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The boundary between morphology and phonology and the concept of morphologization

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1. Research question and data

At what point does a historically proven phonological cause-and-effect relationship, whereby phonological feature X causes and determines phonological feature Y, cease to hold and the dephonologized Y element stand as a marker of some morphological distinction?

The question is relevant to cases in which the original phonological conditioning element is still present (1) and where it has disappeared (2-4)

(1) Sabino type of metaphony in which the historical phonological conditioning element is still present: (Servigliano ; cf. Camilli 1929: 224–231; data taken from Loporcaro 2016:60 and Torres-Tamarit)

Morphological distinction	(Alternation) /ɔ/ - /o/ /o/ - /u/	Gloss	(Alternation) /ɛ/ - /e/ /e/ - /i/	Gloss
1/3SG – 2sg	[ˈmɔːre] - [ˈmoːri]	'die'	[rrepˈprɛtsːo] - [rrepˈpretsːi] [ˈmetːe] - [ˈmitːi]	'take care' 'put'
F-M	[ˈmɔrta] - [ˈmortu] [ˈloːpa] - [ˈluːpu]	dead(F/M) wolf(F/M)	[aˈpɛrta] - [aˈpertu] [pesa] - [pisu]	open heavy
SG-PL	[ˈfjore] - [ˈfjuri]	'flower/s'	[ˈpɛːde] - [ˈpeːdi]	foot(PL)

(2) Morphologized metaphony effects in nouns in Neapolitan (Vignuzzi and Avolio 1994; Avolio 1994: 644–645; quoted from Loporcaro 2016:59)

Pattern Alternation	SG	PL	Gloss	FEM	MASC	Gloss
/ɛ/ → /ie/ /ɔ/ → /uə/	['vɛrmə] ['pɛːrə]	['vjermə] ['pjeːrə]	'worm(s)' 'foot(PL)'	['bːɔːnə] ['mɔrtə]	['bːwoːnə] ['mwortə]	'good' 'dead'
/e/ → /i/	['meːsə]	['miːsə]	'month(s)'	['sekːə]	['sikːə]	'dry'
/o/ → /u/	[nə'poːtə]	[nə'puːtə]	'nephew(s)'	['sordə]	['surdə]	'deaf'

(3) Morphologized metaphony effects in nouns and verbs in Grottaminarda (Cox 1977)

Pattern Alternation	SG	PL	Gloss	1SG	2SG	Gloss
/ɛ/ → /ie/	[rɛnd]	[riend]	'tooth'	[pɛrd]	[pierd]	'lose'PST-INPF
/e/ → /i/	[peʃ]	[piʃ]	'fish'	[sper]	[spir]	'hope'PRS.IND
/ɔ/ → /uə/	[vɔv]	[vuəv]	'ox'	[trɔv]	[truəv]	'find' PRS.IND
/o/ → /u/	[ku'lor]	[ku'lur]	'colour'			

(4) Morphologized metaphony effects in nouns and verbs Ticino Canton, Switzerland (Canalis , 2016) [1]

Pattern Alternation	SG	PL	Gloss	1SG	2SG	Gloss
/a/ → /ɛ/	['tavul]	['tɛvul]	'table'	['vali]	['vɛli]	'be worth' PRS.IND
/ɛ/ → /i/[2]	[rɛd]	[rid]	'net'	[par'lɛvi]	[par'livi]	'speak' PST-INPF
/e/ → /i/	['debul]	['dibul]	'weak'	[vend]	[vind]	'sell' PRS.IND
/u/ → /y/	[ku'lur]	[ku'lyr]	'colour'	[ris'pund]	[ris'pynd]	'to answer' PRS.IND
/ɔ/ → /ø/	[kɔrp]	[kørp]	'body'	['trɔvi]	['trøvi]	'to find' PRS.IND

2. Phonologically based accounts of morphologization

With reference to the data above in (4) Canalis (2016) claims that the morphological exponent of 2sg on verbs and PL on nouns and adjectives whilst only phonetically detectable via the vowel-height of the root vowel is phonologically represented as an invisible floating feature at the end of the plural forms which docks on to the stressed vowel position of the root and raises it. Specifically he states

Even if Ticinese metaphony is primarily seen as a mechanism to express some nominal or verbal categories, with the lexicon specifying which roots undergo metaphony and which roots use other morphological exponents (or no exponent at all as in many cases singular and plural forms are identical), the exponent itself is made of phonological material, and therefore needs to be specified in phonological terms (ibid:132)

3. What is phonology?

Core of phonology is related to the the automatic and unconscious production of different realizations (allophones) of the same mental element (phonemes). These systematic alternations across words cannot be the result of speakers memorising each of the possible infinite combinations of words or finite combination of phonemes. Rather, there is a higher level of organisation and abstraction, which is the phonology.

(5) Distribution of allophones of Portuguese /s/ and /z/ in coda position.

