instead of the expected /-t-/ (or /-s-/) (from Rohlfs (1968:137):

(i) *è tocco lo meridian dal sole* (Dante, Purg 4, 137) (cf. modIt. *toccato*)' the meridian is touched by the sun' *di quanto mondo egli aveva cerco (Boccaccio, Dec. 7, 7* (cf. modIt. *cercato)* ' in all the lands he had searched for'
or t'avesse ella cieco (Cecco Angiolieri, Son. 1) (cf. modIt. cecato) ' she had blinded you'

One can assume the surface morphosyntactic structure in (ii) for these forms, crucially containing a /-Ø-/ exponent for Asp^0 instead of /-t-/ (or /-s-/) – I assume that they are athematic (since they are irregular):

(ii) $[[[\text{cerc-}]_{\text{Root}}\ \emptyset\ ]_{\text{Asp}^0}\ \text{-o}]_{\text{AGRAdj}}$ (cf. $[[[[\text{cerc-}]_{\text{Root}}\ \text{-a-}]_{\text{TV}}\ \text{-t-}\ ]_{\text{Asp}^0}\ \text{-o}]_{\text{AGRAdj}}$)

Modern Italian has developed adjectival pairs such as the following ones where one member is participial with the expected exponent /-t-/ for Asp^0 and the other one a *participio accorciato* with exponent /-Ø-/: *stancato/stanco* 'tired', *svegliato/sveglio* 'awaken', *logorato/logoro* 'worn out', *lessato/lesso* 'boiled', *arrostito/arrosto* 'roasted', *caricato/carico* 'loaded, charged', *guastato/guasto* 'broken', *troncato/tronco* 'truncated', *gonfiato/gonfio* 'swollen', etc. Both members of the pairs involve stative adjectives as shown by the use of degree suffixes (many *participi accorciati* actually appear to reject these suffixes, though for reasons which remain unclear: *lessatissimo/*lessissimo* 'very boiled' *logoratissimo/*logorissimo* 'very worn', etc.

appear in verbal contexts or have truly eventive or resultative intepretations. Thus, the participle forms in (65), which are modified by the superlative suffix *-issim-* and in prenominal (attributive) position, have clear stative interpretations; still they are identical to their counterparts in verbal environments in (66):

(65)
uno spaventatissimo bambino	'a very scared boy'
un appassionatissimo cantante	'a very passionate singer'
un attesissimo evento	' a much expected event',
una amatissima donna	'a much loved woman'
dei coloratissimi fiori	'very colourful flowers'

(66) *Lo scoppio ha spaventato il bambino/ il bambino è stato spaventato dallo scoppio*
'the explosion scared the child/the child was scared by the explosion'
La partita ha appassionato tutti/tutti sono stati appassionati dalla partita
'the game thrilled everyone/everyone was thrilled by the game'
Ho atteso Carlo per molto tempo/ Carlo è stato atteso per molto tempo
'I waited for Carlo for a long time/Carlo was waited for for a long time'
Ho amato Maria/Maria è stata amata
'I loved Maria/Maria was loved'
I bambini hanno colorato i fiori/i fiori sono stati colorati dai bambini
'The children coloured the flowers/the flowers were coloured by the children'

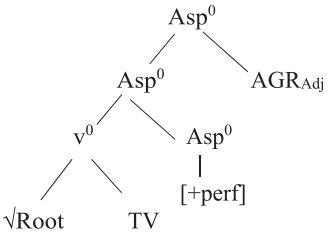
An obvious question, however, arises once we assume that stative participles are built in the syntax: if stative participles have the minimal structure in (62), how do they get the more complex surface morphological structure in (67) (that must be assumed for truly verbal participles, including eventive/resultative ones as discussed above)?

(ii) *stancatissimo/stanchissimo*, 'very tired' *gonfiatissimo/gonfissimo* 'very bloated'

A possible semantic specialization in these pairs appears to have developed so that the one with overt participial morphology indicates that the relevant state results from an actual change of state, whereas the other one with nonovert participial morphology indicates a pure state. I assume, however, that they both involve the same basic morphosyntactic structure in (ii).

An essentially similar analysis is provided in a very different framework by Thornton (2004:231) who proposes that 'these formations more than participle conversions should be analyzed as reductions based on the corresponding full participles, with elimination of the thematic vowel and of the suffix /-t-/ and preservation of the meaning of the base'.

(67)



In particular, the issues to address are the following: 1) How do stative adjectival participles get a TV, the presence of which indicates the presence of a v^0, as discussed above? 2) How does it get the [+perf] feature despite possible interpretations that do not involve a perfective aspect or even past tense as in (68) where the implication is that the relevant square is continuously under surveillance:

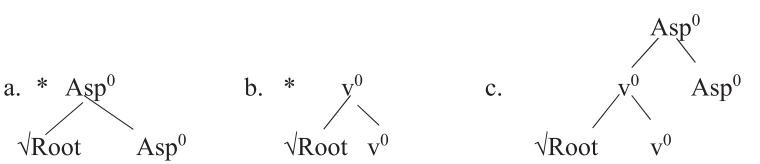
(68) *Da ieri quella sorvegliatissima piazza è il centro di continue manifestazioni*
'Since yesterday that much watched over square is the focus of continuous protests'(cf. participle: *sorvegliata* 'watched over')

I propose that the answer to these questions can be found if we assume that also in this case we are dealing with an instance of ornamental morphology, in particular with a generalization on the morphosyntactic form of words stating that the presence of a structural component may require the presence of another structural component, purely formally, regardless of the syntax and semantics. This was done in (57). Now, I will further widen its extent as in (69).

(69) Given a Complex X^0 U, if v^0 is present in U, then also Asp^0 is present in U, and vice versa

This could be a purely language-specific development internal to Italian, and actually to Latin as discussed later. However, I would like to assume that (69) is a UG condition on morphological structures that can be active/deactivated on a language specific basis. It follows that the structures in (70a) and (70b) are disallowed in Italian; only (70c) is possible:

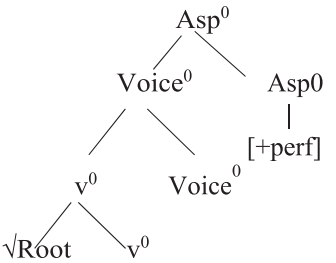
(70)



Once we assume the presence of the Asp^0 node (with the application of the default

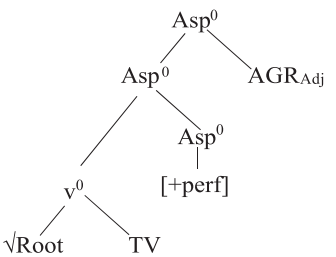
rule in (56)) and that the articulation of the verbal functional skeleton is always the same, also the intermediate voice node between v^0 and Asp^0 is required as in (71).

(71)



Insertion of AGR and TV as well as the pruning of null v^0 and null voice^0 – remember that voice head is always assigned a zero exponent – will apply to this structure. Therefore, the full resulting structure of the participle will be that in (72) (remember that Asp^0= Voice+Asp^0, and TV= v^0+TV).

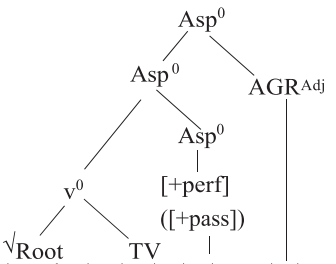
(72)



A stative adjectival participle is thus identical to a verbal participle. As before, the other operations of TV and AGR insertion, and of pruning of null v^0, then generate the surface structure in (73). The stative adjectival participle then acquires the same structure as the perfect participle by morphological adjustments. This accounts for the converging surface shape of perfect participles, passive participles and stative adjectival participles. All these forms have the same surface morpho-syntactic structure.[28]

28 See Haspelmath (1994) on the semantic relation between verbal adjectives and passive participles. Observe, however, that a simple semantic relation fails to deal with the complex surface morphological convergence among verbal adjectives, and passive and perfect participles we observe in (73) (see also Section 6 for the discussion of the emergence of this convergence in Latin).

(73)



5 Nominalizations

As is well known, many Italian nominalizations are traditionally analyzed as involving a participial base, as shown by the fact that irregularity in the participle are carried over to the nominalizations (for discussion of previous analyses of the morphology of Italian nominalizations, see Calabrese 2019):[29]

(74)

Nominalization	Infinitive	Regular Participle	
narrazione	*narrare*	*narrato*	'narrate'
punizione	*punire*	*punito*	'punish'
portatore	*portare*	*portato*	'bring'
traditore	*tradire*	*tradito*	'betray'
venditore	*vendere*	*venduto*	'sell'
battitura	*battere*	*battuto*	'beat'
spaccatura	*spaccare*	*spaccato*	'split'
cucitura	*cucire*	*cucito*	'sow'

(75)

Nominalization		Infinitive	Irregular Participle	
assunzione	'assumption'	*assumere*	*assunto*	'assume
direzione	'direction'	*dirigere*	*diretto*	'direct'
espulsione	'expulsion'	*espellere*	*espulso*	'expell'
scrittore	'writer'	*scrivere*	*scritto*	'write'
distruttore	'destroyer'	*distruggere*	*distrutto*	'destroy'
divisore	'divider'	*dividere*	*diviso*	'divide'

29 In particular see this work for a detailed critique of the most recent OT analyses of these nominalization (Burzio 1998, 2002; Steriade 2016).

chiusura	'closing'	*chiudere*	*chiuso*	'close'
lettura	'reading'	*leggere*	*letto*	'read'
apertura	'opening'	*aprire*	*aperto*	'open'

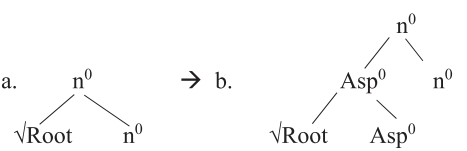
The question to answer at this point is why these nominalizations display such a participial base.

