

What is Suppletive Allomorphy? On *went* and on **goed* in English*

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1. Introduction.
2. Verbal theme vowels
3. *-ed* is bimorphemic
4. Deletion of theme vowels in French and Italian.
5. *-d*
6. *-t = -d* (apart from the voicing)
7. The underlying form of *-t/-d*
8. A digression to English plurals
9. Back to *-t/-d*
10. Back to **goed*.
11. *went*
12. More on English theme vowels
13. Back to *went* and back to **goed*.
14. Suppletive allomorphy in general
15. Merge and bundling.
16. Merge and phonology.
17. Merge and phonological features.
18. More on merge and phonology.
19. Phonology and cyclic rule application.
20. Conclusion.

1. Introduction.

Embick and Marantz (2005, 244) allude to “blocking effects, such as *went* blocking *goed*”. This specific blocking effect is illustrated in:

(1) They went/**goed* to the movies last night.

However, **goed* is also impossible as a past participle:

(2) They have gone/**goed* to the movies several times this month.

This second fact about **goed* could also be stated as a blocking effect. **Goed* would then be blocked as a past tense form by *went* and, separately, as a past participle, by *gone*.¹ Such an approach to (1) and (2) would fail, though, to give a unified account of the impossibility of **goed* in both (1) and (2).

¹Alternatively, in the spirit of Halle and Mohanan (1985, Appendix), one might state that the participle form of *go* must take the suffix *-n(e)* and then have a phonological rule adjust the vowel. From the perspective of a phonological rule approach to *gone* in (2), the impossibility of **goed* in (2) would be even more clearly separate from its impossibility in (1), if (1) involves blocking.

It seems in addition clear that the generalization that **goed* is ill-formed, while accurate, is itself too narrow. Against the background of the fact that *-ed* is the regular productive suffix for both past tense and past participle in English,² as in:

(3) They faxed/mailed/tweeted us yesterday.

(4) They have faxed/mailed/tweeted us several times this week.

we can note the following exceptionless generalization:

(5) An English verb disallows *-ed* in the past tense iff that verb disallows *-ed* as a past participle.

The impossibility of **goed* in both (1) and (2) can now be seen as a special case of (5), which excludes all verbs that would, for example, take only *-en* or zero in the participle form and yet take *-ed* in the past tense. As far as I know, there are no such verbs.

It should be noted that (5) is perfectly compatible with the existence of doublets such as:

(6) John's foot has swollen/swelled (up) considerably since this morning.

Swell has a participle *swollen*, but since it also allows *swelled* as a participle, it doesn't fall under (5). Consequently, the existence of *swelled* in the past tense poses no problem:

(7) John's foot swelled (up) all of a sudden.

Like *swell* in having participle doublets in both *-n* and *-ed* (and past tense in *-ed*) are *mow*, *sew*, *saw*, *shave*, *shear*, *show*.³ All of these are compatible with (5).

2. Verbal theme vowels

An initial ingredient of the understanding of (5) itself must lie in:

(8) The *-ed* found in the English past tense is identical to the *-ed* found with English past participles.

with (8) itself perhaps best understood in terms of Solà's (1994, 215) idea that the English past tense involves a silent auxiliary (AUX) and a past participle (here *mailed*), as in:⁴

²I agree with Collins (2005, 85) that the suffix of the passive participle (whether *-ed* or other) is the same as that of the past participle. This fact, which holds for (most) Germanic and Romance, bears on the question of the exact contribution made by these suffixes, but seems to be orthogonal to the issues addressed by this paper.

Relevant here is the fact that infinitives can sometimes 'stand for' passive participles, as in French (and Italian) causatives - Kayne (1975, sect. 3.5); and can sometimes 'stand for' past participles, as in German and Dutch IPP sentences - Zwart (2011, 309ff.), which might in turn be related to the fairly acceptable English:

i) They said they would do it and do it they have.

ii) Lie though they have,...

³As Bloch (1947, 405) notes, "the participle *shown* is for many speakers more elegant than the participle *showed*". On participial *-en*, see Embick (2003).

