Priscianic word formation: morphomes, referrals and alternatives

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Abstract

This chapter analyzes forms of syncretism whose participant expressions – lexically related words or stems, or affixes – appear to be arbitrarily selected. I evaluate the evidence for these phenomena and consider some independently justified alternatives for their analysis, including non-automatic phonological processes and conditions on the optimal mapping between morpho-syntactic structures and their phonological exponents.

Keywords: syncretism, paradigm, paradigm uniformity, paradigm contrast, morphome, referral, non-automatic phonology

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Table of contents

1.Introduction

Priscian was a 6th century grammarian whose analysis of Latin morphology in *Institutiones Grammaticarum* builds words from other words through mechanisms of affix replacement and truncation that deviate from canonical word formation as understood today. Priscian is not the only one to invoke these procedures, but he may be the earliest, and he has had substantial indirect influence on contemporary work. Some of his derivations are defensible in updated form and find counterparts beyond Latin. Versions of Priscian's practices are being championed in modern morphology under names like *rules of referral, morphomes, thematic spaces* and *parasitic derivations*. Understanding the place of such phenomena in a grammar, and in morphological typology, is a challenge.

This chapter asks what varieties of Priscianic derivations can be empirically supported today. It reviews how Priscian's ideas have found adherents in contemporary morphology. It explores alternatives to some influential Priscianic analyses and implications of Priscianic patterns for the relation between exponence mechanisms and phonology.

1.1. Priscian's derivations

In Priscian's own derivations, a basic word, in its surface form, is stripped of its outer layer of inflection to generate a new word. Frequently, a new affix is added to the stripped stem. I paraphrase below one such procedure. To form certain deverbal nouns, Priscian removes outer suffixes from the perfect participle of the verb, and adds a new suffix to the resulting stem.

1. A Priscianic derivation for masculine agent nouns (*nomen verbale masculinum*)
   a. Input: perfect passive participle — rēct-us 'ruled-Nom.Sg'
   b. Stem formation: strip gender and case-number suffixes — rēct-
   c. Suffixation: add -or — rēct-or 'ruler-Nom.Sg'

The form produced by (1) is a masculine. For corresponding feminines, Priscian starts from the output of (1.c), strips the final *-or* from *rēctor* and replaces it with *-rix* (*-rik-s*: feminine agent suffix plus Nom.Sg), to yield *rēctrix*. In this way, one Priscianic derivation builds upon another[1].

[1] Passages expressing the ideas in (1), as applied to agent nouns, are found in Keil 1859:509, Keil 1859:563. See also (2) below for a different application of the same procedure.

A survey of phenomena one might want to describe in this way suggests that Priscianic derivations generally have three properties: arbitrariness, directionality and surface orientation.

The clearest feature is the first: these derivations are syntactically arbitrary. No exclusive syntactic relation connects the input to the output word, such as would normally justify deriving one from the other. This is intuitively clear in (1), where the participle and the noun diverge in voice (passive in the participle, active in the agentive) and aspect (perfective vs. aspectually undefined), and share nothing in exclusivity. Latin has an active participle (cf. *regent-* 'ruling') but the agent noun isn't built on it: it's not **regent-or*, but *rēct-or*. The evidence for this lack of syntactic connection is presented at length in Aronoff 1994, Steriade 2016 and outlined below.

The second property defining Priscianic derivations is directionality. In (1), the derivation starts from one word class to generate another. The two classes end up having identical stems because the derivation of one builds upon the output of the other. In contemporary terms, one form *is faithful* to the other. A non-directional alternative, explored by Aronoff (1994), is to define a stem allomorph – say, *rēct-* in (1) – and stipulate that it must be identical across some list of categories which includes the passive participle and the agent noun. This procedure generates a pattern of stem identity without the claim that one form is the base of the other.

A general argument for directionality can, however, be formulated for (1) and comparable other cases. It starts from the observation that derivatives frequently inherit *derived* phonological properties from their base, as in cyclic derivations[2]. In such cases, properties that are motivated by the phonology of the base appear in its derivatives, *where they are otherwise unmotivated*. This applies to Priscianic pairs like *rēctus-rēctor*: the participle *rēctus* comes from underlying /reg-t-os/, and is generated in a manner specific only to perfect participles. Normally, an *i* is inserted in Latin C-C clusters across a boundary (e.g. *reg-i-men* 'ruling,' *reg-i-ficus* 'royal'), but this insertion is blocked in participles like *rēctus* by paradigm uniformity considerations[3]. So, the presence of *ct* in *rēctus* is a consequence of *rēctus* being a participle, a member of a verbal paradigm. The *ct*-cluster is transmitted from *rēctus* to the agent noun *rēctor*, where it is otherwise unexpected. Agent nouns, unlike participles, normally do undergo *i* epenthesis: e.g.

[2] Chomsky and Halle 1968.

[3] Epenthesis in perfect participles is blocked when it results in a different syllable count between the participle's stem and its verbal perfect stem. The verbal perfect stem of *reg-* is monosyllabic *rēx-*, hence the participle stem is limited to monosyllabic *rēc-t-,* not disyllabic **reg-it-*. When a root has a disyllabic verbal perfect stem, its perfect participle stem is also disyllabic: *pos-u-*, *pos-i-t-* 'set-perfect', agent noun *pos-i-t-or*. Cf. Steriade 2016.

fic-i-tor 'fig planter' from *fic-us* 'fig tree', *ian-i-tor* 'gate-keeper' from *ian-u-a* 'gate.' We infer that, absent the influence of the participle *rēctus*, the agent noun would have been **reg-i-tor*, like *fic-i-tor.* Occasionally exactly such deviant forms are found[4], confirming the general rule. But the standard agent nouns of Latin, when deverbal, violate the *i*-insertion rule when necessary to preserve a participle's CC cluster. This instance of phonological underapplication suggests a directional form of similarity, like that between a derivative and its cyclic base. Whether this is what Priscian had in mind in his directional derivations is unknown, but seems unlikely.

The third property of Priscianic derivations is that they result in the *surface identity* between expressions. This is seen in the blocked epenthesis mentioned earlier: Latin morphology doesn't just create agent nouns by starting from participles, as with *rēctus-rēctor*, it also ensures that their stems continue to be identical on the surface. If surface identity did not matter, epenthesis would still happen, to generate **rēcitor*. I infer that surface identity does matter.

1.2. Priscianic and Sapirian derivations

Priscian described the entire morphology of Latin in terms comparable to (1). While aspects of that analysis can be defended today (section 4.1), there are good alternatives to his other word-to-word derivations. One might call such alternatives Sapirian[5]: the affix is attached to an underlying representation (UR) or, in neo-Sapirian SPE terms, to a cyclically derived word or stem. For Latin, using the UR of the root as locus of affixation eliminates the need for most word-to-word derivations in *Institutiones*, aside from (1).

A Priscianic account amenable to Sapirian analysis follows in table (2). It is an outline of Priscian's derivation of the comparative form of Latin adjectives. Priscian writes (Keil 1855:83ff) that comparatives are built by suffixing *-or* – accidentally homophonous to the *-or* of (1) – to a caseform of the adjective: that caseform is the Genitive singular, if the adjective is of the 2nd (*o*-) declension, and the Dative singular, if the adjective belongs to the 3rd (*i*- or *C*-) declension.

[4] E.g. *verr-i-tor* 'sweeper', from *verr-ī* 'sweep', alongside *vers-or,* the latter based on the perfect participle *versus*.
[5] As in Edward Sapir's derivations of, for instance, Takelma verbal forms (1912:92). See Anderson 1985:239.

2. Latin adjectives and their comparatives; shaded cells are Priscian's bases

	Basic Adjective			Comparative,	Gloss
	Nom.Sg.	Gen.Sg.	Dat.Sg.	Nom.Sg.	
2nd decl.	tener	tener-ī	tener-ō	tenerior	soft
	piger	pigr-ī	pigr-ō	pigrior	lazy
3rd decl.	ācer	ācr-is	ācr-ī	ācrior	sharp

Priscian derives these comparatives as follows: input *pigrī* (Gen.Sg, 2nd declension) → *pigrī-or* (suffixation) → *pigrior* (regular prevocalic shortening); and similar steps in *tenerī* (Gen.Sg, 2nd decl.) → *tenerī-or* → *tenerior; ācrī* (Dat.Sg, 3rd decl.) → *ācrī-or*→ *ācrior*.

A Sapirian alternative would start by positing *-ior* as the comparative suffix[6]. *-ior* attaches to the stem's UR, as most Latin affixes do. Derivations proceed from this UR, without any need to mention any specific caseform: /pigr/ (UR) → *pigr-ior*; /tener/ (UR) → *tener-ior;* etc.

But, unlike Sapir, Priscian was apparently committed to the idea that *any base of affixation must be a surface word*[7]. In the Latin comparative case, the Nom.Sg. can't serve as this surface base because its surface form neutralizes certain distinctions, like *-Cr* vs. *-Cer*: *piger* < /pigr/ vs. *tener* < /tener/. The oblique cases preserve these contrasts, as does the comparative: *pigr-ior* vs. *tener-ior*. As for why Priscian selects specific caseforms as the base of the comparative, and different ones depending on the adjective's declension class, that's probably because he tries to minimize changes to the formatives involved in his derivations. The caseforms he uses as bases for the comparative end in *-ī*. When *-or* attaches to an *ī*-stem, it yields the comparative without any modification beyond the automatic pre-V shortening. Any other choice of surface base would entail more drastic changes.

Priscian's logic is reconstructible, as just shown, but that doesn't change the fact that most of his analyses offer no empirical advantage over Sapirian derivations. In addition, only the latter are consistent with a restrictive theory of word formation which incorporates the principle in (3). I call this requirement *Anti-Priscian* to highlight the fact that Priscianic derivations violate it.

[6] All comparatives, including suppletive ones like *melior*, end in *-ior*. This supports a suffix *-ior* over Priscian's *-or*.
[7] Modern echoes of this idea can be found in Albright 2002:p.9 and passim; and perhaps Hayes 1999.

3. Anti-Priscian: The surface phonological exponent E of a syntactic structure S consists exclusively of correspondents of the exponents of the syntactic subconstituents of S[8].

Anti-Priscian uses the language of Correspondence Theory[9] to state that any E should be parsable into the phonological expressions of its syntactic subparts, or into modified surface forms of those exponents – hence the reference to *correspondents* – modified only insofar as changes are dictated by the general grammar. This constraint excludes any part of E originating in a unit that is not an exponent of a subconstituent in E's syntactic structure S. Thus, according to Anti-Priscian, a comparative adjective can't contain the Gen. or Dat.Sg. of the positive, as Priscian had it, because neither caseform is a syntactic constituent in the comparative.

The same principle excludes most of Priscian's derivations, including (1). That most of these derivations can indeed be replaced by Sapirian analyses is reassuring, as this aligns the empirical evidence with widely shared linguistic expectations about word structure, such as (3).

It is nonetheless true that in a corner of Latin morphology, and in a few others elsewhere, Priscianic derivations that genuinely violate Anti-Priscian are needed. The agent noun *rēctor* should be, according to (3) plus the general phonology of Latin, **reg-i-tor,* with the expected *i*-epenthesis discussed earlier. But it's *rēctor* instead, because the passive participle *rēctus* exerts an influence on the agent noun, despite not being its subconstituent. Understanding why such deviations from Anti-Priscian exist and delimiting their proper domain is the goal here.

2. Priscianic analyses today

Much of the modern literature on Priscianic patterns describes them as arbitrary forms of syncretism. *Arbitrary* means two things in this context. It refers, first, to the assertion that these identities aren't motivated by general linguistic principles, and, second, to the belief that the sets of expressions subject to syncretism can't be described in simple ways, without disjunction, by reference to shared syntactic or phonological properties.

Several mechanisms have been proposed to model these syncretisms: *rules of referral* (Zwicky 1985, Stump 1993, 2001, 2005, 2015; and, with different terminology, the earlier

[8] This principle may remind the reader of Chomsky and Halle's intuition about the phonological cycle: "it is natural to suppose that in general the phonetic shape of a complex unit (a phrase) will be determined by the inherent properties of its parts and the manner in which these parts are combined" (1968:15).
[9] McCarthy and Prince 1995.

parasitic derivations in Matthews 1972 and Morin 1987); *morphomes* (Aronoff 1994, Maiden 2001, 2016, *inter alia*; O'Neill 2011, Herce 2019, 2020 and contributions to Cruschina et al. 2013); plus the *thematic spaces* of Bonami and Boyé 2003, 2008; cf. Pirelli and Battista 2000, a mix of morphomic stems and rules of referral connecting them. Finally, Trommer (2016) outlines a Distributed Morphology[10] mechanism for analyzing patterns described as morphomes.

What defines these approaches? How do they differ?

A feature common to all is the assumption that Priscianic patterns are generated in a post-syntactic, pre-phonological module, identified as "morphology by itself" by Aronoff (1994), or, in a version of this idea, in a post-syntactic component where the spellout of complex expressions is initiated by DM mechanisms, but before phonology completes the spellout (Trommer 2016). Rules-of-referral proponents, like Stump (e.g. 2015:80ff), also envision a pre-phonological location of such referral processes.

Recall now a generalization suggested by the syncretism in (1): it's surface-oriented. It was shown earlier that the identity between the stems of Latin agent nouns and of perfect participles should be disrupted, but in fact isn't, by the phonological *i*-epenthesis normally expected in C-C clusters. Epenthesis should produce **reg-i-tor* or **rēc-i-tor*, parallel to *fic-i-tor,* but it doesn't. The fact that epenthesis is inhibited in *rēctor* suggests that the system is aiming at surface identity with the stem of *rēctus*. If so, the grammatical architecture needed here is one where the Priscianic mechanism, however stated, operates as *an identity constraint on the output of phonology*[11]. Indeed, reported Priscianic patterns are described as holding on the surface, or on the surface *modulo* conflicting general phonotactics.

This last statement should be taken with a grain of salt: it has not been systematically vetted, and most of these syncretisms are better understood in non-Priscianic terms anyway, as shown below. But if it holds of even a subset of identities reported as Priscianic, the generalization that they are surface-true is significant: *no pre-phonological mechanism can guarantee the surface status of an identity relation*. That's because phonology can always disrupt, for its own needs, an identity created in earlier modules. If stem identities surface, against expectations, that's because identity constraints on surface forms enforce them.

[10] Halle and Marantz 1993

[11] The same arguably holds for the related phenomena of Base-Derivative Identity and Paradigm Uniformity. Arguments that favor surface-oriented identity relations for all these phenomena are found in Benua 1997, Burzio 2003, Steriade 2000, Albright 2011, among others.

Turning now to the different mechanisms proposed as accounts of the Priscianic patterns, *referral* or *conversion* are directional mechanisms, closest to Priscian's practice. The grammar defines exponents for one class of morpho-syntactic expressions; a rule of referral stipulates that a second class must have exponents that are identical to the first. Rules of referral, in the form advocated by Zwicky (1985) and Stump (1993), are stated as constraints requiring identity between various members of an inflectional paradigm, typically stems or whole words. The directionality is implemented by referencing one category's exponent when defining that of another. Thus, the Stem-formation rule in (4), from Stump 2015, defines one of the processes of perfective stem formation in Latin by reference to the imperfective:

4. A stem-formation rule (Stump 2015:78)
   Where L is a first conjugation verb such that Stem <L, σ:{imperfective}>)=*Xā*,
   Stem <L, σ:{perfective}>) =*Xāv*, by default.

This constraint states that the stem of the perfective is by default identical to the substring X that precedes the theme vowel *ā* in the imperfective of the 1st conjugation verbs. That substring is, in turn, defined by other rules. Constraints like (4) can override other exponence constraints, or be overridden by them (Stump 1993) but the claim is that they don't interact with phonology.

By contrast, *morphomes,* as proposed by Aronoff (1994) and explored by Maiden and others, are sets of morphological categories constrained to have identical exponents at the stem or affix level, without derivational priority of any one category over others. Explicit, extended grammar fragments containing both referrals and morphomes appear in the work of Stump (2001, 2005, 2015 and references there), along with some comparisons with non-Priscianic alternatives. In some implementations of the morphome idea (Stump 2001:chap 6, 2015:chap 5; Bonami and Boyé 2003, Boyé 2011) classes of stem allomorphs are identified by unique indices. The indices are required in such grammars precisely because their authors believe that no non-arbitrary property, syntactic or phonological, characterizes the relevant sets of expressions. The cells in a morphological paradigm refer to these indices when locating their required exponents.

Trommer (2016) proposes to describe in Distributed Morphology patterns reported in the literature as morphomic, by adapting two aspects of DM technology already in use. A set of post-syntactic redundancy rules assigns a *parasitic* feature value to lists of expression types. *Parasitic* means here lacking grammatical content, uninterpretable in syntactic or phonological terms.

Each redundancy rule on such a list is defined by a syntactic property or context, but the list as a whole shares nothing at all. The parasitic feature bears a remote similarity to the index assigned to stem allomorphs by Stump and others, but stem indices refer to *classes of exponents* whereas the parasitic features identify *classes of morphosyntactic contexts*.