Phonemic contrast: *se* 'if' [s]*e* - *Zé* 'Joe' [z]é; *selo* 'stamp' [s]*elo* – *zelo* 'zeal' [z]*elo; caçar* 'hunt' *ca*[s]*ar* – *casar* 'marry' *ca*[z]*a; assa* 'he bakes' *a*[s]*a* – *asa* 'wing' *a*[z]*a*

[1] The historical process which resulted in these forms is more complex tan that explained here and involved diphthongiastion and their subsequent coalesence into simple vowels (see Canalis, 2016:128-129) for details.
[2] In the verbal morphology /ɛ/ can also alternate with /e/: 1SG ['bɛvi] – 2SG ['bevi]

Word internal coda: *risca* 'stripe' *ri*[ʃ]*ca*; *suspiro* 'sigh' [s]*u*[ʃ]*piro; susto* 'fright' [s]*u*[ʃ]*to*; *asfalto* 'asphalt' *a*[ʃ]*falto*; *Azteca* 'Aztec' *a*[ʃ]*teca; rasga* 'tear' *ra*[ʒ]*ga; Lisboa* 'Lisbon' *Li*[ʒ]*boa; mesma* 'same' *me*[ʒ]*ma*; *desde* 'since' *de*[ʒ]*de;*

Utterance final: *três* 'three' *tre*[ʃ]; *mais* 'more' *mai*[ʃ]; *nós* 'we' *no*[ʃ]; *os* 'the(M.PL)' *o*[ʃ]; *as* 'the(F.PL) *a*[ʃ]; *maus* 'bad(M.PL)' *mau*[ʃ]

Word final + vowel: *mais o menos* 'more or less' *mai*[z] *o meno*[ʃ]; *os ouvidos* 'the ears *o*[z] *ouvido*[ʃ]; *nós olhamos* 'we look' *no*[z] *olhamos*; *as Aztecas* 'the Aztecs' *a*[z] *A*[ʃ]*teca*[ʃ]; *maus amigos* 'bad friends' *mau*[z] *amigo*[ʃ]

Word final + cons: *as patas* 'the paws' *a*[ʃ] *pata*[ʃ]; *as batas* 'the gowns' *a*[ʒ] *bata*[ʃ]; *maus tempos* 'bad times' *mau*[ʃ] *tempo*[ʃ]; *maus dias* 'bad days' *mau*[ʒ] *dia*[ʃ]

6.What is Morphology?

Despite there being no consensus on what morphology actually is (see Stewart 2016:1-9 for an overview), the correlate of the automatic and unconscious phonological alternations above in morphology could be compared to the different instantiations in which a lexeme can appear. Thus, verbs in the Romance languages display a large number of different word forms which correspond to the same lexeme; speakers are able to produce these forms automatically and effortlessly in the relevant contexts. Such words are not merely memorised, however, since available corpus studies suggest that speakers do not encounter every inflectional form of even relatively frequent items (Blevins, Milin, and Ramscar 2017) and therefore speakers are capable on the basis of limited input to extrapolate and produce forms that they have never heard before. Thus, there must exist a higher level of organisation and abstraction to capture this creative capacity and this is the essence of morphology.

<u>Main differences in morphological theories</u>

(i) the basic unit of mental storage (the word, the stem or the morpheme)
(ii) the extent and degree of mental storage.

<u>Orthodoxies in most prominent theories of morphology</u>

(i) lexical minimization: one stores only the most basic information which is not derivable by grammatical/generative processes.
(ii) morphology is a constructive process in which words are built out of smaller bits (morphemes)

7. Plural formation in Spanish

For similicity I have disregarded invariable form such as *cactus, dosis* and foreign borrowings

(6) *X* > *Xs* when X ends in a vowel

*perro – perro*s 'dog(s)'; *gato – gatos* 'cat(s)'; *mesa - mesas* 'table(s)'; *silla - sillas* 'chair(s)'

(7) X> X*es* when X ends in a consonant

pan – panes 'bread(s)', *capitán – capitanes* 'capitans', *sol – soles* 'sun(s)', *cantar-cantares* 'poem/song'

Constructive theories + lexical minimization**:** -*s* and -*es* are allomorphs of biunique -*S* [PLURAL] and the phonology determines the allomorph since morphology is conceived as a part of, or a continuation of, the lexicon, i.e. it is the place where the idiosyncratic pairings of form and meaning, both lexical and grammatical, reside, but with the added task of being responsible for the concatenation of the morphemes and with the knowledge of the order in which they should be concatenated *pan+s, *s+pan* (Generative Phonology (Roca 1994), Lexical Phonology (Kiparsky 1982), Optimality Theory (Prince 2004; Prince and Smolensky 1993) and Stratal Optimality Theory (Bermúdez-Otero 2012, 2013, forthcoming; Kiparsky 2000, 2015)

pan+s > [panes] via EITHER rule of epenthesis in complex codas or constraint against complex codas.