⁴Solà's proposal (which he extended to the English present tense - though cf. Leu (2016) on *-s* as a present tense morpheme) embodied the claim that lexical verbs do not raise in English because they are all participles, in a way different from Pollock (1989); remaining to be understood from Solà's perspective is why English participles differ in their raising behavior from French past participles, which allow short verb

(9) They AUX emailed us yesterday.

With respect to (8), we can now wonder about the status of verbs that show *-ed* neither in the past tense nor in the participle form, for example, *feel*. Such verbs are straightforwardly compatible with (5), but I have not yet said how exactly they differ from regular verbs like *request* or *email*.

Let me take over from Romance (and Slavic) languages the notion of verbal theme vowel.⁵ In a language like Italian verbs show what is called a theme vowel, as seen in:

(10) telefonare ('telephone(infin.)')

(11) credere ('believe(infin.)')

(12) partire ('leave(infin.)')

In these forms, *-re* is the infinitive ending.⁶

The theme vowel in (10)-(12) is the vowel that immediately precedes the infinitive ending, i.e. *-a-*, *-e-*, or *-i-*. As seen from these examples, Italian has three visibly different theme vowels. More directly relevant to English is a fact discussed in detail for Italian by Calabrese (2015) (cf. also Dell (1976) on French), namely that in certain

movement, as in Pollock (1989, 417), and from Italian (dialect) participles, as in Cinque (1999, 146).

A past participle with a silent *have*-like auxiliary is found in Italian in sentences like:

i) Una volta vistala,... ('one time seen her,...')

On these, see Belletti (1981; 1990) and Cinque (1990, note 25).

To account for verbs whose past and participle forms differ, Solà (p. 215) postulates "that one form (*eaten*) is selected by the overt auxiliary, whereas the other is selected by a null auxiliary (or is the unmarked form)". As for the interpretation of sentences like (9), it is presumably calculated in the same way as corresponding French sentences with a visible auxiliary + participle and yet a simple past-like interpretation, e.g.:

ii) Jean nous a écrit hier matin. ('J us has written yesterday morning' = 'J wrote to us yesterday morning')

On this kind of interpretation and its distribution in Romance and Germanic, see Giorgi and Pianesi (1997, 84ff.).

⁵On theme vowels in Catalan, see Oltra Massuet (1999).

Set aside here is the question whether theme vowels are (sometimes) to be analyzed as light verbs; also set aside are possible differences within the set of Romance theme vowels. That the theme vowel might be verbal is perhaps suggested by the (marginal) existence of sentences like:

i) ?The old man walked unbentedly away

with two past tense/participial morphemes, *-t-* and *-d-*.

That the French theme vowels *-e-* and *-i-* are morphosyntactically distinct is suggested by the fact that the latter is unpronounced in the present indicative in a way that the former is not:

i) partir ('to leave'); elle part ('she leaves')

ii) porter ('to carry'); elle les porte ('she them carries')

⁶Almost certainly to be decomposed into *-r-* plus *-e-*, as in Cardinaletti and Shlonsky (2004). On infinitival *-r-*, see Raposo (1987a, b) and Kayne (1999). For an argument that infinitive raising in Romance affects the licensing of PRO (and therefore must be in narrow syntax), see Kayne (1991).

environments, with certain verbs, the theme vowel in Italian is not pronounced. For English, let me take over by transposition from Italian (and French) the following minimal claim:⁷

(13) Some English verbs have a theme vowel.

3. *-ed* is bimorphemic

A more specific proposal, given (13), can now be formulated as:

(14) English *-ed* is actually two morphemes, the first of which is a verbal theme vowel.

In other words, a form like *requested* is to be analyzed as in:

(15) request -e- -d

with *-e-* the theme vowel and *-d* the past tense/participle morpheme.⁸ This *-e-* is, in a way sensitive to phonological conditions, often not pronounced, as it is not in, for example, *repaired* or *touched*.