Thus, to model Priscian's syncretism in (1), Trommer (2016:76ff) has a redundancy rule assign to the stems of perfect participles the value [αP] for a parasitic feature P; a second rule assigns the same [αP] value to stems of agent nouns[12]. Other forms, including present participles, receive by default the opposite [-αP] value. In a subsequent step, a second set of rules, DM's Vocabulary Items (VI), spells out exponents for various feature bundles, which now include the values of the parasitic P feature. The presence of [αP] conditions one or more of the VI rules. As a result, the whole collection of [αP] items created by [αP]-assigning rules undergo the same VI rule, if that rule is conditioned by [αP]. In Latin, [αP] is assigned in this analysis to perfect participles and agent nouns, among other categories. The shared [αP] value conditions insertion of a stem-forming affix *-t,* as in *rēc-t-us, rēc-t-or*, and of the same root allomorphs in suppletive verbs, e.g. *lā-t-us* 'borne' and *lā-t-or* 'bearer', suppletive allomorphs of *ferre* 'to bear'.

As noted earlier, this analysis does not address the fact that the phonological component preserves the stem identities created by this combination of parasitic and VI rules. This is unexpected: VI rules necessarily precede phonology, so they can't control its operations.

There are no apparent limits to how syntactically divergent the recipients of a parasitic [αP] value can be. In this sense, Trommer's mechanism lives up to the definition of morphomes as arbitrary syncretisms. The DM framework does impose locality constraints on the structural distance between nodes that condition a VI rule and its site of insertion (2016:80ff), and is thus more restrictive than strictly morphomic alternatives.

3. Restrictiveness

Referral, morphomes and thematic spaces can describe not only all Priscianic patterns reported in the literature, but also most imaginable relations of identity between stems, words or affixes. That's a deliberate design feature of these mechanisms, a consequence of the basic belief in arbitrary identities that underlies the referral and morphomic literature.

[12] Trommer mentions the equivalent case of future participles (e.g. *rēctūrus* 'who shall rule'), instead of the agent noun. See below section 4.1 for the full scope of this Latin stem identity.

It is important, then, to compare what is formally possible under these approaches to what is empirically necessary. This comparison is now within reach, due to a survey of morphomes in Herce 2020, which adds to the collections in Aronoff 1994, Maiden's works, and Stump 2001, 2015. Using these resources, I take below a global look at the major syncretisms identified as Priscianic in the literature. I ask how common the truly arbitrary identities are.

The answer turns on how we analyze paradigm-internal organization (section 4.3) and on two other choices: (a) what syntactic/semantic features one is prepared to entertain (sections 4.3.1 and 4.5), and (b) what is the grammatical status of non-automatic phonology, the sound processes that are restricted lexically or morphologically, or lack transparency for some other reason (section 4.2). Question (b) refers to the belief expressed in the morphomic literature that phonology only deals with productive and transparent processes, essentially just allophonic ones[13]. If so, morpheme alternants that can't be generated by automatic phonological processes must instead be lexically listed and distributed across contexts by morphological mechanisms.

These choices of theory matter in a discussion of Priscianic patterns, because most such reported identities can be reanalyzed as forms of non-arbitrary syncretism, without appeal to stem indices or parasitic features, if non-automatic phonological processes are recognized as part of phonology; and, further, if a flexible conception of paradigm structure is adopted, in which ranked and violable exponence constraints evaluate sets of exponents that don't exactly correspond to standard inflectional paradigms; and, finally, if a few new syntactic/semantic features are adopted. *Under these conditions, we can identify most reported Priscianic patterns as non-arbitrary*. Some may be syntactically arbitrary, like (1), but not in other respects.

Experimental evidence that bears on the learnability of arbitrary syncretism is presented by Nevins et al. 2015, who compared syntactically arbitrary to syntactically motivated syncretic patterns, and showed that the former are systematically harder to learn in the laboratory. If they're also hard to learn in real life, that would make them diachronically unstable. This issue of morphomic stability over time has been discussed by Maiden (2013, 2016, 2018) and Herce (2020:360). Their view is that arbitrary patterns can be productive and resilient in linguistic history. But the significance of such assessments depends on whether the stable syncretic pattern is indeed arbitrary, a point reexamined in sections 4.2.3 and 4.5 below. It also depends on the finer grained examination of the diachronic development: Steriade (2016) argues that the

[13] Boyé 2011, Stump 2015, Maiden 2016, Herce 2020.

Priscianic pattern in (1) was productive in Latin only while the evidence for a non-arbitrary analysis was available. When this evidence was obscured, the pattern became truly arbitrary and collapsed in short order.

Returning now to the choices of theory mentioned above, we will see that certain central Priscianic patterns are hard to fully analyze with morphomes, referral, or parasitic redundancy, harder than expected given that these devices were designed to describe virtually any identity at all. By contrast, most attested patterns are amenable to forms of analysis in which the surface identities emerge from the interaction of constraints on paradigm-internal similarity, uniformity and contrast. The next sections develop these points by examining three relevant classes of phenomena: similarity-based syncretism (sec. 4.1); phonologically conditioned but morphologically restricted identities (sect. 4.2); syncretism emerging from constraints on paradigmatic uniformity and contrast (sect. 4.3).

4. Morphomic analyses and alternatives

4.1. Similarity-based Priscianic syncretism

4.1.1. Latin

Perhaps the best studied Priscianic stem identity involves the Latin pairs of the type *rēctus-rēctor* in (1). Priscian described this pattern directionally, using the perfect participle (PfP) as the base of the agent noun. Evidence for the directional aspect of his account was outlined in section 1.1. In the same spirit, Matthews (1972:170ff) proposed a *parasitic derivation*, a rule of referral, using the PfP as base. Later, Aronoff (1994) presented a morphomic account of the pattern.

A second look at the data shows that this syncretism is predictable (Steriade 2016). Further, when a complete analysis is attempted, the morphomic mechanisms turn out to be hard to deploy without substantial revision of the underlying theories, or loss of generalization.

To illustrate the full pattern, table (5) contains a list of Latin deverbal derivatives whose stems are identical to those of the verb's perfect participle, PfP. The underlying root is reflected in the shape of the infinitive, (5.a). The stem of the PfP, in (5.b), is the surface realization of the root plus the participial suffix *-t*. The rows that follow, (5.c-j), contain deverbal derivatives whose stems are systematically identical to the PfP, across all Latin verbs[14].

[14] Latin spelling rules include: <V̄> = [V:], <qu> = [k^{w}] , <c> = [k], <x> = [ks]. Empty cells in (5) and below are accidentally missing forms.

5. Stem identity between Latin perfect participles (PfP) and some deverbal derivatives

	'speak'	'write'	'have'	'rule'
a. infinitive	loqu-ī	scrīb-e-re	hab-ē-re	reg-e-re
b. PfP	locūt-us	scrip-t-us	hab-it-us	rēct-us
c. future active part.	locūt-ūr-us	script-ūr-us	habit-ūr-us	rēct-ūr-us
d. agent noun	locūt-or	script-or		rēct-or
e. event/state noun	locūt-iō	script-iō	habit-iō	-rēct-iō
f. event/result noun		script-ūr-a	habit-ūr-a	rēct-ūr-a
g. verbal adjective	locūt-īv-us	-script-īv-us		
i. frequentative verb				rēct-it-ō
j. desiderative verb			habit-ūr-iō	

The stem identity in (5) is *metasyncretic*: it does not reduce to one choice of exponent, or one choice of applying or blocking a phonological process, as there are many such choices, rather it must be expressed as a global condition of surface identity between the PfP stem and that of the derivatives in (5)[15].

In another class of derivatives, illustrated by (6), suffixes attach to the bare verb root.

6. Deverbal derivatives whose stems match the present root/stem

	'speak'	'write'	'have'	'rule'
a. agent noun		scrība	hab-ēna	
b. active adjective	loqu-ax			
c. verbal adjective	-loqu-i-bilis		hab-ilis	reg-i-bilis
d. event/result nouns	loqu-ēla			reg-i-men
	-loqu-ium			reg-iō
e. frequentative verb		-scrīb-illo		

The stems of these derivatives differ from those of their PfP: agentive nominals include *loqu-ax* 'talkative', not **locūt-ax*; event nouns include *reg-i-men,* not **rēct-i-men.* Despite the difference in stem shape, the derivatives in (5) and (6) are syntactically similar: there are agent nouns, event nominals, active or passive adjectives and frequentative verbs in both groups.

A phonological difference turns out to predict the differences in stem formation between the two classes of derivatives: the forms in (5.c-j), and only they, contain *t*-initial suffixes. This fact is not easily observed in (5), since items like *rēctor* can be variously parsed as *rēct-or*, as Priscian does, with an o-initial suffix, or as *rēc-tor* with a *tor* suffix. The evidence for the latter

[15] Cf. Steriade 2016. On metasyncretism, see Harley 2008 and references there.

parse comes from denominal derivatives. The denominal agent nouns, e.g. *fic-i-tor* 'fig planter', litterally 'figger', show that the agent suffix in (5.d) is *-tor,* not *-or*. Abstract nouns like *lusc-i-tiō* 'blindness' (cf. *lusc-us* 'blind') show that the nouns in (5.e) contain the suffix *-tiō* not *-iō*. Similar evidence is available for all the suffixes in (5): all are unambiguously *t*-initial when denominal. Not accidentally, the suffix marking the PfP is also *t*-initial. Then the syncretism in (5) involves pairs of stems consisting of the same verbal root plus a *t*-initial suffix: an inflectional suffix, like the *-t-* of the PfP and the *-t-ūrus* of the future participle, or a derivational suffix like *tor, tiō, tīvus,* etc.

The derivational suffixes in (5) turn out to have internal structure: they consist of a stem extension, *t-* or other obstruents, plus the suffix proper, i.e. *-or, -iō, īvus,* etc. The generalization specific to (5) then pertains to the constituent, or *minimal stem*, containing the verbal root plus the C stem extension: if two minimal stems contain the same root and identical or homorganic stem extensions, then the minimal stems must be strictly identical. The constraint is stated in (7):

7. No Partial Similarity: Minimal stems containing the same root and stem extension Cs with the same place feature and identical [±sonorant] values can't be phonologically distinct.

Without No Partial Similarity, Latin would allow pairs of derivatives like {[*rēc-t*]*-us, **[*reg-i-t*]*-or*}, the latter being the expected agent noun, given *fic-i-t-or*. But such pairs contain the same roots and their suffixes are *t*-initial, so, according to (7), their stems can't be distinct. To satisfy (7), the stems become strictly identical and converge on *rēct-*, hence {[*rēc-t*]*-us*, [*rēc-t*]*-or*}. They could also converge on the stem *[*reg-i-t*]-, but constraints discussed in footnote 4 preclude this, so the direction *rēctus→rēctor* comes from further constraint interaction. Since (7) holds of surface structures, that explains the blockage of epenthesis in derivatives like *rēctor*.

This solution can be implemented in a grammar where Markedness and Faithfulness constraints interact with *exponence constraints*, which regulate how syntactic features and syntactic structures correspond to phonological entities[16]. Anti-Priscian is one such constraint. It is violated in syntactically arbitrary derivations, whether those involve deriving adjectival comparatives from Genitives or Datives, as in (2), or agent nouns from passive participles, as in

[16] See Wolf 2008 on a theory of such syntax-to-correspondence mappings and empirical evidence for it.

(5). A constraint-interaction analysis makes it possible to uphold the relevance of Anti-Priscian in the face of apparent deviations from it: No Partial Similarity conflicts with Anti-Priscian and happens to rank above it, in Latin. A compressed Optimality Theoretic analysis of the pair *rēctus-rēctor* based on these ideas appears below. The winning candidate {[*rēc-t*]-*us,* [*rēc-t*]-*or*} violates Anti-Priscian in the sense that the stem *rēc-t-* of [*rēc-t*]-*or* is in mandatory correspondence with that of [*rēc-t*]-*us*, even though neither of the corresponding syntactic structures is a subconstituent of the other.

8. Latin Priscianic identity as motivated violation of Anti-Priscian

root: *reg*-; suffixes: *t-, -us, t-or*	No Partial Similarity (7)	Anti-Priscian (3)
☞[rēc-t]-us, [rēc-t]-or		*
[rēc-t]-us, [reg-i-t]-or	*!	

Turning now to accounts of this Latin data that use morphomes, rules of referral, or parasitic redundancy, these analyses must identify the paradigm cells subject to stem syncretism by listing sets of morpho-syntactic properties, like *perfect, future, adjective*, *agentive*. But this characterization is insufficient. The derivatives whose stems merge with the PfP's are syntactically identical to those that don't: recall that there are agent nominals, event/result nouns, verbal adjectives and frequentative verbs in each one of the lists in (5.c-j) and (6). The right description of the syncretic pairs refers to the phonological form of their suffix. It is unclear if a revision along these lines is possible in morphomic and referral accounts. But it is clearly not feasible for the more restrictive of the morphomic mechanisms, Trommer's parasitic redundancy approach: that's because [αP] assignment rules feed, hence precede, the VI rules, and yet any [αP] assignment rule would have to rely on information generated by the VI rules to distinguish the *t*-suffixed derivatives in (5) from the ones in (6). Further, as seen earlier, if the Priscianic derivation unfolds before the phonological component, phonological rules like epenthesis will undo any identity pattern established earlier. Latin contradicts this prediction.

4.1.2. Other similarity-based syncretisms

Syncretic patterns parallel to those of Latin crop up elsewhehere. The general form they take is that members of an inflectional paradigm, or sets of co-derivatives, merge completely or acquire strictly identical stems, whenever the joint effect of affixation and phonology would

produce phonologically similar, but not yet identical constituents. A list of such phenomena is presented in Steriade 2016. I outline here two others.

Siptár and Törkenczy (2000:184, fn. 9) and Takács (2021) report on a dialectal variant of Hungarian verbs. A process normally triggered only by the imperative suffix *-j* applies in this dialect to all verb roots followed by *j*-initial suffixes. Definite imperatives of *t*-final verbs undergo, in all dialects of Hungarian, a palatalization process that turns [tj]→[ʃ:], as seen in (9.a). The stop→fricative component of this process is specific to the imperative in the standard dialect. The normal fate of /tj/, aside from the imperative, is to palatalize while preserving its stop quality, /tj/→[c], as in (9.b.i). In a regional Hungarian variety, however, it is not only the definite imperatives that undergo spirantizing palatalization [tj]→[ʃ:], but all [t-j] strings created through inflectional suffixation in verbs. This includes indicatives like (9.b.ii). The result is that, as in Latin, phonologically similar pairs of cells in the same lexical paradigm acquire identical stems or merge altogether:

9. Hungarian j-suffixed verbs, standard and regional variants; verb is 'hit' (Takács 2021)

	(a) Imperative 1st pl	(b) Indicative 1st pl
(i) Standard Hungarian	/yt-j-yk/ → [yʃ:yk]	/yt-jyk/ →[ycyk]
(ii) Regional variant		/yt-jyk/ → [yʃ:yk]

Outside of the verbal paradigms, the regional dialect shown in (9.ii) continues to maintain the standard non-spirantizing palatalization, /tj/→[c], e.g. /ɔdɔt-jɔ/ →[ɔdɔcɔ] 'data-POSS-3sg', *[ɔdɔʃ:ɔ]), so the change in indicatives like [yʃ:yk] is not due to a general change in this dialect in how *t*-palatalization applies. Rather it is a change limited to verbal paradigms. Within these paradigms, the pairs of inflectional cells that merge – e. g. [yʃ:yk] and [ycyk] – are already string-identical in underlying form, and very similar on the surface. The dialectal change is to make these similar forms strictly identical on the surface.

Lithuanian verb inflection offers a similar case, with further revealing details. Our starting point is Arkadiev's (2012) claim that the infinitive stem is the base of affixation for a large set of verbal categories, some of which are seen in (10.a). All and only the suffixes in this set begin with obstruents. In that respect they resemble the infinitive, whose suffix is *-ti*. All other verb suffixes are sonorant-initial and don't adopt the infinitive stem. Some appear in (10.b).