Relying on Alexiadou (2001) (see also Ippolito 1999), let us assume that an aspectual head is actually present in all nominalizations including eventuality-referring roots, i.e., roots referring to states, actions and events. So, the hypothesis is that root denoting eventualities always require an Asp node in which the aspectual features of the root eventuality are interpreted, or perhaps modulated. It could be part of a verbal functional skeleton selecting the root, or could be inserted by the rule in (76):

(76) Ø → Asp^0 / √root ___ if √root refers to an eventuality

Given the simple nominal structure in (77a) (Marantz 2001; Embick and Marantz 2008), rule (76) then changes it into (77b) when containing an eventuality root.

(77)



Now remember that during the discussion of stative participial adjectives, I proposed the morphological condition in (69) (repeated here as (78)), a generalization on the morphosyntactic form of words whereby the presence of a structural component may require the presence of another structural component, purely formally, regardless of the syntax and semantics:

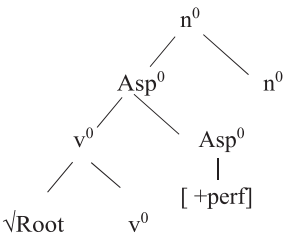
(78) Given a complex X^0 U, if v^0 is present in U, then also Asp^0 is present in U, and vice versa.

Assuming that this condition is active in Italian, the Asp^0 head will require the insertion of a v^0 node. In addition, this Asp^0 is assigned the default [+perfect] specification by (56), repeated here as (79):

(79) Ø → [+perf]/ [___]$_{Asp0}$

The structure in (80) will then be generated:

(80)



Therefore, verbal participles, stative adjectives and the bases of nominalizations will eventually converge into the same morphosyntactic structure in (80) due to the effect of (76), (78) and (79) with the proviso that the v^0, which is inserted in the structure in (80) to satisfy these requirements, is obviously semantically empty. What is generated in the complement of n^0 in (80) is then a participial structure. We thus have an immediate account for why participles appear as bases of nominalizations with suffixal /*-ore, -ione, -ura*/. Crucially, here Asp^0 is assigned the appropriate participial exponents.

To account for nominalizations such as those in (74)–(75), we then need to assume the VIs for n^0 given in (81) where each n^0 has a diacritic index indicating its semantic "flavour", for example α triggers the "agentive" interpretation of the root eventuality (I will not deal with these flavors here (see Melloni 2017 for discussion of the semantics of nominalizations):

(81)	a.	/-or-/	<–>	n^0_α (agentive)	vinc-i-t-or-e[30]	'winner'
	b.	/-yon-/	<–>	n^0_β (action)	transform-a-z-ion-e	'transformation'
	c.	/-ur-/	<–>	n^0_γ (result)	ar-s-ur-a	'burning heat'
	d.	/-oi-/	<–>	n^0_δ (location)	lav-a-t-oi-o	'lavatory'

The regular forms show the presence of the thematic vowel, irregular ones its absence. In addition, the appearance of the [-t-/-s-] allomorphs of Asp^0 is accounted for by the VI in (34), repeated here in (82):

(82) a. /-s-/ <–> [+perf] / $Root^{\surd}$ ____
b. /-t-/ <–> $[\ ]_{Asp}$[31]

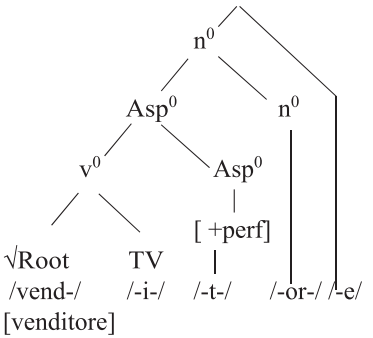
30 There are cases in which instead of the expected irregular (athematic) participial bases, a thematic regular one is found, i.e., regular thematic *vincitore* instead of the irregular athematic *vintore* (cf. participle *vinto*, infinitive *vincere* 'win'). As discussed in detail in Calabrese (2019), impoverishment of the diacritic triggering athematicity accounts for such cases. See this work of an exhaustive analysis of participial morphology in nominal contexts.

31 See note 17.

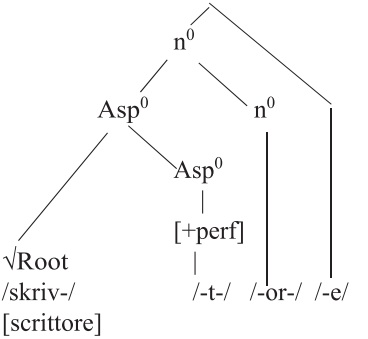
Consider the two nominalizations *venditore* 'seller' and *scrittore* 'writer'. They have the surface morphosyntactic structures in (83).

(83)

a. Thematic participial structure



b. Athematic participial structure



These structures and their surface morphophonology are derived as in (84):

(84)

Syntax:	a. [[VEND]$_{Root}$	n^0]	b. [[SCRIV^{noTV}]$_{Root}$	n^0]
Morph.SpellOut:				
Insert Asp^0 (76)	[[[VEND]$_{Rt}$ Asp^0]	n^0]	[[[SCRIV^{noTV}]$_{Rt}$ Asp^0]	n^0]
Insert v^0 (78)	[[[[VEND]$_{Rt}$ v^0] Asp^0]	n^0]	[[[[SCRIV^{noTV}]$_{Rt}$ v^0] Asp^0]	n^0]
Insert [+perf] (79)	[[[[VEND]$_{Rt}$ v^0]] Asp^0] [+perf]	n^0]	[[[[SCRIV^{noTV}]$_{Rt}$ v^0]] Asp^0] [+perf]	n^0]
Insert TV(40)	[[[[VEND]$_{Rt}$ v^0 TV]] Asp^0] [+perf]	n^0]	n/a	
Phon.SpellOut:				
Root VI	[[[[vend] v^0 TV]] Asp^0] [+perf]	n^0]	[[[[scriv] v^0] Asp^0] [+perf]	n^0]
v^0 VI (44a)	[[[[vend] Ø TV]] Asp^0] [+perf]	n^0]	[[[[scriv] Ø] Asp^0] [+perf]	n^0]
Prune Ø (42)	[[[[vend] TV]] Asp^0] [+perf]	n^0]	[[[[scriv] Ø] Asp^0] [+perf]	n^0]
TV VI	[[[vend i] Asp^0] [+perf]	n^0]	n/a	
Asp^{0}VI (82b)	[[vend i t]	n^0]	[[scriv t]	n^0]
C assimilation (cf. Fnt. 2)	n/a		[[scrit t]	n^0]
n^0 VI (81)	[vend i t	or-]	[scrit t	-or]
Class Marker	vend i t	or- e	scrit t	-or- e
Output	*venditore*		*scrittore*	

Pace Burzio (2002), the phonological spell-out derivation is cyclic: the construction of the phonological shape of the participle must be done in the inner cycles before the computation of the outer nominal cycle.

I assume that all Italian nominalizations have the same morphosyntactic structure including both v^0 and Asp^0, with only changes in exponence of the latter. If this is correct, we also have an explanation for the presence of a verbal base with a TV in other nominalizations.

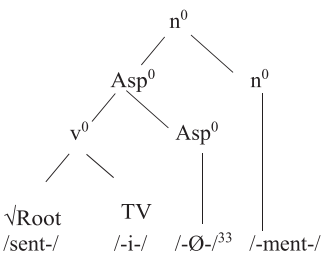
Consider the nominalizations in (85):

(85) *Cambiamento* 'change', *movimento* 'movement', *accompagnamento* 'train, suite' ,
sentimento 'feeling'

Asp^0 here displays the exponent /-Ø-/ found in other verbal categories, as in (86) (see §6 for discussion of the history of this suffix and an account of its phonological shape):[32]

(86) a. /-Ø-/ <–> [$]_{Asp}$ / $\_\_n^0{}_\varepsilon$
b. /-ment-/ <–> $n^0{}_\varepsilon$

(87)



The overall consequence of this analysis is that every eventuality root, or root merged with Asp^0, will acquire surface verbal morphology — in particular verb class patterns (i.e., TV). Their verbal morphology may be participial in some cases but not in other ones (i.e., those having Ø as exponent of Asp).[34]

6 Brief History of Latin Participial Morphology

The Italian suffixal /-t-/ that appears in perfect participle forms and related word-formation processes discussed up to now has its historical roots – through Latin – in the PIE adjectival passive suffix **-tó-*, and of the PIE agentive and action/result nominal suffixes **-tér/tor, *-ti-, *-tu-*. In this section, I will investigate their historical development into Latin (and eventually Romance). This will also lead to an analysis of the development of perfect participial forms in Latin, and to an account for their disparate uses in this language.