We are now in a position to understand a striking fact, namely that *-ed* forms never show a stem alternation, i.e. adding *-ed* never changes the bare form of the verb, the reason now being formulable as follows:⁹

(16) The English theme vowel *-e-* protects the stem from being affected by *-d*. An exemplary minimal pair is *tell* vs. *spell*:

(17) tell, told

(18) spell, spelled

By (16), the theme vowel *-e-* in *spelled* ensures that the stem remains *spell* in *spelled*. In *told*, on the other hand (and similarly for *sold*), there is no theme vowel. Therefore a stem alternation is possible and we have *told* rather than **telled*. In the spirit of Chomsky and Halle (1968, 69, 184n), the orthography here seems to be telling us something about abstract representations. The orthographic presence of *-e-* before *-d* in *spelled* is a clue to the morphosyntactic presence of a theme vowel that is missing in *told* and *sold*, even though that *-e-* in *spelled* is not pronounced.¹⁰

⁷In the languages in question, theme vowels are invariably suffixal, never prefixal, relative to the verb stem; for indirectly relevant discussion, see Kayne (2015).

⁸Since this *-d* (underlyingly *-t*, as argued further on) is also found with passive participles, as mentioned in note 2, it cannot, as Collins (2005, 91) had seen clearly, by itself contribute 'pastness'.

The decomposition of *-ed* into *-e-* + *-d* was not envisaged by Embick (2015, 25) or by Kayne (2016, sect. 6).

⁹This is in the spirit of Embick's (2010; 2015) discussion of locality. Cf. more specifically Calabrese's (2015, 70) statement that "root based contextual allomorphy occurs only when the thematic vowel is absent"; rather than contextual allomorphy in the DM sense, though, we are almost certainly looking at alternations that are morphophonological, as in Halle and Mohanan (1985, Appendix) or some variant thereof.

It must also be the case that the theme vowel *-e-*, as arguably the Italian theme vowel *-a-*, must never (for reasons to be elucidated) itself trigger a stem change.

In addition, since participial *-en* admits stem alternations, as in, for example, *break*, *broken*, it must be the case that the *e* of this *-en* is not the theme vowel.

Let us now similarly compare *told* and *repaired*. In neither form is there a pronounced theme vowel. Yet *told* shows a stem alternation and *repaired* does not. There is no **repar(e)d*, despite the existence of *reparation*. Similarly, we have *appeared* and not **appar(e)d*, despite *apparent*.

It appears, then, that there are two distinct ways in which an English theme vowel can fail to be pronounced in a past tense or past participle form. In the regular cases with *-ed*, the theme vowel *-e-* can or must fail to be pronounced in a way that is sensitive to the phonology, as in *repaired*, *appeared* and *touched* (as opposed to *requested* or *thudded*), and in these cases the theme vowel blocks stem alternations even though it is not actually pronounced.

On the other hand, in *told* and *sold*, the stem alternation that we see in comparing those forms with *tell* and *sell* is telling us, in particular given (16), that the theme vowel is absent in some stronger sense than with *repaired*, *appeared* and *touched*. Let me, transposing again from Calabrese (2015), take the following position:¹¹

(19) In *told*, *sold*, the theme vowel has not been merged at all.

Put another way, English verbs usually have a theme vowel *-e-* in past tense and past participle forms. This *-e-* is sometimes deleted (*repaired*, *appeared*, *touched*); sometimes it is merged but not deleted (*requested*, *thudded*). Sometimes, however, it is not merged at all (*told*, *sold*). (Doublets like *wept*, *wept* are now to be interpreted as cases of verbs that show optional merger of the theme vowel.)

In the preceding paragraph, I have taken the pronunciation or not of theme vowel *-e-* in the regular *-ed* cases to be a matter of deletion vs. non-deletion of *-e-*, rather than to be a matter of epenthesis vs. non-epenthesis. The primary empirical reason for favoring deletion over epenthesis in these *-ed* cases has to do with the contrast between:

(20) hear, heard; sell, sold; tell, told; say, said; shoe, shod
on the one hand, and:

(21) repair, **repared*; appear, **appared*; thud, **thodded*; spell, **spolled*
on the other.