Problem: There are always exceptions to these 'phonological' rules/constraints. Spanish has complex codas with nasals in word internal and word final position *consciente, instituto, inscripción, transcurso, trans, Sanz, Sáenz*.

It is the morphological process of plural formation (*tren- trenes *trens* 'train – trains') that imposes certain phonological constraints not the phonology (*trans tranes**) this phenomenon is morphologically conditioned phonology.

Phonological theories have two different ways to deal with rules that apply productively in certain morphological contexts (i.e. Spanish regular plural formation with nouns ending in /n/ whereby n+s > *nes*) but whose lack of application is also permitted more generally (*trans, instituto, webcams*). Inkelas (2014: 11) classifies these as the following:

- Single Grammar Theories: 'each language has a single phonological grammar, but the grammar includes, along with fully general phonological rules or constraints, other rules or constraints which are indexed to particular morphological environments and take effect only there'. Sound Pattern of English (Chomsky and Halle 1968) was one such model, as are Optimality-theoretic models which employ morphologically indexed constraints (Pater 2000; Itô and Mester 1999; Pater 2010; Coetzee 2009; Alderete 2001b; Alderete 2001a; Itô and Mester 1995)[3].

[3] See Bermúdez-Otero 2012 for a critical assessment of such models.

- Multiple Grammar Theories: 'a language has multiple sub grammars, each indexed to one or more morphological constructions or lexical strata. Each sub grammar is composed of fully general rules and constrains' (Lexical Morphology and Phonology ((Kiparsky 1982), Cophonology Theory (Inkelas and Zoll 2007; Anttila 2002) , Stratal OT (Bermúdez-Otero 2012, 2013, forthcoming; Kiparsky 2000, 2015)

8. Patterns of plural formation in Portuguese

(8) pattern of plural formation: $X_{(SG)} > Xs_{(PL)}$

carro – carros 'car(s)'*; irmã – irmãs* 'sister(s)'*; homem* [ɔmẽj̃]– *homens* [ɔmẽj̃ʃ] 'men'; *armazém – armazens* 'warehouse(s)'; *pau – paus* 'stick(s)'

(9) pattern of plural formation: $X_{(SG)} > Xes_{(PL)}$

bar - bares 'bar(s)'; *cruz - cruzes* 'cross(es)'; *rapaz - rapazes* 'boy(s)'; *português – portugueses* 'Portuguese(PL)'

(10) pattern of plural formation: $X_{(SG)} > X_{(PL)}$

um reles pires 'one common saucer'; *dois reles pires* 'two common saucers'; *um simples lapis* 'one single pencil'; *dois simples lapis* 'two single pencils'.

(11) pattern of plural formation: $Xl_{(SG)} > Xis_{(PL)}$

animal – animais 'animal(s)'; *papel – papéis* 'paper(s)'; *lençol – lençóis* 'sheet(s)'; *paul – pauis* 'swamp'; *fuzil – fuzis* 'rifle';

(12) pattern of plural formation: $Xil_{(SG)} > Xeis_{(PL)}$

projétil – projéteis 'missile(s)' *fóssil – fósseis* 'fossil(s)'; *réptil - répteis* 'reptile(s)'

(13) pattern of plural formation: $X\tilde{ɐ}\tilde{w}_{(SG)} > X\tilde{ɐ}\tilde{w}ʃ_{(PL)}$

mão - mãos 'hand(s)'; *cristão > cristãos* 'christian(s)'; *chão > chãos* 'floor(s)'; *cidadão > cidadãos* 'citizen(s)'; *irmão > irmãos* 'brother(s)'.

(14) pattern of plural formation: $X\tilde{ɐ}\tilde{w}_{(SG)} > X\tilde{ɐ}j̃ʃ_{(PL)}$

pão > pães 'bread(PL)'; *cão > cães* 'dog(s)'; *capitão > capitães* 'captain(s)'; *alemão > alemães* 'German(s)'; *capelão > capelães* 'chaplain(s)'

(15) pattern of plural formation: $X\tilde{ɐ}\tilde{w}_{(SG)} > Xõj̃ʃ_{(PL)}$

pensão – pensões 'hostel'; *vagão – vagões* 'carriage(s)'; *dedão – dedões* 'big thumb(s)'; *sensação – sensações* 'sensation(s)'; *obrigação – obrigações* 'commitment(s)'; *leão - leões* 'lion(s)'; *acção – acções* 'action(s)'.