---

32 These nominalizations are systematically thematic. As discussed in Calabrese (2019), the root diacritic triggering athematicity is systematically impoverished in the context $\_\_n^0{}_\varepsilon$. But see Section 6 for the situation in Latin.

33 The /-Ø-/ is left here for the sake of the exposition. Otherwise, remember that as soon as a /-Ø-/ exponent is inserted, it undergoes pruning, which leads to upward node fusion.

34 See Calabrese (2019) for discussion of other Italian nominalizations.

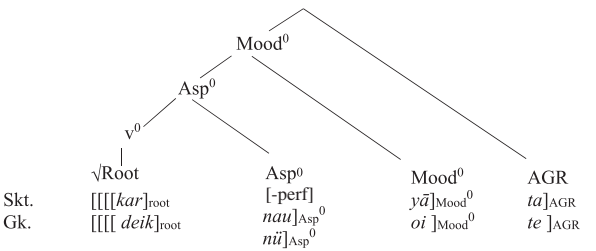
In order to understand what happened in Latin, we need to consider the development of PIE verb structure in this language. The PIE basic stem systems are the so-called Present, the Perfect and the Aorist, which are distinguished in terms of aspectual features: [–perfect] for the present, [+perfect, +stative] for the perfect, and [+perfect, –stative] for the Aorist (where the features are tentative, and used only for expository purposes). The basic verbal morphosyntactic structure of PIE verbs in the present system can be observed in the following subjunctive and optative forms from Vedic Sanskrit and Classical Greek (for a discussion of the realization of Voice in PIE and for an analysis of the fact that voice and tense features appear to be marked together with the phi-features in AGR, see Calabrese 2019):

(88) a. *kr̥̊ṇuyā́ta* 'make-Imperfective-Optative-Active-2PL Root kar
[[[[*kar*]$_{\text{root}}$ *nau*]$_{\text{Asp}^0}$ *yā*]$_{\text{Mood}^0}$ *ta*]$_{\text{T}^0+\text{Voice}^0+\text{AGR}}$
δεικνύοιτε 'point-Imperfective-Optative-Active-2PL Root: deik
[[[[*deik*]$_{\text{root}}$ *nü*]$_{\text{Asp}^0}$ *oi*]$_{\text{Mood}^0}$ *te*]$_{\text{T}^0+\text{Voice}^0+\text{AGR}}$

b. *kr̥̊ṇávadhv* 'make-Imperfective-Subjuntive-Middle-2PL
[[[[*kar*]$_{\text{root}}$ *nau*]$_{\text{Asp}^0}$ *a*]$_{\text{Mood}^0}$ *dhve*]$_{\text{T}^0+\text{Voice}^0+\text{AGR}}$
δεικνύητε 'point-Imperfective-Subjuntive-Middle-2PL
[[[[*deik*]$_{\text{root}}$ *nü*] $_{\text{Asp}^0}$ *e:*]$_{\text{Mood}}$ *te*]$_{\text{T}^0+\text{Voice}^0+\text{AGR}}$

The basic surface morphosyntactic structure of the forms in (88) is that in (89). Given the structural convergence between Sanskrit and Greek, one can plausibly hypothesize that this surface structure can be reconstructed for PIE (after pruning and other operations discussed in Calabrese (2019):

(89)



PIE displays a wide variety of affixes (cf. Ringe 2006, Rix 1986, Rix and Kümmel 2001, Szemerényi 1996), which traditionally form the different classes of the present and involve root dependent realizations of [-perfect] aspect. Some of these affixes may have had different nonaspectual functional or derivational properties originally in pre-PIE stages, cf. the causative flavour of the **ne*-affix (Bertocci 2017, Meiser 1993). Such properties can no longer be clearly identified at the PIE stage (see Burrow 1955:302). At this stage, these suffixes can only treated as aspectual markers.

(90)

	Sanskrit	PIE	cf. Greek
$[[bhav]_{Root}$	$- a]_{Asp^0}$	$*- e^{35}]_{Asp^0}$	$- e]_{Asp^0}$
$[[raudh]_{Root}$	$- na]_{Asp^0}$	$*- ne]_{Asp^0}$	$- ne]_{Asp^0}$
$[[pas]_{Root}$	$- ya]_{Asp^0}$	$*- ye]_{Asp^0}$	$- ie]_{Asp^0}$
$[[star]_{Root}$	$-nau]_{Asp^0}$	$*- new]_{Asp^0}$	$-nü]_{Asp^0}$
$[[ad]_{Root}$	$- Ø]_{Asp^0}$	$*- Ø]_{Asp^0}$	$- Ø]_{Asp^0}$

The [−perfect] aspect is realized through the different root dependent VI listed below:

(91)
a. /*-e-/ <–> $[\text{-perfect}]_{Aspect}$ / Root $^{-a-}$____
b. /*-ye-/ <–> $[\text{-perfect}]_{Aspect}$ / Root $^{-ya-}$____
c. /*-ne-/ <–> $[\text{-perfect}]_{Aspect}$ / Root $^{-na-}$ ____
d. /*-new-/ <–> $[\text{-perfect}]_{Aspect}$ / Root $^{-nau-}$____
e. /*-Ø-/ <–> $[\text{-perfect}]_{Aspect}$ / Root $^{-Ø-}$___

PIE Aorist and perfect forms are given below (from Ringe 2006: 28-29):

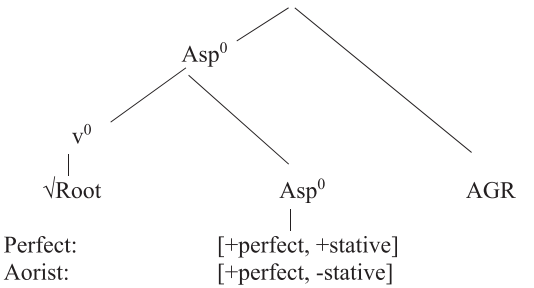
(92) a. Root perfects:
*wóyd-Ø- ~ *wid-Ø- ‘know’
b. Reduplicated perfects:
*me-món-Ø- ~ *me-mn-Ø- ‘remember’

(93) a. The root aorist with no overt suffixal element:
*gwém-Ø- ~ *gwm̥-Ø- ‘step’
*bhuh$_2$-Ø- ‘become’
b. The /-s-/ aorist.
*déyk-s- ~ *déyk-s ‘point out’
*wéǵ’h-s- ‘transport’
c. The /-é-/ aorist (traditionally called the thematic aorist)
*h$_1$lud^h-é- ‘arrive’
d. Reduplicating aorist
*wé-wk-e- ‘say’ (root *wek)*

PIE Aorist and perfect form surface structure is given here:

35 See Calabrese (2019) for arguments showing that what is traditionally called “thematic” *-e- in PIE is not an inserted ornamental piece as the Latin TVs but actually an exponent of Asp^0.

(94)



The relevant VIs are given below. Reduplication is due to special morphophonological rules which are not discussed here.

(95) a. Perfect
/*-Ø-/ <–> [+perfect, +stative]

b. Aorist
/*-Ø-/ <–> [+perfect, -stative] / Root$^{\emptyset}$ ___
/*-s-/ <–> [+perfect, -stative] / Root^{s} ___
/*-e-/ <–> [+perfect, -stative] / Root^{e} ___

To understand the development of the Latin conjugation system, one must consider PIE derived stems. We have derived verbs such as the following (Ringe 2006:28):

(96) Statives in *-éh$_1$-*
**h$_1$rudh-éh$_1$-* 'be red' < **h$_1$rewdh-* 'red'
Factitives in *-h$_2$-*
néwe-h$_2$-* 'renew' <newo* 'new'

Causatives and iteratives in **-éye-* (with *o*-grade root) from basic roots:
**sod-éye-* 'seat (someone)' < **sed* 'sit down'
**bhor-éye-* 'be carrying around' < **bher* 'carry'

Desideratives in **-(h$_2$)sé*, with and without reduplication Ci from basic roots,
wéid-se-* 'want to see' <weyd* 'catch sight of'
ki-kl̥- h$_1$se-* 'try to conceal' <kel* 'hide'

Denominatives in *-yé-* formed from nominals:
**h$_2$kh$_2$ows-yé-* 'be sharp-heared < **h$_2$ek* 'sharp' and **kh$_2$éw-es* 'hear'

Factitives in **-yé-* formed from adjectives:
pr̥kto-yé-* 'frighten' <pr̥k-to-* ' afraid'

Originally verb-forming suffixes were associated with present (imperfective) aspect and were incompatible with other aspectual markers (for discussion and possible historical motivation for this situation, see Ringe 2006:26–35, Sihler 1995:494). Probably, this indicates that the v^0-node under which these derivatives were inserted and the Asp^0 node were originally fused together (see Calabrese 2019).

