

Endogenous stratal splits and the life cycle of affixes

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RETROSPECT AND PROSPECT

The debate on stratal splits

§1 Stratal Phonology, the constraint-based stratal-cyclic theory of phonological computation adopted in this course (◀1), is often criticized on the grounds that the patterns of stratification exhibited by individual languages are **arbitrary**.

This criticism takes several forms:

(i) *The objection*

Many opacity effects fail to emerge from the relative sizes of the cyclic domains of the phonological processes involved.

In such cases, Stratal Phonology is forced to resort to ‘**strata of convenience**’ (McCarthy 1999 [ROA ms]: 10, Calabrese 2005: 460).

The response

The stratal affiliation of a phonological process is determined solely by the size of its cyclic domain. Therefore, two processes with cyclic domains of identical size must belong to the same stratum.

Stratum-internal opacity does exist, but it yields to independently motivated constraint-based solutions such as distantal faithfulness (◀2 §4-§24).

Some lines of inquiry within the broad stratal tradition seem to give less prominence to these considerations (e.g. Rubach 2000, 2014), but they nonetheless uphold the basic principle that strata are distinguished by domain size, with lower strata having larger domains (Rubach 2018: 20-21).

(ii) *The objection*

The three levels of Stratal Phonology (◀1 §13ff) are not enough to capture the often rampant **phonological non-uniformity** shown by different grammatical constructions within the same language.

Stratal analyses that do real justice to this non-uniformity become indistinguishable from less restrictive models like Cophonology Theory (Inkelas 2012: 155-156).

The response

The three levels of Stratal Phonology prove sufficient if one makes a principled distinction between lexically stored allomorphy (◀5), morphological exponence, and phonology proper. In particular, apparently nonconcatenative exponence involves Generalized Non-Linear Affixation.

See e.g. Trommer & Zimmermann (2010), Trommer (2011), Zimmermann (2017), and the references in Bermúdez-Otero (2018: 123).

(iii) *The objection*

Stratal Phonology lacks explanatory depth because the split between stem-level and word-level affixation is **synchronically arbitrary** (Newell 2015: 12) and varies erratically from language to language.

The response

Deradical items are always stem-level. Also typically stem-level are low-productivity non-compositional derivational constructions (◀3 §30-§32) and suppletive inflected forms (Bermúdez-Otero 2011: 2022).

The theory of the stem level works fine as long as this inner core of stem-level items is subject to non-analytic listing. The location of the outer boundary between the stem and word levels is a contingent product of diachronic forces and is less crucial (◀4 §30-§32).

A pending assignment: the life cycle of affixes

§2 Nonetheless, the argument under §1iii highlights a pending task:

a complete theory of stratal phonology requires

not only a diachronic account of the stratal affiliation of phonological processes (◀6),
but also a diachronic account of the stratal affiliation of grammatical constituents.

This session makes a preliminary contribution to the latter.

§3 One of the main diachronic forces driving the life cycle of affixes is **grammaticalization**, which converts phrase-level into word-level elements (Givón 1979: 209, Hopper & Traugott 2003: 6).

I illustrate this phenomenon with an analysis of prosodic words in European Portuguese (Bermúdez-Otero & Luís 2009):

Presumably under the influence of a universal Suffixation Bias (Cysouw 2006, Hupp et al. 2009), European Portuguese pronominal enclitics have grammaticalized as affixes whilst pronominal proclitics remain independent phrasal elements.

§4 I then turn to show how endogenous morphological and phonological change can cause **splits between stem- and word-level affixation**.

I illustrate this phenomenon with a discussion of the behaviour of affixes in respect of closed syllable shortening in the Early Middle English dialect of the *Ormulum* (Bermúdez-Otero 1999: 212-215).

Two factors play a key role in this split:

- low-**productivity** items requiring listing (e.g. irregular inflection, unproductive derivation) remain in the scope of closed syllable shortening;
- high-productivity productive constructions (e.g. regular inflection, productive derivation) escape the domain of closed syllable shortening, presumably under the influence of an **Anti-Alternation Bias** (◀ §34ii, §23).

§5 Finally, I use evidence from suffixes like *-ism* and *-ize* in Late Modern English to illustrate a mechanism of **affixal emancipation**, whereby erstwhile stem-level affixes can become word-level when their selectional restrictions are relaxed and their productivity increases.