(16) Vowel alternation SG-PL /o/ ~ /ɔ/

car[o]ço - car[ɔ]ços 'stone(s)'*; c[o] rpo - c[ɔ]rpos* 'body(s)'; *f[o]go - f[ɔ]gos* 'fire'; *j[o]go - j[ɔ]gos* 'game(s)'*; [o]lho - [ɔ]lhos* 'eye(s)'; *[o]sso - [ɔ]ssos* 'bone(s)'*; p[o]rto - p[ɔ]rtos* 'port(s)'

(17) Root vowel alternations in nouns: M.SG – M.PL- F.SG – F.PL /o/ ~ /ɔ/ ~/ɔ/ ~/ɔ/

f[o]sso – f[ɔ]ssos – f[ɔ]ssa – f[ɔ]ssas 'trench(es) – pit(s)'; *h[o]rto – h[ɔ]rtos – h[ɔ]rta – h[ɔ]rtas* – 'small vegetable garden – larger vegetable garden'; *p[o]rco – p[ɔ]rcos - p[ɔ]rca - p[ɔ]rcas* 'pig(s)(M) – pig(s)(F)' *[o]vo – [ɔ]vos - [ɔ]va - [ɔ]vas* 'egg(s) – fish roe';

(18) Root vowel alternations in adjectives: M.SG – M.PL- F.SG – F.PL /o/ ~ /ɔ/ ~/ɔ/ ~/ɔ/

m[o]rto - m[ɔ]rtos - m[ɔ]rta - m[ɔ]rtas 'dead(ADJ)'; *n[o]vo – n[ɔ]vos - n[ɔ]va - n[ɔ]vas* 'new'; *m[o]rno – m[ɔ]rnos - m[ɔ]rna - m[ɔ]rnas* 'luke-warm'; *charm[o]so – charm[ɔ]sos - charm[ɔ]sa - charm[ɔ]sas* 'charming'

(19) Lexemes with no alternations but /o/ in all forms

f*[o]fo – f[o]fos - f[o]fa – f[o]fas* 'cute'; m*[o]ço – m[o]ços - m[o]ça – m[o]ças* 'young boy(s) – young girl(s)'; *esp[o]so – esp[o]sos - esp[o]sa – esp[o]sas* 'husband(s) – 'wife(s)'*; d[o]rso – d[o]rsos* 'back(s)'; *alm[o]ço – alm[o]ços* 'lunch(es)'; *esc[o]va – esc[o]vas* 'brush(es)'; *ac[o]rdo - ac[o]rdos* 'agreement(s)'

(20) Lexemes with no alternations but /ɔ/ in all forms

s[ɔ]lo – s[ɔ]los 'soil(s)/ground(s)'; *son[ɔ]ro – son[ɔ]ros - son[ɔ]ra - son[ɔ]ras* 'voiced(ADJ)'; *c[ɔ]lo – c[ɔ]los* 'lap(s)'; *v[ɔ]to – v[ɔ]tos* 'vote(s)'; *dev[ɔ]to – dev[ɔ]to s - dev[ɔ]ta - dev[ɔ]tas* 'devout(ADJ)'; *bl[ɔ]co – bl[ɔ]cos* 'block(s)'; *m[ɔ]do – m[ɔ]dos* 'way(s)'

<u>Historical development of the plurals of the type (13)-(15) (for information only)</u>

The historical development is illustrated in (21) in which the Latin forms in brackets represent apocope of final -E. Stage one represents the result whereby, due to regressive assimilation conditioned by a following nasal consonant, the vowel was nasalised and the consonant, after a period of progressive weakening and erosion, was lost. In word final position the resultant nasal vowel diphthongised creating the SG-PL distinctions of stage two. The vowel ã was subsequently raised to ɐ̃ (stage 3) and, for reasons which reamin not entirely clear, the sequences -ɐ̃õ -ãw̃ -õw̃ all merged to -ɐ̃w̃ (Sampson 1983; 1999: 195), producing the modern alternations in which the

form of the plural is no longer predictable from the phonological form of the singular, except for [ẽj̃]. Word final /s/ is represented here as [s].
(21)

Latin forms	stage one	stage two	stage three	stage four
HŎMIN(EM) – HŎMINES	ɔmẽ - ɔmẽj̃s	ɔmẽj̃ ɔmẽj̃s		
MĂNU(M) - MĂNUS >	mão - mãos	mão - mãos	mẽo - mẽw̃s	mẽw - mẽw̃s
PĀN(EM)- PĀNES >	pã - pãj̃s	pãw̃ - pãj̃s	pẽw̃ - pẽj̃s	pẽw̃ - pẽj̃s
RATIŌN(EM) - RATIŌNES	razõ - razõj̃s	razõw̃ - razõj̃s		razẽw̃ - razõj̃s

Historical development of the vowel alternations in (16)-(18) (for information only)