However, evidence from Vedic Sanskrit (a few cases) and Classical Greek (the regular situation) show that verb-forming derivative suffixes must have been able to co-occur with aspectual suffixes already in later stages of the proto-language:

(97) Aorist denominative/causative in Vedic Sanskrit (Whitney 1885, 1889)

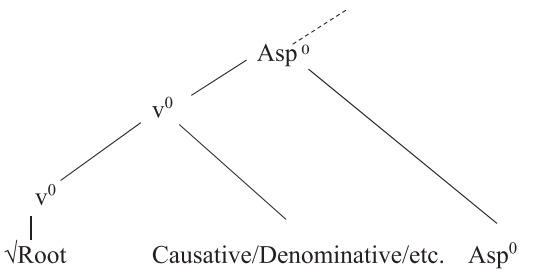
pāp -ay-iṣ-	from *pāpa-ya-* (denominative /-ya-/)		'lead into evil (*pāpa*)'
vyath-ay-is-	from *vyath-aya-* (causative /-aya-/)		'disturb'
dhvan-ay-is-	from *dhvan-aya-*		'envelope'

(98) Aorist denominative/causative in Greek (just stem, no augment) (Sihler 1995)

-οἰκ-η-σ-	<**woik-eye-se*	'inhabit'	Denominative from οἶκος 'house'
-φορ- η-σ-	<*bhor-eye-se-*	'carry about/ wear'	Causative from φερω 'bring'

We can then assume that at later stages of proto-language the v^0 node was no longer fused with Asp^0, and that these derivatives could appear as independent morphosyntactic elements under the v^0 node. The derived verbs in (96), (97) and (98) had thus the morphosyntactic structure in (99) ($Voice^0$ is omitted):

(99)



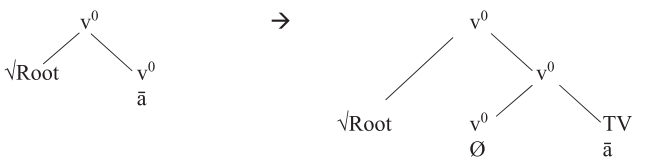
As discussed below, the PIE derived verbs discussed above played a major role in the development of Latin verbal system and formed the bases for the regular verbal conjugations. In contrast, the original underived PIE verb forms became a closed, relic class and gave rise to the third irregular conjugation.

One can in fact assume that in pre-Latin, verb-forming derivatives were inserted under the v^0-node independently of Asp^0 suffixes as in (99). Therefore, there could be an overt suffixal piece such as the **-eye-* characteristic of causatives in PIE, the **-ye* of denominatives, the **-eh$_1$-* characteristic of statives, etc., between root and Asp^0. A

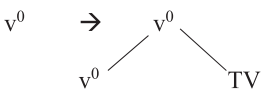
crucial development of Latin is that these overt pieces became the thematic vowels appearing between root and aspect in all forms of the verb, including in the perfect forms (Ernout 1953, Leumann et al. 1963, Sihler 1995). Thus, the *-ā-* conjugation developed mostly from denominatives in *-ye-* whose bases were the nominal stems of the *-ā-*(<**-eh₂-*) declension: */-ā-/ < *-eh₂-ye*: e.g. *curō* 'cure' (cf. *curā* 'cure'). The *-ē-* conjugation developed mostly from the stative suffix *-ē-*(<**-eh₁-*), or from causatives in **-eye-*(with *o*-grade of root): */-ē-/<*-eh₁*: e.g., *sedeō*'I am sitting' (<**sed-eh₁-*;cf. *sīdo*, **si-sd-* 'I sit down'), */-ē-/<*-eye*: e.g. *moneō* 'I warn' (<**mon-eye-*). The -ī- conjugation developed mostly from denominatives in **-ye-*, /-ī-/<*-denominative **-ye*: e.g. *finio* 'limit' (cf. *finis* 'end'); but also from original stems in **-ye-*: *venio* 'come' (<**gʷen-ye-*).

Assuming that the thematic vowels were just ornamental morphology, a crucial development in the history of Latin is then the change by which the v^0-forming derivatives such as */*-eye-/, /*-ye-/, /*-eh₁-/,* etc., lost their functional motivation as exponents of special verb forming derivatives in v^0 and became purely structural elements representing "ornamental" pieces structurally added to all instances of v^0 by the rule in (101) (see Calabrese 2020) for further discussion of this development):[36]

(100)



(101)



In this way, thematic forms such as the present, imperfect and perfect ones in (102) developed:

(102)

am-ā-mus	*am-ā-bāmus*	*am-ā-bimus*	*am-ā-vimus*	*am-ā-verāmus*
dēl-ē-mus	*del-ē-bāmus*	*dēl-ē-bimus*	*dēl-ē-vimus*	*dēl-ē-verāmus*
fīn-ī- mus	*fīn-ī-bāmus*	*fīn-ī- bimus*	*fīn-ī-vimus*	*fīn-ī- verāmus*
Pres. Ind.	Imperf. Ind.	Fut. Ind.	Perf. Ind	Pluperf.Ind
am-ā-verimus	*'love'*			
dēl-ē-verimus	*'delete'*			
fīn-ī- verimus	*'finish'*			
Fut.Perf. Ind				

36 Rule (101) was eventually extended to all functional nodes.

A thematic vowel, however, was never inserted if there was a root-conditioned exponent in Asp^{0} as in the following perfect forms.

(103) Athematic Perfects

dūc-s-īmus	*dūc-s-erāmus*	*dūc-s-erimus*	*dūc-s-erīmus*	*dūc-s-issemus*
(dūximus)	*(dūxerāmus)*	*(dūxerimus)*	*(dūxerīmus)*	*(dūxissemus)*
lēg-Ø-i	*lēg-Ø-erāmus*	*lēg-Ø-erimus*	*lēg-Ø-erīmus*	*lēg-Ø-issemus*
Perf. Ind	Pluperf.Ind.	Fut.Perf. Ind	Perf. Subj.	Pluperf. Subj.

Calabrese (2019) argues that if the thematic vowel had been inserted in this case, the adjacency required for these irregular exponents would have been lost, and they would have been replaced by the regular Asp^{0} exponent /-v-/. Given that this did not happen, we have to assume that roots of these verbs, which eventually became mostly part of the 3rd conjugation, were analyzed as not undergoing TV insertion in the perfect (see Calabrese 2020 for further discussion).

We thus have an account of the development of thematic and athematic morphology in Latin. We can now turn to perfect and participial forms of this language. Let us begin with the perfect ones. Another major development characterizing the Latin verbal system was the conflation of the PIE Aorist and Perfect (Leumann et al. 1963, Sihler 1995). Here, I will not deal with the reasons for this change or with its syntactico-semantic consequences, but only with its implications for the verbal morphology of Latin.

The perfect exponents of Latin are given in (104):

(104) Latin

a. /-Ø-/ <—> Perfect / Root^{ø} ___, root^{ø}= vert, etc
b. /-s-/ <—> Perfect / Root^{s}- ___, root^{s} = scrib, etc.
c. /-v-/ <—> Perfect

The exponent /-v-/ cannot be traced back to PIE, is not found in other Italic languages and is peculiar to Latin.[37] The exponents /-s-/ and /-Ø-/ can instead be traced back to PIE. They, in fact, are etymologically related to the PIE VIs in (95a) and b), repeated in (105):

37 According to Sihler (1995:585), the default exponent /-*v* (=[*w*])-/ for Aspect [+perf, +stat] may have originally developed as a hiatus filler between the thematic vowel and vocalic endings. If this is correct, one must assume that at one point, there was a general use of /-Ø-/ as the default exponent of Asp. Once the hiatus breaking /-*w*-/ was reanalyzed as an exponent of Asp, as proposed by Sihler, /-Ø-/ became one of the exponents of Asp for athematic roots not taking /-*s*-/. See Sihler (1995:585) for discussion of other accounts of the development of this exponent.

(105) PIE
a. Perfect
/*-Ø-/ <–> [+perf. +stat]
b. Aorist
/*-Ø-/ <–> [+perfect, -stative] / Root^{ø} ___
/*-s-/ <–> [+perfect, -stative] / Root^{s} ___

Latin /-s-/ directly derives from aorist /-s-/. Latin /-Ø-/ instead derives from both perfect and aorist /-Ø-/. So, we have perfect forms with reduplication that underwent changes such as the following[38] *sēd-Ø-ī* < **se-sd-Ø-*> 'sit' (Sihler 1995:582). At the same time, we have aorist forms that were preserved in Latin: *fīd-Ø-ī* < **bheid-Ø-*, present *findō* 'split' (cf. Skt. *bhinátti* 3sg pres. vs *bhét /bháit-Ø-t* 3sg. aor.), *līqu-Ø-ī <leik^{w}*, present *linquō* 'leave' (cf. Skt. *riṇakti* 3sg pres. vs *riktám /rik-Ø-tam*/ 2du Aor.) (for more examples and detailed discussion, see Sihler 1995:581–2).

Let us now turn to the perfect participle. It is etymologically based on PIE suffix /*-tó-/. In surface morphology, this suffix is usually directly attached to the root, which undergoes ablaut changes (zero grade).[39] Examples of these suffixes in Sanskrit and Greek forms are provided below (cf. Benveniste 1948; Chantraine 1927; Szemerényi 1996; Sihler 1995; Whitney 1889).