10. Lithuanian stems: all forms from *kir̃š-ti* < /kirt-ti/ 'chop'[17], [18]

a. Obstruent-initial suffixes		b. Sonorant-initial suffixes	
Infinitive: -ti	kir̃š-ti	Present, person-number: -u, -i, -a…	kert-ù, kért-i
Imperative: -k	kir̃š-k-ite	Past, person-number: -au, -ai, -o…	kirt-aũ, kir̃t-o
Future: -s	kir̃š-(s)-iu	Optative: -ie	te-ker̃t-ie
Subjunctive: -t, č	kir̃š-č-iau	Pres. active participle: -ant	ker̃t-ą̃nt-is
Past passive part: -t-as	kir̃š-t-as	Pres. passive participle: -a-m-as	ker̃t-a-m-as

The stem syncretism in (10.a) is manifested in three ways. First, a process of assibilation, *t→s/_{t,d},* normally restricted to alveolar clusters, unexpectedly overapplies in verbs before all obstruent-initial suffixes, as with the 2pl imperative *kir̃š-k-ite* from /kirt-k-ite/ (10.a). *Tk* clusters don't normally assibilate in Lithuanian (Kenstowicz 1972: 18), but they do before the imperative suffix *k.* Second, suppletive verbs like *es-/bu-* 'to be' use the infinitive root allomorph (*bu-*) in all and only the categories marked by obstruent initial suffixes (Arkadiev 2012:14). This suggests that the stem identity is metasyncretic, as in Latin. Finally, processes of accent shift (aka *Saussure's Law*) and vowel lengthening, which display normal, phonologically-conditioned application in the infinitive, apply in other verb forms marked by obstruent-initial suffixes *only if they have applied in the infinitive*. Thus, the infinitive *kir̃š-ti* predictably fails to trigger Saussure's Law. Because accent hasn't shifted in the infinitive, the same process is blocked in the subjunctive and future, whose endings would normally be expected to trigger it:

11. Normal and underapplication of accent shift (Saussure's Law), cf. Arkadiev 2012
    a. Normal accent shift to the final in the past indicative: *kirt-au̇̃*
    b. Normal failure to shift accent in the infinitive: *kir̃š-ti*
    c. Underapplication of accent shift in the present subjunctive: *kir̃š-čiau, *kirs-čiau̇̃*
    d. Underapplication of accent shift in the future: *kir̃š-(s)-iu, *kirs-iu̇̃*

While the overapplication of assibilation results in the segmental identity of all pre-obstruent verb stems, the underapplication of Saussure's Law preserves the accentual identity of these

[17] Cf. Arkadiev (2012), Kushnir (2019:112), Senn (1966:§317), and Wiedmann (1897). I am grateful to Yuriy Kushnir for extended conversations that helped me understand the pattern described here. See Kushnir (2019) for an analysis of the entire accentual system of Lithuanian, including a different interpretation of this data.
[18] Notation: circumflex marks on [r̃], [ũ] denote a High-toned second element in an accented nucleus. [ù] is a High-toned (surface) accented short vowel, [ér] is a High-initial accented complex nucleus.

stems. The joint effect of over- and under-application is then the complete surface identity between all verb stems followed by obstruents in any one verb's inflectional paradigm[19].

This presentation of Lithuanian stem syncretism relies on Arkadiev's (2012) observations, but our interpretations diverge. Arkadiev presents this stem identity as *morphomic*, in Aronoff's (1994) sense, but this is debatable. First, the over- and underapplication facts show that this syncretism is directional, as defined in section 1.1, but morphomes can't recognize directionality. (Recall that Latin syncretism is also directional, from verbal perfect stems to perfect participles, to deverbal derivatives. The Hungarian syncretism is arguably directional too.) More significant for understanding morphomes, the Lithuanian syncretism is not arbitrary: the verb categories whose stems are identical share the fact that their stems precede obstruents. Morphomes, by contrast, were expressly devised for the description of arbitrary identities. No case described thus far supports the existence of such phenomena.

In closing this survey of similarity-based syncretism, I note that similarities that stop short of full identity are also avoided in the syntagmatic domain, leading frequently to the complete identity of repeated similar units[20]. The syncretisms we examined in this section can be seen as the paradigmatic counterparts of such syntagmatic similarity-avoidance phenomena, which are abundantly attested. The dispreference for partial similarity could be the broad factor that underlies all these phenomena.

This section has reported two general findings. First, some of the best documented and productive Priscianic patterns in the literature are not arbitrary: they don't lack linguistic motivation, and they don't arbitrarily select their participant expressions. Then such patterns don't justify grammatical mechanisms designed for the description of arbitrary identities. Instead, they suggest taking a second look at all other reported Priscianic identities. Second, stem syncretisms like that of Latin can be modeled in a grammar that recognizes the Anti-Priscian condition in (3), provided this principle is modeled as a violable constraint[21].

4.2. What phonology can do

Many syncretisms reported as Priscianic can be analyzed instead as the phonologically conditioned selection of listed allomorphs (Carstairs 1988, Nevins 2011, Paster 2015), or as

[19] Some deviations from strict stem identity exist, when triggered by automatic processes. See Arkadiev 2012.
[20] MacEachern 1999, Zuraw 2002; Rose and Walker 2004, Gallagher 2010.
[21] Steriade 2016 shows that Anti Priscian is required as an active constraint in the grammar of Latin derivatives.

phonological rules of restricted applicability. An instance of allomorph selection is the distribution of the English indefinite article, with *a* before consonants, and *an* before vowels. A lexically restricted rule is Velar Softening (Chomsky and Halle 1968:219), a rule limited to Latinate morphemes, but fully productive within its restricted domain (Pierrehumbert 2008).

This section compares morphomic analyses of paradigmatic alternations, a vast recent literature due in substantial part to Maiden and Stump, to analyses housed in the phonological component. Unlike the morphomic accounts, phonological analyses can be made explicit without arbitrary stem indices or parasitic features. Their predictions can be verified beyond the paradigms that morphomes are limited to. Phonological analyses are rejected in the morphomic literature on the strength of the *a priori* belief that phonology can model only processes of unrestricted generality. The revealing consequences of this rejection are examined next.

4.2.1. Heterogeneous restricted processes and their morphomes: the 'N pattern'

A class of alternations found in Romance verb paradigms is identified as morphomic by Maiden (2009, 2011, 2016:40, 2018). Table (12) is a pan-Romance summary of the verbal categories that contain the two root allomorphs, called below A and B, which result from these alternations. Maiden refers to this arrangement as the *N-pattern*.

12. N-pattern cells of the Romance verb (based on Maiden 2018:167)

<table>
<tr><th></th><th>1sg</th><th>2sg</th><th>3sg</th><th>1pl</th><th>2pl</th><th>3pl</th></tr>
<tr><td>indicative</td><td colspan="3" rowspan="2">set A</td><td colspan="2" rowspan="2">set B</td><td rowspan="2">set A</td></tr>
<tr><td>subjunctive</td></tr>
<tr><td>most other tenses, moods</td><td colspan="5"></td></tr>
</table>

(13) illustrates the N-pattern in Romanian verbs. The set A cells are shaded.

13. Romanian stress-based alternations in verbal paradigms, based on Maiden 2016:40. Boundaries, stresses, IPA symbols and the data in (ii) were added; stems are bracketed.

(i)	1sg	2sg	3sg	1pl	2pl	3pl	gloss
a.	[já]-u	[jé]-i	[já]	[lu]-ə́-m	[lu]-á-tsi	[já]-u	'take'
b.	[mór]	[mór]-i	[mwár]-e	[mur]-í-m	[mur]-í-ʦi	[mór]	'die'
c.	[usúk]	[usúʧ]-i	[usúk]-ə	[usk]-ə́-m	[usk]-á-tsi	[usúk]-ə	'dry'
d.	[jub-ésk]	[jub-éʃt]-i	[jub-éʃt]-e	[jub]-í-m	[jub]-í-tsi	[jub-ésk]	'love'
e.	[lukr-éz]	[lukr-éz]-i	[lukr-e̯áz]-ə	[lukr]-ə́-m	[lukr]-á-tsi	[lukr-e̯áz]-ə	'work'
f.	[plak]	[plaʧ]-i	[plaʧ]-e	[pləʧ]-é-m	[pləʧ]-é-tsi	[plák]	'please'

(ii)		infinitive	gerund	participle		gloss
a.		[lu]-á	[lu]-í-nd	[lu]-á-t		‘take’
b.		[mur]-í	[mur]-í-nd	[mur]-í-t		‘die’
c.		[usk]-á	[usk]-í-nd	[usk]-á-t		‘dry’
d.		[jub]-í	[jub]-í-nd	[jub]-í-t		‘love’
e.		[lukr]-á	[lukr]-í-nd	[lukr]-á-t		‘work’
f.		[pləʧ]-eá	[plək]-í-nd	[plək]-ú-t		‘please’

The A/B alternations in (13) are heterogeneous. They involve diverse changes, subject to different restrictions, but all relate to stress: the shaded set A stems are accented, those in set B are unaccented. Stress is non-automatic but semi-regular in Romanian.

Maiden rejects any phonological analysis of such data, asserting that it involves “*fundamentally nonsensical and accidental* patterns of allomorphy in the verb […] which cannot be ascribed to any extramorphological conditioning and [are] the accidental effect of a complex set of sound changes” (2016:41; *extramorphological* means syntactic or phonological).

If the pattern in (13) is nonsensical, the only analytical option is to enumerate the cells where stems of sets A or B occur. That list is a morphome. As the morphome-based analyses of the N-pattern remain unstated[22], I attempt to reconstruct one here. A first possibility is (14):

14. A first morphomic account of the pattern in (13)
    The stems of all present indicative singular forms, and of the 3rd person plural, are identical to each other (set A), and distinct from the stems of all other verbal categories.

There are, however, alternations *within* each of set A and B: note the *k/ʧ* alternations in (13.c,f), *sk/ʃt* in (13.d), and *e/(e̯)a, o/wa* in (13.a,b,e). These are nonsensical too, as Maiden indicates in other works, just like the N-pattern. Then they must be morphomes as well, but different from the N-morphome. The grammar must identify the unique property whose distribution is regulated by the N-morphome. What is that property?

It’s an aspect of the stem vocalism. The set A/set B alternations relate stressed low to destressed mid vowels, as in *plak/plək* (13.f), stressed non-high to destressed high vowels, as in *ja/lu* (13.a) or *mor/mur* (13.b); stressed high vowels to zero, as in *usuk/usk,* (13.d); and stressed syllabic stem extensions to their absence, in forms with desinential stress, as in *ez/Ø, esk/Ø*

[22] Maiden 2005, 2009:64ff, 2011, 2016, 2018 are works that discuss the N-pattern without offering an analysis. See also O’Neill 2011, Herce 2019 who note, without resolving, some of the analytical difficulties discussed here.

(13.d-e). Separating the suppletive alternations (13.a, c-e) from the rest, we obtain the patterns below:

15. N-morphome alternations summarized:

(a) non-suppletive	
set A (stressed)	set B (stressless)
wa	o, u
a	ə
o	u

(b) suppletive	
set A (stressed)	set B (stressless)
a	u
e (in *esk, ez*)	Ø
u	Ø

Arranged in this way, the N-pattern doesn't look random. The (a) table in (15) looks like a *chain shift*, a global change in which nuclei vowels raise, and thus reduce in sonority, in stepwise fashion: diphthongs compress to monophthongs, low vowels raise to mid, and mid to high[23]. Each of these processes is attested elsewhere[24]; chain-shift arrangements of stressless reduction are also attested elsewhere[25]. What is unusual here is that the chain shift in (15) incorporates processes with different degrees of regularity: the *o* → *u* raising is broadly attested, but not general, while the *wa*→*o* compression and *a* → *ə* raising are fully regular, though subject to certain general, but not identical, restrictions. Other suppletive cells in (15.b) show a pattern related to the chain shift: destressed vowels are replaced by higher ones, or delete. A global view of these processes reveals a coherent, typologically motivated picture of stepwise sonority reduction in destressed syllables. The change from A to B isn't random[26].

These remarks lead to the beginning of a phonological account of (13), but that's not to the morphomic analysis intended by Maiden. We return to the task of reconstructing that. We can use Trommer's idea of a parasitic feature or index, with 'set A/set B' as names of the indices.

16. A revised morphomic account of (13)

In the present indicative, stems of the singular and of the 3rd plural have the set A vocalism, as defined in (15). All other stems have the corresponding set B vocalism.

[23] On chain shifts: Gnanadesikan 1997, Lubowicz 2011. The deletion of high vowels can be analyzed as the ultimate reduction in sonority. On vowel height and sonority: Crosswhite 2004, Parker 2008.
[24] On stressless reduction in Barnes 2006:chapter 2 and Crosswhite 2004.
[25] Zuraw 2003 on Palauan.
[26] Eulàlia Bonet (p.c., May 2022) reminds me that vowel reduction in Central Catalan proceeds along the same lines: reduction from a to schwa is exceptionless; reduction from o to u and e to schwa have exceptions; mid open vowels always raise at least to mid close vowels (Mascaró 1976; Bonet & Lloret 1998).

The question to ask next is if the morphomic statement in (16) is right in describing the distribution of A/B in *paradigmatic* terms. The clear alternative is to describe it accentually: set A stems are stressed, set B stressless. When a vowel of set A loses stress, it changes to its set B equivalent. This is confirmed by data from another conjugation class, below:

17. A non-N pattern in Class VI verbs: *tradʒ-e* 'to pull'; *kwás-e* 'to sew', *fáʧ-e* 'make'[27]

1sg	2sg	3sg	1pl	2pl	3pl	infinitive	participle	gerund
trág	trádʒ-i	trádʒ-e	trádʒ-em	trádʒ-e-ʦi	trág	trádʒ-e	trá-s	trəg-índ
fák	fáʧ-i	fáʧ-e	fáʧ-e-m	fáʧ-e-ʦi	fák	fáʧ-e	fək-út	fək-índ
kós	kóʃ-i	kwás-e	kwás-e-m	kwás-e-ʦi	kós	kwás-e	kus-út	kus-índ

Unlike the conjugation classes in (13), Class VI keeps stress on the stem in all present forms. As a result, theere is no N-Pattern in these paradigms: the set A vocalism occurs in most cells. When stress does shift off the root in class VI verbs, as in participles like *fək-út* or gerunds like *trəg-índ*, the vowel changes seen in (15) are triggered too. This means that Class VI verbs are not immune to such alternations, rather it's just their stress that differs from the classes in (13). Further, *within* Class VI, participles can't always shift stress off the root: cf. *trá-s* vs. *fək-út.* This means that *no* paradigmatic statement of the vocalic alternations is possible. We have seen then that the A/B alternations are found in all verbs, while the A/B distribution can be described morphomically for only some verbs. That suggests that a morphomic statement is wrong for all, while an accentual account of the alternations is predictive and general:

18. Accentual description of the N-pattern (preliminary; non-suppletive forms only):
When a set A vowel loses stress, it becomes the corresponding set B vowel.
= When a vowel loses stress, its sonority decreases by one step; high vowels delete.

This is not yet a full phonological analysis of the N-pattern alternations, but it is sufficient to highlight the defect in *any* morphomic statement of this data: paradigm structure is not the right predictor of these alternations, but stress is.

Further details confirm (18). First, there are variant pronunciations of the 1st-2nd Pl forms of the verbs in (17), with stress shifted to the ending. In that case, the root vowel always reduces: *fəʧ-é-m, fəʧ-é-ʦi* as opposed to *fáʧ-e-m, fáʧ-e-ʦi.* Shifted but unreduced **faʧ-é-m, *faʧ-é-ʦi* are

[27] Data from Lombard and Gâdei (1981: II 97), whose verb classification I use. There are some 80 verbs in Class VI.

impossible. Second, stress can shift in clitic groups too, to avoid certain forms of lapse, as in (19). This shift is not obligatory, but when it does happen, and only then, the changes in (15), i.e. reduction (a→ə) and diphthong compression (wa→o), always ensue.

19. Stress shift and its vocalic consequences in clitic phrases (Lombard-Gâdei 1981:II103)

spárʤe-l 'spill it!'	spárʤe-ʦi-l ~ spərʤé-ʦi-l, *spardʒé-ʦi-l 'you-pl spill it!' (spill-2pl-it))
skwáte-l 'take it out!'	skwáte-ʦi-l ~ skoté-ʦi-l, *skwaté-ʦi-l 'you-pl take it out!' (take out-2pl-it)

Similar stress shifts occur in derivational morphology, with identical consequences for vowel quality. Morphomic statements do not predict them. The phonological analysis in (18) does.

20. Stress shift and vocalic consequences outside of verbal paradigms

kás-ə 'house-FEM SG'	kəs-úʦ-ə 'house-DIMIN-FEM SG'
kwás-e 'sew-TV(INF)'	kus-ə-tór 'sew-TV-AGENT' (i.e. tailor)
skwát-e 'take-out-3Sg'	skoʦ-ə-tór 'take-out-TV-AGENT'

The data in (19-20) confirms that no list of paradigm cells can describe, let alone explain, the 'N-pattern' alternations, but stress does, because it relies on predictive laws connecting stress to sonority.

To summarize, an observationally correct morphomic grammar of the N-pattern must identify the property that alternates and the context of alternation. The property behind the set A/B division is plausibly reinterpreted in phonological terms, as vowel qualities disfavored in stressless syllables. As for the context of alternation, it can't be fully described in paradigmatic terms: not all verbal paradigms display the same N-pattern, because not all have the same stress. A phonological analysis allows the N-pattern alternations to be unified with parallel stress-based alternations in the language, and places it within the broader typology of stressless vowel reduction. These findings cast doubt on the existence of any N-morphome in Romanian.