These are due to the metaphonic effects of Latin final -U upon stressed /ɔ/. In proto-Ibero-Romance -U was the desinential marker of singular (and usually masculine gender) for Latin class II nouns and adjectives; it alternated with the desinence -OS in the plural. Witness the regular effects of metaphony which gave rise to the morphological patterns in (16): FŎCU(M) > f[o]go vs. FŎCOS > f[ɔ]gos 'fire(s)'; *[ˈɔssu] > [o]sso vs. *[ˈɔssos] > [ɔ]ssos 'bone(s)'; ŎUU(M)> [o]vo vs. *[ɔwos] > [ɔ]vos 'egg(s)'; IŎCU(M) > j[o]go vs. *[ˈjɔkos] > j[ɔ]gos 'games'. The patterns of alternation in (17)&(18) whereby the feminine forms display an open vowel were undoubtedly influenced by the effects of final -A on stressed [o] which could be lowered to [ɔ] (HŌRA > h[ˈɔ]ra 'hour'; FŌRMA > f[ˈɔ]rma 'shape'). Thus, *[ˈmoɾno] > m[o]rno vs. *[ˈmoɾna] > m [ɔ]rna 'luke-warm', *[ˈmoɾnas] > m[ɔ]rnas, *[ˈmoɾnos] > m[ɔ]rnos; this last example, *m*[ɔ]*rnos,* is analogical with the morphologized pattern of plural formation.

Analisis of plurals for singular nouns ending in *-ão* within a single grammar theory (Azevedo (2005))

Nouns in *-ão* are analysed as having a phonological representation in /n/ on the basis of the /n/ in derived forms. Thus, given the existences of the forms *patrono* 'patron saint', *canino* 'canine', *manual* 'manual', the words *patrão* 'patron', *cão* 'dog', and *mão* 'hand' are given the underlying forms /patron/ /kan/ and /man/. It is then stipulated that they have the following theme vowels: /e/ for *patrão* and *cão* (/patron+e/ /kan+e/) but /o/ for *mão* (/man+o/). Note that these theme vowels are never pronounced. As to the phonological rules acting on these forms, the assumption is that /n/ nasalizes the preceding vowel yielding /patrõ/, /kã/, and /mã/ but unexplainedly and paradoxically when this vowel combines with the theme vowel /e/ in the singular (/patron+e/ /kan+e/) it produces the diphthong /ã[4]w/ ([patrãw̃], [kãw̃]) but when it combines in the plural (/patron+e+s/ /kan+e+s/) it forms the sequences /õe/ and /ãe/ which respectively diphthongize and yield the expected endings when combined with the plural [patrõjs] [kãjs]. Unsurprisingly, the concatenation of the theme vowel /o/ to *mão* produces the expected same results in both the singular and the plural [mãw̃ – mãw̃s].

[4] Note that Azevedo represents this diphtong as possesing [ã] as opposed to [ẽ] as the first element.

Orthodoxies still prevalent in many phonological and morphological theories

'the idea, tacitly admitted in all quarters of early generative phonology, that etymologically, paradigmatically or semantically related items contract a synchronic derivational relationship (Johnathan Kaye calls this the central dogma). Otherwise, it was argued, a generalisation would be missed. Therefore, any two such underlying items had a common underlying form, and their surface representation was derived by rule.' Scheer (2011:104)

Intermim conclusion: Analyses within single grammar theories constitute a gargantuan task for the phonology but also for the infant learner who must adopt a strategy of lexical minimization and discover what these underlying forms are and the sequence of rules which act on them. Indeed Bermúdez -Otero (2012) is fiercely critical of these rules which he characterises as being arbitrary and unrestricted and therefore bestowing upon the phonology an excessive power which "utterly destroy[s] the empirical content of morphological and phonological hypotheses" (Bermúdez-Otero 2012:80).

7.1 Distribution of diphtongised root allomorphy in Spanish

Assumed to be a case of phonologically conditioned allomorphy. Assumption is that there are two stored stems a diphthongised and a non-diphongised one and the phonology determines their distribution. The rhizotonic forms of the verb are referred to as N-pattern forms.

(22) A selection of Spanish verbs which display N-pattern vocalic allomorphy: *negar* 'refuse'*, perder* 'loose'*, poder* 'be able', *sentir* 'feel', *convertir* 'convert', *morir* 'die'.

	Indicative	Subjunctive	Indicative	Subjunctiv	Indicative	Subjunctive
1SG	niego	niegue	pierdo	pierda	puedo	pueda
2SG	niegas	niegues	pierdes	pierdas	puedes	puedas
3SG	niega	niegue	pierde	pierda	puede	pueda
1PL	negamos	neguemos	perdemos	perdamos	podemos	podamos
2PL	negáis	neguéis	perdéis	perdáis	podéis	podáis
3PL	niegan	nieguen	pierden	pierdan	pueden	puedan
	Indicative	Subjunctive	Indicative	Subjunctive	Indicative	Subjunctive
1SG	siento	sienta	convierto	convierta	muero	muera
2SG	sientes	sientas	conviertes	conviertas	mueres	mueras
3SG	siente	sienta	convierte	convierta	muere	muera
1PL	sentimos	sintamos	convertimos	convirtamos	morimos	muramos
2PL	sentís	sintáis	convertís	convirtáis	morís	muráis
3PL	sienten	sientan	convierten	conviertan	mueren	mueran

Evidence from other varieties of Ibero-Romance that this stress-diphthong relationship is not one of cause and effect but a historical accident.

