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The morpheme vs similarity-based syncretism

Latin t-stem derivatives

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6.1 Introduction

Latin has a large group of derivatives whose suffixes appear to attach to the stem of the verb's passive participle. The agent noun *caesor* 'cutter' is an example: inside *caesor* there is a stem *caes-* that is identical to that of the participle *caesus*, *-i* 'which has been cut-masc.-sg', from the verb *caedere*. The same stem *caes-* appears in other derivatives: *caesiō* 'an act of cutting', *caesūra* 'a cutting, separation', *caesus*, *-ūs* 'the fact of cutting', *caesim* 'by cutting'. Other deverbal forms add their suffixes to the root: e.g. *caedēs* 'a cutting down, carnage' and *caeduus* 'fit for cutting'. What is striking about this data is that no syntactic property is shared exclusively by the forms using *caes-*, or by their complement set using *caed-*. What then is the rationale for the stem selection? Why did Latin choose *caes-or* over **caed-or*, but *caed-ēs* over **caes-ēs*? This is what we set out to explain.

This Latin pattern is an instance of a general morphological phenomenon. I call it *syntactically arbitrary syncretism*, or SAS. We have an instance of SAS whenever two morphosyntactic categories—e.g. a passive participle and an agent noun—share an identical substring which cannot be the exponent of a bundle of uniquely shared syntactic properties. SAS does not reduce to accidental homophony of stems. Rather, it reflects a basic mechanism of exponence that is yet to be identified.

SAS has received a great deal of attention in the last two decades. The reader will recognize it as the phenomenon analysed with rules of referral by Zwicky (1985), Stump (1993, 2001, 2005), Baerman (2004), Blevins (2005), Hansson (1999, 2009), and others; with morphemes, by Aronoff (1994), and later, with similar mechanisms, by Pirrelli and Battista (1998, 2000), Bonami and Boyé (2002, 2003), Maiden (2005),

and others; finally, within Distributed Morphology (Halle and Marantz 1994), with elsewhere morphs, by Embick (2000) and Embick and Halle (2005).

The Latin stem identity of pairs like *caesus-caesor* figures prominently in Aronoff's (1994) argument that morphology is an autonomous component of grammar. Starting from the Latin data, Aronoff claims that some exponence mechanisms are arbitrary, both syntactically and phonologically. Aronoff's claim is that no general principle favours forms like the agentive *caesor* over alternatives like **caedor*. Latin chooses *caesor* because its grammar contains an arbitrary morphological rule. In Aronoff's book and later morphemic works, the claim that morphology is autonomous is based on the supposed existence of such arbitrary rules.

Beyond the issue of morphological autonomy, the need for descriptive devices like morphemes, rules of referral, and elsewhere morphs stems from an unexamined assumption, shared by all the theories cited above: that the phonological identities defining SAS are unpredictable, not just syntactically, but in all respects. Consistent with this assumption, all three theories put forth mechanisms that are sufficiently unconstrained to predict that any pair of paradigm cells is as likely to carry identical exponents as any other.

This issue of arbitrariness is addressed here. A new analysis of the Latin stem identity in *caesus-caesor* shows that this pattern belongs to a cluster of productive SAS cases that become predictable when their phonology is understood. This opens up the possibility that closer analysis will reveal comparable regularities elsewhere. The overall programme is to identify the non-arbitrary mechanisms behind productive instances of SAS and to learn more in the process about the formal nature of exponence mechanisms. A secondary proposal is that a new type of constraint may prove useful in analysing SAS. It requires pairs of exponents that are lexically related and phonologically similar to stand in correspondence (cf. McCarthy and Prince 1995). In turn, correspondence may lead to strict identity, yielding the appearance of syncretism and, occasionally, the appearance of arbitrary syncretism, or SAS.

While the main focus here is on showing that phonological analysis eliminates a class of arbitrary syncretisms, the present work also tells in detail the story of some large fragments of Latin morphology. One reason to explore the Latin system in depth is that it is an integrated system *où tout se tient*, to an extent that has not been recognized. A full picture of the inflectional system constrains our options in analysing derivation. A look at the entire derivational system reveals laws that are missed when the focus is a single affix. Further, the rich data available in the Perseus database (<http://www.perseus.tufts.edu>) can be used to settle anew major points of Latin grammar, going beyond the incomplete store of generalizations of the older treatises. The reader interested just in the main points about syncretism can skip the Latin detail and read nonlinearly: interim summaries outline the results of each main section.

Here is the map of the paper. Sections 6.2.1–6.2.4 introduce the basic facts in the *caesus-caesor* syncretism. I show in 6.2.5 that the stems of passive participles and of

derivatives like *caesor* are identical in ways that eliminate the possibility of accidental homophony. Section 6.2.6 shows that their identity is directional: it is the derivatives that adapt their stems to match those of the participles. Section 6.2.7 shows that the identity between the stems of participles and those of derivatives is syntactically arbitrary. Section 6.2.8 establishes the underlying form of the derivational suffixes used by derivatives like *caesor*. An essential result emerges: all suffixes participating in the Latin stem syncretism begin with coronal obstruents. The stem syncretism is thus phonologically predictable, and rooted in the similarity between stems. Section 6.3 presents the formal analysis. Rounding out the Latin analysis, section 6.4 shows that the occurrence of passive stems is under syntactic control wherever the issue of stem similarity is moot. Finally, section 6.5 places in broader typological perspective the claim that phonological similarity can act as a trigger of syncretism. Some of the data is relegated to the Appendix, to streamline the argument.

6.2 The Latin syncretism: *t*-stem derivatives

The stem of Latin perfect-passive participles occurs inside deverbal derivatives that are neither perfect nor passive (Matthews 1972; Aronoff 1994). This is an instance of SAS. The basic generalizations about it are established in this section: (a) some deverbal derivatives have a stem that is identical to that of the perfect-passive participle; (b) this identity is directional: it is the derivatives that adjust their shape to that of the participle; (c) the identity is not syntactically motivated; but (d) it is phonologically predictable: the derivatives that adopt the participial stem are those marked by *t*-initial suffixes, as the participle is. The generalizations in (a) and (c) build on the work of Aronoff and Matthews.

6.2.1 Overview of the Latin syncretism

(1) illustrates the deverbal derivatives that use the stem of the perfect/passive participle. The underlying root appears in the imperfective infinitive (1.a); the perfect-passive participle (1.b) has a stem that is identical to that of a class of deverbal forms I call *t*-derivatives (1.c); non-*t* derivatives exist as well and attach their suffixes to the unmodified root (1.d).

(1) Latin *t*-derivatives and non-*t* derivatives

- a. Root, in imperfective infinitive: *caed-e-re* ‘to cut, kill’
- b. Perfect-Passive Participle (*t*-Participle): *caesus, -i* ‘that has been cut’
- c. *t*-Derivatives:

Agent Noun: *caesor* ‘cutter’

Future Active Participle: *caesūrus* ‘who will cut’

Event/Result Noun: *caesūra* ‘cutting’

Event Noun: *caesiō* ‘cutting’

Event Noun: *caesus, -ūs* ‘cutting’

Adverb: *caesim* ‘by cutting’

d. Non-*t* Derivatives:

Event Noun: *caed-ēs* ‘carnage’

Adjectives: *caed-uus*, *caed-īvus* ‘fit to be cut’

Agentive compound member: X-*cid-a* < X-*caed-a* ‘killer-of-X’

The analytical problem posed by *t*-derivatives is that the identity between their stem and that of the *t*-participle is not predictable by simple phonological means. As initial illustration, (2) presents two pairs of otherwise identical verbs: *jubēre* and *habēre*, *scribere* and *cubere*. The members of each pair are differentiated by unpredictable differences in their *t*-participle: to *jubēre* and *habēre* correspond, respectively, the participles *jussus* vs *habitūs*; to *scribere* and *cubere* correspond *scriptus* and *cubitūs*. The critical information appears in the rows of (2.c), which show that whatever the *t*-participle stem of a verb is, the *t*-derivatives of that verb adopt its shape, complete with idiosyncratic properties. (2.d) reinforces the point in (1.d), showing that not all deverbal derivatives use the participial *t*-stem.

(2) Unpredictable identity between perfect participial stem and stem of *t*-derivatives

a.	Roots in imperfective infin.	<i>jub-ē-re</i>	<i>hab-ē-re</i>	<i>scrib-e-re</i>	<i>cub-e-re</i>
b.	Perfect-pass. participles:	<i>juss-us</i>	<i>habit-us</i>	<i>script-us</i>	<i>cubit-us</i>
c.	<i>t</i> -Derivatives: Agent Ns:	<i>jussor</i>	<i>habitor</i>	<i>scriptor</i>	<i>cubitor</i>
	Event/result Ns:	<i>jussus</i>	<i>habitūs</i>	<i>scriptūra</i>	<i>cubitūs</i>
	Event Ns:	<i>jussiō</i>	<i>habitīō</i>	<i>scriptiō</i>	<i>cubitiō</i>
d.	<i>Non-t</i> -Derivatives: Adjs:		<i>hab-ilis</i>	<i>scrib-ilis</i>	<i>cub-ili-s</i>
	Agent/Instrument Ns:		<i>hab-ēn-a</i>	<i>scrib-a</i>	<i>-cub-īn-a</i>
		‘order’	‘have’	‘write’	‘recline’

What mechanism generates the stem identity between the *t*-derivatives and the *t*-participles? What predicts the different behaviour of *t*- and non-*t* derivatives? The Romans chose to say *caesor*, *caesiō* over **caedor*, **caediō*, but they also chose *caedes*, *caeduus* over conceivable **caesēs*, **caesuu*s. What determined those choices? I will argue they are not arbitrary, but driven by general conditions, whose effects can be documented outside Latin and which can be modelled with modest additions to our constraint set, and only minimal changes to our understanding of how the syntax and the phonology of exponence interact. First, however, we consider existing proposals.

6.2.2 Morphemes

The *t*-stems of Latin occupy a central part in Aronoff’s (1994) argument for morphemes, a precursor of Bonami and Boyé’s (2002, 2003) thematic space proposal.

It plays an equally important part in Matthews' (1965, 1974) theory of parasitic rules, the precursors of Zwicky's (1985, 1990) and Stump's (1993) rules or referral. Aronoff's proposal uses the morpheme, a function from a set of grammatical categories to a set of exponence rules generating surface stems. The stem is the expression that inflectional affixes attach to. The grammar states which morphological category is expressed by which exponence rules. (3) illustrates how this idea applies to part of the data in (1), replacing the exponence rules with the surface stems they generate.

- (3) Aronoff's (1994) morphemic stem proposal applied to 'cut' and its derivatives

Categories	Exponents	Stem ₁	Stem ₂	Stem ₃
	Imperfective	caed-, in caedere		
Inflection	Verbal Perfect		ce-cid-, in ce-cid-isse	
	Perfect Participle			caes-, in caesus
	Agent noun, Event noun ₁			caes-, in caesor caes-, in caesiō
Derivation	Event noun ₂	caed-, in caedēs		

There are three surface stems in the conjugation of each Latin verb, illustrated in (3) by *caed-*, *cecīd-*, and *caes-*. Inflectional categories—e.g. moods and tenses in the imperfective aspect, moods and tenses in the verbal perfect (= perfect aspect in active verbs), and the perfect passive participle—select these stems as the expressions to which their affixes attach. So do derivational categories. In Aronoff's view, the choice of pairing an affix to a stem is arbitrary because stems are not exponents of syntactic or semantic functions and are thus free to be selected by any affix.

The morpheme allows any pattern of stem syncretism to be expressed, as do rules of referral and the morpheme-like thematic spaces. Such proposals facilitate initial discussion of phenomena that might otherwise be ignored for lack of descriptive technology, but the claim that the pairing of stem types and morphosyntactic categories is arbitrary should be closely examined in each case. We do this here for Latin.

6.2.3 Latin verbal bases

There are four potential bases of affixation in Latin verbs, four expressions that a derivational suffix could in principle attach to: (a) the unsuffixed root; (b) a perfect participial stem, known also, I think erroneously, as the *supine* stem, here the *t-stem*; (c) the verbal *perfectum* stem, used by perfect infinitives and perfect tensed verbs; (d) and the *infectum*, or imperfective stem. *Infectum* ('not accomplished') and *perfectum* ('accomplished') are aspectual notions (Ernout and Thomas 1972; Hofman and

Szantyr 1971). For common verbs, the shape of these stems is not obviously predictable: (4) illustrates the range of possibilities.¹

(4) Potential Latin bases for a deverbal formation

root	<i>infectum</i> (present stem, in 2nd plural form)		<i>perfectum</i>			
			verbal perfect stem (in 2nd plural form)	t-stem (in perfect-passive part.)		
<i>am-</i> ‘love’	<i>amā-</i>	<i>amā-tis</i>	<i>amāv-</i>	<i>amāv-is-tis</i>	<i>amāt-</i>	<i>amāt-u-s</i>
<i>caed-</i> ‘cut’	<i>caed-i-</i>	<i>caed-i-tis</i>	<i>cecīd-</i>	<i>cecīd-is-tis</i>	<i>caes-</i>	<i>caes-u-s</i>
<i>ag-</i> ‘drive’	<i>ag-i-</i>	<i>ag-i-tis</i>	<i>ēg-</i>	<i>ēg-is-tis</i>	<i>āct-</i>	<i>āct-u-s</i>
<i>duc-</i> ‘lead’	<i>duc-i-</i>	<i>duc-i-tis</i>	<i>dux-</i>	<i>dux-is-tis</i>	<i>duct-</i>	<i>duct-u-s</i>
<i>gnō-</i> ‘know’	<i>gnōsc-i-</i>	<i>-gnō-sc-i-tis</i>	<i>gnōv-</i>	<i>-gnōv-is-tis</i>	<i>-gnit-</i>	<i>-gnit-u-s</i>
<i>pel-</i> ‘repel’	<i>pell-i-</i>	<i>pell-i-tis</i>	<i>pepul-</i>	<i>pepul-is-tis</i>	<i>puls-</i>	<i>puls-u-s</i>
<i>fer-</i> ‘carry’	<i>fer-</i>	<i>fer-tis</i>	<i>tul-</i>	<i>tul-is-tis</i>	<i>lāt-</i>	<i>lāt-u-s</i>

The verbal *perfectum* stem is not used as a base in derivation. But each of the other three bases is: there are root-based derivatives (e.g. *ag-men* ‘that which is driven’ from *ag-* ‘drive’; *fer-culum* ‘bier’ from *fer-* ‘carry’), *inflectum*-based derivatives (e.g. *am-ābilis* ‘lovable, loving’; *gnō-sci-bilis* ‘knowable’); and *t*-stem derivatives (e.g. *duct-i-bilis* ‘leadable’ from *duc-*; or *lāt-ūr-a* ‘a carrying’ from *lāt-*, from *fer-*, *lāt-* ‘carry’).

The syntactic distribution of a stem in the verbal system predicts its permissible occurrences in deverbal forms. This point is explored in section 6.4.3 below but one example can anticipate it: for many suffixes, *t*-stems are limited to derivatives that refer to the arguments of the passivized verb, in line with the use of the *t*-stem in the passive *t*-participle. Thus, adjectives like *duct-i-bilis* and *duct-ilis* ‘which can be led’ are based on a *t*-stem (cf. *duct-us* ‘led’) and denote only passive ability; only root-based *duc-bilis* can mean ‘who can lead’.

The fact that the verbal *perfectum* stem is never used in derivation reflects a similar restriction, reminiscent of the prohibitions found in other systems on tensed verb forms inside derivatives: the Latin restriction limits the layer of inflectional affixes to the periphery of the word, excluding them from the derivational stem.²

¹ Unless otherwise noted, the source of Latin data is searches in the Perseus Digital Library at www.perseus.tufts.edu, cross-checked with Kühner and Holzweissig (1966), Leumann (1977), Ernout and Meillet (1959).

² Further effects of this restriction are found in the Latin treatment of PPs like *per noctem* ‘over night’ when they are turned into verbs: *per noctem* becomes not *pernoctem-ā-re* but rather *pernoct-ā-re* ‘to pass the night’, with the noun’s preposition-assigned case ending excised.

It is against this background of constraints on the use of the verb stems that the class of *caesor*-type derivatives stands out: in such forms, suffixes seem to attach to the perfect-passive *t*-stem, in violation of otherwise general constraints on its use. It is the size and productivity of this class, and the striking mismatch between its interpretation and the function of the *t*-stem elsewhere in the verbal system, that has drawn attention to it.

6.2.4 Shared exponence properties of *t*-participles and agent nouns

The most productive member of the class of *t*-derivatives is the agent noun in *-(t)or*.

(5) Agent nouns

<i>caesor</i>	<i>amātor</i>	<i>repulsor</i>	<i>āctor</i>	<i>fissor</i>	<i>-lātor</i> ³
‘cutter’	‘lover’	‘repeller’	‘driver’	‘splitter’	‘carrier’

These nouns are formed as if by stripping the *t*-participle of its inflectional endings and then suffixing *-or* to the result.

(6) Building Latin agent nouns on the passive-perfect *t*-participle

- Input: *t*-participle *caesus* *amātus* *repulsus* *āctus* *fissus* *lātus*
- Remove final $-VC_0$ *caes* *amāt* *repuls* *āct* *fiss* *lāt*
- Suffix *-or* *caes-or* *amāt-or* *repuls-or* *āct-or* *fiss-or* *-lāt-or*

(6) is not our analysis—it represents the Latin grammarian Priscian’s ideas about similar data, as retold by Matthews (1974: 85ff.)—but it usefully highlights the formal link between the agent noun and the *t*-participle. It is not possible to derive the right result by doing something simple and sensible, like suffixing *-or* or *-tor* to the verb root:

(7) No suffixation of *-or* (a) or *-tor* (b) to the root

- Root in infinitive *caed-e-re* *am-ā-re* *repell-e-re* *ag-e-re* *fi(n)d-e-re* *-fer-re*
Suffix *-or* to root **caed-or* **am-or* **repell-or* **ag-or* **fi(n)d-or* **fer-or*
- Suffix *-tor* to root *caed-tor* *am-tor* *repell-tor* *ag-tor* *fid-tor* *-fer-tor*
After rules apply *caesor* **amptor* **repeltor* *āctor* *fissor* **fertor*

The success rate of *-tor* suffixation (7.b) is an improvement over *-or* (7.a), but it still misses key points: among them, the fact that the theme vowels and the root allomorphs found in the *t*-participle are always, invariably, those found in agent nouns, as in all *t*-derivatives.

It will be useful to understand some of the changes that apply in (7.b). First, obstruents devoice before voiceless sounds, lengthening a preceding non-high vowel in the process.

³ This form, like others cited below, does not occur unprefixed, hence the initial hyphen.

- (8) Devoicing; non-high vowels lengthen before devoiced stops

Input	<i>caed-tus</i>	<i>ag-tus</i>	<i>fid-tus</i>
After devoicing and lengthening of [-high] vowels	<i>caet-tus</i>	<i>āc-tus</i>	<i>fit-tus</i>

Clusters of alveolar heteromorphemic obstruents beginning with a stop (*t-t*, *t-s*) geminate to *ss*. Then geminates reduce to singletons after long nuclei.

- (9) Alveolar gemination; degemination after long nuclei

	after short V: <i>fid-</i> ‘split’	after lengthened V: <i>ed-</i> ‘eat’
<i>t</i> -participle input	<i>fid-tus</i>	<i>ed-tus</i>
devoicing, lengthening	<i>fittus</i>	<i>ēttus</i>
<i>tt</i> → <i>ss</i> , <i>ts</i> → <i>ss</i>	<i>fissus</i>	<i>ēssus</i>
degemination	n/a	<i>ēsus</i>

Lengthening after devoicing and the *tt*→*ss* merger are restricted processes in classical Latin; but in forms marked by *t*-initial suffixes, the former is widespread and the latter operates without exception.

A Priscianic derivation of the agent nouns would first generate the participles by suffixing *-t* to the root and applying the rules in (8–9). The participle stem thus created would then be suffixed by *-or*. Our analysis retains an aspect of this derivational sequence—it derives first the participial stems, then refers to their shape when forming the agent nouns—but it derives new results from revising the representation of the agentive suffix: it is *-tor*, not *-or*. Once the correct form of the suffix is identified, the process causing identity between the participle’s stem and that of the derivative will come into focus.

6.2.5 Systematic stem syncretism

To show that one stem formation process copies the output of another, one must eliminate first the possibility of accidental homophony between them; then one must inquire into the source of the shared properties. The evidence that excludes accidental homophony between the *t*-participle’s stem and that of derivatives like *caesor* was outlined by Aronoff (1994) but it must be reviewed again, to separate predictable from truly unpredictable properties of the *t*-stems. The issue of directionality has not been addressed earlier: I take it up in section 6.2.6, building on the observation that properties motivated by syntactic considerations in one stem are carried over, without this motivation, to the other.

6.2.5.1 What is predictable and unpredictable in the stem of *t*-participles All aspects of the *t*-participle stem, predictable or not, are systematically shared with the agent noun and comparable *t*-derivatives. The details of this point are examined next.

Earlier we saw that *ts*, *tt* become *ss*, and that *ss* degeminate after long nuclei. Both rules are exceptionless in suffixes. Thus, in pairs like *caesus*, *caesor* and *fissus*, *fissor*, the stems *fiss-* and *caes-* can be independently derived starting from /caed-tus/, /caed-tor/; /fid-tus/, /fid-tor/ by (8–9). No condition of stem identity is needed here.