More should be said now about the phonological analysis. Recall that the stress-based processes in (13, 17, 19-20) are non-automatic and heterogeneous: they involve raising reduction, diphthong compression, and suppletive vowel deletion, all of which happen under loss of stress. Formal unification in one *rule* will be hard to achieve. But a complete phonological account of (13) can be obtained in a constraint-based analysis, by distinguishing Markedness

from Faithfulness and by adopting lexically-indexed constraints[28]. A single set of Markedness constraints governing dispreferred vowel qualities in syllables that have lost stress covers all the forms of reduction seen in (13, 17, 19-20) in a general way, consistent with the typology of vowel reduction. The variety of means employed to satisfy these constraints in Romanian, and the lexically idiosyncratic aspects of the alternation, stem in part from the fact that some of the relevant Markedness constraints (e.g. *no stressless o*) are lexically indexed to just some morphemes, while others (e.g. *no stressless a*) are general, albeit restricted to derived environments and the native lexicon[29]. Within these limits, and subject to the general constraints on chain-shifts, productivity is general. The non-automatic quality of stress itself can be understood in similar terms: it looks irregular (e.g. *plaʧém* vs. *trádʒem*), not because stress assignment is not part of phonology, but because it is generated by a system of interacting Markedness and Faithfulness constraints, some of which are indexed to lexical items or morphological classes[30].

Both the phonological account and the morphomic analysis of the N-pattern must incorporate lexical restrictions, although in different parts of the analysis: the morphomic account must stipulate that there is no N-pattern morphome in class VI verbs, to fit the data in (17); the phonological account must adopt lexically indexed Markedness constraints to account for o→u raising and u→Ø deletion. So lexical restrictions must be adopted in either case. But only one analysis uses an arbitrary list of paradigm cells.

The synchronic evidence from other Romance languages that Maiden (2018:153ff) cites in support of the N-pattern is comparable to what we see in (13): compression of destressed diphthongs and stepwise raising of vowels, from lax to tense and from mid tense to high. Some of these changes originate as secondary extensions of an original reduction process (Maiden 2018:154), a fact that is consistent with a productive phonological interpretation of the pattern. The converse of reduction under loss of stress is attested too: under stress, historically tense vowels generally lower to lax in Portuguese (Maiden, ibidem). That development too favors a phonological interpretation: the direction of the change, from tense to lax under stress, is not random, but consistent with a typology that links accentual prominence to increased sonority and

[28] Pater 2010, Inkelas 2014: chapter 2.
[29] On derived environments: Kiparsky 1993, McCarthy 2003 and references there.
[30] Romanian verb stress is analyzed by Feldstein 1994-1995 and Steriade 2021.

lower height (Crosswhite 2004)[31]. Vowel alternations relating to the N-pattern are also found in Surmiran, or Rumantsch, and have been analyzed in non-morphomic terms by Anderson (2011), as phonologically condition suppletion. To a non-specialist in Rumansch, they look similar to the Romanian data analyzed above. See also Maiden's (2011) response.

Finally, a substantial component of the N-pattern across Romance is the development of stress-related suppletion, as with the *esk-Ø, ez-Ø* alternations in (13.d-e). The pan-Romance history of these verbal extensions is told by Maiden (2018:156ff.) Their synchronic analysis can involve diverse considerations depending on the language. For Italian, Burzio (2003) argues, in line with Serianni (2003:§85), that the verbal extensions are distributed to satisfy a hierarchy of accentual markedness and uniformity constraints, unrelated to stressless reduction: in a paradigm like {*fin-**ísk**-o, fin-**íf**-i, fin-**íf**-e, fin-jámo, fin-íte, fin-**ísk**-ono*} the attested distribution of *-isk-* insures that the verb root is uniformly unstressed, that stress never lands to the left of a heavy penult, and that only the strict minimum of empty morphs like *isk* are used. These considerations are well-understood, independently supported factors, active elsewhere in Romance, as in Surmiran (Anderson 2011) and Central Catalan (Eulàlia Bonet, p.c.) If we ignore them, we should ask why other N-morphome-compatible distributions don't exist, e.g. *{*fín-o, fin-i, fin-e, fin-if-ámo, fin-isk-áte, fin-ono*}. This impossible verb is as much an N-pattern as the attested paradigm: the *-isk* extension is associated with set B, its absence with set A. What excludes it? Its absence suggests that the N pattern has no inherent attraction.

In closing this section, let me mention a different morphome-inspired analysis of the N-pattern, contained in Pirelli and Battista's (2000) study. This is an explicit non-phonological analysis of alternations similar to (13) found in the verbal paradigms in Italian. While Maiden's unstated analysis commendably distinguishes processes like vowel reduction from palatalization, seeking to identify their separate effects in morphological terms, Pirelli and Battista give up entirely on the idea of identifying distinct components in the observed alternations. Instead, they obtain a description that closely matches the data by proliferating stem indices to cover the entire set of Italian verb stems. As an example, the Italian verb *fin-íre,* comparable to (13.d), requires in their account 3 distinct listed stems: one found in [*fin-ísk*]-*o*, comparable to set A [*jub-ésk*]

[31] Maiden has uncovered a reverse change (2018:156) whereby *u* appears under stress and dipthongized *ue* in stressless syllables, the opposite of what accentual markedness predicts. This change is limited to one verb in one Leonese dialect and is not predicted by the morphomic account either.

(13.d), i.e. root stress, no palatalization; one in [*finíʃ*]-*i,* comparable to set A [*jub-éʃt*]-*i*, i.e. root stress *with* palatalization; and a default one in [*fin*]-*jámo,* comparable to set B [*jub*]-*ím*. A total of eight stems per verb are invoked in the full analysis of Italian verbs (2000: 23). The multiplication of stems reflects the unsupported belief that the grammar of Italian is incapable of identifying the discrete processes that combine to generate these alternations and can just detect globally different expressions.

4.2.2. Unrelated processes and their morphomes: the L/U patterns

A different class of alternations is analyzed next. They look morphomic, i.e. arbitrary, when described as unified processes, but they arguably involve disparate collections of unrelated regularities, each separately analyzable in phonological terms.

Maiden (2016:37, 57) proposes two morphomic schemata for Romance verbs, a U-shaped paradigm, for central Italian and old Romanian (21.a); and an L-shaped pattern for other Romance systems (21.b). Shaded cells in (21) have identical stem-final consonantism, and different from the rest of the paradigm. Light-grey cells show some variation. Like the N-pattern, the alternations forming the L- and U-pattern are presented as nonsensical. They are indeed, if we attempt a single analysis for all the data presented, but not otherwise.

21. The U-pattern and the L-pattern (adapted from Maiden 2016)

a. U-pattern: central Italian and early Romanian

	1sg	2sg	3sg	1pl	2pl	3pl
indicative pres.						
subjunctive pres.						
other tenses/moods						

b. L-pattern: elsewhere in Romance

	1sg	2sg	3sg	1pl	2pl	3pl
indicative pres.						
subjunctive pres.						
other tenses/moods						

The U-pattern is illustrated below by Italian Velar Palatalization, (22.a), and, in (22.b-d), by alternations undergone by roots that end in coronals (*l, ʎ, r*; *n, ɲ;* occasionally *d*) or vowels. The latter include what I will call *G-Intrusion* (22.b-c) and *R-Deletion* (22.d).

22. The U-pattern in Italian (cf. Maiden 2016; I added boundaries, IPA symbols and URs)

a. Velar Palatalization. Instances of [ʤa] represent underlying /g-ja/,

pjaŋg-e-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	pjáŋg-o	pjándʒ-i	pjándʒ-e	pjandʒ-ámo	pjandʒ-éte	pjáŋg-ono
subj.pres.	pjáŋg-a	pjáŋg-a	pjáŋg-a	pjandʒ-ámo	pjandʒ-áte	pjáŋg-ano

b. G-Intrusion after *n.* Instances of *ɲ* represent underlying */n-j/.*

pon-e-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	póŋg-o	pón-i	pón-e	poɲ-ámo	pon-éte	póŋg-ono
subj.pres.	póŋg-a	póŋg-a	póŋg-a	poɲ-ámo	poɲ-áte	póŋg-ano

c. G-Intrusion after vowel, *gg* = [g:]

tra-e-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	trágg-o	trá-i	trá-e	tra-jámo	tra-éte	trágg-ono
subj.pres.	trágg-a	trágg-a	trágg-a	tra-jámo	tra-játe	trágg-ano

d. R-Deletion

mor-i-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	muój-o	muór-i	muór-e	morj-ámo	morí-te	muój-ono
subj.pres.	muój-a	muój-a	muój-a	morj-ámo	morj-áte	muój-ano

In the case of *R*-Deletion and G-Intrusion, changes relative to underlying representations occur in the shaded cells. In the case of Velar Palatalization, the changes occur in the clear cells. This makes a unified description of the U-pattern hard to envision. Nonetheless, I attempt to reconstruct what might be the intended rule:

23. The U-pattern: a morphomic description of (22)

In the *e*- and *i*-conjugations, the 1st Sg and the 3rd Pl indicative present, the subjunctive singular and the subjunctive 3rd Pl forms differ as follows from the rest of the paradigm:

a. They lack any root-final *r*.

(e.g. *muo-j-o*, not **muor-j-o*)

b. After a root-final voiced coronal or a vowel, they contain a *g*.

(e.g. *pon-g-o*, not **pon-o*)

In all other cells of the *e*- and *i*-conjugation,

c. There can be no root final velars. The velars from any other cells surface there as palatoalveolars.

(e.g. *pjándʒ-i*, not **pjáng-i*)

The changes defining the U pattern happen in complementary sets of cells, so (23) must be a disjunctive statement. It reveals no generalization that couldn't be separately stated for Velar Palatalization (23.c), G-Intrusion (23.b) and R-Deletion (23.a).

One can argue that the morphomic statement in (23) – and any other attempt to unify the changes in (22) – is not just inelegant, but incorrect too. If the changes in (23) did form a single process, one would expect them to be of comparable regularity, but only some apply regularly.

Velar Palatalization can be stated generally for Italian, as a result of interactions between Markedness constraints and Paradigm Uniformity, for all conjugations (Giavazzi 2010, Steddy 2015, Flor 2021). While Palatalization generates alternations only in the *e*- conjugation, consistent with (23), Flor and Steddy's accounts explain this without stipulation. Under further typologically supported assumptions, Velar Palatalization can be stated generally, across all lexical categories and across the inflectional-derivational divide (Flor 2021). The generality of this process undermines the paradigm-based morphomic description in (23.c), which covers only verbs and which ignores the link between the changes (*k*→*ʧ,g*→*ʤ*) and their pre-palatal (*_i, e*) context. That context is constant for all parts of speech and all morphological structures.

By contrast, G-Intrusion is limited to an arbitrary list of verbs, one that has been fluctuating historically and continues to be uncertain. Its application in contemporary Italian depends on the root final consonant, the lexical item, the conjugation class and the dialect[32]. Overall, out of some 50 *e*/*i*-conjugation verbs that seem eligible for G-intrusion, fewer than half undergo it, in stark contrast to Velar Palatalization.

As for R-Deletion (22.d), this process is phonologically predictable, though only three verbs qualify as its targets. What it does is to eliminate *r* in *Vrj* strings. Thus, intermediate *mór-i-o* undergoes gliding to *mór-j-o,* and then loses its *r* to become *mojo*, eventually *muójo*. By contrast, *mor-j-ámo* doesn't meet the stress condition of R-Deletion and *móri* lacks the *j*. Whether productive or not, R-Deletion must be distinct from Velar Palatalization because they involve

[32] G-Intrusion data, based on Serianni 2003:303ff, Maiden and Robustelli 2014, shows substantial fluctuations in the application of this process to different verb classes. The ratios shown below, e.g. 1/5 in the top left cell, represent numbers of verbs with G-intrusion out of all verbs that end in the consonant labeling each row.

root ends in	e-conjugation	é-conjugation	í-conjug.	G-Intrusion rate
l-	1/5 (*svelgo*, archaic)	2/4 (*dolgo*)	1/2 (*salgo*)	36%
ʎ-	4/4 (*colgo*)	-	-	100%
n, ɲ-	5/5 (*vengo, spengo*)			100%
V-	1/2 (*traggo*)	-	-	50%
d-	2/24 (*chieggo*, archaic)	2/5 (*veggo*, dialectal)	0/1	13%

different changes, as the comparison between (23.a) and (23.c) shows, and because the accentual conditions that constrain them are distinct: in verbs, Velar Palatalization need not apply directly after a stressed vowel, while R-Deletion must. More on stress and Velar Palatalization in Giavazzi 2010 and Flor 2021.

The other language reported to have a U-pattern morphome, Old Romanian, displays Velar Palatalization (24.a-b) and Assibilation, *d→ʣ*, (24.c). Here too, there is no uniform paradigmatic characterization of the forms that undergo Palatalization (compare *duk-ɨndu* in (24.a) to *fuʤ-indu* in (24.b)) and no paradigmatic parallelism between it and the context of Assibilation.

24. The U-pattern in Old Romanian (based on Maiden 2016:57ff):

duk- 'lead'; *fug-* 'flee'; *ved-* 'see'

(a) duk-e-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	duk-u	duʧ-i	duʧ-e	duʧ-e-mu	duʧ-e-ʦi	duk-u
subj.pres.	duk-u	duʧ-i	duk-ə	duʧ-e-mu	duʧ-e-ʦi	duk-ə
gerund	duk-ɨndu					

(b) fug-i-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	fug-u	fuʤ-i	fuʤ-e	fuʤ-i-mu	fuʤ-i-ʦi	fug-u
subj.pres.	fug-u	fuʤ-i	fug-ə	fuʤ-i-mu	fuʤ-i-ʦi	fug-ə
gerund	fuʤ-indu					

(c) ved-e-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	vədz-u	vedz-i	ved-e	ved-e-mu	ved-e-ʦi	vəd-u
subj.pres.	vədz-u	vedz-i	vadz-ə	ved-e-mu	ved-e-ʦi	vadz-ə
gerund	vədz-ɨndu					

Maiden states that Velar Palatalization is "an ancient and long-extinct sound change" (2016 : 57) as a way to justify a non-phonological account of this distribution. In fact, this process continues to apply predictably today – not just in verbs, but across morphological contexts – as it has throughout the history of Romanian: in derived environments, before a suffixal front vowel, only *ʧ/ʤ* occur and velars are generally impossible[33]. For the data in (24), the difference between front and back vowels is necessary and sufficient to explain the distribution between velars and palatoalveolars, including the different gerunds in (24.a-b), *duk-ɨndu* vs. *fuʤ-indu*. A morphomic analysis can't connect the front/back quality of suffixal vowels, *i* vs. *ɨ*, to the stem consonantism,

[33] As in Italian, surface forms containing *ʧ, ʤ* followed by a back vowel, e.g. *duʧam* < *duk-e-ám* 'carry-IMPF-1Sg', are the result of the automatic loss of a front glides after palatals and palatoalveolars, and do not arise otherwise. Velars are mostly excluded before front vowels in derived environments, with very limited affix-specific exceptions. In non-derived environments both velars and palatoalveolars are possible before *e, i*.

ʤ vs. *g,* so it must mention not only combinations of persons numbers and moods, but also the conjugation class, *e-* vs. *i-*, to characterize this morphome[34]. A third paradigm, in (25), confirms that no uniform *paradigmatic* context describes Palatalization, but that its segmental context is fully predictive: in the *a*-verbs, the class shown in (25), the distribution of e/ə endings differs in the 3rd Sg from that of *e-* and *i*-verbs. Correspondingly, the context of Palatalization differs too.

25. No U-pattern for Romanian Velar Palatalization: *a*-verbs like *apuk-á* 'to grab'

apuk-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	apuk-u	apuʧ-i	apuk-ə	apuk-ə-mu	apuk-a-ʦi	apuk-ə
subj.pres.	apuk-u	apuʧ-i	apuʧ-e	apuk-ə-mu	apuk-a-ʦi	apuʧ-e
gerund	apuk-indu					

By contrast, the context of *D*-Assibilation (24.c) is phonologically unpredictable (e.g. 1Sg *vəʣ-u* vs. 3Pl *vəd-u*). Its paradigmatic domain is also quite different from that of Palatalization. Not surprisingly, D-Assibilation has been eliminated from Modern Romanian, leaving behind just a few suppletive remains. It offers no evidence for a U-morphome.

The evidence for a L-morphome in Spanish and Portuguese is similar to the data of tables (22.b,c) on G-Intrusion, with three differences: the 3Pl. indicative is not subject to G-Intrusion in Iberian; all subjunctive forms undergo it; a velar is inserted after *θ,* in addition to *n, l,* V:

26. G-Intrusion as an L-pattern in Spanish (cf. Maiden 2016)

val-e-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	valg-o	val-es	val-e	val-emos	val-eis	val-en
subj.pres.	valg-a	valg-as	valg-a	valg-amos	valg-ais	valg-an

jaθ-e-	1sg	2sg	3sg	1pl	2pl	3pl
indic.pres.	jazg-o	jaθ-es	jaθ-e	jaθ-emos	jaθ-eis	jaθ-en
subj.pres.	jazg-a	jazg-a	jazg-a	jazg-amos	jazg-ais	jasg-an

[34] Maiden (2016:58) proposes to turn this additional complexity of the morphomic analysis into an asset. He notes that there are Romanian dialects in which the gerund *fuʤ-indu* of (24.b) has been restructured to *fug-ind*. This allows, for those dialects, a more uniform paradigmatic account, which does not need to mention conjugation classes. In fact, however, the change to *-ind* gerunds for *i*-verbs like *fuʤ-i* is entirely unrelated to palatalization. Gerunds in *-ind* for most *i*-verbs are substandard but common, no matter what consonant ends the root. Thus forms like *sorb-ind, askuʦ-ind, miros-ind, sokot-ind, ven-ind*, all from i-verbs, can be found on Google, along with *fug-ind*. The real explanation for these forms is that *-nd* gerunds, which used to be preceded by a version of the conjugation-specific theme vowel, are now being reanalyzed as containing invariant *-ind* in all conjugations.