GRAMMATICALIZATION

The phonology of prosodic words in European Portuguese (Bermúdez-Otero & Luís 2009)

§6 *Derivational suffixation ≠ evaluative suffixation*

(i) Derivational suffixes beginning with /i/ trigger softening of final /t, k, g/ in a lexically specified subset of roots: e.g.

<i>profet-a</i> [pru'fɛtɐ]	'prophet'	~	<i>profec-ia</i> [prufi'siɐ]	'prophecy'
<i>católic-o</i> [kə'tɔliku]	'Catholic'	~	<i>catolic-ismo</i> [kətuli'siʒmu]	'Catholicism'
<i>psicólogo-o</i> [psi'kɔlugu]	'psychologist'	~	<i>psicolog-ia</i> [psikulu'ʒiɐ]	'psychology'

(examples from Mateus & d'Andrade 2000: 99)

(ii) In contrast, the evaluative suffixes *-inho* and *-ito* never trigger softening: e.g.

<i>profet-inha</i>	[prufi'tiɲɐ], not *[prufi'siɲɐ]	'prophet-DIM'
<i>católicu-inho</i>	[kətuli'kiɲu], not *[kətuli'siɲu]	'Catholic-DIM'
<i>psicólogo-inho</i>	[psikulu'giɲu], not *[psikulu'ʒiɲu]	'psychologist-DIM'

These examples are naturally attested (e.g. *profetinha* in the website of *IOL Portugal Diário* 1 June 2007), though at extremely low frequencies, probably owing to competition from the diminutive allomorph *-zinho* (whose prosodic behaviour is different: see e.g. Vigário 2003: 48, 219ff.). However, forced elicitation demonstrates that the absence of softening is absolutely systematic.

(iii) **Hypothesis A:**

- derivational suffixation is stem-level;
- evaluative suffixation is word-level.

§7 *Inflectional suffixation ≠ pronominal encliticization*

Multiple phonological criteria oppose inflectional suffixes to pronominal enclitics:

(i) **Stress**

All EP suffixes are stress-affecting in general: primary stress in stem+suffix combinations is confined to a final three-syllable window. In contrast, pronominal enclitics are stress-neutral.

E.g. <i>lév-a</i>	<i>lev-á-va-mos</i>	but	<i>lev-á-va-mos=lhes</i>
'he carries'	'we carried'		'we carried for them'

(ii) **Nasal diphthongization**

Nasal diphthongs occur only in word-final syllables (Mateus & d'Andrade 2000: 47):

e.g. *enfiarnos* [ɛ'fjɐnu], not *[ɛ'fjɐnu] 'we insert'

But nasal diphthongs are also found in the final syllable of verbs in verb+enclitic combinations:

e.g. *dizem=lhe* [dizɛ̃ɲi], not *[dizɛ̃ɲi] 'say.3PL.PRESIND=3SG.DAT'

(iii) **Mid vowel centralization before palatals**

Within words, front mid vowels are centralized to [ɐ] before a palatal consonant or high front vowel in the next syllable (Vigário 2003: 78-82; cf. Mateus & d'Andrade 2000: 19):

e.g. <i>telha</i> [tɛ.ɐ]	'tile'	<i>senha</i> [sɛ.ɲɔ]	'signal'
<i>cereja</i> [sɛ.'ɾɛ.ʒɐ]	'cherry'	<i>fecho</i> [fɛ.ʃu]	'bolt'
<i>veículo</i> [vɛ.'i.ku.lu]	'vehicle'		

But centralization is blocked before enclitics:

e.g. *dê=lhe* [dɛ.ɐi], not *[dɛ.ɐi] 'give to him/her'

(iv) **Distribution of /ɐ/**

*[ɐ ...Cɐ...] but *damos=[ɐ]e* 'we give to him/her'

(v) **Hypothesis B:**

- inflectional suffixation is word-level;
- pronominal encliticization is phrase-level ...but cf. §9iii below.