(23) Comparison between present indicative and imperatives forms in Astrurian (Lena) and Spanish. Orthographic stress marks have been inserted for ease in the exposition.

Asturian (Lena)	*correr* 'run'	*morrer* 'die'	*golver* 'return'
3sg pres. indic	cuérre	muérre	güélve
2sg imperative	cúrre	múrre	gúlve

Spanish	*correr* 'run'	*morrer* 'die'	*golver* 'return'
3sg pres. indic	córre	muére	vuélve
2sg imperative	córre	muére	vuélve

(24) Infinitive and 3SG present indicative verb forms of Spanish verbs which display the diphthong-monophthong alternation correlated with stress and semantically related words in which the diphthongized allomorph appears in unstressed position

Alternation within the verb	Gloss	Related Word	Gloss
contar - cuenta	tell a story	cuentista	story-teller
gobernar – gobierna	govern	gobiernista	governmental
empedrar – empiedra	pave with stones	piedrecita	little stone
cegar – ciega	blind	ciegamente	blindly
fregar – friega	wash	friegaplatos	dish-washer
apernar – apierna	grab by the legs	piernón	a big leg

(25) Derived words in *-ista* which display the diphthong-monophthong alternation when compared with semantically related words

independentista 'independentist' (c.f. *independiente* 'independent' – *independencia* 'independency')*; ochocentista* 'researcher of/relating to the XIX century' (cf. *cien/cientos* 'hundred/hundreds(ADJ)' - *centenar* 'hundred') ; *concertista* 'soloist at a concert' (c.f. *concierto* 'concert')*; dentista* 'dentist' (c.f. *diente* 'tooth' – *dental* 'dental')

(26) Derived words in *-ista* which **do not** display the diphthong-monophthong alternation when compared with semantically related words

antigobiernista 'person against the government (ADJ)' (c.f. *antigobierno* 'against the government' vs. *antigubermental* 'against the government(ADJ)' - *gobierno* 'government' – *gobernar* 'govern'); *vientista* 'player of wind instrument' (c.f. *viento* 'wind' – *ventoso* 'windy'); *cuentista* 'person who likes to tell stories' (c.f. *cuento* 'story' – *contar* 'to tell a story'); *mueblista* 'furniture

maker' (cf. *mueble* 'furniture' – *mobilario* 'furniture (collective noun)'; *(moto)sierrista* 'person who uses a (chain)saw' (*(moto)sierra* '(chain)saw' – serrar 'to saw')

(27) Derived words in *-ero* which display the diphthong-monophthong alternation when compared with semantically related words

herrero 'black-smith' (cf. *hierro* 'iron') *terrero* 'relating to the earth' (cf. *tierra* 'earth') *merendero* 'place to have a snack/pick-nick area' (c.f. *merienda* 'picnic/snack') *pedrero* 'stone-cutter, quarry-man' *picapedrero* 'stonecutter' (c.f *piedra* 'stone'); *pimentero* 'pepper container' (cf. *pimienta* 'pepper'); *portero* 'door-man' (cf. *puerta* 'door'); *boyero* 'ox-herd' (cf *buey* 'ox')

(28) Derived words in *-ero* which **do not** display the diphthong-monophthong alternation when compared with semantically related words

huertero 'person who owns an allotment' (cf. *huerta* 'allotment' – *hortaliza* 'vegetable'); *tierrero* 'cloud of dust' (cf. *tierra* 'soil, earth' – *terral* 'cloud of dust'); *hielera* 'cooler' (*hielo* 'ice' – *helar* 'freeze'); *mielero* 'honey pot' (*miel* 'honey' – *meloso* 'sweet') *cuentero* 'person who tells stories' (cf. *cuento* 'story' – *contar* 'to tell a story')

Conclusion: there are some sets of words which participate in the alternation and some that do not and although there are some productive processes, much is reliant on memory (e.g. *cuesta – costar* 'cost' vs. *el coste* 'the cost') and cannot simply be derived via cyclical processes on two different strata.

7.2 Stress in the Spanish verb

A more fundamental problem with the explanations of phonologically conditioned allomorph selection in Spanish, however, is the assumption that stress in both languages is phonologically conditioned.