We have also seen one case of suppletion: the root *fer-* ‘to carry’ has the *t*-participle *lätus* and corresponding agent nouns in *-lätor*. But genuine suppletion is limited to this one case. What then are the idiosyncratic choices shared by *t*-participles and *t*-derivatives? They include the choice of theme vowels; the quality and position of root consonants; the root vocalism; and the choice of suffixes.

6.2.5.2 Theme vowels If the *t*-participle contains a theme vowel, the agent noun is thematic too: e.g. *am-ā-tus* and *am-ā-tor* from *am-ā-re* ‘love’, *aud-ī-tus* and *aud-ī-tor* from *aud-ī-re* ‘hear’. If not, not: *scrip-tus* and *scrip-tor* from *scrib-e-re* ‘write’.

For most *ā-* and *ī*-verbs, the same theme vowel tends to appear throughout a verb’s conjugation and in derivatives. In this respect, the similarity of *aud-ī-tus* and *aud-ī-tor* emerges from basic properties of Latin word formation, without any need for stem-identity conditions. However, in about 30 *ā-* and *ī*-verbs, the expected theme vowels are missing in the *t*-participle. In all such cases, the theme vowels are also missing in corresponding agent nouns: *sar(c)-t-us*, *sar(c)-t-or* from *sarc-ī-re* ‘patch’; *iū-t-us*, *iū-t-or* from *iuv-ā-re* ‘help’.

Further, for all verbs other than *ā-* and *ī*-verbs—a group of over 300—the occurrence and quality of a theme vowel cannot be predicted in the *t*-participle; in all these cases, the *t*-derivatives agree with corresponding participles. Two pairs illustrate this in (10). The roots *pet-* ‘seek’ and *scrib-* ‘write’ lack a theme vowel in the *infectum*;⁴ in the *perfectum* they diverge, the former having *ī* while the latter remains athematic. The pair *hab-* ‘have’ and *cav-* ‘beware’ have the same theme vowel, *ē*, in the *infectum* and diverge in the *perfectum*. The *perfectum* theme vowels are unpredictable, as the comparison between rows (10.a) and (10.b) shows; but the theme vowel in the *t*-derivative is always identical to that of the *t*-participle, as seen by comparing (10.b) with (10.c).

- (10) Unpredictable theme vowel variation: *t*-participles and *t*-derivatives vs. infinitives
- | | | | | |
|-----------------------------------|------------------|--------------------|------------------|------------------|
| a. <i>infectum</i> | <i>pet-i-tis</i> | <i>scrib-i-tis</i> | <i>hab-ē-tis</i> | <i>cav-ē-tis</i> |
| b. <i>perfectum t</i> -participle | <i>pet-ī-tus</i> | <i>scrip-tus</i> | <i>hab-i-tus</i> | <i>cav-tus</i> |
| c. <i>t</i> -derivative | <i>pet-ī-tor</i> | <i>scrip-tor</i> | <i>hab-i-tor</i> | <i>cav-tor</i> |
| | ‘seek’ | ‘write’ | ‘have’ | ‘beware’ |

⁴ The medial [i] of *pet-i-tis* is not a theme vowel but an anaptyctic vowel: cf. Godel (1973: 74), Steriade (forthcoming).

We generalize over the entire set: the quality and length of all presuffixal vowels matches in all *t*-participles and corresponding *t*-derivatives.

6.2.5.3 Root consonantism Latin verbs contain synchronically unrecoverable remnants of ablaut and infixation. Their results must be analysed by listing a range of stem allomorphs and stating conditions on their distribution, or by lexically indexing stem formation rules. Stem allomorphs are, in this respect too, identical in *t*-participles and *t*-derivatives:

- (11) Root C differences between stems of the tensed perfect, *t*-participle and *t*-derivatives:

Root	tensed perfect	<i>t</i> -participle	<i>t</i> -derivative
<i>fig-</i> ‘fashion, mould’	<i>finx-ī</i>	<i>fic-t-us</i>	<i>fic-tor</i> ‘moulder’
<i>pig-</i> ‘paint’	<i>pinx-ī</i>	<i>pic-t-us</i>	<i>pic-tor</i> ‘painter’
<i>pis-</i> ‘pound, crush’	<i>pins-u-ī</i>	<i>pis-t-us</i>	<i>pis-tor</i> ‘miller’
<i>pug-</i> ‘puncture’	<i>pu-pug-ī</i>	<i>punc-t-us</i>	<i>ex-punc-tor</i> ‘blotter out’
<i>ta(n)g-</i> ‘touch’	<i>te-tig-ī</i>	<i>tac-t-us</i>	<i>tac-tor</i> ‘toucher’

The grammar must distinguish attested pairs like *{fictus, fector}* from unattested **{finctus, fector}* or **{fictus, finctor}*. Ablaut poses similar problems. Roots like *sperm-ō* ‘separate’, with perfect forms *sprēv-ī*, *sprē-tus*, and *t*-derivatives like *sprē-tor*, display a form of metathesis. Neither its occurrence nor the quality of the resulting presuffixal vowel can be predicted. These features of the *t*-participle are systematically passed on to the *t*-derivatives.

There are sundry other changes to the root consonantism in *t*-participles, all of which are synchronically inexplicable: among them, the loss of the root labials in *pressus* and *iussus* (from *prem-* ‘press’, *iub-* ‘order’). These changes are all duplicated in *t*-derivatives: e.g. *pressor* and *iussor* are agent nouns corresponding to *pressus* and *iussus*.

6.2.5.4 Root vocalism Unpredictable changes affect root vowels in pairs of *inflectum* and *t*-participle like *stā-re* ‘stand’ vs *sta-tus* ‘having stood’. In nearly all such cases, the root vowel of the *t*-derivatives agrees with that of the participle: corresponding to *status* there is *stator*; similarly (*trans-ī-re* ‘go through, pass by’ vs (*trans-itus*, (*trans-*)*itor*; *ser-e-re* ‘sow’ vs *satus*, *sator*; *pell-e-re* ‘push’ vs *pulsus*, *pulsor*.

The lengthening that accompanies devoicing is idiosyncratic, and always shared by *t*-participles and *t*-derivatives: lengthening occurs, triggering degemination, in *ēsus*, *ēsor* (*ed-ere* ‘eat’); it does not occur in minimally different *cessus*, *cessor* (*ced-ere* ‘retreat’).

6.2.5.5 Perfect suffixes If the participle is suffixed by *-s* rather than *-t* (e.g. *pulsus*, on *pell-e-re* ‘push’) the agent noun is too (*pulsor* ‘pusher’). In some cases, this participial *-s* is locally unpredictable: the effect of *tt*→*ss* and degemination does not explain

pulsus, or *pressus* (*prem-e-re* ‘press’); or *iussus* (*iub-ē-re* ‘order’); or *fixus* (*fig-e-re* ‘fix’).⁵ The exceptional consonantism is always found in corresponding *t*-derivatives, e.g. *pressor*, *iussor*, and *-fixor*.

An unexpected *ū* appears in *locūtus* ‘spoken’, *secūtus* ‘followed’, *solutus* ‘turned’ from *loqu-ī*, *sequ-ī*, *solv-e-re*; the same *ū* is present in the corresponding agent nouns *locūtor*, *secūtor*, *solutor*. This *ū* is missing in similar verbs whose root also ends in *u* or *qu*: *coqu-e-re* ‘cook’, *cōctus*; *-linqu-e-re* ‘abandon’, *-lictus*. For these same verbs, the *ū* is similarly missing from the *tor* agent noun: *cōctor*, *-lictor*.

6.2.5.6 Summary This section has reviewed the idiosyncratic stem properties shared by *t*-participles and *t*-derivatives, as typified by *-tor* nouns. The data establishes that the stem of *t*-participles and that of *t*-derivatives cannot be generated independently of each other. Either a single stem is generated, and a mechanism like Aronoff’s morpheme assigns it simultaneously to the two morphological classes, or else, as Priscian assumed, one category copies the stem of the other. Generalizing over the data surveyed, (12) states a descriptive fact in need of analysis:

- (12) For any Latin verb, the unit [Root-(V)-CoronalObst*]—the string composed of the root, a possible theme vowel plus any suffix-initial cluster of one or more coronal obstruents (*t*, *s*, *ss*, or *st*)—is identical in the verb’s *t*-participle and in its *t*-derivatives.

There are rare exceptions (cf. (23) below), but this is the overwhelming rule. To appreciate its productivity, of the roughly 1,400 *-tor* agent nouns found in the Perseus database, only 7 (e.g. *of-fertor* ‘one who bears’; the expected *ob-lātor* is also found) deviate from (12). All other *t*-derivatives behave comparably, as shown in section 6.7, the Appendix.

6.2.6 Directionality

The stem identity reviewed above is *directional*: it is the *t*-derivatives that borrow their stems from *t*-participles. This is shown by the observation that the syllable count of the *t*-participle’s stem matches that of the verbal *perfectum* stem.⁶ (13) illustrates this: a monosyllabic verbal perfect stem tends to go with a monosyllabic

⁵ Most instances of unpredictable *s* in the *t*-participle come from the tensed perfect *s*-affix (e.g. *par-s-ī*, *par-s-us*, on *parc-* ‘spare’), so they are predictable in a broader context. (*Pulsus* comes from *pld-tos*, but the *ld* cluster is synchronically unrecoverable in *pellō* or any other form.) The relation between the *perfectum* stems (tensed and participial) is analysed in Steriade (forthcoming) and section 6.3.5.

⁶ Earlier Latin scholars have noted analogies between the *t*-participle and the tensed perfect, mostly without itemizing the specifics. Ernout (1953: 188) notes that there is ‘une union, secondaire sans doute, mais étroite, entre les deux formes, si bien que des influences analogiques se sont exercées de l’une à l’autre: *bien de parfait latins ne s’expliquent que par le participe en *-to- et réciproquement*’. See also Leumann (1977: 616–17). The discussion here shows that these were not isolated instances of four-part analogy but general properties of the expression of aspect in Latin.

t-stem, independently of the syllable count of the *inflectum* (13. a–b); disyllabic verbal perfect stems are almost invariably paired with a disyllabic *t*-stem, again regardless of the length of the *inflectum* (13.c–d). Aspectual stems appear in brackets.

(13) Rhythmic correspondence between verbal perfect stems and *t*-stems

Infectum	Verbal Perfect	Perfect Part. (<i>t</i> -stem)	gloss
a. [scrib]-ō	[scrip-s]-ī	[scrip-t]-us	'write'
b. [mov-e]-ō	[mōv]-ī	[mōt]-us	'move'
c. [mol]-ō	[mol-u]-ī	[mol-i-t]-us	'grind'
d. [hab-e]-ō	[hab-u]-ī	[hab-it]-us	'have'

Lexical counts in Perseus show that this effect is systematic. I used the group of 325 strong verb roots, defined as those *not* belonging to the regular first (*ā*) and fourth (*ī*) conjugations. The latter have rhythmically matched aspectual stems (e.g. *aud-ī-*, *aud-ī-v-*, *aud-ī-t-* for 'hear') for a more general reason: they maintain the same theme vowel throughout, adding only non-syllabic aspectual suffixes to it. By contrast, the aspectual stems of strong verbs *can* diverge rhythmically from each other, as seen in (13.b, c). This is, then, the only class that can inform us about a rhythmic correspondence effect specific to the perfect.

Several counts were carried out on the set of strong verbs. In the first, I included all attested variants of each strong verb stem—e.g. both *posu-ī* and *posīv-ī* 'I placed'—each variant counting as a distinct verb. In a second, I collapsed all variant stems with the same number of syllables. The results were very similar. Further, I experimented with the assumption that the reduplicating syllable of perfects like *ce-cin-ī* 'I sang' is outside the stem, and then with the opposite assumption. Here again the results were comparable, because there are comparatively few verbs that reduplicate. (14) reports the count that collapses variants with identical syllable numbers and places the reduplicating syllable outside the stem. The notations ' 1σ ' and ' 2σ ' refer to stems that have, respectively, one and more than one, mostly two, syllables. A handful of verbs with trisyllabic perfect and *t*-stems are included in the latter class.

(14) Percentages of the strong verbs whose *t*-Participle stem matches in its syllable count the corresponding verbal perfect stem.

	1 σ Verbal Perf.	2 σ Verbal Perf.
1 σ <i>t</i> -Part. (N=202)	0.86 (e.g. <i>scrip-s-</i> , <i>scrip-t-</i>)	0.14 (e.g. <i>rap-u-</i> , <i>rap-t-</i>)
2 σ <i>t</i> -Part. (N=86)	0.07 (e.g. <i>fūg-</i> , <i>fug-it-</i>)	0.93 (e.g. <i>hab-u-</i> , <i>hab-it-</i>)

We see that a rhythmic match is found in the vast majority of strong verbs. Even the deviant paradigms—e.g. *[fūg]-ī*, *[fug-it]-us* 'flew, flown'—frequently have newer variants that enforce the correspondence, like *[fūg-ī-v]-ī*, *[fug-it]-us*.

How is this match achieved? I summarize the analysis of Steriade (forthcoming). The Latin verbal perfect has three productive exponents: the suffixes *-s* and *-u/v* (e.g. [scrip-*s*]-*ī* [mol-*u*]-*ī*, [pet-*ī*-*v*]-*ī*) and the option of lengthening the root vowel (e.g. [vīd]-*ī*, [mōv]-*ī*) without further affixation. The distribution of these exponents is largely determined by independent phonotactics: *-s* is dispreferred after sonorants, and impossible after vocoids; *-v* is impossible after consonants, while both *-u* and *-v* are impossible after *u-* or *v(V)-*final roots.⁷ Modulo these constraints, strong roots prefer the suffix *-s* and default to *-u/v* otherwise. The lengthening option is productively used only when all else fails, i.e. when the root ends in *-v* [w], a sonorant, which rejects both the *-s* and the *-u/v* suffixes. Leaving aside archaisms and further paradigmatic factors, it is these phonotactic considerations that determine the number of syllables in the tensed perfect stem: two, as in [mol-*u*]-*ī*, or one, as in [scrip-*s*]-*ī*, [mōv]-*ī*. (15) illustrates one aspect of the analysis, showing how phonotactics (**s*/[+SON]_V) interact with affixal preferences (USE -*s* >> USE -*u*) to yield the distribution of *-s* and *-v/u*.

(15) Deriving two verbal perfect stems

(a) The verbal perfect of a sonorant final root

Root [mol]-; Perfect suffixes: <i>-s</i> , <i>-u</i>	* <i>s</i> /[+SON]_V	USE - <i>s</i>	USE - <i>u</i>
[mol- <i>s</i>]- <i>ī</i>	*!		*
☒ [mol- <i>u</i>]- <i>ī</i>		*	

(b) The verbal perfect of an obstruent-final root

Root [scrib]-; Perfect suffixes: <i>-s</i> , <i>-u</i>	* <i>s</i> /[+SON]_V	USE - <i>s</i>	USE - <i>u</i>
☒ [scrip- <i>s</i>]- <i>ī</i>			*
☒ [scrib- <i>u</i>]- <i>ī</i>		*	

**s*/[+SON]_V: no *s* between sonorants

USE -*s*/ USE -*u*: affixal preference constraints in the formation of verbal perfect.

Turning now to the perfect participle, this has two exponents, *-t* and *-it*. Both are well formed after most consonants. Their observed distribution is determined by a condition

⁷ Meiser (2003:17ff) reviews earlier proposals for predicting the choice of affixes that mark the tensed perfect stem. One of these is empirically supported: this is Mester's (1994) idea that cretic structures (Heavy-Light-Heavy) are avoided, because they contain an unfootable medial syllable. This predicts, among other patterns, that after V:C or VCC-final roots *-u* is not usable. This idea is not inconsistent with the proposals defended here, since the right overall account may include both segmental and rhythmic constraints. Mester's idea explains a number of residual forms not derivable with the system of segmental preferences proposed in Steriade (forthcoming). However, at least 16 per cent of the strong verb roots taking *-u* tensed perfects do contain a XVCC root allomorph in the perfect.

of rhythmic correspondence to the verbal perfect stem, MAX/DEP V (PERFECT): there must be as many syllables (or nuclei) in the stem of the verbal perfect as in the stem of the participial perfect. This condition selects *-it* in [mol-it]-us, to match the disyllabic stem of [mol-u]-i, and *-t* in [scrip-t]-us to match [scrip-s]-i.

- (16) Deriving the perfect participles corresponding to the verbal perfects in (15)
- (a) The perfect participle corresponding to a monosyllabic verbal perfect stem

Base [scrip-s]- Suffix: -t, -it	DEP V (PERFECT)
☒ [scrip-t]-us	
[scrib-it]-us	*!

- (b) The perfect participle corresponding to a disyllabic verbal perfect stem

Base [mol-u]- Suffix: -t, -it	MAX V (PERFECT)
☒ [mol-it]-us	
[mol-t]-us	*!

MAX/DEP V (PERFECT): If two verb forms have the same lexical head and the same aspectual value, then each nucleus in the stem of one has a corresponding nucleus in the stem of the other.

In this analysis, the *t*-stem owes its shape to the fact that it is an exponent of the same aspectual category as the verbal perfect. The syllable count of the *t*-participle stem thus generated is then passed on to *t*-derivatives, which, as seen in section 6.2.7 below, are aspectually neutral. Monosyllabic stems like that of [scrip-t]-us, motivated by the monosyllabic tensed [scrip-s]-i, are transmitted to corresponding *t*-derivatives like *scriptor*; disyllabic stems like [mol-it]-us are passed on to *t*-derivatives like *molitor*. The choice between *-t* and *-it* variants in *t*-derivatives is thus derived via a three-step scenario: (1) generate tensed perfect stems; (2) generate *t*-participle stems, by rhythmic correspondence to the tensed perfect stem; (3) generate the *t*-derivative stems by similarity-based syncretism to the participial *t*-stem. (The mechanics of step 3 are about to be examined.) This three-step analysis predicts the syllable count in *t*-stems from the segmental composition of the root, independent affixal preferences, and general phonotactics, as they affect the verbal perfect. A non-directional analysis of the same data which ignores the verbal perfect (Aronoff 1994) cannot predict the structure of any stem. That is because an attested pair of *t*-participle and *t*-derivative like {*molitus*, *molitor*} is as good, on that analysis, as the unattested *{*moltus*, *moltor*}; conversely, the pair *{*scribitus*, *scribitor*} is as good as {*scriptus*, *scriptor*

A necessary consequence of the directional analysis is that *t*-stems are not meaningless. They are primarily exponents of the perfect aspect and of the non-active

voice of perfect participles. Then, this analysis will have to explain how the perfect stem ends up in non-perfect, aspectually neutral derivatives.

Our scenario provides the analytical basis for Priscian's intuition that *t*-derivatives copy the stem of the *t*-participle. It also gives a first reason to reject Aronoff's morphome analysis. In a morphemic account, it is essential that the *t*-stem be meaningless and syntactically neutral, as opposed to being the specific exponent of some morphosyntactic category. Our results suggest, to the contrary, that the shape of the *t*-participle's stem is engineered to reflect a specific aspectual category, the perfect. If the *t*-stem is not syntactically neutral, then the morpheme is not the right mechanism to distribute it across syntactic categories.

6.2.7 Syntactic factors

To complete the picture of the *t*-stem syncretism, this section shows that there is no syntactic feature shared exclusively by the perfect *t*-participle and the *t*-derivatives, no property whose hypothetical exponent would explain their shared stem.

The *t*-participle is aspectually perfective⁸ and, for transitive non-deponent verbs, passive. It refers to the theme, never to an external argument: *dictus* means 'which has been said', not 'having said'. Non-passive *t*-participles come exclusively from intransitive verbs (*conspirātus* 'who has conspired with' from *conspirō*; *consultus* 'who has meditated', from *consulō* 'to ask, take counsel') or from deponents (*imitātus* 'who has imitated' from *imitor*).⁹

This aspectual value of *t*-participles is not always shared by corresponding *t*-derivatives. The passive diathesis never is. Thus, agent nouns refer to the external argument of the corresponding verb: just as *dictus* invariably refers to the theme, so does *dictor* 'sayer' refer to the agent.

The event whose participant is denoted by agent nouns can be seen as intended, contemplated, or unfolding. In (17.a), for instance, *successor* means someone who is intended to substitute (*succedere*) for someone else: the succession need not be accomplished. In (17.b), fleeing (*fugiens*) happens while the ass is carrying (*āsinō vectōre*) the fugitive: *fugiens* itself is imperfective, so the aspect of carrying (*vectōr-e*) must be imperfective too. The remaining examples make the same point.

⁸ Cf. Benveniste (1948: 167): 'to- signals the accomplishment of the verbal action in its object. The derivative in *-to-* has this passive sense in all of its uses.'

⁹ The generalization in the text is due to Brugmann, who shows (1905: 97) that there is no active use for the *t*-participle of non-deponent transitives: 'the verbal adjective in *to-* belonging to transitive active verbs were employed only in a passive sense'. This is illustrated through a comparison between *tacens* and *tacitus*, both of which can mean 'silent', from *taceō*, and *verens* and *veritus*, 'fearful' from the deponent *vereor* 'I am fearful'. Brugmann notes a difference between these verbs: while both participles of the deponent can take direct objects, '[i]t was ungrammatical (*unlateinisch*) to say *hanc rem tacitus* ("having been silent on that thing" with the direct object *hanc rem* "that thing") as opposed to *hanc rem tacens* "being silent on that thing", with the active present participle'.