Like its Italian counterpart, G-Intrusion is a minor process in Spanish: e.g. the 1st Sing *valgo* from *valer* 'be worth' contrasts minimally to *huelo*, **holgo,* from *oler* 'smell'. Nonetheless, one can characterize phonologically why it can apply in some paradigm cells and can never apply in others: *g* is inserted, if at all, only before *non-front vowels*[35]. All accounts must state that G-Intrusion happens in verbs and not in nouns, and in some verbs, but not in others. But, in addition, the morphomic account must also separately list each paradigm cell where G-Intrusion happens, because it rejects a phonological statement. This is another direct consequence of the undefended assumption that phonologically restricted generalizations don't belong in phonology.

4.2.3. Diachronic stability

We should highlight now the relevance of N, L and U-morphomes for the broader question of morphomes' diachronic stability brought up earlier. At issue is whether arbitrary syncretisms survive intact over several generations of learners, as asserted by Maiden (2018 and elsewhere) and Herce (2020:360, et passim). If they do survive, that could be an indication that learners identify such identities as unified phenomena, and learn them, despite their arbitrary nature.

We have seen that the N pattern is widespread in Romance and that, in Eastern Romance at least, it survives to this day. So it is stable, if survival over several centuries counts as that. But we have also seen that the N pattern is not arbitrary. It is a class of modifications triggered by a single general principle, the avoidance of sonorous vowels in de-stressed positions, and applying to phonologically defined sets of targets, not to arbitrary sets of paradigm cells. Its stability is irrelevant to the argument that learners internalize morphomic grammars.

The L and U-pattern are indeed arbitrary, if defined as Maiden argues, but the evidence shows that neither survives as a unified general process, if there ever was one, and that there is no possible synchronic connection between the micropatterns they summarize. One of these micropatterns, however, is velar palatalization, a general, non-arbitrary phonological process, and a stable one at that, in both Italian and Romanian.

Then the data discussed until now, in sections 4.1 and 4.2, does suggest a connection between stability and arbitrariness: the diachronically stable syncretisms are *not* phonologically arbitrary, while the arbitrary ones are indeed unstable, if ever detected.

[35] Eulàlia Bonet (p.c. May 2022) notes that the distribution of intrusive g is different in Catalan, where outside the indicative present, *g* extends across entire tense/ mood paradigms regardless of the quality of the following vowel.

Patterns relevant to this question are also presented below. We analyze next Sanskrit grade alternations, which are stable but not phonologically arbitrary. The Chinantec syncretisms discussed in section 4.3.2 are identified as stable by Herce (2020), but they are not arbitrary either, if analyzed as interactions of general exponence conditions, which reference morpho-syntactic features and the identity or distinctness of their exponents within a paradigm. Finally, the paradigm shifts that operated from the 1930's to the present time in Chichimec (Feist and Palancar 2021), can be interpreted, as seen in section 4.4, as changes in the ranking of paradigm distinctness vs. uniformity constraints, not as changes in the distribution of morphomes.

4.2.4. Morphomes in Sanskrit

Stump's morphological theory (2001, 2015) makes use of morphomic mechanisms. Arguments for their use involve in part the Sanskrit *grades* (2001:169ff; 2015:74ff). These are fixed shapes of the stem differentiated by the presence of pre-suffixal *a* and the length of pre-suffixal nuclei. I discuss these cases here because they involve considerably greater analytical complexities than the Romance morphomic patterns considered above, while illustrating the same main theme: analyses that reject non-automatic phonological rules must replace them by complex stipulations about paradigm structure, which can't generalize from one paradigm type, or one lexical category, to another. The main grade types of Sanskrit are shown in (27).

27. Stem grades in Sanskrit: *svasar-* 'sister

a. full	XaC_0-	Loc.Sg. svásar-i
b. zero	XC_0- or $\underset{.}{X}C_0$-	Instr.Sg. svásr-ā, Instr. Pl. svásṛ-bhis
c. long	$XāC_0$-	N.Pl. svásār-as
d. zero lengthened	$\bar{\underset{.}{X}}C_0$ -	Acc.Pl. svásṝ-s

The zero grades, in rows (b, d), stem from loss of the pre-suffixal *a* and can produce syllabicity alternations: e.g. full grade *ar* becomes zero-grade [r] next to vowels, and [ṛ] elsewhere.

Stump argues that the grades are morphomes in the Aronovian sense, functions from a syntactically arbitrary set of categories to a collection of exponents that is also phonologically arbitrary. We examine the careful, explicit analyses he presents, and consider some alternatives.

4.2.4.1 Strong grades and the Accusative Plural

One argument for a morphomic analysis of the Sanskrit grades is based on nominal stems ending in *nC*, like those in (28-29). These display full or long grades in the 'strong' cases –

Nominative, Vocative, Accusative – of all numbers, but not in the Accusative Plural, whose stem appears in the zero grade in most Sanskrit nominals. Stump assigns the full and long grades to a single category, the strong grade, characterized by nuclear *a,* long or short, in predesinential position. Strong-grade cells are highlighted below. For any strong-grade stem in *XanC₀* the corresponding zero grade is *XaC₀*: here, surface *a* realizes underlying *n*, made syllabic by the loss of full-grade *a*, thus *XanC₀* → *XnC₀,* by zero grade formation, → *XaC₀,* by *n*-vocalization.

28. Grades in Sanskrit nt-adjectives: *bhagavant-* 'blessed'[36]

	Singular		Dual		Plural	
N.	long	bhágavān(t)	full	bhágavant-āu	full	bhágavant-as
Acc.	full	bhágavant-am	full	bhágavant-āu	zero	bhágavat-as
Voc.	full	bhágavan(t)	full	bhágavant-āu	full	bhágavant-as
other	zero	bhágavat-ā, …	zero	bhágavat-os, …	zero	bhágavad-bhis, …

(28) shows that the set of strong-grade case forms is not syntactically coherent, because the Acc. Pl. is excluded from this group. In a different class of *nC*-stems, that of perfect active participles in *vans*, grades are differently realized, with the participial suffix *vans* reduced to zero grade *uṣ*, rather than the expected *vas*, and some full grades are replaced by long grades. Despite these differences, the strikingly gappy distribution of strong and zero grades remains the same:

29. Grades in Sanskrit nt-adjectives: *tasthivans-* 'having stood'

	Singular		Dual		Plural	
N.	long	tasthiv̐án(s)	long	tasthiv̐áns-āu	long	tasthiv̐áns-as
Acc.	long	tasthiv̐áns-am	long	tasthiv̐áns-am	zero	tasthúṣ-as
Voc.	full	tásthivan(s)	long	tasthiv̐áns-āu	long	tasthiv̐áns-as
other	zero	tasthúṣ-as, …	zero	tasthúṣ-os, …	zero	tasthúṣ-ām, …

Taken together, this data seems to display both sides of Aronoff's morphome. We have two arbitrary collections of case-number categories mapped to two grades, strong and zero. Each grade is expressed through allomorphs that look unpredictable: the zero-grade of *bhagavant-* is *bhagavat-* not **bhagut-*, while that of *tasthivans-* is *tasthuṣ-* not **tasthivas-*.Why? If neither phonology nor syntax bring coherence to this picture, perhaps morphomes will help.

[36] (C) stands for an underlying C deleted in sandhi.

But when the evidence for the grade morphomes is considered, non-morphomic accounts emerge, not just as conceivable alternatives, but as necessary ones. A global look at the Sanskrit grades, in nouns and verbs, shows that zero grades are phonologically predictable. The zero grades, as in the Acc.Pl. forms in (28-29), are conditioned by endings that are underlyingly accented, like all suffixes that condition zero grades, a point anticipated by Whitney (1889:§311) and Macdonnell (1910: §22) and demonstrated by Kiparsky (2010).

4.2.4.2. Zero grade and accent

Recall that the zero and strong grades differ in the presence/absence of underlying presuffixal *a*[37]. Earlier work has shown that the *a*-less zero grade is derived from the full grade[38], rather than being underlying or co-listed with it; and that *a* is lost before any accented suffix (Kiparsky 2010.) The difference between accented and unaccented case endings is seen independently of grade alternations in monosyllables like *pad-* 'foot' (Whitney 1889: §390ff), whose predesinential *a* can't delete, for phonotactic reasons, but whose accent shifts predictably: it falls on an accented ending, if there is one, and otherwise it defaults on the initial.

30. Accent shift in an unaccented root; grades listed to facilitate comparison to (27-29)

pad- 'foot'	Singular		Dual		Plural	
N.	long	pā́t-(s)	full	pád-āu	full	pā́d-as
Acc.	full	pád-am	full	pád-āu	zero	pad-ás
Voc.	long	pā́t-(s)	full	pád-āu	pā́d-as	pā́d-as
Other	zero	pad-í,…	zero	pad-bhyā́m, …	zero	pat-sú, …

Comparing (30) to (28-29), a correlation emerges: the *endings that attract accent in (30) are the same as those that trigger zero grade*, i.e. the loss of pre-suffixal *a* in (28-29). An account of this correlation builds on the idea that both the accent attractors and the zero-grade triggers have underlying accents. Roots like *pad-*, and endings that don't trigger zero grade, lack an accent. In (30), accent lands on any underlyingly accented syllable, e.g. Instr.Sg. in *pad-ā́,* and, absent any lexical accent, on the initial, e.g. Acc.Sg *pád-am*. The stems in (28-29) carry underlying accents and keep them, but their predesinential *a* still deletes before underlyingly accented endings. This

[37] The [a] of zero-grade [vat] of *bhagavat-as* (2) realizes interconsonantal [n]: /vant/→/vnt/ (by zero grade) → [vat].
[38] Whitney (1889:§237); Macdonnell (1910: §22); Steriade 1988.

is one aspect of Kiparsky's (2010) proposal: zero grade targets an *a*, accented or not, provided it precedes an underlying accent.

The ingredients in this analysis are underlying lexical accents, a zero-grade process that deletes *a* before underlying accents, vocalization of expected *ṇ* as *a*, and a process (the *Basic Accentuation Principle, BAP*[39]) which selects the first of several accents. The derivation below is presented as a sequence of ordered steps[40].

31. Deriving accent and grade alternations
    a. Zero Grade: delete *a* before an accented suffix (cf. Kiparsky 2010)
    b. N-vocalization: interconsonantal [n] becomes *a*
    c. BAP: only the first accent of a word surfaces
    d. Initial Accent: an underlyingly unaccented word receives an initial accent

Underlying	pad-as (N.Pl)	pad-ás (Ac.Pl.)	bhágavant-as (N.Pl)	bhágavant-ás (Ac.Pl)
Zero Grade		blocked (*pd-)		bhágavnt-ás
N-vocaliz.				bhágavat-ás
BAP				bhágavat-as
Initial Accent	pád-as			
Surface	pád-as	pad-ás	bhágavant-as	bhágavat-as

Longer unaccented nouns, like *pumans-* 'man,' display both accent shifts *and* grade alternations.

32. Accent shift in Ns in an unaccented root

pumans- 'man'	Singular		Dual		Plural	
N.	long	púmān(s)	long	púmān(s)-āu	long	púmān(s)-as
Acc.	long	púmān(s)-am	long	púmān(s)-āu	zero	pums-ás
Voc.	full	púma(ns)	full	púmān(s)-āu. .	long	púmān(s)-as
Other	zero	pums-í,…	zero	pum(s)-bhyā́m,	zero	pum(s)-sú,

The combination of zero grade and accent shift in *pumans-* is exactly what the grammar in (31) predicts for an unaccented root. The accent shifts onto the very same endings that are preceded by zero grade stems, because these are the accented endings[41].

[39] Kiparsky and Halle 1977

[40] A parallel analysis of these alternations is challenging, because Zero Grade is opaque, but perhaps not impossible. This point about parallelism is independent of the present discussion.

[41] The *pumans-* → *pums-* zero grade, rather than the expected *pumans-* → *pumṇs-* → **pumas-,* is idiosyncratic, but not inexplicable. This case is akin to the *-vans/-uṣ* alternation and others, like *-yank/-īk.* It suggests that certain stems eliminate any predesinential *a* in zero grade contexts, including *a*'s resulting from a vocalized *n*. The full analysis is too long to develop here, and its point is independent of the present discussion of morphomes.

Returning to the paradigms in (28-29), we see now that their gappy structure is explained by the zero grade mechanism in (31.a), a process sensitive to underlying accents. The complexities of Sanskrit grade and accent alternations can't be fully laid out here, but, short of a complete account, the following generalization can be offered in support of the idea that the zero grade is always conditioned by accented endings:

33. A correlation between accented endings and zero grades: All and only the endings that follow stems in their zero grade can surface bearing a non-contracted accent[42].

The analysis in (31) offers a direct account of this correlation: zero grade is triggered by accented endings, and those endings are the only kind that attracts surface accents. A morphomic account like Stump's leaves (33) unexplained, because it distributes stem grades to arbitrary lists of case forms (cf. 2001:178, (3)) rather than letting them emerge from interactions with accent.

The morphome-inspired expectation that stem shapes, including grades, are independent of their phonological contexts is stated by Stump as a general principle, the *Indexing Autonomy Principle* (2001:184). But the IAP is directly contradicted by any analysis that predicts (33).

Stump does consider and reject some phonological accounts as alternatives to the morphomic analysis, if not Kiparsky's accentual analysis. I expect he'd reject that too, along with all the non-morphomic analyses he does consider, because zero grade formation is not an "automatic phonological process" (cf. Stump 2015: 77; passim). Indeed, far from being automatic, Zero Grade is opaque in every sense of the term: it's restricted to some morpheme classes, it is not surface-true (e.g. Gen.Du *sénay-os* 'army', **sény-os*), nor surface-apparent (Acc.Pl. *tasthúṣ-as*, with zero grade followed by unaccented *-as* on the surface). But, while non-automatic, this process is pervasive in Sanskrit and essential to explaining (33) and other regularities.

The most general conclusion of this discussion is that some morphomes are just artefacts of the analysts' *a priori* belief that a phonological grammar can't model non-automatic processes. I turn next to a related case, also analyzed morphomically by Stump. I show this requires an extension of the accentual processes interacting with grade formation, not morphomes.

[42]A contracted or *svarita* accent results from an accented V becoming a glide, with shift of its accent onto an adjacent V. This accent shift is irrelevant here: all V-initial endings participate in it.

4.2.4.3 No morphomes in the 9th class presents

The Sanskrit verb class called *class 9 presents* (Whitney 1889:§717ff) uses a suffix with two variants, *nā* and *nī*, to mark imperfective aspect. Their distribution, shown in (34), is arbitrary when stated paradigmatically: *nā* occurs in the singular indicative active, present and imperfect; in 1st person imperatives, for all numbers and both voices; in all subjunctives; and in the 3rd person singular imperative active. *Nī* appears in the dual and plural of most moods and tenses, probably in all optatives, in 2nd person imperatives of all numbers and voices, in the active imperative of 3rd persons dual and plural, and in most middle forms. Clearly neither *nā* nor *nī* occur in contexts forming a syntactically unified class. The segmental context – the consonants and vowels that surround them – also fail to predict their distribution: roots are invariant before *nā*/*nī;* and some suffixes after *nā* are the same as those that follow *nī*. Then *nā*/*nī* could represent a morphome, and that's how Stump presents it. A paradigm illustrating the *nā*/*nī* distribution follows, based on Stump 2015:74, with some additions: accents and subjunctive active forms[43].