(29) Minimal pairs in the verb of *cantar* 'sing' which display identical segmental propoerties but different stress patterns

canto 1SG.PRS.IND *cantó* 3SG.PRET.; *cante* 1SG.PRS.SBJ *canté* 1SG.PRET; *cantara* 1SG&3SG.IPFV.SBJ

cantará 1SG&3SG.FUT.IND; *cantaras* 2SG.IPFV.SBJ *cantarás* 2SG.FUT.IND; *cantaran* 3PL.IPFV.SBJ

cantarán 3PL.FUT.IND

(30) Words which have the same segmental properties but different stress assignment depending on their morphological properties

proparoxytonic in noun	gloss	paroxytonic in 1SG.PRS.IND	oxytonic in 3SG.PRET	gloss
continuo	continuous (adj)	continúo	continuó	continue
hábito	habit (noun)	habito	habitó	live

cálculo	calculation (noun)	calculo	calculó	calculate
válido	valid (adj)	valido	validó	make valid
náufrago	castaway (noun)	naufrago	naufragó	be shipwrecked

(31) Words which have the same segmental properties but different stress assignment depending on their morphological properties

proparoxytonic	gloss	paroxytonic in 1SG&3SG. .IPFV.SBJ	oxytonic in 1SG&3SG.FUT.IND	gloss
cáscara	shell (noun)	cascara	cascará	crack
cítara	zither (noun)	citara	citará	quote
pícara	crafty (adj)	picara	picará	chop
máscara	mask (noun)	mascara	mascará	chew
búlgara	Bulgarian (adj)	vulgara	vulgará	make known

Bermúdez-Otero is of the opinion that stress in Spanish is predominantly a matter of phonology 'in which the tenses that show alternations between rhyzotonic and arhyzotonic stress [present indicative and subjunctive] reflect the default metrical regularities of the language, whereas nonalternating tenses [imperfect indicative] reflect underlyingly prespecified prosody.'(Bermúdez-Otero and Luís (2016); see also Bermúdez-Otero (2013: 39-41)). This succinct summary is used as a justification for the rhizotonicity of the N-pattern forms and the phonological selection of the diphthongised stems in these cells. However, upon analysis of the data it becomes clear that such default metrical regularities are tenuous and empirically unfounded and depend upon a number of theory internal contrivances to produce the desired result.

(32) Selection of tenses of the Spanish verb *cantar* 'sing' and the differential stress patterns

	Present		Imperfect Subjunctive		Imperfect Indicative	preterite
	Indicative	Subjunctive	forms in *-ra*	forms in *-se*		
1SG.	cánt-o	cánt-e	cant-á-ra	cant-á-se	cant-á-ba	cant-é
2SG.	cánt-a-s	cánt-e-s	cant-á-ra-s	cant-á-se-s	cant-á-ba-s	cant-a-ste
3SG.	cánt-a	cánt-e	cant-á-ra	cant-á-se	cant-á-ba	cant-ó
1PL.	cant-á-mos	cant-é-mos	cant-á-ra-mos	cant-á-se-mos	cant-á-ba-mos	cant-a-mos
2PL.	cant-á-js	cant-é-is	cant-á-ra-is	cant-á-se-is	cant-á-ba-is	cant-a-ste-is
3PL.	cánt-a-n	cánt-e-n	cant-á-ra-n	cant-á-se-n	cant-á-ba-n	cant-a-ron

Generalisation: default metrical regularities: stress is paroxytonic for words ending in vowels and oxytonic for words ending in consonants.

Problem (data): only produces the correct results in 12/30 forms[5] and oxytonic stress would be expected in the 2SG, 1PL, 3PL present indicative (**cantás, *cantamós, *cantán*).

FIX: 'a word final consonant belonging to an inflectional marker does not project a mora, and so is irrelevant to stress' (Bermúdez-Otero 2013: 40).

Problem (method): This is a wildcard and serves no other purpose than to explain the morphological facts which are the explanandum.

Problem (data). Fails to produce the correct results in the 2PL forms of the present (*cantáis, cantéis*) since the glide of the 2PL marker *-is* forms a syllable with the thematic vowel, and thus the expected outcome would be *cántai<s>, cántei<s>*.

Fix: syllables headed by falling diphthongs attract stress.

Problem (data): Contrary to fact as demonstrated by 2PL forms of the imperfect indicative and subjunctives in (32); the pattern of desinences V́+(C)Vjs is valid for all verbs in the entire language and attested in borrowed words *yóquey* [ˈjokej] 'jockey', jóquey [ˈxokej] 'hockey' and *las películas de Disney* [ˈdiznej] 'Disney films'.

Fix: the imperfect indicative and subjunctive select an underlyingly accented theme vowel, and thus the accent is morphologically determined in these forms. Similar recourse to morphemes being underlying accented is needed elsewhere: 1SG & 3SG preterite *canté – cantó* in order to distinguish 1SG present subjunctive and indicative *cante – canto.*

Problem (method): why cannot stress be morphologically specified in all forms of the verb if it is allowed to be morphologically marked in a large proportion of them?

*Reason***:** N-pattern memorised stress implies *not* phonologically conditioned allomorphy *but* morphologically conditioned phonology. Such a conclusion, however, necessitates that multiple forms of a lexeme are memorised, since the N-pattern is a stipulation about nine different inflectional forms.