- (17) a. *Minuciō Fabius successor in Algidum missus.* (Livy, *Ab Urbe Condita*, 3, 29, 7)
‘As for Minucius, Fabius was sent to Algidum to replace him.’
b. *āsino vectōre fugiens* (Apuleius 6, 29) ‘as she is leaving, an ass carrying her¹⁰
c. *illō cultōre deōrum* (Lucan 8, 478) ‘when he was serving to the gods’
d. *comissātōre Lyaeō* (Martial 9, 61, 15) ‘when Bacchus was carousing there’

In any given instance, the passive diathesis of *t*-participles differs from the invariably active character of the *tor*-nouns; the perfective aspect of *t*-participles differs from the aspectually unspecified *tor*-nouns. No other syntactic property can justify the stem identity between them.

The same goes for the other *t*-derivatives. The abstract nouns in *-tiō* and *-tus* were examined by Rosén (1981), in a larger study of Latin event nouns which shows that that both *-tiō* and *-tus* can be used to refer to the contents of earlier clauses, whether the events described there are completed or not. In the following passages, a *-tiō* noun, *aedificatiō* ‘building’, and a *-tus* noun, *abitus* ‘going off’, refer anaphorically to ongoing or future activities described by earlier clauses using *infectum* verbs. The meaning of *aedificatiō* in (18.a) is ‘the fact that building is happening’; *abitus* in (18.b) means ‘the fact that going off will be happening’. The examples and broad translations are from Rosén (1981: 17, 22).

- (18) a. *Ecce autem aedificat, columnam mentō suffigit suō, apage, non placet mihi illaec aedificatiō.* (Plautus, *Miles Gloriosus*, 209–10)
‘Here he is building something: he puts a pillar under his chin; damn it, I am sure I don’t like this way of building of his.’
b. *Simō Senex: Nunc mihi exsequī certa rēs est ut abeam . . . hinc ad fōrum.*
Tranio: Abitus tuos tibi, senex, fecerit male. (Plautus, *Mostellaria*, 705–11)
‘Simō: Now I have made up my mind to go off, by all means, from here to the forum.
Tranio: You will be the one to suffer from going off like this, old top.’

The *-tiō* and *-tus* nouns coexist in Latin with event nouns that are non *t*-derivatives, e.g. *-mentum* (e.g. *blandimentum* ‘flattery’) and *-ēla* (*querēla* ‘lamentation’). All share the anaphoric uses illustrated above: no tendency is reported to limit *t*-derivatives to completed events and to reserve the non-*t* derivatives for the complement set. There is no observable aspectual difference between the *t*-event nouns and the equivalent non-*t*-derivatives; hence no syntactic rationale for the former’s use of the *t*-stem.

¹⁰ See Pultrová (2007) for discussion; examples (17.b–d) are due to her.

There are other ways to highlight the fact the *t*-stem syncretism defies one's intuitive expectations about the relation between morphosyntactic structure and phonological exponence. Aronoff (1994) notes that *t*-derivatives (whose full list appears in the next section) are a heterogeneous group, ranging from frequentative verbs to agent and event nominals: if they have nothing in common, they are a fortiori unlikely to share, as a group, any syntactic feature with the *t*-participle. In section 6.4, I use a third argument: I show that the *t*-stem is found in non-*t*-derivatives forms (e.g. *duct-ibilis* 'leadable') but only when they refer to a passive subject. This is an expected restriction on the use of the *t*-stem, if we identify it with the stem of the passive *t*-participle. But, once again, *t*-derivatives, and only they, violate such restrictions: the analysis must identify these violations and formulate the limited conditions under which they surface.

6.2.8 *The form of t-suffixes*

Earlier sections have shown that *t*-derivatives contain a stem that is identical to one found in *t*-participles; that this stem is shaped by conditions originating in the verbal *perfectum*; and that no syntactic reason compels the *t*-derivatives to adopt it. The next step is to understand the mechanism of this stem adoption process. To do this, it is necessary to examine the phonological composition of the suffixes that select the *t*-stem. These are analysed as vowel-initial by Matthews (1974) and Aronoff (1994), who parse all *t*-derivatives as *t*-stem-VX_{suffix}:

- (19) Internal structure of *t*-derivatives according to Aronoff (1994), Matthews (1974):

	<i>t</i> -Stem	Suffix	Inflection
<i>t</i> -Participle	<i>caes-</i>	Ø	- <i>u-s</i>
<i>t</i> -Derivative	<i>caes-</i>	ōr-	-(s)
	<i>caes-</i>	iōn-	-(s)
<i>t</i> -Participle	<i>script-</i>	Ø	- <i>u-s</i>
<i>t</i> -Derivative	<i>script-</i>	ōr-	-(s)
	<i>script-</i>	iōn-	-(s)

This section argues against such parses, showing that the entire group of *t*-derivatives contains *t*-initial, not V-initial suffixes. This result allows us to detect predictability where earlier analyses could not. If *t*-derivatives contained V-initial suffixes, as in (19), nothing would differentiate them from similar formations that do not affix to the *t*-stem. One of these is the agentive *-ax*, e.g. *aud-ax* 'who dares' (*aud-* 'dare',

t-participle *aus-us*). This suffix cannot attach to *t*-stems, since forms like **aus-ax* are impossible. Nothing distinguishes *caes-or* from **aus-ax* except the shape of the suffix. Under the right assumptions about suffix structure, the selection of the *t*-stem becomes predictable: the agentive *-or* is really *-tor*, a *t*-suffix; the agentive *-ax* is not; and only *t*-suffixes take *t*-stems.

The analytical complexity shifts then to other questions: how is the unique *t* of *auditor* parsed? Does it belong to the *t*-stem *audit-* or to the suffix *-tor*? If *auditor* comes from underlying /*auditor*-*tor*/, it should surface as **audīsor*. Why does it not? Why is *caesor*, not **caestor*, the result of adding *-tor* to the stem *caes-*? The proposal of similarity-based syncretism will resolve this.

6.2.8.1 *t*- and non-*t*-derivatives A full list of deverbal forms using the *t*-stem appears below. Aronoff (1994) offers an earlier survey. Forms with a postposed asterisk illustrate structures that are attested with other verbs. The suffix internal structure is examined in section 6.3.5. More data is given in section 6.7, the Appendix.

(20) Deverbal forms built by affixation to the stem of *t*-participles

Syntactic category		suffix ‘speak’	‘cut’	‘eat’	‘conquer’
passive-perfect <i>t</i> -participle	<i>t</i> -	<i>locūtus</i>	<i>caesus</i>	ēsus	<i>victus</i>
supine, a verbal noun	<i>tu-</i>	<i>locūtus*</i>	<i>caesus</i>	ēsus	<i>victus</i>
future active participle	<i>tūro-</i>	<i>locūtūrus</i>	<i>caesūrus</i>	ēsūrus	<i>victūrus</i>
agent noun, masculine	<i>tōr-</i>	<i>locūtor</i>	<i>caesor</i>	ēsor	<i>victor</i>
agent noun, feminine	<i>tric-</i>	<i>locūtrix</i>	<i>caestrix*</i>	ēstrix	<i>victrix</i>
event, quality noun	<i>tīōn-</i>	<i>locūtiō</i>	<i>caesiō</i>	ēsiō*	- <i>victiō</i>
event, result noun	<i>tūra</i>	<i>locūtūra*</i>	<i>caesūra</i>	ēsūra*	<i>victūra*</i>
desiderative verb	<i>tūri-</i>	<i>locūtūriō*</i>	<i>caesūriō*</i>	ēsūriō	<i>victūriō*</i>
intensive verb	<i>t</i> -	<i>locūtiō*</i>	<i>caesō</i>	ēsō	<i>victō*</i>
frequentative verb	<i>t-it-</i>	<i>locūtītō*</i>	<i>caesītō</i>	ēsītō	<i>victītō</i>
verbal adjective	<i>tīvo-</i>	<i>locūtīvus</i>	<i>caesīvus</i>	ēsīvus	<i>victīvus*</i>
adverb	<i>tim</i>	<i>locūtim*</i>	<i>caesīm</i>	ēsīm*	<i>victim*</i>
instrument, event noun	<i>trum</i>	<i>locūtrum*</i>	<i>caestrūm*</i>	ēstrūm*	<i>victrum*</i>
root		<i>loqu-</i> (<i>lok^w-</i>)	<i>caed-</i>	<i>ed-</i>	<i>vic-</i>

The next set has not yet figured in the analysis of the *t*-stem syncretism: the forms in (21) below can be deverbal too, but their suffixes do not attach to the *t*-stem. It is *loqu-ax*, not **locūt-ax* despite *locūtor*; *lūd-icrum* not **lūs-icrum* despite *-lūsiō*; *-fericulum*, not **lāt-iculum*; *flu-idus* not **flux-idus* despite *fluxiō*, *fluxūra*; *reg-imen* not **rēct-imen*, etc.

(21) Deverbal forms built by affixation to the root or to the *inflectum* stem

syntactic category	derivative	related verb forms	
		infinitive	t-participle
adjective of inclination: -(ē)c-	<i>loqu-ax</i> ‘talkative’		
adjective of ability: -(b)iili-	<i>loqu-i-bili-s</i> ‘utterable’	<i>loqu-ī</i>	<i>locū-t-us</i>
event, result N: -ēla	<i>loqu-ēla</i> ‘utterance’		
instrument N: -(c)ro-	<i>lūd-i-cru-m</i> ‘plaything’	<i>lūd-e-re</i>	<i>lū-s-us</i>
stative Adj: -(b)undo-	<i>lūd-i-bundu-s</i> ‘playful’		
verbal Adj: -uo-	<i>caed-uu-s</i> ‘fit to cut’	<i>caed-e-re</i>	<i>caes-us</i>
instrument, event N: -(c)ulo-	<i>-fer-i-culu-m</i> ‘offering’	<i>-fer-re</i>	<i>-lū-t-us</i>
instrument N: -(b)ulo-	<i>fund-i-bulu-m</i> ‘funnel’	<i>fund-e-re</i>	<i>fū-s-us</i>
instrument N: -(b)ro-	<i>lav-ā-brum</i> ‘washtub’	<i>lav-ā-re</i>	<i>lau-t-us</i>
stative Adj: -ido-	<i>flu-id-us</i> ‘flowing’	<i>flu-e-re</i>	<i>fluc-s-us</i>
event N: -men(to-)	<i>reg-i-men</i> ‘guidance’	<i>reg-e-re</i>	<i>rēc-t-us</i>
event, result N: -mōnio-	<i>al-i-mōniūm</i> ‘nourishment’	<i>al-e-re</i>	<i>al-t-us</i>
verbal Adj: -(ā)neo-	<i>suc-cēd-āneus</i> ‘that follows’	<i>-cēd-e-re</i>	<i>cessus</i>

I show next that the difference between (20) and (21) is predictable: all the suffixes in (20) are all *t*-initial; none of those in (21) are. Any derivative whose suffix begins with *t* adopts the stem of the *t*-participle, whose own suffix is, in most cases, *-t*. Historically, the event and agent affixes in (18) began with *t*: they descend from Indo-European *-tōr*, *-tēr* and *-ti*, *tu* (Benveniste 1948, Monteil 1970), so historically *victor* is *vic-tor*, not *vict-or*. We will see that these suffixes continue to be *t*-initial in classical Latin and in Proto-Romance.

6.2.8.2 *The agent suffix -tor* (22) illustrates agent nouns whose base is not a verb. These always end in *-i-tor*.

(22) Non-deverbal agent nouns

Base		Agent noun	
<i>iān-u-a</i>	‘gate’	<i>iān-i-tor</i>	‘gatekeeper’
<i>fund-a</i>	‘sling’	<i>fund-i-tor</i>	‘sling fighter’
<i>fīc-us</i>	‘fig’	<i>fīc-i-tor</i>	‘fig planter’
<i>olīv-a</i>	‘an olive’	<i>oliv-i-tor</i>	‘olive tree planter’
<i>vindemi-a</i>	‘grape harvest’	<i>vindem-i-tor</i>	‘harbinger of vintage’
<i>advers-us</i>	‘towards’	<i>advers-i-tor</i>	‘one who goes to meet another’
<i>port-us</i>	‘harbour’	<i>port-i-tor</i>	‘harbour toll gatherer’

There is a telltale short *i* before the suffix, a buffer vowel found before other C-initial derivational suffixes, like *iān-i-culum* ‘little gate’, *asper-i-ter* ‘roughly’. This *i* shows that agent nouns like (22) are not based on accidentally unattested denomininal verbs. Had they existed, those unattested denominals would have belonged, like all other Latin denominatives, to the class of regular *ī*- or *ā*-verbs, e.g. **ian-ī-re* or *ianu-ā-re*; **fund-ī-re* or **fund-ā-re*. Their *t*-participles and agent nouns would then have regularly kept the long theme vowel: **fund-ī-tus*; hence expected **fund-ī-tor*, like *aud-ī-tus*, *aud-ī-tor*. The short *i* we find instead shows that there are no verbs behind the agentives in (22), so no *t*-participles. The *t* of *-tor* belongs to the agent suffix.

Evidence for a *-tor* suffix is also found in exceptional deverbal agent nouns that use a base distinct from the *t*-stem. The *t* of such forms cannot come from the *t*-participle.

(23) Deverbal agent nouns not based on the passive-perfect participle

Verb	Agent noun
<i>verr-ī, versus</i> ‘to sweep’	<i>con-verr-i-tor</i> ‘who sweeps together’
<i>imporcāre, imporcātus</i> ‘to put in furrows’	<i>imporc-i-tor</i> ‘god of furrows’
<i>-fendere, -fensus</i> ‘to ward off, defend’	<i>in-fend-i-tor</i> ‘advocate’
<i>librāre, librātus</i> ‘poise, balance, hurl’	<i>libr-i-tor</i> ‘hurler’
<i>favēre, fautus</i> ‘to favor’	<i>fav-i-tor</i> ‘favourer’ (alongside <i>fautor</i>)
<i>deversārī, deversātus</i> ‘to put up at an inn’	<i>devers-i-tor</i> ‘guest at an inn’

These nouns are rare exceptions to the generalization in (12), which would predict **conversor*, **imporcātor*, **infensor*, etc., but they reveal a significant element of regularity: whenever the stem of the agent noun and the participial *t*-stem are distinct, the suffix is *-tor*. An *-or* suffix will produce, under the same exceptional circumstances, **converror*, **imporcōr*, and denominals like **iānor*, **fundor*, instead of *iānitor*, *funditor*.

The comparison of (22)–(23) with the regular deverbal agentives like (5) reveals a new generalization. Recall from (5) the agent nouns in *-sor*: *caesor*, *repulsor*, *fissor*, *fixor*. This is a large group, totalling 146 nouns, each of which corresponds to a *t*-participle in *-sus*. There are no agentive *-sor* nouns lacking verbal bases, and no *-sor* nouns from verbs whose participles end in *-tus*. Rather, *-sor* only appears under the influence of a *-sus* participle. The forms in (23) show that it is occasionally possible for a *-sus* participle to correspond to a *-tor* agent noun, as in the pair *conversus-converritor*, but the converse is impossible: *-sor* nouns do not exist without *-sus* participles, so **vixor* ‘conqueror’ is impossible, given *victus*. This asymmetry is a

distinct indication that the similarity between the *t*-participle and the *t*-derivatives is directional rather than bilateral, as claimed by Aronoff. Normally, the agent noun takes its stem from the *t*-participle; the participle, however, is immune to the influence of the agent noun, or indeed to that of any *t*-derivative. A summary of these generalizations on the stem of masculine agent nouns appears below:

- (24) The agent nouns end in
- sor* if deverbal, when the corresponding *t*-participle is *-sus*.
 - tor* in all other cases:
 - if the base is a verb whose *t*-participle is *-tus* (*vic-tor*)
 - if the base is not a verb (*ian-i-tor*)
 - if the verb lacks a related *t*-participle (*bib-i-tor*)
 - in rare cases where the agent noun's stem differs from the *t*-stem (*converr-i-tor*).

Identical generalizations obtain for all *t*-derivatives, confirming that the initial of their suffix is also *t*: *s*-deviations from *t* are always due to the influence of an *s*-participle.

6.2.8.3 *A historical excursus: the Romance argument for Latin t-initial suffixes* The speakers of Latin and Early Romance must have known that agent nouns like *victor* contain the suffix *-tor* and not *-or*. We can tell this from the development of agentives, which were restructured in all the Romance languages: the agentive suffix came to attach to the stem allomorph that appears in the active participle or the infinitive. Italian and Romanian data illustrate this below.¹¹

- (25) Romance deverbal agent nouns

	agent noun	infinitive	active part.	pass-perf. part.	gloss
Romanian	<i>înving-ă-tor</i>	<i>înving-e</i>	<i>înving-înd</i>	<i>învins</i>	conquer
Italian	<i>vinc-i-tor-e</i>	<i>vinc-ere</i>	<i>vinc-endo</i>	<i>vint-o</i>	conquer

Had Romance preserved the Latin-style agent noun formations, the forms in (25) would be **învins-or* in Romanian, and **vint-ore* in Italian. Such forms occur in Romance only as archaisms or as learned borrowings from Latin. The productive pattern is the one in (25).

¹¹ On Italian agent nouns, cf. Burzio (1998), Tucker (2000), and Steriade (2003). The Spanish pattern is comparable to that of Italian: Bermúdez-Otero (2007). Old French lost its intervocalic *t*, so the *t* of Latin *-tor* is no longer found in French agent nouns, but they too display a stem that is distinct from the passive, e.g. *pren-eur* ‘one who takes’, on the stem of *pren-ant* ‘taking’, rather than **pris-eur* on *pris* ‘taken’.

Steriade (2003) argues that the change producing structures like (25) is not a misparse of original *Root-(V)-t-or* structures but rather a modification in the stem selection mechanism for agentives, one of the two surviving descendants of the Latin *t*-derivatives. The other Romance descendant of the Latin *t*-formations +  event nominals denoting results, achievements, or completed actions. These were not restructured, and they continue to use the stem of the perfect participle (Huot 1997 on French event/result *-(t)ion* nouns; Samek-Lodovici 1997; Ippolito 1999 on Italian *-(t)ata* result nouns; and in section 6.6 below on Romanian result nouns in *-(t/s)ură*). This divergent treatment suggests that the formation of inherited Latin *t*-derivatives was preserved intact if their perfect-passive stem could be syntactically justified, as in the result nouns, but not otherwise; hence not in the agentives. Under this assumption, we expect that the Romance agent nouns will change their stem. Any modification of the *suffix* in *t*-derivatives is unmotivated by this syntactic consideration and thus not expected. We use this premise to compare the two competing hypotheses about the shape of the agentive suffix in Latin: had this been identified as *-or* at the time of the stem restructuring, the change should have yielded innovative forms like Italian **vinci-ore* or **vinc-ore*, and Romanian **inving-or*. That clearly did not happen. If the suffix had been identified as *-tor*, as the Latin evidence already indicates, then the Romance stem change should yield exactly the structures attested. This is then an argument for the continuity of the *-tor* suffix, from Indo-European into the modern Romance languages.

6.2.8.4 Summary on the underlying segmentism of t-suffixes. In earlier sections, I have shown that Latin learners were exposed to evidence for *-tor*, in the form of non-deverbal agentives (*iānitor*), in deverbal nouns created in the absence of *t*-participles (*bibitor*) or deviating from them (*converritor*). The *t*-initial suffix also helps explain why *-tor* triggers *t*-stem syncretism while otherwise similar suffixes, like *-ax*, do not. Had learners experimented with the assumption of an agentive *-or*, they would have discovered that it is impossible to predict why *-or* and *-ax*, among many other comparable pairs, diverge in their stems. The Romance evidence adds a critical element to these arguments. It suggests that learners were not only exposed to evidence supporting a *-tor* suffix but also that they had internalized its significance. We explain in this way the fact that it is *-tor*, not *-or*, that resurfaced after the grammar of Romance changed the base of the agentive suffix. Evidence comparable to that of *-tor* is found in section 6.7, the Appendix, for the other *t*-initial suffixes in (20). Armed with the conclusion that this entire affixal class begins with *t*, we proceed to the analysis of *t*-stem syncretism.

6.3 The phonological analysis of *-tor* nouns

6.3.1 Loci of derivational affixation in Latin

A generalization emerging from (22–23) is that the default structure of *t*-derivatives is [ROOT-i-[tōr]_{suffix}]_{stem}-, as in *iān-i-tor*, *bib-i-tor*. Generally, all *t*-derivatives follow the pattern [ROOT-i-[tX]_{suffix}]_{stem}-, whenever they are free from the pressure of *t*-participles. The same [Root-i-[CX]_{suffix}]_{stem} structure is found in most productive derivational formations of Latin, as seen in the non *t*-derivatives below:

- (26) Non-*t* derivatives with C-initial suffixes, if C≠t: [ROOT-i-[CX]_{suffix}]_{stem}-
Inflections
loqu-i-bili-s ‘utterable’
reg-i-ment-um ‘directive’
lud-i-cr-um ‘thing to laugh at’
vert-i-bul-um ‘joint, thing to turn on’

Setting the *t*-derivatives aside, this allows a general statement of possible attachment sites for Latin derivational suffixes:

- (27) a. Derivational suffixes attach to the root or the *inflectum* stem.
b. A buffer *-i-* separates any stem-final C from a suffix-initial C.