34. Distribution of *nā*/*nī* in class 9 presents. The verb is *krī-* 'buy'.

Voice	*Tense/Mood*	*Pers.*	Singular	Dual	Plural
Active	Pres.Indic.	1	krī-ṇā́-mi	krī-ṇī-vás	krī-ṇī-más
		2	krī-ṇā́-si	krī-ṇī-thás	krī-ṇī-thá
		3	krī-ṇā́-ti	krī-ṇī-tás	krī-ṇ-ánti
	Imperf.Indic.	1	á-krī-ṇā-m	á-krī-ṇī-va	á-krī-ṇī-ma
		2	á-krī-ṇā-s	á-krī-ṇī-tam	á-krī-ṇī-ta
		3	á-krī-ṇā-t	á-krī-ṇī-tām	á-krī-ṇ-an
	Subjunctive	1	krī-ṇā́-ni		krī-ṇā́-ma
		2	krī-ṇā́-s		krī-ṇā́-tha
		3	krī-ṇā-t		krī-ṇā́-n
	Optative	1	krī-ṇī-yā́-m	krī-ṇī-yā́-va	krī-ṇī-yā́-ma
		2	krī-ṇī-yā́-s	krī-ṇī-yā́-tam	krī-ṇī-yā́-ta
		3	krī-ṇī-yā́-t	krī-ṇī-yā́-tām	krī-ṇī-y-ús
	Imperative	1	krī-ṇā́-ni	krī-ṇā́-va	krī-ṇā́-ma
		2	krī-ṇī-hí	krī-ṇī-tám	krī-ṇī-tá
		3	krī-ṇā́-tu	krī-ṇā́-tām	krī-ṇántu

[43] Forms with *nā* are highlighted. Empty cells have accidentally missing forms. Subjunctive middles are not listed because they're uninformative. Before V-initial suffixes, *nā*/*nī* are truncated: for such cells, I mostly follow Stump's decisions on whether it's *nā* or *nī* that should be reconstructed. Those cells can also be ignored. In all forms, the /n/ of *nā*/*nī* surfaces as *ṇ* in these examples, due to the retroflexion harmony triggered by the preceding *r.*

Middle	Pres.Indic.	1	krī-ɳ-é	krī-ɳī-váhe	krī-ɳī-máhe
		2	krī-ɳī-ṣé	krī-ɳ-áthe	krī-ɳī-dhvé
		3	krī-ɳī-té	krī-ɳ-áte	krī-ɳ-áte
	Imperf.Indic.	1	á-krī-ɳ-i	á-krī-ɳī-vahi	á-krī-ɳī-mahi
		2	á-krī-ɳī-thās	á-krī-ɳ-áthām	á-krī-ɳī-dhvam
		3	á-krī-ɳī-ta	á-krī-ɳ-átām	á-krī-ɳ-ata
	Optative.	1	krī-ɳ-ī-yá	krī-ɳ-ī-váhi	krī-ɳ-ī-máhi
		2	krī-ɳ-ī-thás	krī-ɳ-īy-áthām	krī-ɳ-ī-dhvám
		3	krī-ɳ-ī-tá	krī-ɳ-īy-átām	krī-ɳ-ī-rán
	Imperative	1	krī-ɳ(á)-āi	krī-ɳá-vahā-i	krī-ɳá-mahā-i
		2	krī-ɳī-svá	krī-ɳ-áthām	krī-ɳī-dhvám
		3	krī-ɳī-tám	krī-ɳ-átām	krī-ɳ-átām

While Stump presents the distribution of *nā*/*nī* as unpredictable, simply adding accents to the verb forms, as I've done in (34), shows that the accentual context predicts the difference: *nī* is always unaccented*; nā* occurs mostly under accent, with predictable deviations in words that contain a preceding accent, like the 1st sg. imperfect active *á-krī-ɳā-m*. In those forms, an accented morpheme precedes *nā,* like the *á* of *á-krī-ɳā-m*. The BAP favors this accent over that of *nā*. As the *nā*/*nī* distribution is predictable, this data doesn't justify the use of morphomes.

But perhaps we should ask if it's accent itself that's distributed unpredictably. Such a finding could justify a morphomic entity of a more abstract nature. A brief examination suggests instead that the accent in these class 9 paradigms is itself predictable.

In a first step, we assume that all accents are underlying and we use them to predict the *ā*/*ī* vocalism. The Zero Grade and the BAP, (31.a, c) offer an account for *nā/nī* as an instance of the full/zero alternation, given that long *ā* raises to *ī* or *i*, before an accent, just as short *a* deletes in that context[44]. Second, *nā* must be underlyingly accented – otherwise Initial Accent (31.d) will yield * *krī́-ɳā-mi*, not *krī-ɳá-mi*. If so, it must be deaccented, in addition to being zero-graded, before an accented ending, hence *krī-ɳī-vás,* not **krī-ɳī́-vas*. As a result of deaccentuation, the connection between grades and surface accent is transparent in most forms of the *nā/nī* paradigms. The revised analysis below includes this addition as Rule (35.a) and predicts the vocalic alternation *nā/nī* for all forms in (34).

[44] This is a general effect in Sanskrit: root *ā* also typically surfaces as *ī* or *i* in zero grade contexts (Whitney 1889). Parallel full/zero alternations between Class 7, 8 present suffixes *na/n* and *nau*/*nu* confirm this: full-grade *nau* and *na*, like Class 9 *nā*, occur under accent, while zero-grade *n* and *nu,* like *nī*, occur only before an underlying accent. In all cases, as predicted by (31.a), full grade /a/ is replaced by something else, Ø or *ī,* in the zero-grade.

35. *nā/nī* alternations and accents in present and imperfect forms of class 9 presents

a. Deaccent *nā́* (preliminary): deaccent *nā́* before an accent.

b. Derivations:

Underlying	krī-ɳā́-mi	krī-ɳā́-más	á-krī-ɳā́-m	á-krī-ɳā́-má
Deaccent *nā́*		krī-ɳā-más		á-krī-ɳā-má
Zero Grade		krī-ɳī-más		á-krī-ɳī-má
BAP			á-krī-ɳā-m	á-krī-ɳī-ma
Surface	krī-ɳā́-mi	krī-ɳī-más	á-krī-ɳā-m	á-krī-ɳī-ma

The presence of accents on the endings is itself predictable, as anticipated. The details are complex, but the decisive fact is that the rules that decide which verbal morpheme is accented – an ending or a preceding morph – are shared by different classes of presents, marked by different present suffixes or by no suffix at all (Whitney 1889:§668, 689, 703, 722). These rules then pertain to the desinential accents and bear only indirectly on the accent of preceding morphemes like *nā/nī*. Their existence confirms the need for an accentual analysis of the *nā/nī* alternation.

We examine now the details. Consider first the indicative in (34). The endings of the active singular are all unaccented and contain short high vowels (e.g. *-mi, -si, -ti*), or no vowels (*-m, -s, -t*). By contrast, the active dual and plural endings begin with *a* and are all accented (e.g. *-más, -thá, -ánti*)[45]. In the indicative middle, all endings whose accent can be observed begin with *-a* or *-e*[46]. When their accent surfaces, in the indicative present, these desinential non-high vowels are all accented: e.g. *-é, -váhe, -tá, -dhvám*. All surface accented endings are preceded by a zero grade, as predicted. The generalization then is that *a/e*-initial endings get an accent, which regularly triggers zero-grade on any preceding suffix, including *-nā.* All other endings are unaccented, *because they lack an a*. Low vowels are known to attract accents[47], so a height-sensitive accent rule, even if restricted to endings, is hardly surprising. Here I write rule (36.a), which assigns accent to a desinence-initial non-high vowel. In the imperfect, the BAP assigns the unique surface accent to the tense prefix *á-*, and thus makes rule (36.a) opaque. But the accents

[45] The optative 3rd pl listed by Stump as *kri-ɳī-yus* would be accented *kri-ɳī-yús*, if attested, but that would be due to elision from underlying *kri-ɳī-yā́-us,* not to an accent originating on the ending *-us.*

[46] The imperfect 1st sing. *á-krī-ɳ-i* contains an ending *-i*, whose accent or ability to trigger zero grade cannot be verified. My analysis predicts that *i* is unaccented and preceded by full-grade *ɳā*, whose *ā* should elide before *-i.*

[47] Such cases are presented by Hayes 1995, Kenstowicz 1997, De Lacy 2004. The mechanism involved in low(er) vowels attracting stress is debated, as are the systems displaying such effects.

that it generates are still directly observable in the present, and inferrable from the full/zero grades in the imperfect.

36. Effects of height on desinential accents in the indicative
    a. Accent *a*: A non-high vowel at the beginning of an ending is accented.
    b. Derivations:

Underlying	krī-ɳ́a-mi	krī-ɳ́a-vas	á-krī-ɳ́a-m	á-krī-ɳ́a-va
Accent *a*		krī-ɳ́a-vás		á-krī-ɳ́a-vá
Deaccent *nā́* (32.a)		krī-ɳa-vás		á-krī-ɳa-vá
Zero Grade		krī-ɳi-vás		á-krī-ɳi-vá
BAP		krī-ɳī-vás	á-krī-ɳa-m	á-krī-ɳī-va
Surface	krī-ɳ́a-mi	krī-ɳī-vás	á-krī-ɳa-m	á-krī-ɳī-va

The accents of other moods are also predictable, but in different terms. The 2nd person imperative has all its endings accented, in all numbers and in both voices, regardless of height: e.g. *krī-ɳī-hí*. Rule (37.c) below covers this observation. Modulo this, all non-indicative moods display surface unaccented endings throughout the active voice, regardless of vowel height: e.g. subjunctive *krī-ɳá́-ma*, optative *krī-ɳī-yá́-ma*, imperative *krī-ɳá́-tām*. Such forms suggest that the non-indicative moods deaccent their active endings. This is what rule (37.b) states. In the middle voice, the imperative deaccents all endings of 1st persons (or, equivalently, all *-Xāi* endings in any voice), eliminating their ability to trigger zero grade or deaccentuation, and yielding such surface forms as *krī-ɳá́-mahāi.* Aside from these, all middle forms follow the simple analysis in (36). This analysis extends to the optative without modification, if its suffix *yā* is accented, like *nā,* and undergoes the same deaccentuation as *nā*.

37. Accents and grades in non-indicative forms
    a. 1st Person Imperative: Deaccent the endings of the 1st person imperative middle
    b. Non-indicative: Deaccent the active non-indicative endings
    c. 2nd Person Imperative: Accent the 2nd imperative endings

d. Derivations:

UR	krī-ṇā́-ma (subj 1st PL active)	krī-ṇā́-mahāi (imper 1st PL middle)	krī-ṇā́-hi (imper 2nd SG active)	krī-ṇā́-tu (imper 3rd SG active)	krī-ṇā́-yā́-ma (opt 1st PL active)	krī-ṇā́-yā́-mahi (opt 1st PL middle.)
Accent a-end. 1st Pers. Imp.	krī-ṇā́-má	krī-ṇā́-máhāi krī-ṇā́-mahāi			krī-ṇā́-yā́-má	krī-ṇā́-yā́-máhi
Non-Indicative	krī-ṇā́-ma				krī-ṇā́-yā́-ma	
2nd Pers Imp.			krī-ṇā́-hí			
Deaccent nā́/yā́			krī-ṇā-hí		krī-ṇā-yā́-ma	krī-ṇā-yā-máhi
Zero Grade			krī-ṇī-hí		krī-ṇī-yā́-ma	krī-ṇī-ī-máhi
Elision						krī-ṇī-máhi
Surface	krī-ṇā́-ma		krī-ṇī-hí	krī-ṇā́-tu	krī-ṇī-yā́-ma	krī-ṇī-máhi

This serial rule analysis can perhaps be replaced by a parallel or a serial constraint-based account. Such a translation will bring out additional points, left out of this discussion. The only point that matters in the present context is that there exist accentual regularities ready to be exploited by any analysis that chooses to avoid morphomic stipulation.

The objective in this section was to illustrate the properties of a grammar that derives the gappy distributions of morpheme alternants from interactions of phonological rules rather than from morphomic statements that map arbitrary paradigm sets of cells to exponents. The ingredients in the present account are non-arbitrary. They include two processes central to the entire phonology of Sanskrit (the Zero Grade and the BAP); an accent rule, (36.a), which predicts accent from height and has counterparts elsewhere; and three rules, (37.a-c), that regulate the accented status of broad classes of endings. Unlike the morphomic statements, these last three apply to sets that are syntactically coherent. Any broad rationale for the accent-to-morphology relations that these three rules generate is unknown to me, but one can explore more principled accounts invoking paradigm contrast for at least some of them.

This section has compared phonological and morphomic accounts for *nā/nī* alternations, with an extension to the accent of Sanskrit verbs in general. We found again that it is the *a priori* rejection of grammars that include non-automatic phonological rules that leads to the adoption of morphomes, not the inherent arbitrariness of the patterns under analysis.

4.3. What exponence constraints can do; and a morphome survey

The evidence considered above suggests that the identity patterns that play a prominent role in the morphomic literature should be analyzed instead in the phonology, as lexically or morphologically restricted processes, or as instances of similarity-based syncretism.

I consider next how typical such cases are, and what the residue may be. Herce's 2020 survey of candidate morphomes makes this assessment possible. Between that work's introductory chapters and its survey, I have counted 100 claimed morphomes, from 81 languages. For each pattern, I attempted a phonological account, departing from Herce's practice of rejecting non-automatic phonological rules. When I thought I succeeded, I classified the pattern as 'phonology' (i.e. a phonological process, albeit restricted) or as 'phonological distribution', i.e. a possible instance of phonologically distributed allomorphs, à la Carstairs 1988. Altogether, there are 39 such cases in Herce's survey.

This leaves almost two thirds of Herce's proposed morphomes without a plausible phonological account, no matter what one's view of phonology is. The next step, then, was to explore non-phonological but non-arbitrary, hence non-morphomic, sources for the remaining 61 candidate morphomes. My working hypothesis was that they might emerge from interactions between a few general types of exponence constraints, defined directly below.

Paradigm Uniformity (PU) constraints underlie processes of paradigm leveling[48]. The basic notions of paradigm and uniformity used in what follows are defined in (38). Note the broad sense of paradigm, not limited to what descriptive grammars might list under this label; and the broad sense of exponents, not limited to words or stems.

38. a. *Paradigm*: a set of lexically related forms (words, roots), or a set of affixes. Both sets share in exclusivity one or more morpho-syntactic features.
    b. *Uniform paradigm*: a paradigm consisting of exponents that are globally identical, or identical in a specific phonological property; or one whose cells contain *stems* that are similar or identical in one of these two senses: all properties or just some properties.

A very simple instance of PU from Italian, noted by Stan Zompì (p.c.), illustrates both notions. In Italian, all sets of 3rd pers. verb forms that have the same tense/mood values also carry identical stress: e.g. the pair of present indicatives *índica* 'show 3rd Sing', *índica-no* '3rd Pl'. This identity is directional: 3rd Pl. forms violate the limitation of Italian stress to the last three syllables, in order to maintain accentual identity to the corresponding 3rd Sg form. This identity

[48] Kiparsky 1970; some analyses in Albright 2002, 2011, Burzio 2003, 2005, McCarthy 2005, Steriade 2000, 2021.

holds over all Italian non-suppletive tense/mood subparadigms. The paradigm it governs – all 3rd persons with identical mood/tense features – is non-standard, but meets the definition in (38.a).

The PU constraints used below use the format of Base-Derivative identity constraints (Benua 1997), when directional, and that of Optimal Paradigms (McCarthy 2005) when non-directional.

Related to Paradigm Uniformity are the *Size Cost* (SC) constraints identified by Storme (2021:7) as ingredients in analyses of systematic syncretism. Their effect is to limit the number of globally distinct morphs allowed in a given paradigm. The difference between standard PU constraints and SC constraints is, first, that only the former can penalize differences in individual dimensions, like stress, while the latter penalize only the global distinctness of exponents; and, second, that SC constraints are non-directional – or of indeterminate directionality – so they are more easily analyzed in Optimal Paradigms or equivalent formats. There are some 20 systems in Herce's survey that appear to systematically limit the number of globally distinct exponents in paradigms. One such case is that of Kosena subject agreement suffixes (Herce 2020:237): exactly 2 distinct subject suffixes are used in each non-indicative 9-cell mood paradigm, and 3 in the 9-cell paradigm of the indicative.

Paradigm Contrast (PC) constraints require pairs of forms that belong to the same paradigm and differ minimally, in just one morpho-syntactic property, to have distinct exponents, or to have exponents that differ in a specific way[49].

An instance of PC, analyzed by Crosswhite (1999), involves Trigrad Bulgarian pairs of nouns that differ minimally in number. Such pairs surface as distinct, even when phonology is expected to neutralize their difference. Bulgarian normally reduces stressless *o* to *a*, but in this dialect reduction is blocked whenever it would create homophonous singular-plural pairs: e.g. *zárn-a* 'seed-pl' vs. *zárn-o* 'seed-sg,' with unreduced stressless *o*, but *per-á* 'pen-pl' vs. *pér-a* 'pen-sg', from UR /pér-o/, with uninhibited *o→a* reduction in sg-pl pairs differentiated by stress.

A possible format for PC constraints is (39), a class of constraints that identifies the smallest paradigm in which homophony is disallowed (clause (i)) and the morpho-syntactic feature differentiating the forms required to be distinct within this class (clause (ii)):

[49] PC constraints have been proposed by Crosswhite 1999, Ito and Mester 2004, Kenstowicz 2005, Pertsova 2015, among others, and are explored as a class by Wunderlich 2012.

39. *Paradigm Contrast (PC)*: Assign a violation to any set of lexically related forms that are phonologically identical, if (i) they share the morpho-syntactic feature(s) P and (ii) they differ in the morpho-syntactic feature Q.

In what follows I will be using analyses that combine ranked and violable PU and PC constraints to derive representative cases from Herce's (2020) survey. The effect of PU constraints is sometimes indistinguishable from that of Distributed Morphology mechanisms (Halle and Marantz 1993), such as syntactically underspecified Vocabulary Insertion rules and impoverishment (Bonet 1991). The goal here is not to argue for (38-39), as against DM, but to explore non-arbitrary grammatical statements, whether DM or constraint-based, as alternatives to the claims of arbitrariness inherent in morphomic analyses.

First, however, a comment on the types of paradigmatic identities that can be characterized with such constraint combinations as (38-39). In small 4-cell paradigms, all conceivable identities can be described with PU and PC constraints. In such limiting cases, their descriptive potential is observationally identical to that of morphomes or rules of referral. The difference in expressiveness between these approaches emerges in larger paradigms.