§8 *The derivational prefixes re- and des- are word-level and adjoin under ω'*

The blocking of vowel reduction (Vigário 1999: 272-273, 2003: 167) shows that the derivational prefixes *re-* and *des-* attach at the word level, but are separated from the stem by a ω -boundary:

(i) Non-low vowels resist unstressed vowel reduction in word-initial position: e.g.

ocupar [ɔku'par], not *[uku'par] 'occupy'

(ii) Reduction is also blocked in stem-initial vowels after *re-* and *des-*: e.g.

des-ocupar [diz-ɔku'par], not *[diz-uku'par] 'vacate'

(iii) The generalization cannot be that reduction is blocked initially in stem-level domains, because EP vowel reduction applies at the word level, as shown by the fact that it is fed by the stress shift triggered by word-level suffixes like *-inho* (§6ii): e.g.

selo [selu] 'seal' ~ *sel-inho* [sɛ'liɲu] 'seal-DIM'

Corroborating evidence

§12 *Emphatic initial stress*

- (i) European Portuguese has an optional process, akin to French *accent d'insistence*, that assigns emphatic initial stress to ω -initial syllables (Vigário 1999: 274ff; 2003: 120-1, 201ff).
- (ii) This process is phrase-level since it counterbleeds word-level unstressed vowel reduction (Vigário 2003: 121); cf. §8iii.

(iii) But prosodic structure erected at the word level is cyclically transmitted to the phrase level.

Therefore, we predict that all of the following are potential targets for phrase-level emphatic initial stress, since they are all ω -initial:

- stem-initial syllables,
- the prefixes *re-* and *des-*,
- articles and prepositions.

Crucially, accessing stem-initial syllables at the phrase level does not violate inward cyclic locality (Orgun & Inkelas 2002; Bermúdez-Otero 2012: 81-82; ◀5§18-21), since the target is prosodic, not grammatical.

(iv) The prediction is confirmed!

- a. $[\omega \text{ des } [\omega \text{ Qcupar}]]$ target = stem-initial σ
 or $[\omega \text{ DES } [\omega \text{ ocupar}]]$ target = *des-* prefix
 'vacate'
- b. $a \text{ inteligência } [\omega \text{ da } [\omega \text{ CAtalogadora}]] \text{ foi determinante}$ target = word-initial σ
 or $a \text{ inteligência } [\omega \text{ DA } [\omega \text{ catalogadora}]] \text{ foi determinante}$ target = P+article
 'the intelligence of the archivist was crucial'

§13 *Morphosyntactic evidence*

The oddest aspect of §11 is the claim that **pronominal proclitics are phrase-level,**
 but **pronominal enclitics are word-level.**

Yet this surprising claim is borne out independently by three pieces of morphosyntactic evidence (Luís 2004, 2009):

(i) Separability

	Proclitics?	Enclitics?
Clitic can be separated from verb:	YES	NO
<i>Acho que ela lbo ainda não disse.</i>		
I.think that she 3SG.DAT_3SG.MASC.ACC yet not told		
'I think that she hasn't told it to him/her/them yet.'		

(ii) Coordination

	Proclitics?	Enclitics?
Clitic takes wide scope over coordination:	YES	NO
<i>Acho que lbes [leram uma história e deram um livro].</i>		
I.think that 3PL.DAT [they.read a story and they.gave a book]		
'I think that they read them a story and gave them a book.'		

(iii) Allomorphy

	Proclitics?	Enclitics?
Verb+clitic combination displays arbitrary allomorphy:	NO	YES
<i>Procuramo=lo todo o dia.</i> (not expected * <i>procuramos=o</i>)		
searched.1PL=3SG.MASC.ACC all the day		
'We searched for him all day.'		
Cf. <i>lâpis azul</i> (not * <i>lâpi[Ø]zul</i>)		
pencil blue		
'blue pencil'		

Implications

§14 Q. Why do European Portuguese pronominal proclitics remain independent words, whilst pronominal enclitics are contained within the same grammatical word as the host?

A. Because the synchronic demarcation between word-level and phrase-level elements is the outcome of diachronic processes of grammaticalization, and the universal Suffixation Bias (Cysouw 2006, Hupp et al. 2009) causes left-leaning elements to grammaticalize faster than right-leaning ones.

§15 The fact that a stratal analysis of European Portuguese

- (i) splits enclitics from proclitics
 and (ii) groups prefixes together with enclitics
 is not a liability, but an achievement.

These groupings (i) are real, as confirmed by independent diagnostics,
 and (ii) look arbitrary only if considered from a purely synchronic viewpoint.

ENDOGENOUS STRATAL SPLITS

The early history of the stem-level/word-level split in English

§16 It is sometimes suggested that the stratal split between stem-level and word-level affixation in English arose historically through intense contact with French, Latin, and Greek in the Middle and Early Modern periods.

If stratal splits were the product of **exogenous contingencies like contact**, we would have cause to doubt the hypothesis that lexical stratification is a deep architectural property of language.