(106) /*-tó -/ [Root (in zero grade)+ -tó -]
Sanskrit: *piṣ-ṭá,* Root*: paiṣ* 'crush', *smi-ta*! Root*: smai* 'smile' *uc-tá [uktá]*
Root: *vac* 'say'
Greek: *κλυτός*, Root: kleu 'hear, celebrate, *τατός*, Root: *τειν* '*extend*', *θετός*, Root: *t^{h}ē* '*set*, *put*' (*tίθημι*), *στατός*, Root : *stē 'stand'*

The original meaning of this suffix is stative as referring to the root's internal argument; therefore, passive in the case of agentive roots but active in the case of unaccusative roots. It refers to a state. See the following Greek cases for example:

---

38 The presence of /-Ø-/ is usually associated with root vowel lengthening. The reasons for this and the relevant morphophonological rule governing this process are not discussed here (see Sihler (1995:582).

39 However, there are also special cases in which they are attached to a base including the root and a verbalizer (causative, denominal or desiderative):

(i) /*-*to*/[Root] V-Deriv]] -tó-]
Sanskrit: *kār-i-tá*, base: *kar-aya-*'cause to make/do' *cod-i-tá*, base: *cod-aya-* 'set in motion' *arp-i-tá*, base: *arp-aya-* 'cause to go', *mīmāṃ-s-i-tá* 'called in question' base: *mima ṃsa-* 'think-desiderative', *bham-i-tá* 'enraged', base: *bhama* 'wrath' + *ya* 'denom".
Greek: *τῑμᾱτός*, base: *τιμ-ᾱ*

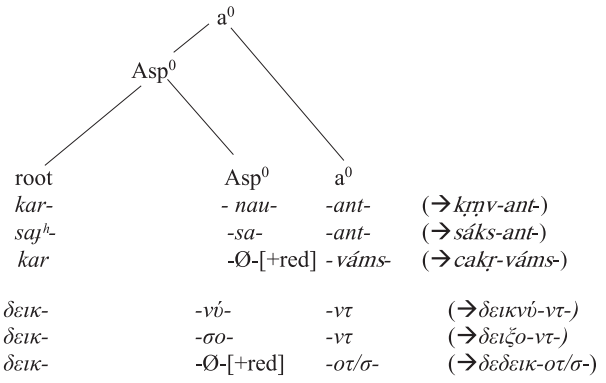
(107) *ρυτός (< ῥέω* ‘flow’) ‘in the state of being flowing’
κλυτός (< *kleu* ‘hear’) ‘in the state of being heard, famous’
γραπτός (< *γραφω* ‘write’) ‘in the state of being written’
ἀκουστός (<*ἀκούω* ‘hear’) ‘in the state of being heard, audible’
νοητός (< *νοέω* ‘think’) ‘in the state of being thought, thinkable’
αἱρετός (<*αἱρέω* ‘take, catch’) ‘in the state of being chosen, elected/conquerable, intellegible’

The stative adjective with /*-tó- /was thus originally outside of the verbal system (Brugmann 1895; Joffre 1986:212; Laurent 1999:17; Embick 2000; Vincent 2011:2, Remberger 2012:273). This can be seen when this suffix is compared to true verbal participial forms, which display internal verbal aspectual morphology, as in the following Sanskrit and Greek forms:

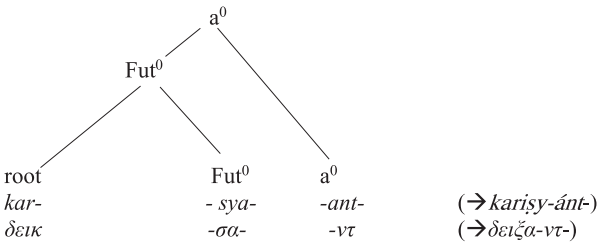
(108) **Active Participles**

Present	**Future**	**Aorist**	**Perfect**	**Root**	
bháv-ant-	*bhaviṣy-ánt-*		*babhū-váṃs*	*bhav*	‘be’
ḱṛṇv-ant-	*kariṣy-ánt*	*kr-ant-*	*cakṛ-váms*	*kar*	‘make/do’
bhind-ant-	*bhid-ant-*	*bhid*			‘split’
		vid-ánt-	*vivid- váms*	*vaid*	‘find’
		sáks-ant-	*sāsah-váms*	*saȷ^{h}*	‘prevail’
δεικνύ-ντ-	*δειξο-ντ-*	*δειξα-ντ-*	*δεδεικ-οτ/σ-*	*deik*	*‘show’*
διδό-ντ-	*δωσο-ντ-*	*δό-ντ-*	*δέδωκ-οτ/σ-*	*do/ō*	*‘give’*
λυο-ντ-	*λυσο-ντ-*	*λυσα-ντ-*	*λελυκ-οτ/σ-*	*leu*	*‘untie’*

(109)



(110)

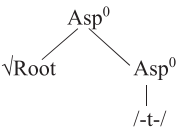


The suffix /*-*tó*- /, however, never appears with an aspect or future component like the other participial forms (cf. (108)): for example, forms like the following appear not to be possible in Sanskrit:

(111) *†kr̥̊ṇutá-* <from present of *kar*: *kar-nau-tá-*
†cakr̥̊tá-- <from perfect of *kar*: *kar*+Redupl.*-tá-*
†karisitá- <from furture of *kar*: *kar-i-sya-tá-*

One could then hypothesize that the suffix /*-to-/ found in the Sanskrit and Greek stative adjectives in (106)-(107) could be analyzed as involving an aspectual /-t-/ as in the structure in (112), and a class marker /-o-/ not represented there.

(112)

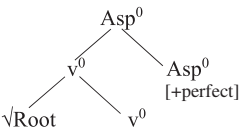


If we assume that both (69) and (56) (here repeated as (113)–(114)) were already operative in pre-Latin morphology, the structure in (112) would be disallowed, and thus changed into that in (115) where the feature [+perfect] is inserted because of (44), repeated here as (114):

(113) Given a complex X^{o} U, if v^{o} is present in U, then also Asp^{o} is present in U, and vice versa.

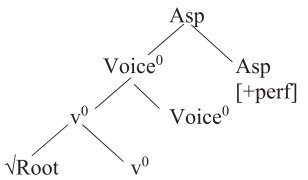
(114) Ø → [+perf] / [___] $_{\text{Asp}^{o}}$

(115)



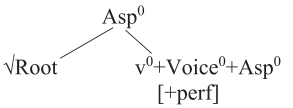
Furthermore, once we assume the presence of the Asp^{o} node and that the articulation of the verbal functional skeleton is always the same, the intermediate Voice node between v^{o} and Asp^{o} is also required as in (116).

(116)



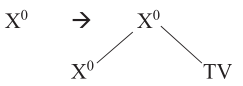
Note that the structure in (116) could be also assumed for PIE. If v^0 and Asp^0were assigned null exponence, as appears to be the case, the resulting structure after the pruning of the null exponents would be that in (117) which would be indistinguishable from that in (112) on the surface.

(117)



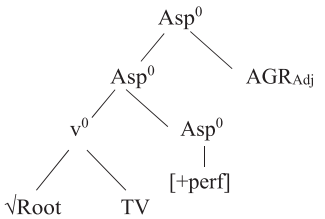
As mentioned above, the crucial change in Latin was the introduction of v^0 thematic vowels, i.e., the introduction of the rule in (118) (extended to all heads here):

(118)



It is this innovation that transforms the morphological status of the /t-/ constructions. In fact, after the insertion of the TV, as well as the insertion of AGR_{Adj} the full resulting structure from (116) will be that in (119) (remember that because of pruning Asp^0= Voice+Asp^0, and TV= v^0+TV).

(119)



A stative adjectival participle thus became a true verbal participle showing a thematic vowel like true verbal forms. The introduction of the thematic vowels led to the situation that we observed synchronically in Italian stative adjectives which display verbal participial morphology. The thematic vowel revealed the presence

of v^0 and thus the stative adjectives were fully integrated in the verbal conjugation system and could come to be used as verbal passive participle forms.[40]

Let us consider their exponence now. As mentioned above, the exponent Latin inherited from IE was /-*t*-/. This exponent is regularly preserved in thematic roots. However, a change affected it in roots with athematic perfect participle: in early Latin, clusters of heteromorphemic coronal stops were affected by a process that changed them into a geminate coronal fricative: *tt–> ss*. This geminated fricative was degeminated after long vowels: *rīd-to* → *rīssu* → *rīsu* but *mit-to* → *missu* (cf. Ernout (1953:226, see also Matthews 1991)

At a certain point in Classical Latin, one must assume that the shortened /*s*/ resulting from this process was reanalyzed as being the exponent /*s*/ of the Vocabulary Item in (104b), which was already present in Latin. In fact, in Latin we find many cases in which we have /s/ in the perfect participle instead of the etymologically expected /*t*/ regardless of the phonological environment. In all of them, the perfect displays suffixal /*s*/ (cf. Ernout (1953:226) See sample cases in (120).