From an epenthesis perspective, the *-e-* in *repaired*, *appeared*, *spelled*, etc. is, since it is not pronounced, purely orthographic, so that all that is added to the verb stem, morphologically speaking, is *-d*. In which case we lose the possibility, given above in (16), of distinguishing (20) from (21) in terms of the absence in (20) vs. the presence in (21) of a theme vowel, in parallel with Italian (see note 9). From an epenthesis perspective, forms like *repaired*, *appeared* and *spelled* could just as well be written as

¹⁰In *fled*, the *e* is not a theme vowel, but rather is part of the stem.

¹¹This is especially plausible to the extent that theme vowels make no essential contribution to interpretation. Theme vowels, if sometimes merged, sometimes not, would be akin to the feminine gender morpheme in Italian, in Ferrari's (2005) sense; cf. the discussion of privative features in Preminger (2014, 46) and references cited there, as well as in Farkas (2006).

An alternative suggested by Chris Collins (p.c.) that I will not pursue here would be to have the theme vowel merged consistently, with all verbs, but to have it deleted in cases like *told*, *sold*. That deletion might then involve movement in the manner of Kayne (2006), in which case we might say that theme vowel deletion in *touched* et al. is more phonological, in the specific sense that such movement would not be involved.

repaired, *appeared* and *spelled*. But that would make it even clearer that the absence of any stem change with such verbs, in comparison with the verbs of (20), becomes less easy to understand, if theme vowels are not present with regular *-ed* verbs.¹²

4. Deletion of theme vowels in French and Italian.

In addition to this consideration from English, the phonological behavior of the well-attested theme vowels in French and Italian also, I think, tilts in favor of deletion over epenthesis.¹³ Calabrese (2015, 75) proposes that Italian deletes a theme vowel that precedes another suffixal vowel. But even closer to English, in this case, is French, which has a productive theme vowel *-e-* parallel to the Italian *-a-* of (10). A French example is:

(22) parler ('speak(infin.))

in which the *-e-* preceding infinitival *-r* is the theme vowel. This *-e-* is pronounced as /e/ in infinitives and in past participles;¹⁴ in finite tenses it often deletes, in a way that recalls Italian. Of more particular interest to the present discussion, however, is the behavior of this *-e-* in the future and conditional.

The future and conditional in French are composed of the infinitive followed by endings that are almost certainly to be equated with (sometimes reduced) forms of the verb *avoir* ('have'), even synchronically, as suggested by Pollock (2006, parag. 43). A representative example of a future tense form in French would be:

(23) Je parlerai. ('I will-speak')

in which the ending *-ai* is identical to the first person present of *avoir*, as in:

(24) J'ai votre livre. ('I have your book')

Of background importance is the fact that the theme vowel *-a-* of Italian infinitives seen in (10) is, in the future and conditional, replaced by (non-reduced) *-e-*. Of more direct importance is the fact that French has a parallel change that, though not seen in the orthography, replaces the full /e/ of (22) with a schwa in future and conditional forms like (23); this schwa is often deleted. Of specific relevance to the present discussion of English is the question of the conditions under which the theme vowel *-e-* in French future and conditional forms is deleted.

¹²Note that *hear* and *heard* do not have the same nucleus, contrary to the regular *-ed* case of *fear* and *feared*. As Chris Collins notes (p.c.), Harley's (2005) observation that *resignedly* and *blindly* are pronounced differently (the theme vowel in *resignedly* must be pronounced) is unexpected from an epenthesis perspective (though Harley doesn't take it to be). For a reason why epenthesis might be unavailable in general, see section 18 below.

¹³I am indebted to Chris Collins (p.c.) for bringing up the issue of deletion vs. epenthesis and for discussing it in detail with me.

¹⁴The past participle form is seen in:

i) Ils ont parlé. ('they have spoken')

In *-er* infinitives (apart from the future and conditional as discussed just below), the *-r* is not pronounced in colloquial French, although it is in *-ir* infinitives like *partir* ('leave(infin.))' and in infinitives like *prendre* ('take(infin.))' that show no visible theme vowel.