I begin by considering the identity patterns that can be defined by PU conditions over a minimal 4-cell paradigm, one defined by the binary syntactic features [±F] and [±G][50]. (40) displays six of twelve conceivable patterns of identity over such a paradigm. In these six cases, only one PU constraint is active in each paradigm. This constraint is identified at the bottom of each table. Shaded cells mark the pairs of exponents this constraint requires identity for.

40. Six identity patterns definable on a four-cell paradigm by individual PU constraints

a.

	+F	-F
+G	A	A
-G	B	B
	PU (αG)	

b.

	+F	-F
	A	B
	A	B
	PU (αF)	

c.

	+F	-F
	A	A
	B	C
	PU (+G)	

d.

	+F	-F
	A	B
	A	C
	PU (+F)	

e.

	+F	-F
	A	B
	C	C
	PU (-G)	

f.

	+F	-F
	A	C
	B	C
	PU (-F)	

[50] The paradigms in (40-41) are graphically similar to those in Wunderlich (2012:166), an important study that discusses the formalization of paradigm identity and distinctness, but the actual proposals differ.

The paradigm in (40.a), for instance, is generated by a constraint PU(αG) requiring cells that share [+G] or [-G] to have identical exponents for one or more features. (40.c) is generated by PU(+G), which requires identity only for [+G] pairs. Other cases in (40) are similar.

Further identities emerge if *two* PU constraints target overlapping regions in a paradigm, as in (41). In most such cases, the joint effect of two PU constraints is to generate 'unnatural' and seemingly arbitrary classes of identical cells, apparent candidates for morphomic analysis. A real case of this type, one of many, is analyzed in section 4.3.1.

41. Five identity patterns defined by combinations of two PU constraints

a.

	+F	-F
+G	A	A
-G	A	B

PU (+G)
PU (+F)

b.

	+F	-F
+G	A	B
-G	B	B

PU (-F)
PU (-G)

c.

	+F	-F
+G	A	A
-G	B	A

PU (-F)
PU (+G)

d.

	+F	-F
+G	A	B
-G	A	A

PU (+F)
PU (-G)

e.

	+F	-F
+G	A	A
-G	A	A

PU (αF)
PU (αG)

Some combinations of PC & Size Cost constraints can result, for small paradigms, in patterns of identity connecting only sets of cells that are polar opposites, differing on both G and F.

42. A 4-cell paradigm with an identity pattern generated by PC and SizeCost (SC) constraints

	+F	-F
+G	A	B
-G	B	A

PC_1: pairs of αF forms distinct for G must have distinct exponents.
PC_2: pairs of αG forms distinct for F must have distinct exponents.
SC: a penalty for each pair of distinct exponents in a paradigm

The paradigm in (42) is modeled on that of the Somali definite article[51] and can be generated by activating the two PC constraints defined in (42), together with the SC constraint, a non-directional PU constraint violated by any globally distinct pair of exponents. The function of SC is to block an alternative way of satisfying PC, by adding exponents beyond the minimally necessary two that satisfy the two PC constraints. With SC active but outranked by the PC constraints, the pattern in (42), candidate (d), is selected.

[51] Baerman et al. 2005:104. Lecarme 2002 notes alternative interpretations.

43. Selecting a polarity pattern as optimal. Constraints as defined in (42)

			PC_1	PC_2	SC
a.	A	B			***!*
	C	D			
b.	A	B	*!*		**
	A	B			
c.	A	A		*!*	**
	B	B			
☞d.	A	B			**
	B	A			

The paradigm in (42) contains two pairs of identical exponents for two pairs of cells that share no morphosyntactic feature. But the constraints in (42) and (43) do not invoke arbitrary collections of cells, unlike a morphomic description.

A similar point can be made about the first four paradigms in (41). If we attempt to describe each of their four patterns with a single statement, that will have to refer to a set of cells that share nothing in exclusivity: e.g. a rule like 'all [+G] cells plus the [+F, -G] cell have are identical exponents' for (41.a). But, there is no *a priori* reason to reject multiple constraint analyses like those at the bottom of (41). The choice is not between frameworks where identity patterns emerge from one vs. multiple constraints, but rather between morphomic frameworks, where rules can pick out arbitrary sets of cells, and analyses that can avoid this.

The next three sections illustrate the alternatives to morphomic analyses based on PU and PC constraints and show that they yield more appropriately restrictive analyses than morphomes.

4.3.1. Systems with overlapping PU domains

What follows is an illustration of the cases in Herce's survey – at least eight – that can be analyzed as combinations of PU constraints with overlapping domains, as in (41). One of these is the pattern of identities among verbal agreement suffixes found across the moods of Paez, a Colombian language (Herce 2020:255)[52]. Note the gender distinction (M = masculine; F = feminine) among 2nd Sing forms. The identities in (44) are metasyncretic: the set of suffixes identified as C in (44.a) are partly different across moods, but, within each mood paradigm, the members of the C set are identical.

[52] Similar patterns are reported in Slocum 1986, for what may be a different Paez dialect.

44. Identities among Paez verbal agreement suffixes: (a) schematic; (b) interrogative

a.

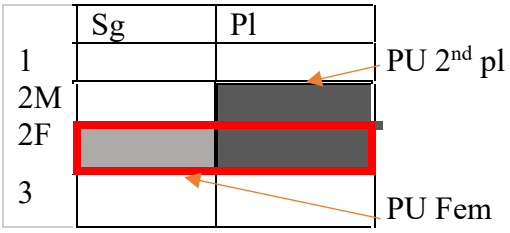
	Sg	Pl
1st	A	E
2M	B	C
2F	C	C
3rd	D	F

b.

Sg	Pl
-tka	-tkhaʔw
-ga	-kwe
-kwe	-kwe
-kha	-ta

A PU-based analysis requires two constraints: PU (2nd Pl) – requiring plural suffixes of the 2nd person to be identical – and PU (Fem), requiring feminine suffixes to be identical. The former bans overt gender distinctions among the 2nd plural suffixes. The latter eliminates overt number distinctions among the feminine suffixes. The appearance of an unnatural class – 2F plus 2 Pl M – is created by membership overlap between the two syncretic sets.

45. Overlap in the domain of Paez PU constraints



Herce's survey and similar others abound in number syncretisms in the 2nd person and, separately, in gender syncretisms in the plural, so each PU constraint we invoke appears to be required independently. Also non-arbitrary, but more complex in this case, is an alternative analysis based on PC & SC constraints, in which the region of identity in (44) is what is left over when PC constraints on number (in 1st and 3rd persons) and on gender (in the singular) are satisfied. Clearer cases of such combinations are discussed by Wunderlich (2012), and below.

4.3.2. PU and PC systems

A more complex set of interlocking identities is found in the stem allomorphs of Lealao Chinantec's mood-aspect paradigms (Herce 2020:208[53]). Below I ignore inflectional affixes and

[53] Cf. Palancar 2015 for considerably more detail on the inflection of this Chinantec dialect. Item (6) in Palancar (2015:33) is a paradigm comparable to those in (45).

prosodic features (tone, length, accent): I focus, as does Herce, on the segmentals of verb stems. These have at most two distinct forms per verb, distributed in representative cases as below.

46. Lealao Chinantec stem distribution across combinations of person-number-aspect values, for two verbs (after Herce 2020:208)

	(a) 'pay'						(b) 'open'					
	Incomplet.		Irrealis		Completive		Incomplet.		Irrealis		Completive	
	Sg	Pl	Sg	Pl	Sg	Pl	Sg	Pl	Sg	Pl	Sg	Pl
1	cø	chi	cø	chi	cø	chi	na	nia	na	nia	na	nia
2	cø	cø	cø	cø	chi	chi	na	na	na	na	nia	nia
3	chi	chi	chi	chi	chi	chi	nia	nia	nia	nia	nia	nia

This data suggests that the Chinantec paradigmatic identities are also metasyncretic: different stem changes express the same morphosyntactic distinctions in the two paradigms, but the identity/distinctness patterns remain constant. The related identity patterns in the verb systems of Palantla and Comaltepec Chinantec (Merrified 1968, Pace 1990) confirm this. Taken together, they suggest that syncretic data like (46) can't be attributed to accidental affix homophony[54].

Before proceeding to an analysis of (46), we should exclude from consideration the lack of number contrast in all 2nd and 3rd persons. These are not differentiated through any means in Lealao, whether stem shape, prosodic features or affix markers. This number neutralization is widespread across Chinantecan dialects and can be taken as a form of impoverishment (Bonet 1991), a distinct phenomenon from the stem syncretism analyzed here. By setting aside the number distinctions in 2nd and 3rd persons, we reduce the paradigms in (46) to 12 cells from the original 18. This reduction is reflected in the candidates evaluated below.

The remaining distributional properties in (46) suggest the need for PU *and* PC constraints. Each verb has no more and no fewer than two distinct stems, for all of its 12 cells. The *no-more-than-two* part can be due to one active SC constraint, or can emerge as the joint effect of several narrower PU constraints whose territories overlap. Pursuing the latter route, I note several syntactically coherent sets of cells with identical stems: all 3rd persons across mood/aspect distinctions, all 1st person sing. forms across moods/aspects, most completive forms, all singular

[54] Some alternations in (46) *could* be due to specific affixes, e.g. a palatalizing prefix *j-* turning <c> [ts] to <ch>, [ʧ], and *n* into <ni>, [ɲ]. Under this interpretation, one still owes an account of the odd class {3rd persons + 1st pl} marked by *j-*, of the vocalic distinctions among these stems, and of parallel Palantla and Comaltepec identities.

[+participant] forms[55]. Some of these sets correspond to subparadigms over which PU operates elsewhere in Chinantec languages, an observation encouraging a claim of systematic, constraint-driven identity. The PU constraints that can help analyze paradigms like (46) appear below.

47. PU constraints on Lealao Chinantec verb stems
    i. **PU 3rd**. Stems of all 3rd person forms are identical.
    ii. **PU 1st, α number**. Stems of all 1st pers. forms with the same number are identical.
    iii. **PU [+completive].** Stems of the completive aspect are identical[56]
    vi. **PU [+participant].** Stems of the 1st and 2nd pers. forms with the same mood/aspect value are identical.

The fact that paradigms in (46) contain *no fewer than two* distinct stems is a hint that PC effects are also at work. Had only PU constraints been active in these paradigms, we might expect identity to spread from stem subparadigms where it is expressly required by an active PU constraint, to regions where identity is not demanded, but where it can satisfy global uniformity, or SC, a perennial consideration. Since global identity is not the pattern in (46), PC effects may be what block it[57]. The more precise evidence for PC conditions is that they simplify the PU conditions by carving out regions of contrast in otherwise uniform subparadigms. Thus, the completive stem set is uniform, aside from the 1st Sg vs. 1st Pl contrast. By ranking a constraint demanding this contrast, (48.i), above PU [+completive] we maintain the general, number-indifferent formulation given in (47.iii). The lack of contrast between 2nd and 3rd person stems in completives differs from the systematic contrast found between them in other aspects. This suggests a further ranking: PU [+completive] >> PC [-author]: [±participant], (48.ii).

48. PC constraints on Lealao Chinantec verb stems
    i. **PC [+author]: [±pl].** Stems of 1st person forms that differ in number are distinct.
    ii. **PC [-author]: [±particip.**]. Stems of 3rd pers. forms are distinct from 2nd pers. stems.

[55] I adopt from Halle 1997 and Harley and Ritter 2002 the inflectional features [±participant] and [±author].
[56] This effect appears to be lexically restricted to certain verbs in Lealao Chinantec.

[57] To repeat, the PC constraints discussed here pertain just to the segmental composition of stems, the focus of Herce's (2020:208) discussion of this data. Tones, quantity and affixes add further distinctions not considered here.

(48.i) seems undominated in Lealao. It is also active in the other Chinantec dialects. Effects of both PC constraints are seen in Palantla, where six out of seven stem-distribution paradigms reported by Merrifield 1968:42ff show surface effects of PC [+author]: [±pl]; in the same work, a distinct set of six paradigm types show effects of PC [-author]: [±participant]. Both PC constraints are also satisfied in the paradigms of Comaltepec suppletive verbs (Pace 1990).

The tableau below shows how some some alternative distributions to (46) are eliminated by rankings over the constraints in (47-48). Absent evidence of directionality, the PU constraints are evaluated in the Optimal Paradigms format: one violation for each distinct pair of stems. PC constraints assess one violation for each pair of cells whose stems should differ, but in fact do not. Violations are summed across all cells of candidate macro-paradigms. Cells eliminated by impoverishment are blacked out.

49. Selecting stem identity patterns for Lealao Chinantec verbs

	Incomplet.		Irrealis		Completive		PC [+auth.]: [±pl]	PU [+compl]	PC[-auth.]: [±partic]	PU [+part]
☞a.	na	nia	na	nia	na	nia		3*	*	6*
	na		na		nia					
	nia		nia		nia					
b.	na	nia	na	nia	na	nia		4*!		6*
	na		na		na					
	nia		nia		nia					
c.	na	nia	na	nia	nia	nia	*!		*	4*
	na		na		nia					
	nia		nia		nia					
d.	na	nia	na	nia	na	nia		3*	3*!	6*
	na		na		na					
	na		na		na					

Candidate (a) is the attested paradigm, (46.b). It violates PU [+completive] three times, because the three [nia] cells in the completive paradigm diverge from the unique [na] cell. The same (a) candidate violates PC[-author]: [±participant] once, because one pair of [-participant] forms, its completive 2nd and 3rd person, are identical. Candidate (a) also violates PU [+participant] six times: there are six pairs of [+participant] forms, across the incompletive, irrealis and completive sets, whose stems differ. Candidate (b) extends to the completive aspect the pattern prevailing in other aspects. This candidate now fully satisfies PC [-author]: [±partic], but it increases the

number of violations of PU [+complet], so it loses to (a). Candidate (c) presents a totally uniform completive paradigm, but that causes it to lose the number contrast in 1st pers. Stems and thus violate PC [+author]: [±pl]. It too loses to (a). Candidate (d) eliminates the 2nd vs. 3rd person distinction. It has the same violations as (a) for the top two constraints but more violations of PC [auth]: [±partic]. A further candidate, (e) below, can't be eliminated on a non-directional view of the PU constraints: the current evaluation of the constraint that's likely to eliminate it, PU [+participant], finds for it the exact same number of violations as for the winner.

50. An additional candidate for (49)

	Incomplet.		Irrealis		Completive		PC [+auth.]: [±pl]	PU [+compl]	PC[-auth.]: [±partic]	PU [+part]
e.	na	nia	na	nia	na	nia		3*	*	6*
	nia		nia		nia					
	na		na		nia					

The remedy could be to switch to a directional interpretation of PU – e.g., to view the 1st person sg as the base of the [+participant] set – or to limit the scope of PU [+participant] to the singular.

There are many more conceivable arrangements of the two stems that Lealao deploys in these verbs. To exclude them all, we need further PU constraints, including one requiring identical 1st person singular stems *across* moods/aspects, without which the completive paradigm can be *{*nia, na, na, na*}, not {*na, nia, nia, nia*}; or else we need to identify distinct morphemes within some of the stems, as suggested in fn. 63. PU and PC constraints will be required even then. As the objective here is to provide the outlines of a non-morphomic analysis, these decisions are left to future work. The point has been to note that generalizations about distinctness and identity within paradigms can be turned into constraints that are not arbitrary in either of the two senses defined earlier, and which can be simplified when ranked.

I return now to the fact that no more nor fewer than two stems are used in this class of Lealao verbs, and in certain other Chinantec paradigms. Why one stem isn't enough follows from the fact that even one PC constraint is active. Why no more than two? It could be that an SC constraint operates here, in addition to narrowly defined PU constraints[58]. I flag this question

[58] Restrictions on the number of stems in the system are not systematic in Chinantec. The related Palantla system (Merrifield 1968) has conjugation classes using from two to three stems while Comaltepec suppletive verbs distribute, in ways similar to Lealao, stems that range in number, for each verb, from two to five.

because 2-exponent paradigms abound in Herce's 2020 survey, and because their existence becomes relevant in comparing PU/PC analyses with morphomic ones.

Finally, a preliminary analysis identifies almost half, 28/61, of the non-phonological instances of syncretism in Herce's survey as involving a combination of PU/SC and PC constraints, the same combination advocated here for Lealao.

4.4. Restrictiveness again, and Chichimec

The combination of PU and PC constraints used in this analysis may prove too powerful, unless limits are imposed on the *locus* of identity and contrast requirements, i.e. on the morpho-syntactic content of the cells subject to PU and PC constraints[59]. But even in their present unconstrained state, the combinations of PU and PC constraints can't describe certain patterns that are well within the descriptive compas of morphomic and referral analyses.