(120)

Present	Participle	Perfect	
māneō	*mānsus*	*mānsī*	'remain'
mergō	*mersus*	*mersī*	'dip in'
mulceō	*mulsus*	*mulsī*	'touch lightly'
spargō	*sparsus*	*sparsī*	'scatter'

I assume that these cases involve extension of the application of the Vocabulary Item in (104b) to new roots, i.e., they involve a reanalysis in which /-s-/ becomes the exponent of both perfect participle and perfect forms in the context of certain given roots, as proposed earlier in the analysis of the Italian counterparts.

---

40 Latin also displays a number of denominal adjectival forms in which suffixal /t/ appears to be directly attached to the root (from Remberger 2012; see also Embick 2000). In most of them the root does not refer to an eventuality but to a concrete referent. Sample forms are given in (i):

(i)

Nonverbal root		Adjectival forms	
barba	'beard'	*barbatus*	'bearded'
cornu	'horn'	*cornutus*	'horned'
onus	'burden'	*onustus*	'burdened'
quinque	five'	*quintus*	'fifth'
honor	'honour'	*honestus*	'honest'

There are two possible analyses for the absence of the thematic vowel. On one hand, one could propose that they have the structure in (116) but that the rule in (118) failed to apply in the context of noneventuality roots. The other possibility is simply that the constraint in (113) failed to apply in the case of these roots. I prefer the latter solution (but see note 44). Further research is needed in this regard.

Thus, the relevant VIs for perfect and perfect participial forms became the ones in (121)–(122):[41,42]

(121) a. /-s-/ <–> $[+\text{perfect}]_{\text{Asp}}$ / Root^{S} ____ Root^{S}= *scrib, curr, sparg*, etc
b. /-t-/ <–> $[+\text{perfect }]_{\text{Asp}}$

(122) a. /-Ø-/ <—> $[+\text{perfect}]_{\text{Asp}}$ / ___ T, $\text{Root}^{\text{Ø}}$ ___, $\text{root}^{\text{Ø}}$= *leg*, etc
c. /-*v*-/ <—> $[+\text{perfect}]_{\text{Asp}}$ / ___ T,

We can now deal with the use of participial bases in nominalizations and with the morphology of the supine and of the future participle, as shown in the forms in (123):

(123)

Infinitive	*vēn-ā-ri*	*aud-ī-re*	*del-ē-re*	*mon-ē-re*
Perf. part.	*vēn-ā-t-u-s*	*aud-ī-t-u-s*	*del-ē-t-u-s*	*mon-i-t-u-s*
Event N	*vēn-ā-t-iō*	*aud-ī-t-iō*	*del-ē-t-iō*	*mon-i-t-iō*
Agent N	*vēn-ā-t-or*	*aud-ī-t-or*	*del-ē-t-rix*	*mon-i-t-or*
Result N	*vēn-ā-t-u-s*	*aud-ī-t-u-s*	*del-ē-t-u-s*	*mon-i-t-u-s*
Supine	*ven- ā-t-um*	*aud-ī-t-um*	*del-ē-t-um*	*mon-i-t-um*
Fut. part.	*ven- ā-t-ūr-us*	*aud-ī-t-ūr-us*	*del-ē-t-ūr-us*	*mon-i-t-ūr-us*
	‘hunt’	‘hear’	‘delete’	‘warn’
iub-e-re	*scrib-e-re*	*cub-e-re*		
ius-s-u-s	*scrip-t-us*	*cub-i-t-us*		
ius-s-iō	*scrip-t-iō*	*cub-i-t-iō*		
ius-s-or	*scrip-t-or*	*cub-i-t-or*		

41 Given (121a), all roots that have /-*s*-/ in the perfect should also have /-*s*-/ in the perfect participle. As a matter of fact, many of them do not (cf. *scriptu*-(cf. *scripsi*), *dictum* (cf. *dixi*), *ductum* (cf. *duxi*), etc.). I account for this by assuming impoverishment of the diacritic triggering insertion of /-*s*-/ in the perfect participle as proposed earlier for Italian (see note 16).

42 Finally, another impoverishment rule is needed for a set of verbs that are thematic in the participle where they display thematic short /-i-/whereas they are athematic in the perfect where they have the suffix [v-].

(i)

Present 1Pl.	Perfect	Participle
domāmus	*domui*	*domitus*
monēmus	*monui*	*monitus*
molimus	*molui*	*molitus*

As I proposed for the Italian verbs that geminate in the perfect – and therefore are athematic – but that are regularly thematic in the participle (see §2), one can say that also in this case an impoverishment rule that deletes the special diacritic that prevents TV insertion in the participle in the case of these Latin verbs is active. Once this diacritic is removed, these verbs will be regularly thematic. One can propose that the thematic short /i/ that is inserted in this case is probably the same thematic vowel that is inserted in the infectum of the III conjugation verbs (see Calabrese 2019, 2020). If Halle (2018) is correct, this vowel is a high back [ɨ] which is deleted before another suffixal vowel, is shortened before [r], otherwise becomes [i].

ius-s-u-s	*scrip-t-ūra*	*cub-i-t-u-s*
ius-s-um	*scrip-t-um*	*cub-i-t-um*
ius-s-ūr-us	*scrip-t-ūr-us*	*cub-i-t-ūr-us*
'order'	'write'	'recline'

Let us consider the nominalizations first. The nominalizations in (123) developed etymologically from the PIE nominal constructions in /**-tér-/-tor-*/ (>Lat. agentive *-tor*) , /**-ti-*/ (>Lat. eventive *-ti-ōn-*) /*-tu-*/ (> Lat. result *-tu-*). In surface morphology, these suffixes are usually directly attached to the root, which undergoes ablaut changes (zero grade or o-grade).[43] Examples of these suffixes in Sanskrit and Greek forms are provided below (cf. Benveniste 1948; Chantraine 1927; Szemerényi 1996; Sihler 1995; Whitney 1889).

(124) a. /*-tor-/ (Pre-Acc) ([Root ⌐ tor-]]
Sanskrit: *dā́tar-*, giver' *váptar-* 'shearer', *dhmā́tar-* 'smelter', *táṣtar-* 'carpenter', *ástar-* 'archer', *sthā́tar-* 'driver', *métar-*'architect'.
Greek: *δώτωρ* 'giver', *γεννήτωρ* 'creator' < *γεννα-* 'generate'; *ῥήτωρ* 'rhetorician' < *ῥη-* "say".

b. /*-tér-/ ([Root – tér-]]
Sanskrit: *dātár-* 'giver', *bhārtár-* 'bringer', *janitár-* ''parent', *dhātár-* 'founder', *yātár-* 'goer'.
Greek: *δοτήρ* 'giver' <*δίδωμι, ἀμύνωρ* <*ἀμύνω*, *βατή* 'goer', *θετήρ* 'establisher', *σωτήρ* 'savior' < *σαο-* "save"; *ψυκτηρ* 'refrigerator' < *ψυκ-* "cool down'

c. /*-ti-/ ([Root -ti-]])
Sanskrit: *rātí* 'gift', *ūtí* 'aid', *rītí* 'flow', *stutí* 'praise', *bhakti* 'division', *viṣṭí* 'service', *kīrtí* 'fame', *pūrtí* 'bestowal', *matí* 'thought', *pītí* 'drink'
Greek: *μάντι*, *λέξις* 'speech', <*λεγ* 'say', *ἔνδοσις* 'distribution'

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43 However, there are also special cases in which they are attached to a base including the root and a verbalizer (causative, denominal or desiderative) as in the following examples with the suffixes (*-tor/*-tér):

(i) (a) /*-tor/ ([Root] V-Deriv]] ⌐ tor-(Pre-Acc])
Sanskrit:No cases, always attached to root
Greek: *θηρήτωρ* 'hunter' < *θηράω* (denom.), *ἡγήτωρ* 'chef' <*ἡγέομαι, κοσμήτωρ* 'who puts order' <*κοσμέω*

(b) /*-tér- / [Root] V-Deriv]] -tér-]
Sanskrit: *śamitár-*, *pavitár-* are from the causatives *śamáyati, paváyati* (*pāváyati*), *cod-ay-i-trī́-* 'impeller' (*codáyati* 'impels'
Greek: *θηρητήρ* 'hunter' < *θηράω* (denom.), *ἀθλητήρ* 'athlete' <*ἀθλέω, ὀρχηστήρ* 'dancer' < *ὀρχέω*

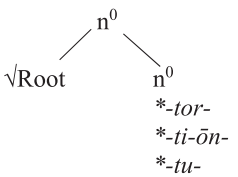
<δο-'give', θέσις "positioning" < θη- 'set' κρασις "mixing"
κερα- 'mix', –(normal grade– κρησις 'use' < κρη- 'use'
ἀνάβασις (< ἀνά-βη- 'climb) 'process of climbing, ascent'; (cf. present βαν- jω→βαίνω)

d. /*-tu-/ ([Root -tu-]])
Sanskrit:*dā́tu* 'share', *já̄tu* 'birth', *dhā́tu* 'element', *tántu* 'thread' *mántu* 'counsel', *sātu* 'receptacle', *sétu* 'tie', *sótu* 'pressure', *krátu* 'capacity'.
Greek: *κλιτύς* 'hill' <*κλίνω, ὀτρυντύς* 'excitement' <*ὀτρύνω, κτιστύς* 'foundation' <*κτίζω*

In Latin, all of these suffixes became characteristically added to the perfect verbal base (Root+TV, otherwise athematic, depending of conjugations or roots). Concomitantly their initial consonant was analyzed as the exponent of the perfect participle, thus acquiring its contextual allomorphy (-s-, otherwise -t- depending of the verb). Aronoff's (1994) Latin third stem was thus formed. The Romance languages, in particular Italo-Romance, essentially preserve the Latin situation. How can we explain this development?