Dell (1973, 232; 1976, 83) proposes a rule that optionally (sometimes obligatorily) deletes the schwa theme vowel in the future and conditional. But this deletion will produce an ill-formed result if the verb stem ends in an obstruent-liquid cluster. Dell (1976, 85) interprets this in terms of a French-wide output condition excluding obstruent-liquid-consonant sequences (within a certain domain). It may be that the deletion of theme vowel *-e-* in English *-ed* forms is subject to a comparable condition that prevents deletion in cases like *thudded* or *batted*.

5. *-d*

Let us now return to (8), repeated here:

(25) The *-ed* found in the past tense is identical to the *-ed* found with participles. In light of the preceding section, this should be broken down into two parallel claims:

(26) The *-e-* found in the past tense is identical to the *-e-* found with participles.

(27) The *-d* found in the past tense is identical to the *-d* found with participles. with *-e-* the theme vowel and *-d* the past/participial morpheme.

The way (27) is formulated amounts to claiming, moreover, that even the *-d* of *told* is, despite the absence of theme vowel, the same *-d* as the one found with regular verbs. This seems both plausible and correct. A relevant consideration comes from (5), repeated here:

(28) An English verb disallows *-ed* in the past tense iff that verb disallows *-ed* as a participle.

With one exception, this generalization extends to *-d* even when theme vowel *-e-* is not present, i.e. we have:

(29) An English verb disallows *-d* in the past tense iff that verb disallows *-d* as a participle.

Verbs with a bare *-d* (i.e. with no theme vowel) that respect (29) by virtue of having *-d* both in past tense and participle, are:

(30) *told, sold, said, had, fled, shod, heard, made*

Despite one apparent exception (*did, done*),¹⁵ I take the verbs of (30) to provide support for the idea that the *-d* of (30) is the same *-d* as the one found with regular verbs (*emailed, etc.*).

6. *-t = -d* (apart from the voicing)

Consideration of the bare suffixal *-d* of (30) leads directly to questions concerning the bare suffixal *-t* of the past tense/participial forms given in:

(31) *spilt, felt, dealt, brought, bought, taught, thought, caught, sought, lost, bent, spent, sent, lent, meant, went, kept, crept, slept, leapt, left*

¹⁵Possibly, the *-d* of *did* might be (an irregular) part of the stem.

The past modals *could, should, would* are not exceptions in standard English insofar as they have no past (or passive) participle to be compared with. The expectation is that varieties of English that have participial versions of these modals will have them in *-d*.

The final *-e* of *made* seems not to correspond to any morpheme.

The question arises as to the exact relation between this *-t* and the *-d* of (30). (In both (30) and (31) the theme vowel has either not been merged or has been deleted - see note 11.)

Let me take the following position:

(32) Past tense/participial *-t* and past tense/participial *-d* are the same morpheme.

and in addition:

(33) What distinguishes past tense/participial *-t* and past tense/participial *-d* is phonological.

One piece of evidence in favor of (32) comes indirectly from (29) insofar as *-t* respects the same type of generalization almost perfectly:

(34) If an English verb allows *-t* in the participle, it allows *-t* in the past tense.

(35) If an English verb allows *-t* in the past tense, it allows *-t* in the participle.

I know of no exceptions to (34) and of only one apparent exception to (35), namely *went, gone*.¹⁶

More intricate support for (32)/(33), and in particular for (33), comes from the following:

(36) Past tense/participial *-t* and past tense/participial *-d* are in complementary distribution.

By this I have in mind a number of things, beginning with:

(37) The *-ed* of regular verbs is not paralleled by any past tense/participial **-et*.

(38) The *-d* of (30) is never replaceable by *-t*.

The generalization stated in (37) is obviously correct.