Pan-Romance generalisations about the N-pattern

The 'N-pattern' refers to a pattern of alternation, recurrent across the Romance languages, whereby the forms of the first, second and third persons singular and third person plural of the present indicative and of the present subjunctive, and the second person singular of the imperative, share a distinctive common form or phonological characteristic (rhizotonicity). This common

[5] The forms are: *canto, canta, cantáis, cante* (1SG&3SG), *cantéis, cantara* (1SG&3SG), *cantase* (1SG&3SG), *cantaba* (1SG&3SG)

form ranges from cases of vocalic allomorph of the root (33), to an augmented stem of various types 0, to suppletive forms ((35)&(36) and even defective forms in Spanish *abolir*.

(33) A selection of Italian verbs which display N-pattern vocalic allomorphy: *morire* 'die', *udire* 'hear', *sedere* 'sit'

	Indicative	Subjunctive	Indicative	Subjunctive	Indicative	Subjunctive
1SG.	muoio	muoia	odo	oda	siedo	sieda
2SG.	muori	muoia	odi	oda	siedi	sieda
3SG.	muore	muoia	ode	oda	siede	sieda
1PL.	moriamo	moriamo	udiamo	udiamo	sediamo	sediamo
2PL.	morite	moriate	udite	udiate	sedete	sediate
3PL.	muoiono	muoiano	odono	odano	siedono	siedano
2SG.	Imperative	muori	Imperative	odi	Imperative	siedi
1SG.	Imp. indic	morivo	Imp. indic	udivo	Imp. indic	sedevo

(34) Augmented stems which display N-pattern allomorphy for the Catalan verb *servir* 'serve', the Occitan verb *obrir* 'open' and the Italian verb *finire* 'finish'.

	Catalan		Occitan		Italian	
	Indicative	Subjunctive	Indicative	Subjunctive	Indicative	Subjunctive
1SG.	serveixo	serveixi	orbéishi	orbéishi	finisco	finisca
2SG.	serveixes	serveixis	orbéishes	orbéishas	finisci	finisca
3SG.	serveix	serveixi	orbéish	orbéisha	finisce	finisca
1PL.	servim	servim	orbím	orbam	finiamo	finiamo
2PL.	serviu	serviu	orbítz	orbatz	finite	finiate
3PL.	serveixen	serveixin	orbéishen	orbéisham	finiscono	finiscano

(35) The verb 'go' in Italian and Catalan, which contains reflexes of Latin VĀDERE 'to go forward in an aggressive way', surviving exclusively in the N-pattern cells but reflexes of AMBULĀRE 'walk' exclusively in the remainder of the paradigm.

	Italian		Catalan	
	Indicative	Subjunctive	Indicative	Subjunctive
1SG.	vado	vada	vaig	vagi
2SG.	vai	vada	vas	vagis
3SG.	va	vada	va	vagi
1PL.	andiamo	andiamo	anem	anem

2PL.	andate	andate	aneu	aneu
3PL.	vanno	vadono	van	vagin

(36) More incursive suppletion in present indicative of the N-pattern; the verb ‘give’ in localities in Italy (Liguria-Piedmont border ((Schädel 1903: 108)), conflates Latin DARE ‘give’ and DONARE ‘donate’; the verb ‘find’ in Sicily (Leone 1980: 36-39;91f.) conflates **tropare* ‘find’ and reflexes of AD + FLARE 'sniff (out)'; and, the verb ‘pull’ in various Romansh varieties ((Decurtins 1958: 31f) conflates Latin TRAHERE ‘pull, draw’ and *tirare ‘pull’.

	Liguria-Piedmont border	Varieties of Sicilian	Varieties of Romansh
1SG.	[ˈdau]	[ˈtrwovu]	[ˈtir]
2SG.	[ˈdas]	[ˈtrwovi]	ˈtiras]
3SG.	[ˈda]	[ˈtrova]	[ˈtira]
1PL.	[duˈnaŋ]	[ˈʃamu]	[tarˈɟaŋ]
2PL.	[duˈna]	[ˈʃati]	[tarˈɟais]
3PL.	[ˈdaŋ]	[ˈtrovunu]	[ˈtiran]

Conclusion

Phonology can explain cases of morphologized metaphony in (4)-(1), the distribution of stem-allomorphy both within and outside the verb in Spanish, and possibly also plural formation in nouns in Portuguese. However, at what cost? In order to capture the synchronic facts it is necessary to distance oneself from the core of what phonology is — as described with reference to the allophony of Portuguese in (5)—and adopt a complex and highly abstract model of phonology which is endowed with powerful devices such as cycles, strata and the ability to create arbitrary constraints and rules which, though not supported by robust empirical evidence, serve their primary function of making the data fit with the theoretical assumptions. These theoretical assumptions are those of lexical minimization and a static morphology responsible only for the concatenation of morphemes in the correct sequences. The cost is also that pan-Romance generalisations regarding the importance of morphomic patterns both in diachrony and synchrony is lost (see (O’Neill to appear) and instead treated as epiphenomena due to different principles.

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