These generalizations will be slightly revised in a bit, but their central part—the fact that the default site of affixal attachment is the root or the *inflectum*—will stand. The conditions in (27) establish a default expectation: they lead us to expect agentives like **scrib-i-tor*, **caed-i-tor*. Then, what needs explaining is why the *t*-participles induce the *t*-derivatives, and only them, to depart from (27). Concretely, our analysis will have to answer questions like (28):

- (28) a. A question about *t*-derivatives:
Why does *script-us* cause expected **scrib-i-tor* to become *scrip-tor*?
Why does *caes-us* cause expected **caed-i-tor* to become *caesor*?
b. A complementary question about non-*t*-derivatives:
Why does *script-us* not cause *scrib-a* to become **scripta*? —
Why does *caes-us* not cause *caed-uus* to become **caes-uus*?

6.3.2 Similarity between minimal stems

The answer to (28.a) is that pairs of lexically related stems like *scriptus* and expected **scribitor*, or *caesus* and **caeditor* are similar in specific respects; the answer to (28.b) is that *scriptus* and *scrib-a*, *caesus* and *caedes* are not comparably similar. Similar stems come to stand in correspondence, and full satisfaction of the constraints on correspondence leads to strict identity. Morphological systems are subject to conditions demanding that distinct paradigm cells be realized by distinct word forms

(Crosswhite 1999, Kenstowicz 2005, Ito and Mester 2004). Sometimes, however, one finds evidence for an additional and ultimately conflicting requirement: contrasting forms in one paradigm must be *very* distinct, over and above the distinctiveness thresholds that prevail in the language at large (Löfstedt 2010). To satisfy such hyper-distinctiveness conditions, paradigm cells may acquire phonologically unexpected differences, as shown by Löfstedt, or they may neutralize contrasts that fall below a set distinctiveness level. I apply this second idea to the Latin case.

There are several possible implementations. The option I adopt is to let local similarity place pairs of related forms in correspondence. Once established, the correspondence relation can enforce complete identity (McCarthy and Prince 1995). I borrow from Zuraw (2002) and Rose and Walker (2004) the idea that phonological similarity is a sufficient trigger of the correspondence relation, and I extend this idea, following Burzio (2005), to the paradigmatic dimension. From Burzio I also adopt the insight that similarity cumulates on multiple dimensions to reach the critical threshold needed for syncretism. In the cases studied here, lexical and syntactic factors will contribute to it too. The reader will observe the connection between the cases discussed here and phenomena studied in Burzio's (2005) work on representational entailments. To keep the focus on the key point that SAS is predictable, I defer discussion of Burzio's formal proposals.

To implement a correspondence-based analysis, we need to identify what units stand in correspondence. Here I anticipate a result from section 6.3.4, which shows that all obstruent-initial suffixes of Latin consist of a consonantal stem extension, followed by the body of the suffix. This motivates the stem structure $[[\text{Root}-(V)-C]_{\text{MinStem}} - \text{VC}_o]_{\text{Stem}}$, with a Minimal stem (MinStem) consisting of the root plus a monoconsonantal suffix or stem extension, embedded within the stem proper. The contribution of the MinStem structure to the analysis of *t*-stem syncretism is to provide the unit on which similarity and correspondence are defined: it is MinStems like [scrip-*t*] and [scrib-*i-t*] that are similar, become correspondents, and eventually merge.

6.3.3 Similarity-based syncretism

Using MinStems, and expectations for Latin derivatives outlined in (27), the data in (29) reminds the reader of the intended effect of *t*-stem syncretism. The MinStems of the centre column are expected in virtue of (27), but surface-identical to those in the left column.

(29) Merging Minimal Stems

- a. [aud-*i-t*]-us *[aud-*i-t*]-or → [aud-*i-t*]-or
- b. [mō-*t*]-us *[mov-*i-t*]-or → [mō-*t*]-or
- c. [locū-*t*]-us *[loqu-*i-t*]-or → [locū-*t*]-or
- d. [coc-*t*]-us *[coqu-*i-t*]-or → [coc-*t*]-or
- e. [lā-*t*]-us *[fer-*i-t*]-or → [lā-*t*]-or
- f. [caes]-us *[caed-*i-t*]-or → [caes]-or

The stem merger must explain four deviations from the derivational template dictated by (27), [ROOT-i-tX_{suffix}]_{stem}:

- (30) Deviations from (27) encountered in *t*-derivatives
- $\bar{V}t$ -, not *it*-: The *t*-derivative contains a [ROOT- \bar{V} - *t*]_{MinStem}-, if it is deverbal and if the verb's *t*-participle contains [ROOT- \bar{V} - *t*]_{MinStem} (e.g. *auditor*, not **aud-i-t-or*).¹²
 - t*-, not *it*-: The *t*-derivative contains [ROOT- *t*]_{MinStem} -, if it is deverbal and the verb's *t*-participle lacks the buffer -*i*- (e.g. *mōtor*, *locūtor*: not **mov-i-tor*, **loqu-i-tor*).
 - Suppletion: The *t*-derivative contains a suppletive allomorph of the verb, if the verb's *t*-participle contains that suppletive allomorph (e.g. *lātor* not **fer-i-tor*).
 - s*-, not *it*-: The *t*-derivative contains [ROOT- *s*]_{MinStem} if it is deverbal and if the MinStem of verb's *t*-participle ends in -*s*. (e.g. *caesor*, not **caed-i-tor*).

These effects cannot be obtained by the application of standard phonological processes. They are obtained by placing surface MinStems in correspondence whenever they satisfy the following similarity conditions: they are lexically related, containing allomorphs of the same root; and they end in coronal obstruents, as all pairs in (29) do. The constraint CORR_{SIM} (subscript SIM for *similarity*) achieves this:

- (31) CORR_{SIM}: For any pair of surface MinStems S₁, S₂
if (a) S₁, S₂ are lexically identical
and (b) S₁, S₂ end in homorganic, [α sonorant] segments
then S₁, S₂ stand in correspondence.

All triggers of syncretism in the present study take this form, combining a lexical-identity condition like (a) with additional similarity clauses like (b). The phonological similarity condition (b) can be written broadly, as shown in section 6.3.4, to include all pairs of homorganic consonants of identical sonorancy, but only *t* and *s* provably participate.

The effect of CORR_{SIM} is seen in the tableaux of (32), which compare candidates that satisfy the conditions in (27) with candidates that satisfy CORR_{SIM}. Correspondence is marked by co-superscripts. The non-correspondent (a) candidates, which abide by (27), are rejected by CORR_{SIM}. Candidates that satisfy CORR_{SIM} are forced by MAX, DEP, and IDENT to become identical, violating (27). This is how the (b) candidates in (32) are excluded.

¹² If the derivational suffix attaches to the *inflectum* stem, as (27) allows it to, then forms like *auditor* are not deviant. What needs to be explained is the fact that **aud-i-tor*, which is also sanctioned by (27), is impossible.

- (32) If CORR_{SIM} is satisfied, further conditions promote strict identity between MinStems

Root: <i>aud-</i> ; Perf. Part: [aud- <i>ī-t</i>] ⁱ - <i>us</i>		CORR _{SIM}	MAX/DEP, IDENT OO	(27)
a.	[[<i>aud-i-t</i>] ^j - <i>or</i>]	*!		
b.	[[<i>aud-i-t</i>] ^j - <i>or</i>]		*! (<i>ī-i</i>)	
c.	[[<i>aud-ī-t</i>] ⁱ - <i>or</i>]			*

Root: <i>caed-</i> ; Perf. Part: [<i>caes</i>] ⁱ - <i>us</i>		CORR _{SIM}	MAX/DEP, IDENT OO	(27)
a.	[[<i>caed-i-t</i>] ^j - <i>or</i>]	*!		
b.	[[<i>caed-i-t</i>] ⁱ - <i>or</i>]		*! (s-d, i-∅, t-∅)	
c.	[[<i>caes</i>] ⁱ - <i>or</i>]			*

Root: <i>fer-, lā-</i> ; Perf. Part: [<i>lā-t</i>] ⁱ - <i>us</i>		CORR _{SIM}	MAX/DEP, IDENT OO	(27)
a.	[[<i>fer-i-t</i>] ^j - <i>or</i>]	*!		
b.	[[<i>fer-i-t</i>] ⁱ - <i>or</i>]		*! (f-l, e-ā, r-∅)	
c.	[[<i>lā-t</i>] ⁱ - <i>or</i>]			*

Suffixes like the *-ax* of *aud-ax* which do not begin with a coronal obstruent cannot violate CORR_{SIM} and thus cannot trigger stem merger.

The merger of MinStems favors the *t*-participle. This fact is analysed here by having the participle function as a derived input in the evaluation of the *t*-derivative. This holds both for productively created participles like *auditus*, *caesus* (analysed as in (15)–(16)) and for suppletive participles like *lātus*, which must be lexically listed. The asymmetry stems from the fact that, while the *t*-participle is an input in the evaluation of each *t*-derivative, no *t*-derivative is ever an input in the formation of the *t*-participle.¹³ This explains why the stem merger cannot result in pairs like **caed-i-tor*, **caed-i-tus*. (It is worth noting again that such pairs are not excluded by the non-directional morphemic analysis.) This is how the analysis reflects Priscian's intuition that it is the *t*-derivative that copies the participle.

As noted earlier, the Latin analysis cannot proceed by *suffixing t-initial suffixes, or t-stem extensions, to t- or s-final stems*, because the result would be intermediate structures like [aud-*ī-t*]-*t-or*, [*caes*]-*t-or*, surfacing as *[*audīsor*], *[*caestor*], or, with *i*-insertion, as [*auditōr*] [*caesītōr*]. The CORR_{SIM} analysis avoids this consequence by distinguishing two senses of the term *base*: one is the *base of affixation*,

¹³ Why it is the *t*-participle that influences the *t*-derivatives, not vice versa, is a point I do not address here. See Steriade (forthcoming) for speculations on comparable directional effects elsewhere in the verbal system of Latin.

the expression to which suffixes are attached; the other is the *correspondence base*, an expression that a derivative may stand in correspondence to. The correspondence base may cause a derivative to become more similar to it (as we have seen that *t*-participles become similar to the verbal perfect stems) or less similar (as in cases of anti-homophony: Kenstowicz 2005). The *t*-participle's stem functions as a correspondence base for the *t*-derivatives, but not as a base of affixation. Further evidence for this distinction is presented in Steriade (1999, 2008) and Steriade and Yanovich (2015).

The Latin CORR_{SIM} constraint is a member of a larger class. Two other instances of it, selected for their similarity to Latin, are discussed in section 6.5 below. In all three cases, lexically related stems or words ending in coronal obstruents undergo syncretism. All CORR_{SIM} constraints involve correspondence between surface forms; hence the designation OO, for *output-to-output* (Benua 1997) on the MAX/DEP IDENT constraints in (30) that enforce similarity between the correspondent stems.

6.3.4 Extensions

This analysis makes predictions beyond the cases considered. Some of these are innocuous, given other facts of Latin morphology, while others make it necessary to sharpen our understanding of the CORR_{SIM} constraint and of MinStems.

According to (31), five other verbal forms are potentially subject to merger with the *t*-participle: the supine, a verbal noun; the future participle; the present participle; the gerund and the gerundive. From the root *caed-* 'cut', these forms are, respectively, supine *caesum* 'cutting'; future participle *caes-ūrus* 'who will cut'; present participle *caed-en(t)-s* 'who is cutting'; gerund *caed-end-um* and gerundive *caed-end-us* 'who must be cut'. The supine and the future participle participate in the *t*-stem merger, as noted by Aronoff and predicted by the current analysis, but the present participle and the gerund forms do not.

First, we justify the fact that the supine and the future active participle do, as a rule, merge their stems with that of *t*-participle. The reason is that both of these categories are marked by *t*-initial suffixes. This is shown when they occasionally, rarely, deviate from stem merger. Thus, while the *t*-participle of *lav-ā-re* 'wash' is *lau-t-us* 'washed', its supine is not **lau-t-um* but *lav-ā-t-um*, a form whose *-t* is clearly not part of this verb's *t*-stem. Similarly, the *t*-participle of *mor-i* 'die' is *mort-u-us*, but its future participle is *mor-i-t-ūrus* 'who will die', not **mort-(u)-ūrus*. As with the deviant agentives of (23), these deviations from *t*-stem merger diagnose their underlying suffixal consonants: by this test, both the supine and the future participle suffix are *t*-initial. Note too that these deviating forms abide by the conditions in (27), and by the generalizations in (24), *mutatis mutandis*.¹⁴

¹⁴ Aronoff (1994) provides further instances of such deviant future participles.

What about the remaining forms? In all the other cases, the suffix is vowel initial: *-ent-* for the present participle and *-end-* for gerunds and gerundives.¹⁵ These do not participate in the *t*-stem merger because the root does not form a MinStem with any VCC suffixes. The evidence of the next section (6.3.5) suggests that the MinStem consists of a root, a theme vowel or buffer *i*, and a monoconsonantal suffix or C extension: the *-enC-* suffixes are V-initial and they are not mono-consonantal. On either grounds they do not qualify as MinStem forming.

The similarity conditions imposed by CORR_{SIM} are met by the pairs *t-t*, *t-s*, but also by *t-d*, *s-d*. There are no *d*-initial deverbal suffixes.¹⁶ But there do exist *t*- and *s*-initial inflectional suffixes that bear comment: the *perfectum s* (e.g. *dixisse* ‘to have said’), the *t*-initial endings of the 3rd person singular (e.g. *dic-i-t* ‘he, she says’) and of the 2nd plural (e.g. *dic-i-tis* ‘you-pl. say’). These items raise the spectre of unwanted correspondence between pairs of substrings like *dik-s-* in *dix-is-se* and *dic-t-* in *dict-us*. A possible remedy is that person, number, and tense/aspect suffixes in verbal forms are introduced at higher levels of structure than either the participial *t/s* or the derivational suffixes. Then, the simplest amendment to the analysis is to assume that MinStems do not contain exponents of such structures. This condition is comparable to the requirement that inflection markers are restricted to the periphery of the Latin word. Under this assumption, neither [*dik-s*] nor [*dic-i-t*] are MinStems, so CORR_{SIM} will not be activated by either.

Beyond the coronal class, the pairs *p-b*, *p-f*, *b-f*, *k-g* and *r-l*, *l-n*, *v-m* meet the phonological similarity condition in (31): ‘homorganic, [a sonorant]’. Of these, *b* initiates several suffixes (*-bulum*, *-brum*, *-bilis*, *-bundus*), as does *k* (*-culum*, *-crum*). CORR_{SIM} predicts that the stems of these sets of derivatives will be identical. However, with the exception of *-bilis*, discussed in section 6.4.3 below, these suffixes are much less productive than the *t*-suffixes, each of which generates hundreds and sometimes thousands of items. This means limited opportunities to observe the effect of pairs of similar affixes on each other’s stem: we do not have more than a couple of roots forming two derivatives with *b*-suffixes, so we cannot tell if the stems of these derivatives are systematically identical, in the way *t*-stems are, over and above what we expect from regular concatenation of affixes to root. Attested forms are consistent with CORR_{SIM}—e.g. pairs like *pud-i-bilis* ‘something to be ashamed of’ and *pud-i-bundus* ‘shy, shameful’ on *pud-*‘be ashamed’. They fall however into the familiar

¹⁵ The short *e* regularly deletes after the non-high *-ā-* and *-ē-* theme vowels of first and second conjugation verbs: *amā-ēnt-s* ‘who loves’; *dēl-ē-ēnd-us* ‘that must be obliterated’. Even after *e*-deletion, the condition that MinStems allows only one C-extension excludes the possibility that these suffixes can generate MinStems. Independent evidence for this condition on C extensions is provided in the analysis of *-bilis* forms, in section 6.4.3.

¹⁶ The adjectival *-idus* begins with invariant *i*, as shown by items like *flu-idus* ‘fluid’, on *flu-* ‘flow’, which lack synchronic justification for a buffer *i*.

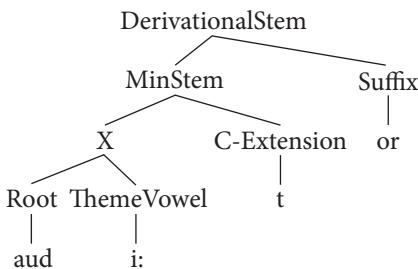
pattern Root-i-Suffix, so their observed stem similarities need not be due to the CORR_{SIM} constraint.

It is possible then, albeit not necessary, to state the phonological similarity condition in broad terms, as applying to all points of articulation. We have also seen that CORR_{SIM} must act in Latin on units corresponding to levels of syntactic structure that exclude tense and agreement markers: the latter have no effect on the *t*-derivatives of their roots.

6.3.5 Minimal stems and suffix internal structure

The MinStem analysis requires *t*-suffixes be bipartite: *tor* in *auditor* must be divided into a *t* extension and an *or* suffix proper to yield the structure [[[*aud*-*i*]-*t*]-*or*:

- (33) Minimal stem and C-extension in *auditor*



This partition allows us to identify the unit of correspondence in strings like *aud-i-t*. If the unit of correspondence was the complete derivational stem of the *t*-derivative, e.g. *aud-i-tor*, CORR_{SIM} would wrongly cause global identity between pairs of stems like *aud-i-t-* and *aud-i-tōr-*, wiping out all affixal distinctions between the two. This is the theory-internal motivation for the MinStem hypothesis.

There is also independent evidence for the MinStem and the affixal division it entails. It comes from the fact that most *t*-suffixes coexist with variants without *t*. The *-tiō* nouns, like *actiō* ‘a driving’ (*ag-* ‘drive’), are found side by side with *-iō* items like *regiō* ‘a directing’ (*reg-* ‘rule’). The syntax of *-tiō* and *-iō* is identical. Similarly, *-īvus* adjectives (e.g. *activus* ‘active’ on *ag-*), coexist with *-īvus* forms (e.g. *in-dic-īvus* ‘indicative’; cf. *dīc-* ‘say’). The identical syntax of these suffixes and their identical VX strings encourage us to treat them as variants, not as distinct morphs. *T*-less variants are better attested for some suffixes than others, but they are attested for most (cf. section 6.7, the Appendix). Optionality in the suffix-initial consonant is found in Latin beyond the *t*-suffixes: *-ilis* and *-bilis*; *-ulum* and *-bulum*, *culum*; *-rum* and *-crum*, *brum* provide comparable pairs. A summary of the evidence for consonantal extensions appears below:

(34) Equivalent CVX and VX suffixes

<i>t</i> -suffix	the <i>t</i> VX variant	the VX variant	root	<i>t</i> -participle
<i>tor</i>	<i>lūsor</i> ‘player’	<i>lūd-or</i> ‘player’	<i>lūd-</i>	<i>lūsus</i>
<i>tiō</i>	<i>-rectiō</i> ‘ruling’	<i>reg-iō</i> ‘direction’	<i>reg-</i>	<i>rectus</i>
<i>tīvus</i>	<i>-dictīvus</i> ‘telling’	<i>-dicīvus</i> ‘telling’	<i>dic-</i>	<i>dictus</i>
<i>tūriō</i>	<i>dictūriō</i> ‘to want to tell’	<i>ligūriō</i> ‘to like food’ (lit. ‘to want to lick’)	<i>dic-, li(n)g-</i>	<i>dictus,</i> <i>li(n)ctus</i>
<i>tūra</i>	<i>fictūra</i> ‘disguise’	<i>figūra</i> ‘shape’	<i>fig-</i>	<i>fictus</i>

<i>b</i> -suffix	the <i>b(R)VX</i> variant	the <i>(R)VX</i> variant	roots
<i>bilis</i>	<i>doc-i-bilis</i> ‘teachable’	<i>doc-ilis</i> ‘teachable’	<i>doc-</i>
<i>bundus</i>	<i>lūd-i-bundus</i> ‘playful’	<i>iuc-undus</i> ‘joyful’	<i>lud-, ioc-</i>
<i>bulum</i>	<i>fund-i-bulum</i> ‘pourer, funnel’	<i>cing-ulum</i> ‘girdle’	<i>fund-, cing-</i>
<i>brum</i>	<i>ter-e-brum</i> ‘instrument for boring’	<i>flag-rum</i> ‘lash, whip’	<i>ter-, flag-</i>

<i>c</i> -suffix	the <i>c(R)VX</i> variant	other <i>(C)(R)VX</i> variants	roots
<i>culum</i>	<i>oper-culum</i> ‘covering, lid’	<i>teg-u-lum</i> ‘covering’	<i>oper-, teg-</i>
<i>crum</i>	<i>sepul-crum</i> ‘place of burial’ <i>läv-ā-crum</i> ‘bath’	<i>fläg-rum</i> ‘lash, whip’ <i>läv-ā-brum</i> ‘bathing tub’	<i>sepel-, fläg-, läv-</i>

The phenomenon of CVX–VX affixal variation is so widespread that merely listing pairs of affix allomorphs, like {*tīvus*, *īvus*}, {*tiō*, *iō*} is an insufficient statement of the general pattern. Affix partition is a step to a better analysis, because the C-extensions are shared by multiple affixes and fall within a narrow class: all are stops. It is then necessary to restrict the range of possible bases for each VX affix: typically these include the root or *infectum* and one or more C stem extensions. Thus, the *-iō* suffix that forms event nouns selects either the root (as in *reg-iō*) or the *t*-extension (as in *ac-t-iō*), but no other extension; the *-ulum* and *-rum* instrument suffixes generally select the *b*-, *t*-, and *c*-extensions (as in *fund-i-bulum* ‘funnel’ on *fund-* ‘pour’, *oper-culum* ‘lid’ on *oper-* ‘cover’), and are, albeit rarely, found on the root (cf. *cing-ulum* ‘girdle’, on *cing-* ‘gird’, *fläg-rum* ‘whip’; cf. *flīgō* ‘strike down’).