Putting aside the cases in note 43, all of these suffixes could be directly attached to the root in PIE. We can assume for them the original structure in (125):

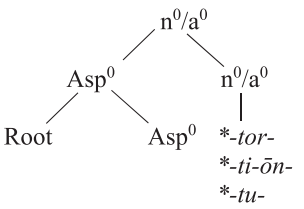
(125)



Given the constraint in (76), repeated here as (126), this structure will be changed as in (127):

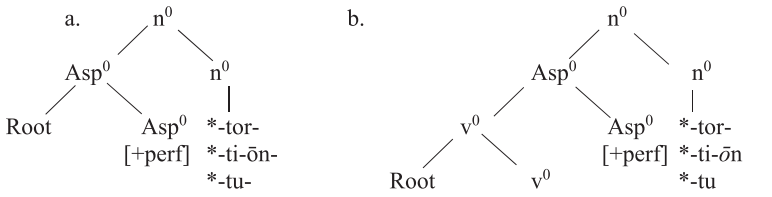
(126) Ø → Asp⁰ / √root ___ if √root refers to an eventuality

(127)



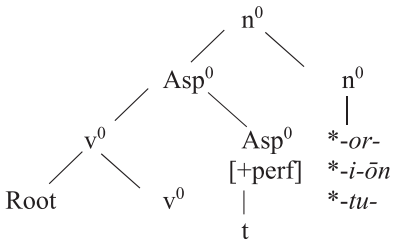
The further morphological repairs discussed above will insert the relevant participial morphology as in (128b) (pruning operations not mentioned).

(128)



Let us now suppose that under pressure of the suffix /*t-o*/, where, as assumed above, the /*-t-*/ was the exponent of [+perf] Asp°, the initial consonantal /*t*/ of /*-t-or*/ , /*-t-iōn-*) and /*-t-u-*/ was also reanalyzed as the exponent of [+perf] Asp° as shown below (on the possible common nature of the /-t-/ of these suffixes, see Szemerényi 1996):

(129)



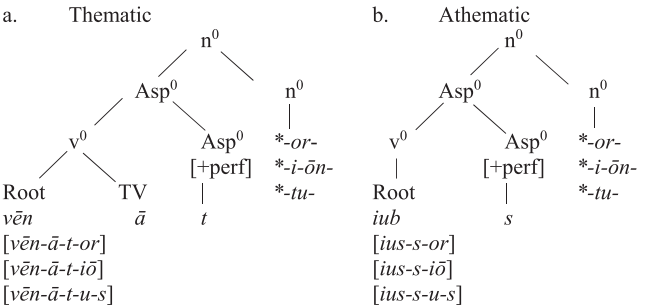
Once these structures underwent insertion of the TV for v°, they became an integral part of the Latin verbal morphology and shared all of the morphological properties of the participial /*-t-o*/. Thus, after pruning of null v°, regular verbs have the structure in (130a). In the case of athematic verbs, as discussed above, a root diacritic prevents TV insertion (cf. (130b). The surface shape of the inner Asp° constituent is then derived by simply applying the regular Latin verbal morphophonology (VIs, MP-rules and regular phonology).[44]

44 Steriade (2016) points out the existence of nominalizations in which the root does not refer to an eventuality, but a concrete referent, such as those in (Steriade 2016:130):

(i)	Noneventuality root	Nominalization	
	ianua 'door'	*ianitor*	'doorkeeper'
	oliva 'olive'	*olivitor*	'olive tree planter'
	vindemia 'grape harvest'	*vindemitor*	'harginger of vintage'

Although the root does not refer to an eventuality, the nominalization does indeed refer to one as their meaning makes it clear. I assume that these nominalizations have the structure in (129) and that the relevant eventuality referring aspectual semantic is introduced by the Asp° node. The relevant repairs discussed above, and the other relevant morphosyntactic operations, eventually convert this basic structure into that in (130a) – they must be thematic since roots such as those cannot carry the diacritic preventing TV insertion. The thematic short /i/ found in these forms is that discussed in note 42.

(130)



The evolution of these suffixes is to be contrasted with that of the non-t-initial suffixes such as the nominal suffix /*-men-(to)-*/ (< PIE **men*-(+ optional addition of suffixal -**to*)-, for example:

(131) PIE Root (in full grade, accented)+ **men-(to)*-
Sanskrit: *bhár-ma* 'the action of bringing', *ján-man* 'birth', *kár-man*'action',
dyót-man 'splendor', *śró-ma-ta-m* 'reputation'
Greek: *πυθ-μήν* 'foundation' < **bhudh*-, *φέρ-μα* 'the action of bringing' (*μα* <-*mn̥* (zero grade of *-men*))

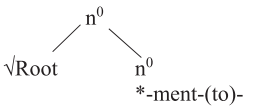
Like the other suffixes in (124), this suffix also appears directly attached to the root in PIE, as shown by Sanskrit and Greek. In Latin, however, it appears attached to a thematic base, as shown in (132) (Leumann et al. 1963):

(132)

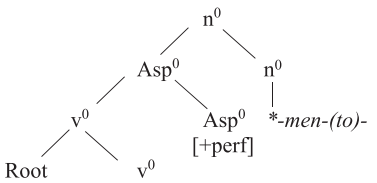
Thematic (Root-TV- *men-(to)*-)	'foundation'
fund-ā-men/ fund-ā-mentum	
līb-ā-men/ līb-ā-mentum	'a drink -offering'
orn-ā-mentum	'ornament'
bland-ī-mentum	'flattery'
imped-ī-mentum	'impediment'
mōl-ī-mentum	'great exertion'
pres. infinitive/perf. participle	
fund-ā-re/fund-ā-t-u-	'lay foundation of'
lib-ā-re/lib-ā-t-u-	'pour out as offering'
orn-ā-re/orn-ā-t-u-	'decorate'
bland-ī-re/bland-ī-t-u-	'flatter'
imped-ī-re/imped-ī-t-u-	'himder'
mol-ī-ri/mol-ī-t-u-	'make exertions'

As proposed before for the suffixes *-ter/tor, -ti, -tu*, we can also assume the basic structure in (133) which, due to the morphological repairs discussed above, becomes (134):

(133)

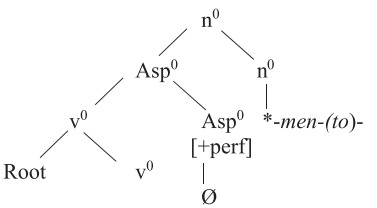


(134)



In this case, the reanalysis seen in (129) was obviously not possible. So, the exponent Ø for Asp^0 was adopted in this case (see (86) in Italian) (see note 33):

(135)



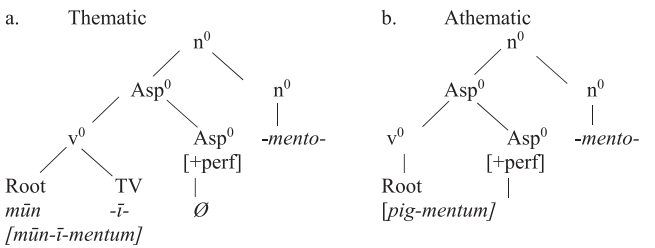
Once these structures underwent insertion of the TV for v^0, they became an integral part of the Latin verbal morphology. At this point, it is very important to observe that the morpho-phonological treatment of the root in the structure in (135) shows the presence of the feature [+perfect], as expected in the analysis developed here. Note in fact that the roots in these constructions not only are systematically athematic when they are athematic in verbal perfect participle forms but also display the same morpho-phonological shape of the latter. Observe the striking cases of *pig-mentum* 'pigment', or *frag-men/frag-mentum* 'fragment', where the root undergoes the operation of nasal deletion characteristic of perfect participle forms: perfect participle *pig[k]-t-u-* 'paint' *frag[k]-t-u-* 'break' (vs infinitive present: *ping-e-re* and *frang-e-re)*. The same holds for *adiū-mentum* 'help' whose root appears with thematic *ā* in non-perfect verbal forms such as the infinitive present *adiuv-ā-re* 'help' but is athematic (with a long *ū*) in perfect forms such as the participle *adjū-t-us*. Other sample forms illustrating the same correlation pattern are given in (136). This provides evidence for the correctness of the structure in (135):

(136) Latin forms in - *men-(to)*-

Athematic (Root- *men-(to)*-)[45,46]		pres. infinitive/perf. participle
acū-men	'a point'	*acu-e-re/acū-t-u-* 'make sharp'
argū-mentum	'argument	*argu-e-re/argū-t-u-* 'argue, accuse'
assū-mentum	'a patch'	*assu-e-re*(*ad-suere/ad-sū-t-u-*) 'sew on'
crī-men	'judicial charge'	*cern-e-re/crē-t-u-* 'comprehend, decree'
dē-trī-mentum	'detriment'	*dē-ter-e-re/ dē-trī-t-u-* 'rub away'
fō-mentum	'warm application'	*fov-ē-re/fō-t-u-* 'warm'
in-crē-mentum	'increment'	*cre-sc-e-re/crē-t-u-* 'grow'
mō-men/mō-mentum	'movement'	*mov-ē-re/mō-tu-* 'move'

Thus, after TV insertion and pruning of null v^0, regular verbs have the structure in (137a). In the case of athematic verbs, a root diacritic prevents TV insertion, as discussed above.[47] We will thus have the structures in (137):

(137)



As mentioned before for Italian, the overall consequence of the Latin changes is that every eventuality root, or root merged with Asp^0, will acquire surface verbal morphology – in particular verb class patterns.