The paradigms examined in the preceding sections have two interesting properties. First, all are differentiated by binary features, like [±author] or [±participant]. Second, most deploy a limited number of exponents, as in Lealao, where exactly two stems are allowed for 12 cells. When these two conditions are met, most conceivable distributional patterns can be described by one or more PU constraints plus one or more PC constraints. Binary features carve the global paradigmatic space into small subregions, e.g. the set of [-participant, -plural], or the set of [+author, +completive] forms. These subregions can then be targeted by PU or PC requirements. A global SC/PU constraint can force the overall number of exponents to reduce to one, for all pairs of cells not constrained by PC conditions. The overall number of exponents will increase beyond one once PC constraints are invoked, but – unless an elaborate network of PC constraints operates – not beyond two. Distributions like (51) can then emerge. They look random, but they *can* be described by PU+PC combinations in paradigms defined by binary-features.

[59] See Albright and Fuss 2012 for some discussion of this issue.

51. Two hypothetical stem distributions in 2-stem paradigms defined by binary features

	a.	
	Sg	Pl
1st [+auth, +part]	A	B
2nd [-auth, +part]	B	B
3rd [-auth, -part]	B	A

b.			
Tense I		Tense II	
Sg	Pl	Sg	Pl
A	A	A	B
A	B	A	A
A	A	A	A

The range of possible analyses differs in paradigmatic systems that allow unrestricted numbers of exponents. Consider (52).

52. Two hypothetical stem distributions in n-stem paradigms defined by binary features

	a.	
	Sg	Pl
1st [+auth, +part]	A	B
2nd [-auth, +part]	C	D
3rd [-auth, -part]	E	A

b.			
Tense I		Tense II	
Sg	Pl	Sg	Pl
A	B	G	D
C	D	H	I
E	F	J	K

The paradigms in (52) contain more than two stems, showing that any SC constraint is inactive here, but they also display systematic identities, seen as shaded pairs of cells. In both paradigms in (52), the identical cells share in exclusivity no features at all. These identities can't be described by a PU+PC system, because no featurally definable subparadigm contains just the right pair. But both can be described by rules of referral or by morphomes. I have not encountered such cases in Herce's survey, nor in other morphomic works known to me.

Consider next paradigmatic spaces partitioned by one or more non-binary – privative or n-ary – features. Supposing case distinctions to involve some such features[60], consider the two case-

[60] See Caha 2008 and later work for a non-binary case-feature proposal that can analyze specific instances of global case syncretism, and implicational relations between them, but neither of the cases in (53). See also the discussion of case syncretism in Baerman et al. 2005:38ff.

number paradigms in (53). The one in (a) is, to my knowledge, unattested; (b) is a schematic representation of *grade contrasts* in the stems of Estonian nouns (Blevins 2005, 2008).

53. Stem distributions in paradigms defined in part by non-binary features.

Cases (i-iii) are known as 'grammatical' cases. Paradigm (b) is based on Estonian.

(a)	Sg	Pl
i. Nominative	A	A
ii. Genitive	B	B
iii. Partitive	A	A
iv. Illative	B	B
v. Inessive	A	A
vi. Allative	B	B
vii. Ablative	A	A
viii. Translative	B	B
ix. Terminative	A	A
x. Essive	B	B
xi. Abessive	A	A

(b)

Sg	Pl
A	B
B	A
A	A
B	A
B	A
B	A
B	A
B	A
B	A
B	A
B	A

In the case of (53.a), the full A-set of cells can't be exhaustively described by one case-feature value, nor – as far as I can tell – by a bundle of such features. The same is true of the B-sets in (53.a). The pairs of cells that contrast in (53.a), as A vs. B, do not appear to form a syntactically coherent set either. This excludes a PU- or PC-based description of (53.a). But morphomic or referral analyses are possible for (53.a). Anything resembling the arbitrary distribution in (53.a) is unattested in the case systems surveyed by Baerman et al. (2005), Blevins (2008), Herce (2020), or any other source known to me[61].

The grade distribution in (53.b), an attested case, is different. In this arrangement, singular and plural grades for any one case always differ, except in the Partitive: *its* stems are always in the same grade. One can conceive of this part of the distribution as generated by the ranking of two constraints, PU Partitive >> PC α case: [±plural]. The top-ranked constraint requires *grade uniformity* among the partitive stems of any noun, while the PC constraint ensures *grade contrast* between the singular and the plural of number-distinct forms of same case, in any lexeme.

[61] In the domain of verbal categories, Herce (2020:171) reports a 2 stem-paradigm that looks like the verbal equivalent of (53), that of Daai-Chin, a Sino-Tibetan language (So-Hartman 2009). This is the only case of its kind in Herce's survey. In fact, So-Hartman, the author of the original description, entertains non-arbitrary accounts of this data, without settling on one. See especially the summary of the data in So-Hartmann 2009:106.

In addition, two of three 'grammatical' cases, the Nominative and Partitive, contrast their grades in the singular (A) with the grades of non-grammatical singular cases and of the Genitive (B). This aspect of the system may require a recognition of a feature like [±grammatical], which traditional grammars already use. Aside from the Genitive, the grammatical cases contrast in the singular the grade of their stems with that of non-grammatical cases.

This is only the beginning of a complete analysis, but it suggests that Estonian is amenable to a PU/PC analysis, in contrast to many other conceivable syncretic arrangements in case-number paradigms. But, as repeatedly noted earlier, all conceivable distributions, including (52.a) and infinitely many variations on that, can be morphomically analyzed, while only a small subset is analyzable in PC/PU terms. A comparison between the typological predictions of a PU/PC analysis of case-number systems to those of Trommer's (2016) morphomes is left to future work.

The combination of Tense-Aspect-Mood features with person-number distinctions yields systems that pose analytical problems similar to (53). Chichimec, an Oto-Manguean language (Palancar and Avelino 2019; Feist and Palancar 2021, and references there), intersects a set of person-number distinctions, which generate from 4 to 11 cells per paradigm, with 8 TAM categories representing a mix of tenses (Present, Future, Immediate Past, Recent Past) plus mood and polarity categories like Sequential, Potential and Negative.

Despite the heterogeneity of these TAM categories, their exponents function overall in ways that suggest coherent, unified macro-paradigms. Thus, stem allomorphs are systematically limited in some verb classes to exactly two overall (e.g. item A14 in Feist and Palancar 2021). Person-number contrasts are sometimes introduced across all TAM categories, or leveled out across all (e.g. items A4 and A6). Some tenses and moods (Potential, Negative and Immediate Past) have jointly differentiated their person-number contrasts over the last century, in some verbal classes; while a complement set of categories (Sequential, Future, Anterior, Recent Past) have leveled out certain distinctions, in other verb classes, over the same period.

Feist and Palancar (2021) have documented these and other changes in the stems of Chichimec verbs. Together, the changes suggest that there are paradigm-level entities that are the object of constraints in this grammar. But whether these units are morphomes, as Feist and Palancar assert, or the relations of uniformity and contrast within subregions of this paradigmatic space remains to be determined. The chief analytical dificulty for a PC-cum-PU analysis is the fact that some categories that can jointly change in Chichimec – the Sequential, Future,

Anterior, Recent Past vs. Potential, Negative and Immediate Past – look heterogeneous. On the other side, the difficulty faced by a morphomic analysis, is – beside its inherently arbitrary nature – the fact most of the changes documented by Feist and Palancar, (29/38 of changes in their appendix B) fall neatly into two classes: a change of ranking, from PU >> PC, within a homogeneous subparadigm, to PC >> PU, within that same subparadigm, or the opposite change, from PC >> PU to PU >> PC. The remaining 9 cases can be seen as ranking changes of the same sort, but operate over the heterogeneous set of tense-mood classes, Sequential, Future, Anterior, Recent Past, or over their complement set.

Before we conclude that these heterogeneous sets of verbal categories, or any other regions in the Chichimec paradigms are morphomes, an analysis of their syntax and semantics is in order. This question is left open here. A related one is taken up next.

4.5. Semantics of TAM categories and non-morphomic alternatives to the PYTA hypothesis

Until now, I have discussed the contribution of phonological analysis and of constraints on optimal exponence on providing alternatives to morphomic accounts. I outline next how a better understanding of the semantic content of inflectional categories could contribute alternatives to morphomic accounts[62].

In Latin, the suffix *-is-* and its predictable contextual variant *-er-* characterize all aspectually perfective forms other than the indicative-present perfect. A further identity involves the inner stem allomorph found in the perfect and marked B in the table below: this B allomorph is a constant marker of the verbal perfect and occurs nowhere else. In the imperfective, the tenses and the moods are differentiated through suffixes and theme vowels, but they also share an inner stem, the so-call *infectum* stem, marked A below.

54. Verb stems and root allomorph distributions in Latin and Proto-Romance

	imperfective (*infectum*)			perfective (*perfectum*)		
	present	imperfect	future	present	pluperfect	future
indicative	A-	A-ba-	A-	B-	B-is-	B -is-
subjunctive	A-	A-re-		B -is-	B -is-	B -is-

[62] See Vincent 2013 for a semantically based account of a different Romance stem-identity in the TAM system: the stem syncretism linking the future and the conditional. A carefully reasoned morphomic/referral account of this data is presented by Morin (1987).

Thus, for the root *fac-* 'make,' stem A is *fac-i-* and appears in *fac-i-ō* 'I make'. Stem B is *fēc-,* and appears in *fēc-ī* 'I made', while B-*is-* appears in the infinitive *fēc-is-se,* subjunctive *fēc-is-s-em* 'that I had made', the future anterior *fēc-er-im* 'I will have made,' and the pluperfect *fēc-er-am,* among other forms. The *-er-* alternant in *fēc-er-im, fēc-er-am* is phonologically predictable from underlying /is/.

This state of affairs changes in Romance. The allomorph B, originally limited to the perfect, extends in Western Romance to a category traditionally called the *subjunctive imperfect*, which is aspectually non-perfective. It also extends to a category labeled the *subjunctive future,* also non-perfective and perhaps limited to Iberian Romance. Meanwhile, the present subjunctive retains the distinct allomorph A, as do all other moods. In the resulting system, the set of tense/mood categories that share the descendant of the Latin B-*is* stem has been dubbed the *Perfecto y Tiempos Afines*, or PYTA, by Maiden (2001 and later work). (54) is a a schematic representation of the PYTA pattern that encompasses the Western Romance paradigms[63]. TAM specifications follow Maiden's description.

55. Verb stems and root allomorph distributions in Western Romance

	present	imperfect	future	preterite	pluperfect
indicative	A-	A-	A-r-	B-	B-er-
subjunctive	A-	B -er-	B -er-		
conditional	A-r-				

Maiden claims that this PYTA set is syntactically arbitrary, a morphome. More significantly, it is a persistent morphome. In the development of Western Romance, the identity within the PYTA set was preserved among a core set of verbs, it was restored after disruptive changes, and the PYTA identity was extended to more forms. Maiden makes the striking observation that "wherever originally perfective subparadigms survive, the presence of the PYTA root in any one of them always implies the presence of that root in all the others." (2005:143)[64]. This combination of syntactic arbitrariness and long-term diachronic persistence is highlighted in

[63] Only synthetic forms are shown, the only ones where the stem could in principle diverge across categories.
[64] See Wheeler 2011 for reservations about this statement regarding PYTA in Catalan. Maiden's generalization does not clearly apply to Italian, whose imperfect subjunctive uses one of the two stems in the *passato remoto,* but not the stem of the original PYTA set. I assume here that the PYTA claim pertains only to Western Romance.

Maiden's work, and must be closely examined when looking for alternatives to morphomes: each isolated system posessing a distribution like (54) can be analyzed by a combination of PU and PC constraints. But such an analysis would leave unexplained the diachronic persistence associated with PYTA.

In evaluating the evidence for this PYTA morphome, two languages are briefly considered here. To preview, we observe that membership in the French PYTA system is semantically justified; the Portuguese system, whose PYTA set adds a future subjunctive, is less well understood but likely similar to French.

The French PYTA identity holds between the root allomorph of the imperfect subjunctive and that of the *passé simple*, the category that continues the simple perfect of Proto Romance.

56. The French PYTA distribution

	present	imperfect	future	passé simple
indicative	A-	A-	A-r-	B-
subjunctive	A-	B -s-		
conditional	A-r-			

The identity between the B allomorphs is systematic and includes suppletive identities like (57):

57. PYTA and non-PYTA forms in 3 French verbs.

The B forms are 1st pl *passé simple* and imperfect subjunctive.

A	B (PYTA)		infinitive, gloss
[sav-]	[sy-m]	[sy-s-jɔ̃]	*savoir*, 'know'
[fez-]	[fi-m]	[fi-s-jɔ̃]	*faire*, 'make'
[met-]	[mi-m]	[mi-s-jɔ̃]	*mettre*, 'put'

It is far from clear that the French PYTA set is *semantically* arbitrary. The dominant use of what traditional grammars call the imperfect subjunctive has been, throughout the history of French, to express the counterfactual or irrealis (Sèchehaye 1906:352ff and passim[65]). The connection between preterite and counterfactual is present in a number of morphological systems presented

[65] "l'imparfait du subjonctif a été légué au vieux français par le latin comme *expression normale du mode irréel*." (1906:352) "l'imparfait du subjonctif n'exprime que l'irréel" (1906:353), while the conditional and the imperfect of the indicative normally express the potential, but just occasionally also the irrealis.

by Dahl 1997and Iatridou 2000. Iatridou outlines the shared semantic component of preterites and counterfactuals that can justify a formal connection (2000: 246ff), and explains why the semantics of counterfactuals are expressed by the past, and not by the present subjunctives (2000:264ff). It could then be that the French PYTA identity between the imperfect subjunctive and the preterite, is justified as expressing a shared element of meaning, possibly Iatridou's *exclusion feature*.

If this exclusion feature is shared not only by the French pair of *passé simple* and imperfect subjunctive but also by corresponding pairs in other Western Romance systems, we are closer to understanding why the distribution in (55) was persistent and resilient: *it was not arbitrary*.

Turning to Portuguese, the distribution of its PYTA set is seen in (58).

58. Portuguese PYTA

	pres	imperfect	future	preterite	pluperfect
indicative	A-	A	A-r	B_1-	B_1-
subjunctive	A-	B_2-	B_2-		
conditional	A-r				

The set of syntactic categories expressed by PYTA allomorphs in Portuguese are the imperfect subjunctive, the future subjunctive, the perfect and pluperfect indicative. Let's assume that the connection between the Portuguese preterite and imperfect subjunctive is the same as in Sèchehaye's account of French. That would then justify the shared use of a stem. What needs explanation is the shared stem between those categories and the subjunctive future. Judging from Vesterinen's (2017) description of the semantics of that category in Portuguese, and of the semantic difference between it and the future indicative or present subjunctive, it appears that the future subjunctive is reserved to situations in which the speaker expresses "epistemic uncertainty regarding the fulfilment of a future event," (Vesterinen 2017:74), greater uncertainty, that is, than regarding the fulfilment of a future event described with the future *indicative*. This reference to greater uncertainty about the fulfillment of some event, is shared, according to Vesterinen, with the imperfect subjunctive. Thus, it is possible that the root identity within the PYTA set of Portuguese is justified either by the fact that all the Portuguese PYTA-expressed categories share one semantic feature, or by the fact that a chain of shared features exists, linking

the preterite to the imperfect subjunctive, based on their shared exclusion feature, and the imperfect subjunctive to the future subjunctive, based on the shared "uncertainty about fulfillment " property[66].

This is only a promissory note for an analysis. Its function is to outline the reasons to continue to believe that resilient morphomes are no morphomes at all, but rather aspects of the exponence system that are motivated by non-arbitrary aspects of the grammatical system: by the similarity between affixes or between stems; or by phonological processes; or by interactions between optimal exponence considerations; or, finally, by the shared syntactic or semantic properties of the categories being expressed.

5. Summary and prospects

I have suggested in this chapter that patterns identified as Priscianic in the post-Priscianic literature mainly fall into four classes, none of them representing arbitrary identities: they are similarity-based syncretisms (section 4.1), the results of non-automatic phonology (4.2), interactions of uniformity and contrast conditions on paradigms (4.3) and possible effects of stem identity between pairs of expressions sharing semantic features (section 4.4). Throughout the discussion, the focus has been on experimenting with non-arbitrary lines of analyses of the syncretic sets.

Many relevant cases could not be discussed here for reasons of space, but also because they seem amenable to the types of analyses proposed elsewhere in this chapter. These cases include the syncretisms found in Dasenech (Baerman et al. 2005), Nepalese (Bonami and Boyé 2008), Sora (Stump 2005), and others analyzed by Stump (2015). A unique case left out for lack of an alternative is the arbitrary set of syncretic categories identified by Round (2016) in Kayardild. But all these cases deserve closer study, and a fully explicit analysis.

Two generalizations proposed at the outset – that many Priscianic patterns are directional and surface-oriented – are clearly true in some cases (including Latin, Lithuanian, Italian 3rd person paradigms) and also in need of serious vetting elsewhere. They have potentially interesting consequences for the formalization of syncretism and for the analysis of related phenomena, including standard cyclic phonology.

[66] I am grateful to Suzana Fong for explaining to me some of the differences between the TAM categories of Portuguese discussed in this section.

The finding that non-automatic phonology is needed to avoid arbitrary analyses of morphological paradigms is not surprising. But finding a framework of analysis that does justice to the complexities of a system of non-automatic processes like that of Sanskrit, while also expressing surface-oriented generalizations contrast and uniformity, remains a task for the future, one of many.

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