For some suffixes, the option of direct attachment, without C-extension, is prominently attested—e.g. *īvus* and *tīvus*; *ilis* and *bilis*—while others are hard to find without a C-extension. Thus, the agent suffix *-or* lacks a *t*-extension in just a couple of forms like *lūdor* ‘player’. There is a good reason for this: unextended *-or* is reserved for state or quality nouns, like *pud-or* ‘shame’ on *pud-e-t* ‘it causes shame’. Some affixes never select any C-extension at all: *-ax* (*aud-ax* ‘bold’) or *-idus* (*flu-idus* ‘fluid’), *-ēla* (*loqu-ēla*). All these differences can be characterized by individual selection conditions: e.g. we assume that the agent suffix is *-ōr*, but we require that it select only the *t*-extension. (35) summarizes all the possibilities: (+) marks rarely attested options.

(35) Affixal differences in the type of base selected

	selected base →	root	<i>t</i> -extension	<i>b</i> -extension	<i>c</i> -extension
a.	<i>-im</i> , <i>-ōrius</i>	+	+		
b.	<i>-or</i> (agent)	(+)	+		
c.	<i>-īvus</i> , <i>-iō</i>	+	+		
d.	<i>-ilis</i>	+	+	+	
e.	<i>-undus</i>	(+)			+
f.	<i>-ulus</i> , <i>-ulum</i> , <i>-rum</i>	(+)		+	+
g.	<i>-āx</i> , <i>-idus</i> , <i>-ēla</i> , <i>-or</i> (quality), others	+			

The fact that the same suffix allows sometimes more than one extension can be used to eliminate an alternative analysis involving affixal C-deletion. Suppose we attempt to derive items like *cing-ulum* via deletion of, say, the *b* of *-ulum* (*cing-bulum* → *cing-Øulum*). Rows (35.d, f) remind us that this analysis will not do justice to the full extent of the variation: *-ulum* and *-culum* variants (e.g. *fundi-bulum*, *oper-culum*) cannot be related via C-deletion.

The data in (34) records cases in which different affixal variants are attested on the same root, with and without a stem extension. Such cases are rare; individual derivatives tend not to vary. There exists, for instance, *actiō* but no **agiō*; we find coexisting *regiō* and *rectiō*, on *reg-* ‘to direct’ but with different meanings (the latter refers to governmental guidance, the former to spatial direction). I do not know if the limited variability reflects spotty attestation, or if the mechanism that underlies the variation predates classical Latin. Such details do not obscure the key point that equivalent CVX and VX suffixes coexist and that, in particular, *tVX* and *VX* variants do. This fact suggests that all derivational *t*-suffixes are divided into an extended Root+*t* MinStem and the suffix proper. This partition is consistent with the idea of MinStem. In turn MinStems are keys to the analysis of the *t*-stem syncretism: they define the units related by correspondence.

6.3.6 A second historical excursus: the later fate of *t*-extensions and *t*-syncretism

The analysis of *t*-stem syncretism depends on identifying *t* as a stem extension in *-tor* and comparable *t*-suffixes. This predicts that if the evidence for stem extensions vanishes, the mechanism generating syncretism becomes rapidly unstable.

This is more than a thought experiment. The VX affixal variants, which provided critical evidence for the stem-extension analysis, were outnumbered by their *tVX*

counterparts in classical Latin. None continues productively into late Latin and Romance: they survive only in frozen forms like *fig-ūra*. It is possible to see in this fact the source of a remarkable development mentioned in section 6.2.8.3: all Romance languages eliminate the syntactically indiscriminate *t*-stem syncretism that characterizes much of Latin's derivational morphology.

The best place to observe this is in the development of agent nouns, which remained as productive in Romance as in Latin, but with a modification of their stems: the descendants of *-tōr* are no longer affixed to the stem of the *t*-participle; cf. (25). One of the most remarkable facts about this change of stem is that it took place very early, affecting across the board all newly generated forms, and leaving intact just inherited lexicalized items or reborrowings from Latin. Of the roughly 40 Italian verbs that have restructured their perfects and are thus unambiguously Italian perfects, not Latin remnants, only one produces an agent noun formed according to the Latin recipe, by using the stem of the perfect participle: *pintore* 'painter' on *pinto*. The others work like *vincitore* (Steriade 2003; Tucker 2000). All other Romance languages went through the identical changes. These are independent innovations, not shared inheritances from Proto-Romance: in each language the stem to which the agent suffix is now added bears traces of sound changes that are unique to that branch of Romance.

We should ask then why it was urgent that in each of the Romance languages, from the earliest documents, the agent nouns switch from the Latin *t*-stem to a new one. We can demote CORR_{SIM} below competing constraints, but possibility is not necessity. The haste with which the Latin *t*-stem syncretism was abandoned in Romance suggests that something had made that change inevitable.

Our analysis identifies the critical factor. What had been a *t*-stem extension in Latin could no longer be recognized once the VX affix variants were lost. At that point, the *t*-suffixes had to be reanalysed as monolithic *-tor*, *-tiō*, *-tīvus*. A direct consequence of this reanalysis was that syncretic pairs inherited from Latin, like *pulsus*, *pulsor* and *victus*, *victor*, could no longer be analysed as effects of CORR_{SIM} applying to the minimal stem: the root and the *t*-portion of the affix no longer formed any unit that could correspond to the comparably structured stem of the perfect participle.

6.3.7 Summary

Some Latin derivational suffixes are bipartite: their initial stop is a stem extension available to multiple affixes; the suffix proper, the exponent of a specific syntactic function, begins with a sonorant, typically a vowel. The root, a possible vowel, plus the C-extension form the MinStem. For any verbal root, the Root-(V)-*t* MinStem of the *t*-derivative is similar to the Root-(V)-*t/s* MinStem of the *t*-participle in the ways prescribed by CORR_{SIM}. On these grounds, the two stems enter in correspondence and are then pressured to become identical.

In this section, our analysis has inched closer to Aronoff's and Matthews' proposals: it has come to agree that the classical Latin suffixes causing *t*-stem syncretism

are, at one level of analysis, vowel-initial. But basic differences remain and these allow this proposal to answer questions that had eluded earlier ones.

First, the *t*-extension and the participial *t/s* suffix are distinct morphological units in this analysis. For Aronoff and Matthews, they are the very same thing. The argument for distinctness starts with the observation that *t*-extensions are found in non-deverbal forms like *iān-i-tor*; and that they always consist of a stop in the default case, never of *s* (cf. (35)). The participial suffix, on the other hand, can be marked by *t* or by *s*. If we conflate the *t*- of the stem extension with the *t/s*-participial suffix, we cannot separate the non-deverbal uses of the *t*-extension seen in *iān-i-tor* from the aspectual function of perfective *s* seen in pairs like *spar-s-ī*, *spar-s-us*. The two morphs participate in syncretism, but their underlying distinctness must be recognized in any complete account.

Second comes the issue of predictability in the *t*-stem syncretism. For us, the affixes that trigger this process are predictable: they are exactly those that select a *t*-extension. Earlier analyses could not obtain this result: without reference to the *t*-extension, a VX affix like the agentive *-or* is indistinguishable from a VX affix like the equally agentive *-ax*. We distinguish them by letting only the former select a *t*-extension. This is an independently observable difference between *-or* and *-ax* when both take nominal bases: compare *iān-i-tor* ‘gatekeeper’, with *t*-extension, with *pugn-ax* ‘combative, inclined to fights’, on *pugna* ‘fight’, without it. Though parallel to *iān-i-tor*, **pugn-i-tax* is impossible because *-ax*, unlike *-or*, cannot select the *t*-extension. The possibility of predicting the class of morphs that lead to syncretism allows us to view this process not as a quirk of Latin grammar but as the result of interaction among general principles. The tools we need are not morphemes and rules of referral, whose *raison d'être* was precisely the impression that syncretism is arbitrary, but rather the more constrained correspondence mechanisms that can take pairs of co-derivatives from partial similarity to total identity.

Third, we have proposed to implement *t*-syncretism as the consequence of correspondence between stems that are similar in their input—e.g. participial [*puls*]-*us* and expected agentive *[*pell-i-t*]-*or* becoming [*puls*]-*us*, [*puls*]-*or*—rather than as a result of adding derivational affixes to the stem of the passive-perfect participle, as Priscian, Matthews, and Aronoff had assumed. Had we done the latter, we would now have to face familiar puzzles about the syntax of these forms: why put a passive-perfective stem inside an aspectually neutral agent noun? This question vanishes once we see that the appearance of the passive stem *puls-* inside the agent noun *pulsor* is the consequence of a phonological chain of events taking place, presumably, in a postsyntactic component. In this sense, our analysis has exonerated the morphosyntax of Latin of the charge of placing exponents of the passive in the wrong syntactic context. The morphosyntactic component is innocent: it assembles unobjectionable structures like the agent noun *pell-i-t-or*, which bear no resemblance to the passive or

the perfect. Phonology then proceeds to modify these, and, following its own laws, produces *pulsor*.

There is another way to look at this last issue: this is to deny that *t*-participles like *pulsus* contain a dedicated exponent of the perfect-passive. To counter this, I give in the next section an argument that the *t*-stem was normally subject to syntactic constraints on its distribution which reflect the fact that it is, among other things, an exponent of the passive.

6.4 The Linking Condition

This section brings in for analysis a new fact. In addition to the *t*-derivatives analysed above, Latin has a second class of deverbal forms containing *t*-stems. These derivatives denote just the participants that can be denoted by *t*-participles: passive subjects (e.g. *duct-ibilis* ‘leadable’; *ductus* ‘led’), and subjects of intransitives or deponents (e.g. *pass-ibilis* ‘who can suffer’; *pass-us* ‘having suffered’ from the deponent *pat-i-or* ‘suffer’). An analysis of this class shows that the *t*-stem is neither meaningless nor syntactically unconstrained: constraints on *t*-stems reflect the passive syntax of *t*-participles. The relation I document between pairs like *ductus-ductibilis*, *passus-passibilis* is the default relation between any base of affixation and its derivative: derivatives inherit both the phonology and the syntactic structure of the bases they contain. If *ductus* is passive and if *ductibilis* is its derivative, *ductibilis* must display effects of the passive voice of the inner verb. Apparent deviations between this default relation of syntactic inheritance between the base of affixation and its derivative, seen in the *t*-derivatives, are due to the effect of CORR_{SIM} , as analysed earlier.

6.4.1 Hypotheses on the syntactic content of the *t*-stem

Earlier work on Latin had sought to sidestep the puzzle of passive stems inside non-passive derivatives by declaring the *t*-stem meaningless or a syntactically unspecified ‘elsewhere’ stem: ‘This Latin stem has no semantic value at all’ (Aronoff 1994: 34, 58); ‘the Vocabulary Items that insert *t*, *s* are highly underspecified with respect to the contexts in which they apply’ (Embick and Halle 2005: 31). If the stem *duct-* of *ductor* ‘leader’ is meaningless and if syntax does not restrict the contexts where its *t*- is inserted, we expect to find this element unrestricted by the syntax of any derivative that contains it. If any restrictions on its occurrence obtain, they should bear no relation to the syntax of the *t*-participle.

This is a testable possibility. If it checks out, this will not affect the phonological analysis presented above, which is made necessary by phonological regularities about *t*-derivatives reviewed earlier and independent of this point. However, if the idea of the meaningless *t*-stems is refuted, this will strengthen the need for our alternative to morphemic or ‘elsewhere’ analyses.

6.4.2 *The t-stems in non-t-derivatives*

The CORR_{SIM} effect discussed earlier is alone responsible for the occurrence of *t*-stems in derivatives suffixed with *t*-extensions. Taking this into account, I check the distribution of *t*-stems in derivatives lacking *t*-extensions, an illustrative subset of which is excerpted below.

- (36) Deverbal forms built by affixation to the root or to the *inflectum* stem

syntactic category	derivative	related verb forms		
		infinitive	t-participle	
adjective of inclination: <i>-āc-</i>	<i>loqu-ax</i>	'talkative'	<i>loqu-ī</i>	<i>locū-t-us</i>
adjective of ability: <i>-(b)ili-</i>	<i>loqu-i-bili-s</i>	'utterable'		
instrument N: <i>-(c)ro-</i>	<i>lūd-i-cru-m</i>	'plaything'	<i>lūd-e-re</i>	<i>lū-s-us</i>
stative Adj: <i>-(b)undo-</i>	<i>lūd-i-bundu-s</i>	'playful'		
verbal Adj: <i>-(ā)neo-</i>	<i>succēd-āneus</i>	'that follows'	<i>-cēd-e-re</i>	<i>ces-s-us</i>

As we are about to see, such non-*t* derivatives do not absolutely reject the *t*-stem as a base of affixation, but they constrain its use. This is most clearly reflected in the formation of the adjectives of ability in *-bilis* and *-ilis*, which can add their suffixes to the *inflectum*, the root, or the *t*-stem. In this section we observe that the range of event participants to which these adjectives can refer depends on the composition of the inner stem. Root and *inflectum*-based forms can refer to any argument of the tensed verb that occupies its subject or object position, while forms containing the *t*-stem refer only to arguments that corresponding *t*-participles refer to: e.g. *ducibilis* means both 'who can lead' and 'leadable', while *ductibilis* can only mean 'leadable'. This pattern is evidence for a mechanism that links the choice of stem in the deverbal derivatives to the argument structure of the verb form employing that stem. Its significance is that it demonstrates a necessary link between the *t*-stem as phonological exponent and the syntactic structures specific to the *t*-participle.

The effects of this link are best documented with *-(b)ilis* adjectives, but further data suggests that it holds for all other Latin derivatives. The glaring exception is the *t*-derivatives: what is needed then is an analysis of Latin that explains why the passive *t*-stem is used in *t*-derivatives in spite of this restriction. The CORR_{SIM} analysis has done this.

6.4.3 *Form and function in -(b)ilis forms*

6.4.3.1 *Arguments denoted by -(b)ilis forms* There are over 700 *-bilis* and about 125 *-ilis* adjectives in the Perseus database. Of the *-bilis* forms, roughly 600 are deverbal and denote things or people that have the potential to participate in an event as its themes,

experiencers, goals, or agents.¹⁷ Thus, *āmābilis* means ‘lovable’; *cantābilis* ‘worthy of singing about’. Both refer to the theme of their verbs, as do most *-bilis* forms. But *dōnābilis* means ‘worthy of a gift’, a potential goal; *patibilis* is ‘capable of suffering’, an experiencer. Some 70 deverbal *-bilis* forms denote potential agents, including *conducibilis* ‘conducive’, *testābilis* ‘who can testify’, *contemplābilis* ‘taking aim’, *captābilis* ‘that can take’, *vulnerābilis* ‘who can cause damage’.¹⁸ A proportionately larger group of *-ilis* adjectives, about 85, are deverbal too. They are similarly divided into a majority that conveys passive ability, like *frag-ilis* ‘breakable’, and a minority that refers to agents or experiencers, like *sens-ilis* ‘who can feel’.

6.4.3.2 *The stem of -(b)ilis forms* The suffix *-bilis* can attach to the root, the *inflectum*, or the *t*-stem.

(37) Bases of *-bilis*

i. The root: Root- (Buffer [i]) - *bilis*

		gloss	Root	inflectum	<i>t</i> -stem
a.	<i>dōc-i-bilis</i>	teachable	<i>dōc</i>	<i>dōc-ē-</i>	<i>dōc-t-</i>
b.	<i>aper-i-bilis</i>	which can open	<i>aper</i>	<i>aper-i-</i>	<i>aper-t-</i>
c.	<i>ten-i-bilis</i>	which can be grasped	<i>ten</i>	<i>ten-ē-</i>	<i>ten-t-</i>

ii. The *inflectum* stem: Root- (*Inflectum* suffix) (Theme V) - *bilis*

		gloss	root	inflectum	<i>t</i> -stem
a.	<i>co-gnōsc-i-bilis</i>	recognizable	<i>gnō-</i> , <i>gni-</i>	<i>-gnō-sc-i-</i>	<i>-gni-t-</i>
b.	<i>aud-ī-bilis</i>	audible	<i>aud</i>	<i>aud-ī-</i>	<i>aud-ī-t</i>
c.	<i>dōm-ā-bilis</i>	tameable	<i>dōm</i>	<i>dōm-ā-</i>	<i>dōm-i-t</i>

iii. The *t*-stem: t-Stem – (Buffer [i]) - *bilis*

		gloss	root	inflectum	<i>t</i> -stem
a.	<i>a-scens-i-bilis</i>	climbable	<i>-scend-</i>	<i>-scend-i-</i>	<i>-scens-</i>
b.	<i>apert-i-bilis</i>	which can be opened	<i>aper</i>	<i>aper-i-</i>	<i>aper-t-</i>
c.	<i>con-fūs-i-bilis</i>	embarrassable	<i>-fū(n)d</i>	<i>fund-</i>	<i>-fūs-</i>

If the base ends in a C, the familiar buffer *i* occurs before *-bilis*, and otherwise the theme vowel is directly followed by *-bilis*. Thus, the distribution of *-ibilis* and *-ābilis*, the common variants of *-bilis*, is predictable: *-ibilis* involves *-bilis* suffixed to a C-final base, with *i* separating stem and affixal consonants as in other formations; while *-ābilis* (e.g. *domābilis*) represents affixation to a verb of the first conjugation, where *ā*

¹⁷ A few are not deverbal: e.g. *aerumnābilis* ‘possibly wretched’ on *aerumna* ‘misery’; *pestibilis* ‘pestilential’ on *pestis* ‘pest’; *febribilis* ‘which produces fever’ on *febris* ‘fever’.

¹⁸ The counts vary because some forms lend themselves to two analyses, as deverbal or denominal: *nauseābilis* ‘which can cause nausea’, could come from the noun *nausea* or from *nauseāre*.

is last element of the *inflectum* stem. Between them, these two options exhaust the bulk of *-bilis* formations.¹⁹

The suffix *-ilis* can similarly attach to the root and the *t*-stem: e.g. *lab-ilis* ‘prone to slip’ and *script-ilis* ‘which can be written’, from *lab-or*, *laps-us* ‘to slip’ and *scrib-o*, *script-us* ‘to write’. Evidence for *inflectum*-based *-ilis* is hard to come by: the most common marker of the *inflectum*, its theme vowel, will delete before the suffix-initial *i*.

The variation in (37) suggests that some roots might allow more than one type of *-(b)ilis* form. Indeed some do: e.g. *labilis*, *lapsilis*; *ascensibilis*, *ascendibilis*.²⁰ In this category we also find cases where variation of form is matched by a difference of interpretation: *ducibilis* can mean ‘that can lead’ while *ductibilis* means just ‘leadable’. This is interesting. It suggests that the stem of passive *ductus* ‘led’ can be used as a base of affixation only if it carries with it something of the syntax of a passive form. Similarly, from the deponent *patior*, *passus* ‘endure, feel’, *patibilis* means ‘which can endure, be endured’, while *passibilis* means only ‘which can endure’, corresponding to the exclusive experiencer-oriented interpretation of *passus*. What are the principles behind this variation? How does the stem of the adjective relate to its interpretation?

6.4.3.3 Linking stems and interpretation To pursue the link between form and interpretation we use an exploratory hypothesis: forms containing the *t*-stem refer to the same arguments as corresponding *t*-participles:

- (38) The Linking Condition (LC): a *-(b)ilis* adjective formed by affixation to the *t*-stem of a verb V can only refer to event participants that a *t*-participle of V can.

I assume that general principles predict the range of argument types that a *t*-participle can refer to. These principles can be inferred from the broad generalizations they produce, which are: (a) all active, obligatorily transitive verbs have *t*-participles that refer only to the verb’s object, generally a theme; (b) any *t*-participles on intransitive or deponent verbs refer to the participant-referring expression in subject position, whatever its argument type. The LC predicts that the arguments to which *-(b)ilis* adjectives containing *t*-stems can refer will be limited by these conditions: (a) *-(b)ilis* forms containing the *t*-stems of transitive verbs will have a strictly passive meaning, referring to the theme; (b) those coming from an intransitive or deponent will refer to whatever event participant the subjects of those verbs can refer to. Supportive examples follow:

¹⁹ Less frequent options are *-ibilis*, e.g. *audibilis*; *-ēbilis*, e.g. *delēbilis*, both on the *inflectum* of fourth and second conjugations; *-ūbilis*, *-ōbilis* contracted from *-uvibilis*, *ovibilis*, e.g. *solvibilis*, *mōbilis*.