But, in fact, key elements of the stratal organization of present-day English arose **endogenously** and were already in place in Early Middle English in dialects showing no effect of contact with French (Bermúdez-Otero 1999: 214).

§17 *Present-day native suffixes with stem-level behaviour*

(i) In present-day English, Latinate stem-level suffixes trigger closed syllable shortening under final consonant extrametricality (see e.g. Myers 1987):

e.g.	<i>intervēne</i> ~ <i>intervēn-tion</i>	<i>percēive</i> ~ <i>percēp-tive</i>
	<i>inscībe</i> ~ <i>inscīp-tion</i>	<i>descībe</i> ~ <i>descīp-tive</i>
	<i>detāin</i> ~ <i>detēn-tion</i>	<i>redūce</i> ~ <i>redūc-tive</i>

(ii) But a few Germanic suffixes show the same behaviour:

• the irregular weak past-tense suffix <i>-t</i> :	cf. word-level regular <i>-ed</i>
e.g. <i>kēep</i> ~ <i>kēp-t</i>	<i>sēep</i> ~ <i>sēep-ed</i>
<i>fēel</i> ~ <i>fēl-t</i>	<i>hēal</i> ~ <i>hēal-ed</i>
• the unproductive derivational suffix <i>-th</i> :	cf. word-level <i>-ness</i>
e.g. <i>dēep</i> ~ <i>dēp-th</i>	<i>stēep</i> ~ <i>stēep-ness</i>
<i>wīde</i> ~ <i>wīd-th</i>	<i>rīpe</i> ~ <i>rīpe-ness</i>

§18 *Stratification in the Ormulum*

Bermúdez-Otero (1999: 212-215) observes that the facts of §17ii are already in place in the dialect of the *Ormulum* (Holt 1878),

a South Lincolnshire text dating to c1180 and showing no influence from French (Parkes 1983).

The *Ormulum* provides direct orthographic information on the application of closed syllable shortening because the author doubled consonant letters in the coda if the preceding vowel was short (Anderson & Britton 1999).

(i) Forms defining domains for closed syllable shortening:

- underived stems

e.g. <blosstme>	'blossom'	OE <i>blōstma</i>
<lihht>	'light'	OE <i>lēoht</i>
- irregular athematic past-tense and past-participle forms of weak verbs

e.g. <demnde>	'deem' pret.3sg.	OE <i>dēman</i>
<hidd>	'hide' p.ptc	OE <i>hȳdan</i>
- *-þel/-te* suffixation

e.g. <maʒʒþe>	'kin'	OE <i>mæg</i>
<seollþe>	'happiness'	OE <i>sēl</i>

(ii) Forms that do not define domains for closed syllable shortening:

- nominal inflection

e.g. sg. <dækenn>	~	pl. <dæcness>, not *<deccness>	'deacon'	OE <i>dēacon</i>
sg. <tākenn>	~	pl. <tacness>, not *<taccness>	'token'	OE <i>tācen</i>
- zero-derived regular weak verbs (including their thematic past-tense and past-participle forms)

e.g. N <tākenn>	~	V <tacnenn>, not *<taccnenn>	'betoken'	OE <i>tācen</i>
N <wæpenn>	~	V <wæpnedd>, not *<weppnedd>	'arm'	OE <i>wæpen</i>
- derivational suffixation

e.g. <god> 'good'	~	<godnesse> 'goodness', not *<goddnesse>	OE <i>gōd</i>
<soþ> 'true'	~	<soþlike> 'truely', not *<soþþlike>	OE <i>sōþ</i>
- compounding

e.g. <boc> 'book'	~	<bocstaff> 'letter', not *<bocstaff>	OE <i>bōc</i>
<shep> 'sheep'	~	<shephirde> 'shepherd', not *<shepphirde>	OE <i>scēap</i>

§19 *The role of productivity*

The constructions diagnosed as stem-level by the operation of closed syllable shortening in the *Ormulum* are unproductive and require lexical listing:

(i) Athematic weak-verb inflection

In Old English, syncope of the verbal theme vowel in past-tense forms had been predictable:

- the *-e-* of class-1 weak verbs was syncope-prone,
 - the *-o-* of class-2 weak verbs was syncope-resistant
- and
- class-1 *-e-* syncope only after heavy syllables.

In Middle English, vowel reduction has neutralized the distinction between *-e-* and *-o-*, and independent developments have obscured the weight conditions on syncope.