We can conclude this historical section by looking into the Latin supine and the future participle. The supine is a deverbal noun originally formed by adding the nominal

45 In the nominalizations in (i) an unexpected short vowel /u/ appears. It is plausible to assume that this /u/ is an exponent for Asp^0 extracted from the relevant perfect forms (*doc-u-i, , mon-u-i)*:

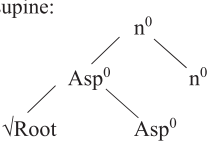
(i) *doc-u-mentum* 'lesson, example' *doc-ē-re, doc-u-i, doc-t-u-* 'teach'
mon-u-mentum 'memorial, monument' *mon-ē-re, mon-u-i, mon-i-tu-* 'advise, warn'

46 The nominalization *reg-i-mentum* 'rule, government' is thematic despite the fact that the root is athematic in the verbal counterpart perfect forms *reg-e-re/reg[k]-t-u-* 'guide'. As all cases of regularization, I assume that it is an instance of a root diacritic impoverishment. The short thematic vowel /i/ is that discussed in note 42.

47 Remember that in Italian the base for this suffix is systematically thematic regardless of the status of the root in the verbal system (cf. *mov-i-mento* 'movement' (cf. *muovere/mosso* 'move-inf/PP'), *trafigg-i-mento* 'piercing' (cf. *trafiggere/trafitto* 'pierce inf/PP'), etc. The Italian innovation in this case, as already mentioned in note 32, is the impoverishment of the root diacritic triggering athematicity in the context of nominal */-ment/*.

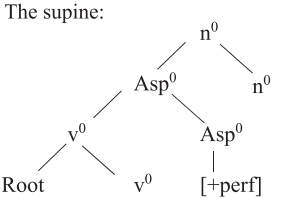
suffix /*-t-u-*/ to the root. We can assume that the supine had the basic structure in (138) (after the application of (126)):

(138) The supine:



Given the constraint in (69), the supine receives "ornamental" verbal structure and thus acquires the "participial" format in (139):

(139) The supine:



The thematic/athematic status and the allomorphy of supine forms, is derived as discussed before – it will contain participial morphology:

(140) Regular supine forms

[[[ ]$_{Root}$	TV]$_{TV}$	*-t-*]$_{Asp^0}$	*-u-*]$_{n^0}$ …	
am	*-a-*	*-t-*	*-u-*	(cf. *amatu-* 'to love')
mon	*-i-*	*-t-*	*-u-*	(cf. *monitu-*'to warn')
aud	*-i-*	*-t-*	*-u-*	(cf. *auditu-* 'to hear')

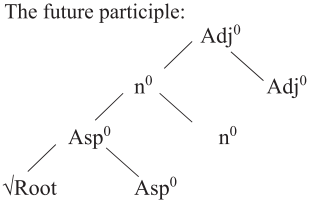
(141) Irregular supine forms

[[[ ]$_{Root}$	*-t-/-s-*	]$_{Asp^0}$	*-u-*]$_{n^0}$ …		
scrib	*-t-*		*-u-*	(cf.	*scriptu-* 'to write')
leg	*-t-*		*-u-*	(cf.	*lectu-* 'to read')
suād	*-s-*		*-u-*	(cf.	*suāsu-*'to advise')
sed	*-s-*		*-u-*	(cf.	*sessu-*'to sit')
expell	*-s-*		*-u-*	(cf.	*expulsu-* 'to expell')

Observe that the featural content of voice does not matter in the construction and assignment of morphology for both the perfect participle and the supine. Therefore, the fact that the perfect participle is usually passive and the supine is active does not matter in the determination of their surface morphology.

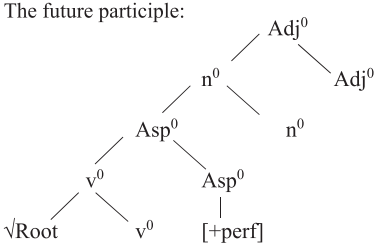
Following Remberger (2012) (see also Vincent 2011), I now propose that the future participle is truly a denominal adjective in its base structure as in (142):

(142) The future participle:



The application of the morphological repairs triggered by (69) will convert (142) into (143):

(143) The future participle:



As discussed before for the supine, regular verbal forms undergo insertion of the TV for v^0 and eventual pruning of the null v^0. Irregular verbs do not undergo insertion of v^0-TV. Application of the relevant VIs for Asp^0 and the VI in (144) for n^0 derives the surface shape of the future participle forms:[48]

(144) /*-ur-*/ <–> [+desiderative/prospective]$_{n^0}$

(145) Regular future participle forms

[[[[[ ]$_{Root}$	TV]$_{TV}$	*-t-*]$_{Asp^0}$	*-ur-*]$_{n^0}$	*-u-*]$_{Adj^0}$ …	
am	*-a-*	*-t-*	*-ur-*	*-u-*	(*cf. amaturu-* ‘about to love’)
mon	*-i-*	*-t-*	*-ur-*	*-u-*	(cf. *monituru-* ‘about to warn’)
aud	*-i-*	*-t-*	*-ur-*	*-u-*	(cf. *audituru-* ‘about to hear’)

(146) Irregular future participle forms

[[[[ ]$_{Root}$	-t-/-s-]$_{Asp^0}$	*-ur-*]$_{n^0}$	*-u-*]$_{Adj^0}$	
scrib	*-t-*	*-ur-*	*-u-*	(cf. *scripturu-* ‘about to write’)
leg	*-t-*	*-ur-*	*-u-*	(cf. *lecturu-* ‘about to read’)
suād	*-s-*	*-ur-*	*-u-*	(cf. *suāsuru-* ‘about to advise’)
sed	*-s-*	*-ur-*	*-u-*	(cf. *sessuru-* ‘about to sit’)
expell	*-s-*	*-ur-*	*-u-*	(cf. *expulsuru-*‘about to expell’)

48 The future participle is exceptionally thematic in the case of *moriturus* ‘about to die’ (cf. perfect participle *mortuus* ‘die-PP’). As other case of regularization, this is a case of impoverishment. The short vowel /i/ inserted in this case is that discussed in note 42.

This accounts for the surface morphology of future participle forms, and for the fact that they appear to contain perfect participle morphology. This is the result of the morphological repairs discussed above.

7 Conclusions

Since Aronoff (1994), the disparate morphosyntactic roles that perfect participle forms have in Latin (and Italian) morphology have played a central role in arguing for morphomic approaches. In this view, participial stems have no inherent features but are simply memorized stem-forms made available by the verb. These morphomic stem forms mediate between syntactic and morphophonological derivations.

As pointed out by Embick and Halle (2005), assuming morphomic stems as lists of memorized sound forms renders opaque the relation between syntactico-semantic structures and phonological forms since internal stem structure in this case is no longer accessible. This prevents the extraction of linguistically significant generalizations on stem structure, and more generally on word forms.

In this article, I have accounted for the disparate morphosyntactic roles that perfect participle forms have in Latin (and Italian) morphology in an approach where the derivation from the syntax to morphophonological form is fully transparent and in which no stem memorization needs to be assumed and where all linguistically significant generalizations on word forms can be extracted. Morphomic effects do not need listing of memorized stem forms.

Assuming DM, I proposed that morphological spell-out, as a first stage of the PF derivation, includes morphological repairs induced by morphological structure conditions. These repairs can manipulate syntactic structures and generate morphological structure that is not motivated syntactically or semantically but only morphologically. Mismatches between syntactic/semantic structure and surface morphology are thus created.

As argued in this paper, morphological repairs induced by condition (69) can manipulate the syntactic structures of adjectival passives and nominalizations and introduce participial structure, which is not motivated either syntactically or semantically. In this sense, Italian (and also Latin) perfect participle forms are semantically opaque insofar as they are the outcome of "syncretic" repair operations, that neutralize the surface contrasts among syntactico-semantic structures that are originally quite different in underlying structure. This "syncretic" participle is Aronoff's (1994) "morphomic" stem with its arbitrary morphosyntactic meaning. This arbitrary stem form, however, does not need to be postulated as a memorized sound form. In fact, it is derived morphosyntactically in a quite simple way.

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