²⁰ More doublets: *rumpibilis*, *ruptibilis* ‘tearable’; *conversibilis*, *convertibilis* ‘changeable’; *suādibilis*, *suāsibilis* ‘persuadable’, *aper(t)ibilis* ‘openable’; *percipibilis*, *perceptibilis* ‘perceivable’.

(39) Deverbal -(b)ilis adjectives containing *t*-stems

- a. Base = transitive verb

<i>concuss-i-bilis</i> ‘shakeable’	<i>concutiō; concussus</i> ‘shake; shaken’
<i>in-flex-i-bilis</i> ‘changeable’	<i>flectō; flexus</i> ‘bend, change; changed’
<i>comēst-i-bilis</i> ‘eatable’	<i>comedō; comēstus</i> ‘eat; eaten’
<i>clūs-ilis</i> ‘closable’	<i>clūdō; clūsus</i> ‘close; closed’
<i>spars-ilis</i> ‘scatterable’	<i>spargō; sparsus</i> ‘scatter; scattered’

- b. Base = intransitive, optionally transitive (glosses for intransitive options only)

<i>of-fens-i-bilis</i> ‘liable to stumble’	<i>-fendō; -fensus</i> ‘stumble; having stumbled, offensive’
<i>di-gest-ilis</i> ‘promoting digestion’ <i>flux-ilis</i> ‘fluid, able to flow’ <i>errāt-ilis</i> ‘wandering’	<i>gerō; gestus</i> ‘digest; having digested’ <i>fluō; fluxus</i> ‘flow; having flowed, loose, flowing’ <i>errō; errātum</i> ‘wander, err; having wandered’

- c. Base = deponent verb

<i>com-pass-i-bilis</i> ‘suffering w. one’	<i>-patior, passus</i> ‘suffer; having suffered’
<i>ē-locūt-ilis</i> ‘eloquent’ <i>laps-ilis</i> ‘slippery’	<i>-loquor, locūtus</i> ‘speak; having spoken’ <i>-labor, lapsus</i> ‘slip; having slipped’

The data summarized here shows that for verbs whose *t*-participle is passive (39.a), the *t*-stem derivative in -(b)ilis refers only to the theme, e.g. *concuss-i-bilis* ‘shakeable’. A handful of exceptions are discussed below. Intransitives (39.b) allow -(b)ilis forms to refer to the verb’s external argument, because their *t*-stem participle can. Optional intransitives allow theme *and* agent-oriented -(b)ilis forms: next to *digestilis* ‘promoting digestion, i.e. able to digest’ we find *digestibilis* ‘digestible’. That is because *digerō* goes both ways on transitivity, allowing both active intransitive *digestus* ‘having digested’ and, from transitive *digerō*, the passive *digestus* ‘digested’. The *t*-participles of deponents like *patior* (39.c) behave like those of intransitives: corresponding -(b)ilis forms likewise follow the intransitive pattern.

We can also state what is *not* found. If the *t*-participle of a verb cannot refer to the theme, then corresponding *t*-stem -bilis items cannot either. Thus, *passus* means ‘who has suffered, endured’ never ‘which has been endured’.²¹ Correspondingly, *passibilis* only means ‘who can endure’, and not ‘endurable’.

²¹ For instance, *passi graviora* ‘those who have endured worse’ (Naevius 1, 24). I have found no example of *passus* in Perseus which refers to the thing endured.

To verify these generalizations, I have searched the set of *t*-stem -(*b*)*ilis* forms in Perseus. There are 68 items involving *-bilis*, counting different prefixed forms on the same root as distinct, as their semantics can diverge; and 72 *-ilis* forms. All *-bilis* adjectives found in the classical language (e.g. *flexibilis*, *prehensibilis*, *plausibilis*, *sensibilis*) are based on transitive verbs and refer only to passive ability, as the LC predicts. Late Latin has five items, all hapaxes, whose glosses suggest violations of the LC: for instance *rīsibilis* (on *rīdere*, *rīsus* ‘laugh’) is said to mean ‘who laughs’ in one text; all other tokens of this word have the passive-ability sense of ‘laughable’²² and thus belong to vast majority of *t*-stem *bilis*-words whose interpretation is linked to the *t*-participle.²³ I conclude that the LC is true of the *-bilis* adjectives at least in the classical language.

The situation is different with *-ilis*. There is a much larger number of items that look problematic for the LC. Some might fall in the category of *-ilis* derivatives based on the active *t*-participle of an intransitive (39.b), with unattested *t*-participles: e.g. *reptilis* ‘who crawls’ (*repō* ‘crawl’). But there is still a substantial residue of forms whose *t*-participles diverge in their interpretation from the corresponding *-ilis* forms: among them, *mictilis* ‘deserving to be defiled’, from the intransitive *mingō*, *mictus* ‘urinate’; *plausilis* ‘applauding, clapping’, from the transitive *plaudo*, *plausus* ‘clap’; *sensilis* ‘who can feel’, from transitive *sentiō*, *sensus* ‘feel’; *deletilis* ‘which wipes out’, from transitive *deleō*, *delētus* ‘destroy; destroyed, wiped out’, and *altilis* ‘nourishing’, from transitive *alō*, *altus* ‘to feed; fed’. These are well-attested classical words. We cannot find a satisfying local explanation for each.

There is however a different way to look at *-ilis*, which draws a tighter connection to the full analysis and solves the problem: this suffix selects a *t*-extension. The clearest evidence comes from forms like the following, which contain an unexpected suffixal *t/s* but not a participial *t*-stem:

- (40) *-ilis* adjectives containing a *t*-extension
- a. *pluviā-tilis* ‘pertaining to rain’ *pluvia* ‘rain’
 - b. *fer-tilis* ‘which can bear fruit’ *ferre*, *lātus* ‘bear’
 - c. *ūten-silis* ‘fit for use’ < *ūtend-* *ūtor*, *ūsus*, *ūtendus* ‘use; used; to be used’
tilis

²² The full list of deviations is: *interfectibilis* ‘deadly’ on *interficere*, *interfectus* ‘kill’; *percussibilis* ‘penetrating’ on *percutere*, *percussus* ‘beat through’; *persuāsibilis* ‘persuasive’ on *persuādere*, *persuāsus*; *visibilis* ‘who can see’ on *vidēre*, *vīsus* ‘see’. These are all hapaxes. The contexts where they occur have been unavailable to me.

²³ Incomplete attestation is a problem in testing the LC: thus *rīsibilis* in the common sense of ‘laughable’ presupposes a passive *t*-participle *rīsus* ‘laughed at’, but this is not found in Perseus texts. We can verify other points predicted by the LC: the base verb *rīdere* is indeed transitive, taking as its direct object the target of laughter (*rideō hunc* literally ‘I laugh him’); this object can be passivized (*rideātur meritō, qui...* ‘will be laughed at deservedly, the one who...’). All this suggests that a passive *t*-participle *rīsus* ‘laughed at’ exists too. Within such limits of plausibly accidental non-attestation, the LC holds.

Forms like *pluviā-tīlis* are denominal, so their *t*- cannot be attributed to a *t*-stem: then where is it coming from? The *t*-stem of *ferō* is *lātus*, but *fertilis* shows *fert-*. This is both a rare violation of CORR_{SIM} and simultaneously evidence for a *t*-extension. *Utensilis* has the same status: it can be unpacked as *ūtend-tīlis*, where *ūtend-* is the stem of gerund *ūtendus* ‘to be used’. When suffixed with the same *-tīlis*, *ūtend-tīlis* will yield observed *ūtēnsilis* via regular devoicing, *tt*→*ss*, and degemination.²⁴ Without the possibility of a *-tīlis* variant, none of these items can be explained.

Once we understand that *-tīlis* can select a *t*-extension, much more than the items in (40) comes into focus. First, all problematic forms for the LC, like *sensilis*, *deletīlis*, *plausilis*, receive a uniform interpretation: the *t*-extension selected by *-tīlis* forms a MinStem with the root, and this MinStem merges with that of the *t*-participle through the correspondence mechanisms examined earlier. So the mismatch between the syntax of, say, passive *sensus* ‘perceived’ and that of experiencer *sensilis* ‘who can perceive’ is parallel to that involving the passive *pulsus* ‘pushed’ and the agentive *pulsor* ‘pusher’: the similarity within each pair of forms is an effect of CORR_{SIM} . To illustrate this, the tableaux in (41) compare the formation of two *-tīlis* adjectives, one with a *b*-extension ((*con*) $[duc-i-b]$ _{MinStem}*-tīlis* ‘who can lead’); and one with a *t*-extension (*sensilis* ‘who can perceive’ < [*sent-i-t*]_{MinStem}*-tīlis*). In the first case, the *t*-participle *ductus* has no effect on *ducibilis* because the MinStems [*duc-t*] and [*duc-i-b*] end in heterorganic consonants; in the second case the *t*-participle *sensus* does exert pressure on the stem of the *-tīlis* adjective, because both MinStems [*sens*] and [*sent-i-t*] end in coronal obstruents and this activates CORR_{SIM} . MAX IO records the loss of affixal consonants.

- (41) (a) *ducibilis*

Root: <i>duc-</i>	CORR_{SIM}	MAX/DEP, IDENT OO	(27)	MAX IO
Perf. Part: $[duc-t]^i$ - <i>us</i>	⋮	⋮	⋮	⋮
Suffix <i>-b</i> - <i>tīlis</i>	⋮	⋮	⋮	⋮
a. $[[duc-i-b]^j$ - <i>tīlis</i>]	⋮	⋮	⋮	⋮
b. $[[duc-t]^i$ - <i>tīlis</i>]	⋮	⋮	*!	*(b)

- (b) *sensilis*

Root: <i>sent-</i>	CORR_{SIM}	MAX/DEP, IDENT OO	(27)	MAX IO
Perf. Part: $[sens]^i$ - <i>us</i>	⋮	⋮	⋮	⋮
Suffix <i>-t</i> - <i>tīlis</i>	⋮	⋮	⋮	⋮
a. $[[sent-i-t]^j$ - <i>tīlis</i>]	*!	⋮	⋮	⋮
b. $[[sent-i-t]^i$ - <i>tīlis</i>]	⋮	*! (s-t), (Ø-i), (Ø-t)	⋮	⋮
c. $[[sens]^i$ - <i>tīlis</i>]	⋮	⋮	*	*(t)

²⁴ Like *fertilis*, *ūtēnsilis* violates Corr_{Sim} : one expects **lātīlis* and **ūsīlis* instead. It is the very fact that Corr_{Sim} is violated here that allows us to directly observe the *t*-extension in these forms.

An adjective like *lab-i-lis* ‘prone to slip’ (*lab-* ‘slip’, *t*-participle *lapsus*) lacks any extension at all. It eludes the effects of CORR_{SIM} in the same way as *ducibilis* does in (41.a).

This analysis explains why we find denominal *-tilis* forms (*pluviā-tilis*) alongside unextended *-ilis* (*imbr-ilis* ‘of rain’, on *imber* ‘rain’) but no denominal **-tibilis* forms alongside *-bilis*: that is because only one C-extension is permitted. The *b*-extension of *-bilis* preempts a *t*-extension. Our analysis can sanction *pluviātilis*, with *t-ilis*, *febribilis*, with *b-ilis*, but no forms like **pluviātibilis*, **pluviābitilis* with stacked *t+b*, *b+t* extensions. On items like *ductibilis* ‘leadable’, see section 6.4.5 below: they do not contain flatly stacked C-extensions but rather a passive stem embedded inside an adjectival one.

One more detail to explain is the fact that the ratio of deverbal *t*-stem *-ilis* forms is much higher than that of *t*-stem *bilis*: over 80 per cent for *-ilis* (72/85) vs 11 per cent for *-bilis* (68/600). This is initially surprising: *-ilis* and *-bilis* both form derivatives denoting potential participation in an event, mostly as a theme, and they contain the very same basic suffix. The difference in *t*-stem ratios can perhaps be understood in the following terms. There is a single *-ilis* suffix; it can attach to a root or an extended MinStem; *t* and *b* are both eligible extensions it selects. The ratio of *t*-stem *-ilis* forms is as high as 80 per cent because this figure conflates two distinct categories: (a) deverbal forms suffixed with the *t*-extension plus *-ilis*, like *sensilis*, whose use of the *t*-stem reflects just the consequences of CORR_{SIM}, not its syntax; and (b) a distinct class of deverbal forms suffixed with unextended *-ilis* and whose use of the *t*-stem reflects a syntactic property of the derivative, namely its passive interpretation. There are fewer *t*-stem *-bilis* items because they are necessarily limited to just the latter class: they cannot contain a *t*-extension.²⁵

The ability of the analysis to explain this striking difference in the frequency of *t*-stems in two almost identical derivational types provides another reason to distinguish the *t*-extension from the suffix-forming *t*-participles, despite their common involvement in syncretism.

6.4.4 *The generality of the Linking Condition*

We have seen that the LC is supported by the vast majority of *-bilis* words, and that *-ilis* forms that seem to violate it do so lawfully because they are *t*-derivatives. We observe next that the LC is fully general. Scattered *t*-stems found with suffixes other

²⁵ A different factor contributes to the relative rarity of *t*-stems with *-bilis* forms: the vast majority of verbs (first or fourth conjugation, *t*-participles *-ātus*, *-ītus*) would form *t-bilis* items longer by one syllable than the ones formed on the *inflectum*: e.g. *amā-bilis* vs **amāt-i-bilis*. Such longer forms are absolutely prohibited: all attested *-bilis* items containing the *t*-stems are as short as the root-based ones, e.g. *ducibilis*, *ductibilis*. (The same length constraint is mysteriously not enforced in *-ilis* forms: *versāt-ilis* ‘changeable’ (*vers-ō*, *vers-ā-t-us* ‘change’) is not blocked by the hypothetical shorter *vers-ilis*. Why this should be remains unknown to me.)

than *-bilis* also have the syntactic properties of corresponding *t*-participles. The adjectival suffix *-āneus* shows the same link between the form of the base and the thematic interpretation of the derivative.

(42) *-āneus* derivatives:

- (a) forms containing *t*-stems have a passive interpretation
 - condit-āneus* ‘suitable for pickling’ *condō, conditus* ‘put up, store; pickle’
 - confūs-āneus* ‘mingled, miscellaneous’ *confundō, confūsus* ‘mix up’
 - reiect-āneus* ‘to be rejected, to be spurned’ *reiectō, reiectātus* ‘reject’
- (b) forms with an active interpretation are based on the root or *infectum*
 - dissent-āneus* ‘disagreeing’ *dissentīō, dissensus* ‘disagree’
 - consent-āneus* ‘consenting’ *consentīō, consensus* ‘agree, consent’
 - oblect-āneus* ‘delighting’ *oblectō, oblectātus* ‘to delight’

Other derivatives that name participants are *-ax* (e.g. *audax* ‘daring’; *audeō, ausus* ‘dare’); *-ō* (e.g. *edō* ‘glutton’; *edō, ēsus* ‘eat’); *-bundus*. (e.g. *cunctābundus* ‘delaying’; *cunctō, cunctātus* ‘delay’; *lūdibundus* ‘playful’; *lūdō, lūsus* ‘play’). These satisfy the LC vacuously, but not trivially: they do not allow theme-oriented derivatives and consequently they lack any *t*-stem derivatives, as our analysis predicts. The *-uus* adjectives (e.g. *noc-uus* ‘harmful’; on *noceō, nocitus* ‘harm’; *exig-uus* ‘scant, limited’; *exigō, exactus* ‘weigh’) use only the root as their base. The LC predicts that they can be theme- or agent-oriented as indeed they are. A large class of derivatives forms names of events, and instruments, locations, or qualities related to these events, with the suffixes *-ēla, -bulum, -culum, -brum, -crum, -mentum, -mōnium, -mōnia*. The LC imposes no constraints on these, unless we treat instrument names as equivalent to agents. Even then, a check of the data reveals no derivatives glossed as instruments and using *t*-stems. *T*-stem forms do occur in this class, but are limited to names of events, locations, or qualities: e.g. *sessibulum* ‘seat, place of sitting’ on *sedēō, sessus* ‘sit’; *parsimōnia* ‘sparingness’, on *parcō, parsus* ‘spare’.

This completes a survey from which all Latin derivational morphology emerges as consistent with the Linking Condition.

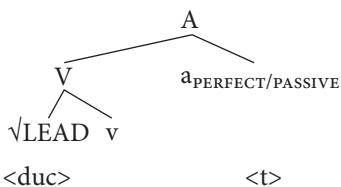
6.4.5 Interpreting the Linking Condition

The simplest account of the Linking Condition is that derivatives like *ductibilis* ‘leadable’ result from two layers of affixation: the passive-perfect *-t* plus an outer derivational affix, *-bilis*. The meaning of *ductibilis* is derived compositionally from the meaning of its components, one of which is a passive participle form. An English form like [[scar-ed]-y], as in *scaredy cat*, is similarly derived as a multiply suffixed form. It contains the phonological form of a passive participle and carries a related passive interpretation: *scaredy* is not *scary*. A closer parallel to Latin *ductibilis* is

provided by the Slovenian deverbal nouns in *-ets*, which denote habitual participants in activities or states (Marvin 2003). The *-ets* nouns contain the stems of the passive (*-en*) or active (*-l*) participles and are interpreted as referring to themes or agents depending on the suffix inside them. Thus *mor-il-ets* ‘killer’ is based on active *mori-l* ‘having killed’ of *moriti* ‘to kill’; *obef-en-ets* ‘the hung person, thing’ is based on the passive *obef-en* ‘which has been hung’.

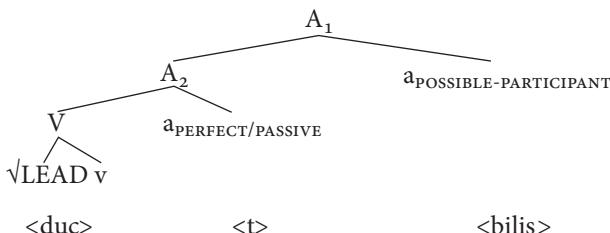
The proposal, then, is that *ductibilis*, like all *-bilis* forms containing *t*-stems, is a derivative whose base of affixation is a passive participle, exactly like Slovenian *obefenes*. The structures in (43–4) make this explicit: morphosyntactic structures are represented as trees whose terminals are either roots, bundles of lexico-semantic features abbreviated by an English gloss in capitals, or functional heads annotated with indications of their category (‘a’ for *adjective* and ‘v’ for *verb*) and subscript features approximating their syntactic-semantic contribution. In a fuller treatment (Steriade forthcoming), these annotations may correspond to distinct functional projections, like *Voice* and *Aspect*. Under each tree appear in angle brackets the morphemes’ exponents. The participle *ductus* is represented as the bare stem *duct-*, stripped of gender, case, and number markers: under further suffixation these other elements disappear.

- (43) *duct-* as in *ductus*, *-a*, *-um*



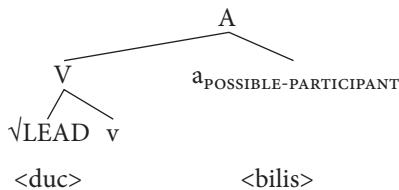
When suffixed to the structure in (43), the *-bilis* suffix will turn this participial structure into the designation of a potential participant in the eventuality denoted by the verb. This contribution is abbreviated as a subscript on the category symbol.

- (44) *ductibilis*



Lacking the inner passive morpheme, root-based derivatives like *ducibilis* are unrestricted in their choice of active or passive interpretation:

(45) *ducibilis*



The critical datum for this study is the contrast between the dual active/passive interpretation of *ducibilis* and the strictly passive interpretation of *ductibilis*. The latter fact follows from the structures proposed: the syntactic structure of passive *duct-* is contained in *ductibilis* but not in *ducibilis*. Regarding *ducibilis*, there is considerably more to say, but none of it is directly relevant to the *t*-stem analysis.²⁶ The main point is that neither *ductibilis*, nor *scaredy*, nor Slovenian *obesenets* can refer to the agent of their inner verbs, because the passive suffixes *-t*, *-ed*, *-an* indicate that the inner verb has been passivized.

This elementary analysis is not available if Latin *-t* is a default morph, inserted in syntactically unrestricted fashion; or, equivalently, if it is meaningless and thus devoid of semantic or syntactic content. A comparison with the explicit proposals of Embick (2000) and Embick and Halle (2005) makes this point concrete. For these writers, the aspect and the voice of Latin verbs is provided with exponents by three rules:

- (46) Realization of Asp not raised to T (from Embick 2000: 218)
- nt-* ↔ [present]
 - s-* ↔ [list]
 - t-* ↔ []

The present participle is marked by the exponent *-nt*: the restriction to the syntactic context [present] blocks insertion of *-nt* into non-present structures. The second exponence rule aims to characterize the handful of unpredictable *s*-participles, like *pulsus*. The third rule inserts *-t* under an Aspect head that has remained bare of exponent in the output of the first two rules. The second and third rule are unrestricted by aspectual information or by voice and are thus free to apply to passive structures,

²⁶ The probable generalization is that Latin derivatives like *ducibilis*, which refer to participants and are root- or *inflectum*-based, denote *any verbal arguments that can occupy the verb's surface subject position*. This includes passive subjects, explaining why *ducibilis* has a dual interpretation, 'leadable' or 'who can lead'. David Pesetsky (personal communication) points out that this generalization is reminiscent of Rappaport and Levin's (1988) and Rappaport Hovav and Levin's (1992) findings about English *-er* nominals. The differences between Latin and English deverbal forms—e.g. the fact that *-er* nouns mostly refer to agents, while relatively few *-bilis* forms do—may derive from the effects of language-internal competition with other available affixes. In Latin there are many more strategies for deriving deverbal agent-denoting expressions, including dedicated agent nouns in *-tor* and adjectives like *-tōrius* and *-ax*. Because these compete with agent-oriented *-bilis*, they necessarily deplete the membership of that class.

like the passive participle, to active verb forms like the active future participle (e.g. *pulsūrus*, *ductūrus* ‘who will push, lead’) and, beyond these, to all *t*-derivatives (e.g. *pulsor*, *duktor*) regardless of voice. So far so good. However, in the absence of syntactic constraints on their application, rules (b) and (c) are also free, in fact compelled, to insert *-t*, *-s* into the stems of all other deverbal derivatives, including *-bilis* and *-āneus*, regardless of their internal syntax.