As a result, Middle English weak verbs have been re-organized into two classes (Lass 1999):

- an open, regular class of weak verbs with thematic *-e-* (> modern *-ed* verbs)
- a closed, irregular class of weak verbs with thematic *-∅-* (> modern *-t* verbs).

(ii) *-th* derivation

The Old English precursor of *-th*, the suffix *-þu*, had been involved in fearsomely complex vowel-∅ alternations (Bermúdez-Otero 2015: 14), and was associated with increasingly unproductive *i*-umlaut.

By Early Middle English, it has become unproductive.

§20 *The role of the Anti-Alternation Bias*

The constructions that remained in the scope of closed syllable shortening in the *Ormulum* are those that we would associate with the stem-level ‘inner core’ in any case (§1iii).

However, if closed syllable shortening started its life cycle as a transparent process applying across the board (◀6§9,§13), then we need to invoke an Anti-Alternation Bias to explain how its domain become narrowed (◀6§23), allowing new superheavy syllables to be created.

Implications

§21 Stratal splits arise endogenously through domain narrowing as relatively highly productive affixes escape the scope of existing phonological alternations under pressure from an Anti-Alternation Bias.

EMANCIPATION

§22 In this section, I show that, when a stratal split is already in existence, the same mechanisms can cause stem-level affixes to escape to the word level if their selectional restrictions are relaxed and they experience an uptick in productivity.

The rise of dual-level behaviour in Late Modern English

§23 Focus on *-ism* (for *-ize*, which behaves in the same way, see Bermúdez-Otero 2018: §5.3.2)

§24 The suffix first entered the English language smuggled inside loanwords borrowed whole (e.g. *baptism*, *Judaism*, *Christianism*).

Initially, *-ism* behaves as a stem-level ‘retracting’ suffix, causing a foot to be erected immediately to its left:

e.g.	<i>so(líp)(sism)</i>	cf.	<i>sòlipsisic</i>
	<i>me(tábo)(lism)</i>	cf.	<i>mètabólic</i>
	<i>pa(rálo)(gism)</i>	cf.	<i>pàralógical</i>

As a stem-level suffix, it triggers stress shift when added to free bases:

e.g.	<i>Cátbolic</i>	but	<i>cathólic-ism</i>	
	<i>cápital</i>	but	<i>capítal-ism</i>	(on innovative <i>cápitalism</i> , see below)
	<i>búreaucrèt</i>	but	<i>buréaucrat-ism</i>	

§25 However, as the number of words containing *-ism* increased, the suffix became more parsable and, eventually, experienced an uptick in productivity, perhaps because of its ability to exploit an unoccupied semantic niche.

This manifested itself, among other things, in an ability to attach promiscuously to all types of bases, including the native Germanic word-stock:

e.g. *Thátcher-ism*
Réagan-ism

§26 At this point, however, *-ism* becomes word-level and so stress-neutral:

e.g.	<i>profèssional</i>	so	<i>profèssional-ism</i>	(not * <i>pròfessionálism</i>)
	<i>cónsonant</i>	so	<i>cónsonant-ism</i>	(not * <i>cònsonántism</i>)

As in our *Ormulum* case-study, then, high productivity entails greater exposure to the Anti-Alternation Bias and a greater likelihood of becoming word level.

§27 Crucially, existing words derived from bound bases retain the old metrical contour created by stress retraction:

e.g.	<i>solíps-ism</i>	
	<i>metábol-ism</i>	(most speakers don't know the word <i>metábole</i>)
	<i>parálog-ism</i>	

This is predictable: there is simple no free base to which the suffix could attach in a word-level cycle.

Similarly, new learned creations derived from bound roots follow the stress-retraction pattern too because deradical items are obligatorily stem-level:

e.g. *àpo-sémat-ism*

§28 Crucially, the original pattern of stress retraction is gradually retreating from old items derived from free bases, as inherited realizations are replaced on an item-specific fashion by new formations involving word-level stress-neutral suffixation:

e.g.	<i>buréaucratism</i>	remains
	<i>capítalism</i>	is gone, replaced by <i>cápitalism</i>

As late as 1969, the art historian Lord Kenneth Clark (1903-1983) said *capitalism* and *capitalist*: listen to 07:15 and 09:18 in <https://tinyurl.com/y56ywmk3>.

§29 This diachronic process of lexical diffusion among the remnants of old stem-level formations with free bases containing a now dual-level affix is precisely what is predicted if stem-level outputs are listed nonanalytically in the lexicon (◀④).

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