This is wrong in two ways. First, it excludes the possibility of root- or *inflectum*-based derivatives like *ducibilis* or *succedāneus*; cf. (37.i–ii) and (42). Under the analysis in (46), we cannot exempt any such items from the application of rules (b)–(c). If there is an aspect head in *ductus*, *ducturus*, *duktor* that functions as the recipient of the *t*-suffix inserted by (c), then there must exist a comparable head in the stem to which *-bilis*, and every other deverbal affix denoting participants, attaches to. Then, since the *t*-morph is inserted obligatorily in *ductus*, *ducturus*, *duktor*, it will also be inserted obligatorily in *ductibilis*, and it will likewise be blind to the voice and aspectual properties of those forms. This brings up the second problem, which is that an analysis incorporating the rules in (46) cannot give an account of the generalization expressed by the Linking Condition: items like *ductibilis* denote all and only the participants that the corresponding *t*-participle can denote.

The conclusion is that derivatives like *duktor* appear to be unconstrained by the LC not because the rule system in (46) applies, but because the affixes in *duktor* are similar enough to the participial *t*, *s* to activate CORR_{SIM}. By contrast, derivatives like *ductibilis* are observably constrained by the LC because CORR_{SIM} is never activated by their suffixes and thus never gets to obscure the connection between exponence and syntactic structure.

6.4.6 Summary

This section has shown that the presence of *t*-stems in both passive participles like *ductus* and in non-passive derivatives like *duktor* is not due to the fact that the *t/s* affix forming *t*-stems is a default marker, free to occur in any syntactic context. Rather, *t*-stems appear in deverbal derivatives under only two circumstances: (a) when the derivative’s base of affixation is the passive *t*-participle, as in *ductibilis*, that is, both when the syntactic structure of that *t*-participle and the exponents of that structure are present in the constituent to which the affix is attached; and (b) when CORR_{SIM} causes a pair of similar minimal stems, one of which belongs to the passive *t*-participle, to become strictly identical.

6.5 Similarity based syncretism elsewhere

I have claimed that the Latin MinStems containing affixal *t/s* syncretize because they are phonologically similar. This section outlines two comparable cases found elsewhere,

selected from a larger class, as the ones that bear the closest similarity to the Latin case. In both cases analysed, lexically related forms that are similar, in that both contain coronal obstruents at their right edge, become strictly identical.

6.5.1 English past tenses and past participles: basic generalizations

English strong verbs can have a distinct past tense (PT) and past participle (PP), as in *wrote, written*. Two suffixes are capable of marking either category: *-t*, as in *dealt*, and the productive *-d* of *swelled*. The suffix *-d* can mark one category as distinct from the other, as in (47.a). In many more cases, *-t* or *-d* mark both categories identically, as in (47.b).

(47) *-t/d* marking in the PT and PP

	PT	PP		PT	PP	
(a)						
	dive	dove	dive-d	dwell	dwel-t	dwel-t (Older)
	swell	swelle-d	swoll-en	dwell	dwell-ed	dwell-ed (Newer)

According to the Google n-grams provided at <http://grammarist.com/usage/dove-dived/>, the innovative form *dove* has been on the increase in American English since 1800, and has since 1980 overtaken rival PT *dived*. For our analysis it matters only that patterns like *dove, dived*, with different PT and PP, are possible in some varieties of English.²⁷ It matters even more, as seen later in this section, that uniform paradigms like *dived, dived* or *sneaked, sneaked* can undergo innovative changes which cause the PT and PP to diverge, as in *dove, dived* or *snuck, sneaked*.²⁸

The comparison between *dove, dived* and *swelled, swollen* suggests that *d* is an equally eligible exponent for either the PT or the PP. Forms like *dwelt* show that *-t* can fulfil either of these functions, albeit less productively.

We might expect then, that, all else equal, individual verbs would allow *-t* and *-d* to contrast, choosing for instance *dwelled* in the past and *dwelt* in the participle, or the other way around. This expectation is based on the fact that the PT *can* develop independently from the PP, as seen above. A look at the list of some 190 strong verbs²⁹ shows, however, that no verb uses *-t* and *-d* as *distinct* suffixes; if *-t* marks

²⁷ Albright (2009), following Pinker (1999), treats the PTs of *dive* as a paradigm gap. The Google n-gram data shows that both *dived* and *dove* are robustly attested, but this need not be inconsistent with Albright's position.

²⁸ On *snuck*, see <http://languagelog.ldc.upenn.edu/nll/%20?p=1931>. Of the speakers of A. English informally consulted by this writer, some express a preference for *snuck* as a PP and for *sneaked* as a PT; others express the opposite preference; a third category prefer the same form for both functions. It is the first two categories of speakers that will be relevant here.

²⁹ The data source is <http://www.englishpage.com/irregularverbs/irregularverbs2.html>, verified against the OED. Prefixed verbs were excluded: they do not differ from their bases. Adjectival forms (as in *burnt toast*, etc.) are not considered: our focus is on verbal forms.

either category, *-d* will not mark the other. We find variation between the two, and known trends towards regularization, but no paradigm-internal contrast. Some verbs use *-t/d* in one category and some other mark in the other (*lade-d, lade-n; swelle-d, swolle-n; dove, dive-d; di-d, do-ne*) but none assigns distinct functions to *-t* and *-d*. A summary of this data appears below: ‘same-x’ means that PT and PP are marked by identical suffixes; ‘diff-T’ means that one affix is *-t* or *-d* while the other is *-n* or \emptyset ; finally ‘diff-t&d’ stands for the unattested possibility that one affix is *-t* and the other *-d*, as in hypothetical but unattested paradigm *dwelt, dwelled*.

- (48) Identity and distinctness of PT and PP suffixes in English strong verbs

paradigm type	same- <i>t</i>	same- <i>d</i>	diff-T	diff- <i>n</i>	diff-t& <i>d</i>
lexical freq.	37	9	19	43	\emptyset
example	<i>dwelt</i>	<i>sold</i>	<i>swelled, swollen</i>	<i>wove, woven</i>	* <i>dwelt, dwelled</i>

Further processes of shortening (*keep, kept*), ablaut (*tell, told*), and consonant loss (*teach, taught*) are frequent additional or sole markers of the PT and PP categories. These processes can apply distinctly to PT and PP, as in (49.a); or identically, as in (49.b).

- (49) Ablaut, shortening, C-deletion apply differently to PT and PP (a); or identically (b)

(a)	PT	PP	(b)	PT	PP
	<i>write</i>	<i>wrote</i>		<i>stand</i>	<i>stood</i>
	<i>sing</i>	<i>sang</i>		<i>dig</i>	<i>dug</i>
		<i>written</i>			<i>stood</i>
					<i>dug</i>

The data in (49) raises the expectation that ablaut, deletion, or shortening could apply in the *t/d*-marked past but not in the *t/d*-marked participle, or vice versa: but this never happens either. No verbs exist like **telled, told* (ablaut in one form), **feeled, felt* (shortening in one form), **thinked, thought* (ablaut and C-deletion in one form). Our second generalization is that if suffixal *-t/d* marks both nonpresent forms, their root allomorphs must also be identical.

- (50) If PT and PP are both *t/d*-suffixed, the same rules apply in both or in neither.

(a)	PT	PP	(b)	PT	PP
	<i>teach</i>	<i>taugh-t</i>		<i>reach</i>	<i>reach-ed</i>
	<i>sweep</i>	<i>swep-t</i>		<i>seep</i>	<i>seep-ed</i>
		<i>taugh-t</i>			<i>reach-ed</i>
					<i>seep-ed</i>

I have verified the pattern in (50) against the full list of strong verbs referenced earlier: the generalization is exceptionless.

- (51) Application of ablaut, shortening, or C-deletion (= ‘root allomorph’*) in PT and PP as a function of whether the suffix is the same (-t/d) or different

	same root allomorph	different root allomorph
same suffix in PT and PP (N= 35)	100% e.g. [swəp-t], [swəp-t]	Ø e.g. *[swip-t], [swep-t] or *[swip-t], [swəp-t]
different suffix (N = 45)	35% e.g. [hid], [hid-ən]	65% e.g. [swel-d], [swəl-ən]

This data suggests that the phenomenon uncovered here is not driven by a constraint on affixal contrast, but involves the global identity of word forms that are lexically related and similar in a local respect: they end in an alveolar stop. It is not the contrast between -t and -d that is prohibited: rather, entire stem-suffix units must be identical if they are headed by the same root, if they are both non-present tenses,³⁰ and if they both end in -t/d.

Verbs ending in nonmorphemic *t* or *d* are subject to the same condition. If only one form ends in -t/d, while the other ends in affixal -n, they can be globally distinct, as in (52.a). But if both end in -t/d, morphemic or not, then they must be globally identical, as in (52.b).

- (52) PT and PP from roots ending in -t/d: only one form ends in -t/d (a), or both do (b).

(a)	PT	PP
	<i>write</i>	<i>wrote</i>
	<i>ride</i>	<i>rode</i>
	<i>hide</i>	<i>hid</i>
		<i>writt-en</i>
		<i>ridd-en</i>
		<i>hidd-en</i>

(b)	PT	PP
	<i>hit</i>	<i>hit</i>
	<i>light</i>	<i>lit</i>
	<i>hold</i>	<i>held</i>
		<i>hit</i>
		<i>lit</i>
		<i>held</i>

No contrasts like **bote*, *bited* or **held*, *hold* are found between PT and PP. For non-t/d-final verbs such patterns are attested: we do find *swam*, *swum*; *dove*, *dived*; *came*, *come*; *sank*, *sunk*. I propose that the culprit is the final consonantism: alveolar stops at the end of both PT and PP force the locally similar pair to become globally identical.

This point too has been verified against the full list of strong verbs, by comparing the identity of root allomorphs in verbs that display ablaut, shortening, or C-deletion and whose PT and PP are bare: within this broad class I have compared roots ending in -t/d and in other segments. All 51 roots ending in -t/d with bare PT and PP forms

³⁰ I treat the English *have*-perfect as a complex *tense*, but the issue is complex. See, in particular, Iatridou, Anagnostopoulou, and Izvorski (2001) on the semantics of the perfect tense.

comply with the proposed generalization. This generalization is distinct from the one that emerges from (51): (51) is about roots that end in suffixed *-t/d*, while the current results, seen in (53), involve root-allomorph identity in verbs that end in root *-t/d*. Beyond this difference, (51) and (53) make the same broader point: pairs of PT and PP ending in *-t/d* must be globally identical.

- (53) Application of ablaut, shortening, or C-deletion (= ‘root allomorph’) in unsuffixed PT and PP as a function the final root consonant

	same root allomorph	different root allomorph
Root ends in <i>t</i> or <i>d</i> (N= 51)	100% e.g. <i>hit, hit, sat, sat, bled, bled</i>	Ø e.g. * <i>sit, sat, *bleed, bled</i>
Root ends in other segment (N = 29)	59% e.g. <i>clung, clung</i>	41% e.g. <i>sang, sung</i>

Strong verbs whose PT does not end in *-t/d* tend to have a distinct participle, typically in (*e*)*n*, e.g. *wove, woven*, and they allow ablaut and the like to differentiate the two nonpresent forms: e.g. *struck, stricken; came, come; swam, swum*. It is even possible for innovative forms to introduce a difference between previously identical PT and PP forms, as seen earlier with *snuck* and *dove*. These innovations are consistent with our generalization. But no innovations exist that differentiate *-t/d*-final PT from *-t/d*-final PP forms: *bleed, bled, bled* does not become partially regularized *bleed, bled, bled*, nor does *bite, bit, bitten* become *bite, bit, bited*.³¹ This rounds out the case for our claim: all pairs of PT, PP ending in alveolar stops are globally identical. Below is a summary of the patterns reviewed. The critical datum is the last row.

- (54) Identical, distinct, and impossible pairs of PT and PP forms

	some suffix	no suffix
Identical, <i>t, t</i> final	<i>burnt, burnt kept, kept</i>	<i>put, put lit, lit</i>
Identical, <i>d, d</i> final	<i>burned, burned made, made</i>	<i>rid, rid held, held</i>
Distinct, no <i>t</i> or <i>d</i>	<i>took, taken wrote, written</i>	<i>came, come sang, sung</i>
Distinct, one <i>-t/d</i>	<i>dove, dived swelled, swollen</i>	n, a
Distinct, <i>-t/d</i> final		impossible

³¹ Ricardo Bermúdez-Otero (*per litteras*) proposes the alternative generalization that ‘no verb has an irregular PT and a regular PP’ in standard English. This generalization, itself in need of an account, is contradicted by the pairs *dove, dived* and *snuck, sneaked*.

6.5.2 Analysis

The synchronic analysis of this pattern must recognize it as an instance of similarity-driven syncretism. Rhyme pairs like [elt], [eld] are distinct enough to contrast in some varieties of English—witness *melt* vs *meld*—but, I conjecture, insufficiently distinct to coexist in a paradigm.³² Potential pairs like *dwelt*, *dwelled* merge to *dwelt*, *dwelt* or *dwelled*, *dwelled*.

The analysis must identify as ‘too similar’ pairs like *dwelt*, *dwelled*, which differ minimally in *-t/d*. In addition, it must generalize to all pairs whose distinct members are similar in just two ways: they are lexically identical, containing forms drawn on the same lexical entry, and they end in alveolar stops. I refer to PT, PP pairs like **bit*, *bited*; **bote*, *bited*, along with similarly structured **told*, *telled*; **told*, *telt*; **bit*, *bitted*: I propose that these are ill formed for the same reason **dwelt*, *dwelled* is. As in Latin, the result to aim for is that when two cells of a verb’s paradigm are too similar in a local respect, they are compelled to become globally identical, regardless of compensating differences elsewhere. The CORR_{SIM} constraint I propose for English is (55).

- (55) CORR_{SIM}:T: For any pair of verbs V₁, V₂,
if (a) V₁, V₂ are headed by the same lexeme,
and (b) V₁, V₂ are both nonpresent forms,
and (c) V₁, V₂ both end in alveolar stops,
then the phonological exponents of V₁, V₂ stand in correspondence.

(56) illustrates the joint role of CORR_{SIM}:T and MAX, IDENT in forcing identity between two potentially distinct forms, *dwelt* and *dwelled*. As before, correspondence is marked by co-superscripts. Both full forms and individual segments may stand in correspondence; hence the need for two sets of superscripts. Syntactic function is marked by subscripts. As in the Latin analysis, I assume that one of the forms in the PT-PP pair has either derivational priority or is lexically listed, while the other may be productively formed by reference to the first. Unlike in Latin, however, it is unclear—and ultimately immaterial—which form has derivational priority. For concreteness, the tableaux list the PP in the input cell as a correspondence base, and evaluate the PT.

- (56) Illustration: *dwelt*, *dwelled*

• root [dwel]; PT [dwel -t ^k] ⁱ PP		CORR _{SIM} :T (OO)	MAX (OO)	IDVOIC (OO)
a.	[dwel-d] ⁱ PT	*!		
b.	[dwel-d ^l] ⁱ PT		*!*(t ^k -d ^l)	
c.	[dwel-d ^k] ⁱ PT			*! (t ^k -d ^k)
d.	[dwel-t ^k] ⁱ PT			

³² See Löfstedt (2010) for the basic idea and its application to Swedish.

Candidate (a) violates $\text{CORR}_{\text{SIM}}:\text{T}$; (b) satisfies it, but lacks a correspondent for the t of PP *dwelt*, violating MAX; (c) fails because IDENT VOICE detects a voicing mismatch between the correspondent segments t^k and d^k . The next tableau illustrates how idiosyncratic properties of the listed PP, over and above the quality of the suffix, are passed on to the corresponding PT:

- (57) Illustration: *told, told*

Lexical entries: • root [tel] • PP: [tol-d] ⁱ PP		$\text{CORR}_{\text{SIM}}:\text{T}$ (OO)	ID VOWEL (OO)
a.	[tel-d] ^j PT	*!	
b.	[tel -d] ⁱ PT		*! (o → ε)
c.	[tol -d] ⁱ PT		

The analysis extends to bare forms like *lit, lit*, from roots ending in *-t/d*:

- (58) Illustration: *lit, lit*

Lexical entries: root [laɪt] • a listed inflected form: [lit]PP		$\text{CORR}_{\text{SIM}}:\text{T}$ (OO)	DEP (OO)
a.	[laɪtəd] ^j PT	*!	
b.	[laɪtəd] ⁱ PT		*!([lit] → [laɪtəd])
c.	[lit] ⁱ PT		

When at least one form lacks final *-t/d*, as *swollen* does, $\text{CORR}_{\text{SIM}}:\text{T}$ (OO) is satisfied without correspondence, so identity is not enforced.

The effect we have to model in English, the global identity of nonpresent verb forms ending in *-t/d*, holds across the board. Listed information could subvert its exceptionless status: any potential paradigm where both the PP and the PT are listed, distinct from each other and ending in *-t/d* runs the risk of predicting that they will surface intact, as hypothetical listed *dwelt* (PP) and listed *dwelked* (PT). Our analysis can predict syncretism here too if $\text{CORR}_{\text{SIM}}:\text{T}$ (OO) and MAX/DEP/IDENT (OO) outrank MAX/DEP/IDENT (IO). In such a case, it remains unclear how the levelled paradigm is realized. I leave this question open.

This section has introduced a second instance of similarity-based syncretism. Several issues remain undecided. First, the English syncretism might not be an instance of SAS: we used it only to illustrate the clear effect of similarity. As formulated in (55), $\text{CORR}_{\text{SIM}}:\text{T}$ (OO) is conditioned by the fact that PT and PP are identified as ‘non-present’, a reference to their sharing some syntactic properties. Without some such identity clause, the analysis will wrongly penalize full paradigms like *sit, sat, sat, light, lit, lit*, or *mind, minded, minded*, where all forms end in *-t/d* but the present differs from

the others. It is conceivable that the analysis could avoid reference to the ‘nonpresent’ feature, in ways that elude us now.³³ Another alternative is noted by P. Graff (personal communication). This starts from the tentative generalization that the local similarity factor in CORR_{SIM} constraints always resides in an affixal segment. This is true for Latin and for the Icelandic case discussed in section 6.5.3, among others. Graff suggests that it may well be true for English as well, if we analyse items like *lit, lit, held, held* as ending in an affixal *-t/d* that has somehow coalesced with the root-final alveolar.

Two further alternatives analyses are not pursued here for reasons of space. One would use a paradigm-internal version of Flemming’s (2002) Minimum Distance constraints: these would prohibit the co-occurrence of similar forms in a paradigm in direct relation to their *degree of overall similarity*. The other option, suggested by E. Flemming (personal communication), is that the morphological exponence system operates with output conditions, such as ‘all PT forms must end in an alveolar stop’.³⁴ These exponence constraints can be satisfied by the reuse of existing, precompiled forms: thus, a lexically listed *t*-final PP can be used to satisfy the PT condition above, yielding syncretic paradigms like *dwelt, dwelled*. On this view, similarity affects syncretism because it determines whether a precompiled form is similar enough to the target of an output-oriented exponence constraint.

These three modes of analysis make divergent predictions. The analysis based on (55) predicts that similar pairs of exponents could become *even more similar*, but stop short of merging. Minimum Distance analyses predict that locally similar pairs can become *more dissimilar*, as an alternative to merger. Neither prediction is confirmed by data known to me, but the overall number of relevant cases is sparse. The precompilation analysis looks the most natural and avoids many problematic predictions, until one notices that it does not actually guarantee the systematic merger between similar forms. That is because both the PT and the PP could in principle be precompiled, in which case they would remain distinct. This is a contingency that the current analysis may be able to deal with successfully. So the precompilation analysis only models a *preference* for similarity-based syncretism. For present purposes, however, the differences between these analyses are secondary: what matters most is that all are able to model the triggering effect of similarity on syncretism. The essential point here is the connection between local similarity and global syncretism, a link that was also key to the analysis of SAS in Latin. A last instance of this is presented next.

³³ When we remove (55.c), ‘V₁, V₂ both end in alveolar stops’, a broad trend is derived: *t, d*-final verbs have identical forms for all three categories: present, PT, PP. This pattern is attested for many verbs (*set, hit, put, cut, rid, spread*; cf. Bybee and Slobin 1982, citing Jespersen), but not all. (55.c) is needed for this residue.

³⁴ See Russell (1999) and MacBride (2004) on morphologies built on the idea that affixes are output conditions rather than lexical entries; cf. also Bybee and Slobin’s (1982) idea of ‘product-oriented’ conditions.

6.5.3 Similarity-based syncretism in Icelandic

Two similar suffixes, *-t* and *-t^h*, mark in Icelandic two verbal categories, the imperative and the past. When these suffixes co-occur in the same lexeme's paradigm, the relevant forms undergo a form of syncretism that is identical to the English case, and similar to the Latin pattern analysed in this chapter. The basic observations on Icelandic come from Hansson (1999), where an analysis distinct from ours is proposed; see also Buchanan (2007).

/t/ is realized in Icelandic as [ð], [t] and /t^h/ as [t^h], [h^t]. In all cases relevant here [h^t] < /t^h/ devoices a preceding sonorant, so /lt^h/, for instance, surfaces as [l^tt]. The data in (60) shows that each of the two suffixes can mark both the imperative and the past. A verb can choose one or the other, but it must chose the same affix as exponent of both categories: ['mäilt] from /mail-t/ means both 'he/she measured' and 'measure!'; ['mäilt^h] from /mail-t^h/ means both 'spoke' or 'speak!'. Thus forms suffixed with *-t* and *-t^h* cannot contrast in any one lexeme's tensed paradigm.³⁵

- (59) Icelandic syncretism of imperative and past tense stems (after Hannson 1999)

gloss	infinitive	PT	2sg imper. (short)	2sg imper. (full)
a. measure	<i>mæla</i> ['maila]	['mäilt]	['mäilt ('θu:)]	['mäilty]
b. speak	<i>mæla</i> ['maila]	['mäilt ^h]	['mäilt ^h ('θu:)]	['mäilty ^h]
c. fall	<i>fella</i> ['fel:a]	['felt]	['felt ('θu:)]	['felty]
d. pour	<i>hella</i> ['hel:a]	['he ^t l]	['he ^t l ('θu:)]	['he ^t ly]
e. burn	<i>brenna</i> ['pren:a]	['pr ^t nt]	['pr ^t nt ('θu:)]	['prenty]
f. spread	<i>glenna</i> ['klen:a]	['kl ^t nt]	['kl ^t nt ('θu:)]	['klen ^t y]

Hansson shows further that the choice between *-t* and *-t^h* is determined in the PT form. The evidence comes from verbs like ['ste:la] 'steal' which lack any *t^h*-suffixed PT: in all these, the imperative defaults to *-t*, e.g. ['stelt] 'steal!'. This suggests that the preferred imperative suffix is *-t*. The *-t^h* imperatives like ['mäilt^h] 'speak!' result from similarity-syncretism with the PT ['mäilt]; when the verb lacks a *-t^h* PT, the preferred *-t* imperatives can surface.

The analysis is identical to that of English; it relies on constraint (60), which is (55), with a modified (b) clause:

- (60) CORR_{SIM:T} (OO), Icelandic: For any pair of verbs V₁, V₂,
if (a) V₁, V₂ are headed by the same lexeme,
and (b) V₁, V₂ are both tensed (non-participial) forms,
and (c) V₁, V₂ both end in alveolar stops,
then the phonological exponents of V₁, V₂ stand in correspondence.

³⁵ Participles suffixed by *-t^h* can contrast with verbal *-t* forms; hence the restriction to tensed forms.

As in Latin and English, this instance of CORR_{SIM}: T (OO) outranks exponence preferences: below USE -T_{IMP} encodes the preference for the imperative in unaspirated -t. Aside from this detail, the tableau below is identical to English (56) and Latin (32).

- (61) Illustration: ['mäɪlt]_{PT}, ['mäɪlt ('θu:)]_{IMP} 'speak'

Lexical entries:	• root /mail/ • listed PT ['mäɪl̩-t ^l] ⁱ PT • imperative suffix -tk	CORR _{SIM} : T (OO) (61)	MAX/DEP (OO)	USE -T _{IMP}
a.	['mäɪl-t ^k] ^j IMP	*!		
b.	['mäɪl-t ^k] ⁱ IMP		*! (^k ≠ ^l)	
c.	['mäɪl̩- t ^l] ⁱ IMP			*

6.5.4 Other similarity effects on paradigm levelling

We have examined three cases of syncretism in which the element of phonological similarity is a constituent-final coronal obstruent. More distant from these, but making the same point, is the Saami syncretism between the comitative singular and the locative plural in nominal paradigms, as analysed by Hansson (2009). In this case, the syncretic paradigm cells contain an identical string *Vin* at the boundary between root and affix: thus, an older Saami pair like *da-inna* 'eye-comitative sing' and *da-i-n* 'eye-loc.pl' undergo syncretism in certain dialects and merge into a common form *dainna*. The pair of forms that merge are string-identical, aside from the final syllable. Hansson analyses this case with rules of referral, but a similarity-based analysis can exploit the fact that there is a non-arbitrary motivation for the syncretism.

Similar to Saami, Romanian feminine nouns have systematically identical plural and oblique singular case forms: some feminine nouns have -e in both functions (*fete* 'girls' and 'of a girl'); some have -j/-i in both (*vaj* 'valleys' and 'of a valley'). No paradigm contrasts the suffix -e with the suffix -j/-i, even though -e is the default feminine plural and -j/-i is the default oblique singular (Steriade 2008). This too is a form of syncretism, plausibly triggered by the featural similarity between the final unstressed front vowels.

A number of accentual mergers take place in A.Greek between the segmentally similar case forms of masculine and feminine adjectives (Vendryes 1929). In consequence of such mergers, a form like *tuptoméno:n* 'beaten-Genitive pl' serves as both feminine and masculine. The expected feminine form would have had a different accent, **tuptomenô:n*, as other feminines of this declension do, but it has merged with the otherwise segmentally identical masculine *tuptoméno:n*. In forms where the feminine is segmentally distinct from the masculine, for independent reasons, the

accentual merger does not happen: feminine *mélaina* ‘black’ has a genitive plural *melainô:n*, with the expected final accent of feminines, and distinct from the masculine genitive plural *meláno:n*. Here the segmental difference from the masculine allows the feminine to preserve its distinct accentuation. Examples of this sort can be multiplied.

6.6 Conclusions: non-arbitrary syncretism

One result of this study is that the best-studied instance of SAS, the *t*-stem syncretism of Latin, is not arbitrary. It is predictable in phonological terms, targeting only pairs of MinStems that stand in a specific relation of similarity. To reach this result, we have reconsidered the segmental composition of the deverbal affixes causing *t*-syncretism, their internal structure, and we have compared them with minimally different deverbal affixes that do not participate in *t*-syncretism to find critical differences.

Once the shape of the suffixes triggering *t*-syncretism is clarified, the options for formal analysis narrow down to just one: these suffixes are not *affixed* to the *t*-stem; rather, a correspondence mechanism *merges* pairs of similar minimal stems. This is essentially the same mechanism we had justified on independent grounds for English and the other instances of similarity-based syncretism. It turns out, then, that the Latin *t*-stem syncretism belongs to a reasonably well-populated class of similarity-driven paradigmatic mergers, some of which are syntactically arbitrary. Importantly, none of these mergers are entirely arbitrary: we can spell out which pairs of exponents participate in merger by identifying phonological and sometimes syntactic properties the merged expressions share. Because these mergers are motivated, their analyses in terms of morphemes, rules of referral, or elsewhere morpheme are not optimal, as these mechanisms are also available to completely arbitrary mergers. Correspondence, the tool we chose, provides a better fit.

Do completely arbitrary cases of syncretism exist elsewhere? Readers can look for them in the data presented by Stump (1993, 2001), Baerman (2004), Blevins (2005), and in the database made available by the Surrey Morphology Group at <http://www.smg.surrey.ac.uk/syncretism/index.aspx>. All these phenomena await fuller exploration and in-depth analysis: the strategy used in this study, or indeed any attempt to find phonological predictability, have not yet been experimented with.

A distinct question is whether genuinely arbitrary instances of SAS, if we ever find them, are used as *productive* mechanisms of exponence. This question is currently being investigated experimentally by Nevins, Rodrigues, and Tang (2015) and their preliminary answer is negative. See also the comments on this point in Bermúdez-Otero and Luís (this volume, pp. 332–5). An extension of the present study yields, in a less direct way, a similar answer. There is no doubt that the *t*-stem syncretism was productive in classical and late Latin: it gave rise to thousands of novel forms, of all derivational types, and to very few exceptions that could suggest that learners had

failed to grasp the mechanism underlying *t*-stem formation. We attribute this sustained productivity to the fact that the system was, however intricate, not arbitrary: speakers who knew enough morphology to segment the minimal stem in attested forms like [caes]-*us* and [caes]-*or*, and who could identify, based on the structure of denominal agentives, the expected form of the agentive as [caedit]-*or*, could formulate the conditions that led [caedit]-*or* to become [caes]-*or*, while still keeping [caed]-*uus* from becoming *[caes]-*uus*. Had the forms participating in *t*-stem syncretism been genuinely unpredictable—i.e. had the system been genuinely morphemic—we would expect variation between, say, *caeditor and caesor or caediūs and *caesuīs or similar variation in the mapping between stem form and thematic interpretation in non-*t* derivatives like the -*bilis* forms. Such variation is not found in a large corpus that spans over seven centuries, confirming that learners were able to find an element of predictability in the system.

The *t*-stem syncretism met with a quick demise when predictability was lost. Recall that all Romance languages eliminated the *t*-stems in agent nouns, before earliest attestations, a fact we attributed to the loss of evidence for minimal stems. While agent nouns were restructured when it was no longer possible to predict their formation via *t*-syncretism, *t*-derivatives that could be reanalysed as based, in a syntactic sense, on the perfect participle—in the same sense in which *ductibilis* ‘leadable’ is based on *ductus* ‘led’—were retained. Thus, result nominals like *caes-ūra* ‘a cut, the result of cutting’ have continued to be formed in Romance: Romanian *ars-ură* ‘a burn, the result of burning’, *scurs-ură* ‘ooze, the result of oozing’ (from *ars* ‘burnt’, *scurs* ‘oozed out’ on the verbs *ard-e* and *scurg-e*) are innovations that appear to follow the old pattern of *caes-ūra*. Italian -*ata* nominalizations (Samek-Lodovici 1997, Ippolito 1999) and French -*ée* nouns (Ferret et al. 2010) are genuine innovations along the same lines. In the context of the contemporary morphology of Romance, these are all standard-issue derivatives of the perfect participle, inheriting not just the form of its stem but its aspect and/or diathesis too. I submit that the diachronic fate of *t*-stems differs in agent vs result nouns because the agent nouns could come to contain *t*-stems only via a process of merger by correspondence, a process that was lost when minimal stems were lost. The result nouns using *t*-stem survived because they could be rebuilt by syntactically transparent means.

This explanation for a remarkable split in the development of *t*-stems in deverbal nouns is available only if we grant that genuinely arbitrary syncretism, the sort that only morphemes and rules of referral can describe, has little chance at long-term survival. This conjecture encourages us to look for predictability in all productive instances of SAS.

6.7 Appendix: *t*-derivatives beyond the agentive

This Appendix provides information on two aspects of the phonology of *t*-derivatives: the fact that their suffix normally begins with *t*; and the fact that this *t* is a stem

extension that can be omitted. I present two kinds of forms supporting the first point: (a) non-deverbal derivatives, e.g. *iān-i-tor* ‘gatekeeper’, on *iān-u-a* ‘gate’, and (b) deviant deverbal *t*-derivatives, deviant in that their stem fails to merge with that of the verb’s *t*-participle (e.g. *offer-tor* ‘offerer’; cf. *oblāt-us*); or forms coming from verbs without *t*-participles. Section 6.2.8.2 has shown that forms like (a) and (b) show that the *t* of agentive *-tor* does not originate in a verbal form. The evidence presented here generalizes this conclusion to all *t*-derivatives. To support the second point, the division of all *t*-initial derivational suffixes into a stem extension and an affix proper, I list *t*-less variants for all *t*-derivatives.

Regarding the locus of affixation, there are four types of nominal derivatives: the rare ones that place their affix directly on the noun’s root (e.g. *fur-tim*, on *fur*); those that insert *i* between the root-final consonant and the suffix-initial *t* (e.g. *iān-i-tor*); those, much more frequent, that attach the suffix to the noun’s own theme vowel (e.g. *ale-ā-tor* ‘dice player’, on *ale-a* ‘dice’); and those that use an extended version of the suffix, *ātX* (e.g. *gladi-ātor* ‘swordsman’ *gladi-u-s* ‘sword’). Derivatives of the last type could perhaps come from unattested first conjugation verbs. Because their testimony is less clear, I left those out.

For each affix, instances of regular affixation to the participial *t*-stem are provided as a comparison term with the irregular or less well attested options that we focus on here.

1. *-t-iō*, an event noun:

- Normal deverbal forms: *-t-iō* suffix, stem of the *t*-participle
cogni-t-iō, ‘knowledge, acquaintance’; cf. *cognō-sc-ō*, *cogn-it-us* ‘to come to know’
mis-s-iō, ‘sending, mission’; cf. *mitt-ō*, *mis-s-us* ‘send’
- Deverbal derivatives suffixed with *-iō*:
condic-iō ‘an agreement’; cf. *dic-ō* ‘say’, *dic-t-us*
internec-iō ‘a massacre’; cf. *nec-ō* ‘slay’, *nec-t-us*
pac-iō ‘a contract’; cf. *pac-isc-or* ‘to make a contract’, *pact-us*
- Nondeverbal derivatives suffixed with *-tiō*:
lusc-i-tiō ‘dimness of sight’; cf. *lusc-us* ‘blind’
cucurbit-ā-tiō ‘a cupping’; cf. *cucurbit-a* ‘a cupping glass’
- Deviant deverbal derivatives suffixed with *-tiō*:
ger-i-tiō ‘a managing, performing’; cf. *ger-ō*, *ges-t-us* ‘to bear, sustain’

2. *-t-ūrus*, agentive adjective, active future participle (cf. Aronoff 1994)

- Normal deverbal forms: *-t-ūrus* suffix, stem of the *t*-participle
cogni-t-ūrus ‘who will come to know’; cf. *cognō-sc-ō*, *cogn-it-us* ‘to come to know’
mis-s-ūrus, ‘sending, mission’; cf. *mitt-ō*, *mis-s-us* ‘send’
- Forms suffixed with *-t-ūrus* in the absence of a perfect participle
fu-tūrus ‘who shall be’; cf. *sum* ‘I am’ (no *t*-participle)

esür-i-tūrus ‘who will be hungry’; cf. *esur-i-ō* ‘I am hungry’ (no *t*-participle)

- Deviant forms suffixed with *-t-ūrus* on a base distinct from the *t*-participle

disc-i-tūrus ‘who will learn’; cf. *disc-ō*, *doc-t-us* ‘learn’

mor-i-tūrus ‘who will die’; cf. *mor-i-or*, *mor-tu-us* ‘die’

fru-i-tūrus ‘who will enjoy’; cf. *fru-or*, *fruc-t-us* ‘enjoy’

3. *-t-ūra* an event, result N:

- Normal deverbal forms: *-t-ūra* suffix, stem of the *t*-participle

cogni-t-ūra ‘the office of a fiscal agent, who looks up the debtors to the treasury’

ad-mis-s-ūra ‘admittance’; cf. *mitt-ō*, *mis-s-us* ‘send’

- Derivatives suffixed with *-ūra*:

fig-ūra ‘a shape, form’; cf. *fing-ō* ‘to shape, fashion’

fēt-ūra ‘a bringing forth, breeding’; cf. *fēt-us* ‘birth; brood’

- Nondeverbal derivatives suffixed with *-tūra*:

agricul-tūra ‘farming’; cf. *agricol-a* ‘farmer’

arc-ā-tūra ‘square landmark of surveyors’; cf. *arc-a* ‘square landmark’

lanist-ā-tūra ‘the profession of a lanista’; cf. *lanist-a* ‘trainer of gladiators’

stri-ā-tūra ‘the fact of being channelled’; cf. *stri-a* ‘furrow’

litter-ā-tūra ‘writing letters’; cf. *litter-a* ‘letter’

4. *-t-rīx* agent N, feminine:

- Normal deverbal forms: *-t-rīx* suffix, stem of the *t*-participle

geni-t-rīx ‘one who gave birth’; cf. *gi-gn-ō*, *gen-it-us* ‘to give birth’

ton-s-trīx,³⁶ ‘female barber’; cf. *tond-e-ō*, *ton-s-us* ‘shave’

- Nondeverbal derivatives suffixed with *-trīx*

ian-i-trīx ‘female gatekeeper’; cf. *ianu-a* ‘gate’

cistell-ā-trīx ‘she who has charge of the money-box’; cf. *cistell-a* ‘box’

5. *-t-im* adverbial:

- Normal deverbal forms: *-t-im* suffix, stem of the *t*-participle

con-ges-t-im ‘in heaps’; cf. *con-ger-ō*, *ges-t-us* ‘to heap together’

ex-pul-s-im ‘by driving out’; cf. *ex-pell-ō*, *ex-pul-s-us* ‘drive out’

- Derivatives suffixed with *-im*

univers-im ‘all together’; cf. *univers-us* ‘whole, entire’

inter-im ‘meanwhile’, cf. *inter* ‘between’

cert-im ‘certainly’, cf. *cert-us* ‘certain’

singult-im ‘sobbingly’ cf. *singult-us* ‘sob’

part-im ‘in part’, cf. *par(t)-s* ‘part’

³⁶ Expected **tonsrix* (minimal *t*-stem *tons-* as in *tonsus*, plus suffix *-rix*) is phonotactically ill formed. Historically *sr* becomes *br* (*funes-ris* → *funebris*). The synchronically productive way to eliminate *sr* is by epenthesis of *t*. This explains all forms in *-s-trīx*, *-s-trum* from verbs whose *t*-participle ends in *-s-us*.

- Nondeverbal derivatives suffixed with *-t-im*
cocle-ā-tim ‘spirally’, cf. *cocle-a* ‘snail’
vir-i-tim ‘man by man, individually’, cf. *.vir* ‘man’
propri-tim ‘properly’ cf. *propri-us* ‘individual, proper’
über-tim ‘abundantly’, cf. *über* ‘rich’
fur-tim ‘like a thief’, cf. *fur* ‘thief’
tribū-tim ‘tribe by tribe’, cf. *tribu-s* ‘tribe’
- 6. *-t-ūri-ō* desiderative verb
 - Normal deverbal forms: *-t-ūri-ō* suffix, stem of the *t*-participle
pet-īt-ūri-ō ‘to be eager for office’ cf. *pet-ō*, *pet-īt-us* ‘to aim, sue for’
nix-ūri-ō ‘to wish to lean upon’ cf. *nīt-or*, *nix-us* ‘to lean upon’
 - Derivatives suffixed with *-ūri-ō*
lig-ūri-ō ‘to want to lick, consume’ *ling-ō* ‘lick’
lux-ūri-ō ‘to luxuriate’ *lux-us* ‘lux’
adulescent-ūri-ō ‘to behave like an adolescent’, cf. *adulescen(t)-s* ‘adolescent’
 - Non-deverbal derivatives suffixed with *-t-ūri-ō*
Sull-ā-t-ūri-ō ‘to imitate Sulla’ cf. *Sull-a* (proper name)
- 7. *-t-īvus* adjective:
 - Normal deverbal forms: *-t-īvus* suffix, stem of the *t*-participle
in-sit-īvus ‘ingrafted’ cf. *in-ser-ō*, *in-sit-us* ‘to graft’
spars-īvus ‘for hurling’ cf. *sparg-ō*, *spars-us* ‘to hurl, cast out’
 - Derivatives suffixed with *-īvus*
cad-īvus ‘falling of itself’, cf. *cad-ō*, *cās-us* ‘fall’
in-dic-īvus ‘indicating’, cf. *dic-ō*, *dic-t-us* ‘say’
absent-īvus ‘long absent’, cf. *ab-sen(t)-s* ‘being away’
inter-ger-īvus ‘that is placed in between’ cf. *inter-ger-ō*, *ges-t-us* ‘place in between’
lix-īvus ‘made into lye’, cf. *lix* ‘lye’
 - Nondeverbal derivatives suffixed with *-tīvus*
tempes-tīvus ‘of the right time’, cf. *tempus* ‘time’, *tempes-* in *tempes-tās*
prim-i-tīvus ‘the first of its kind’, cf. *prim-us* ‘first’
semen-tīvus ‘pertaining to seed, seedtime’ cf. *semen* ‘seed’
- 8. *-t-rum* event and instrument noun:
 - Normal deverbal forms: *-t-rum* suffix, stem of the *t*-participle
claus-trum ‘barrrier, hindrance’ cf. *claud-ō*, *claus-us* ‘to close, close off’
 - Nondeverbal derivatives suffixed with *-trum*
trans-trum ‘a cross-beam’, cf. *trans* ‘across’
tāl-i-trum ‘rap with the finger’ cf. *tāl-us* ‘knuckle bone’

Acknowledgements

I am grateful for written comments on different versions of this work to Mark Aronoff, Ricardo Bermúdez-Otero, David Embick, David Hill, and Martin Maiden; and to audiences at Yale (2014), Harvard (2013), Berkeley (2013), MIT (2010), the Perspectives on the Morpheme workshop (Coimbra, 2010), and Going Romance (Nice, 2009).