The one stated in (38) is straightforwardly correct for the verbs listed in (30), as seen by the impossibility of:

(39) **tolt, *solt, *sait, *hat, *flet, *shot, *heart, *mate*

Although some of these forms are possible in irrelevant senses, none are possible as doublets to (30). At the same time, (38) seems to be true in a stronger and more interesting way. Not only are **tolt, *solt* impossible as past tense/participial forms of *tell, sell*, there seem in addition to be no English past tense/participial verbs at all of the form **Colt*, with C an arbitrary consonant or consonant cluster, no matter what the bare form of the verb might have been.¹⁷ Similarly, **flet*, as opposed to *fled*, is not a possible form of *flee*; but neither is **Cet* a possible past tense/participial form, with suffixal *-t*, for any verb, no matter what the stem might have been. As far as I can see, the same holds for the other subcases of (30).

Alongside (37) and (38), the following arguably holds, too:

(40) The *-t* of (31) is never replaceable by *-d*.

¹⁶Note that *got, gotten* (in American English) is not relevant if the *-t* of *got* is the *-t* of *get*.

My English does not allow *durst*. For varieties of English that do, we would expect that the participle, if it exists, would also show *-t*.

Relevant to the status of *went* here is the fact that some English does allow:

i) You shoulda went there last week.

In any event, the analysis of *went* to be proposed later will have *went* not being exactly the same verb as *go*.

¹⁷As opposed to the monomorphemic *colt, molt, dolt, bolt, jolt, volt*.

This is obviously true for:¹⁸

(41) *feld, *deald, *broughd, *boughd, *taughd, *thoughd, *caughd, *soughd
But as in the discussion of (38), it looks like (40) holds for more than just the particular forms of (41). Take, for example, *feld. Not only is *feld impossible as a past tense/participial form of *feel* (as opposed to *felt*), it seems that *Celd is impossible as a past tense/participial form for any verb, with C again an arbitrary consonant or consonant cluster, and -d the past tense/participial suffix.

In conclusion, then, (32), repeated here, is correct:

(42) Past tense -t and past tense -d are the same morpheme.

7. The underlying form of -t/-d

In agreement with Honda and O'Neil (2008, 45),¹⁹ I take this morpheme to be underlyingly unvoiced, i.e. to be underlyingly /t/. Then the phonology can in part informally be stated as follows:

(43) Past tense/participial /t/ voices to /d/ if immediately preceded by a pronounced vowel.

This statement covers the regular cases with a pronounced theme vowel, like *batted*, *kidded*, as well as the theme vowel-less *fled*, *said*, *had*, *shod*, *made*. It will also cover the case of *heard* (and *barred*) in varieties of English in which the *r* in such forms is not pronounced,²⁰ as well as regular cases in which the stem is vowel-final, e.g. *agreed*, *tied*, *glued*.

8. A digression to English plurals

One indirect piece of evidence in favor of taking the past tense/participial morpheme to be underlyingly unvoiced comes from comparison with the English plural morpheme, i.e. -s, which in some cases induces voicing of a stem-final unvoiced consonant, as in *wolf*, *wolves* (cf. Becker et al. (2012)).²¹ This induced voicing makes it natural to take

¹⁸Note that *spilt*, *spilled* is a doublet analyzable as involving -t and -ed (rather than -t and -d), with *spilled* having a theme vowel and *spilt* not having one; note also that in *held* the *d* is not suffixal, given *hold*.

¹⁹And following a suggestion by Chris Collins (p.c.).

²⁰We take *brought*, *bought*, *taught*, *thought*, *caught*, *sought*, *fought* to contain an /x/ (orthographically -gh-) as in Halle and Mohanan (1985, 110), with this /x/ protecting /t/ from voicing.

²¹Contrasts such as *leaf/leaves* vs. *reef/reefs*/*reeves may well indicate the presence of a deleted nominal theme vowel in *reefs* that protects stem-final *f* from voicing, vs. the absence of such a theme vowel in *leaves*. (Note that the *e* in *wolves* must then be purely orthographic, related to English *have* (even with a lax vowel) vs. the impossible orthography *hav*.) There might be a link between the notion of nominal theme vowel here and Harris's (1991) word marker; cf. also Ferrari (2005).

Palmer et al. (2002, 1587-8) point out that *houses* is unique in showing plural voicing with stem-final *s*. It also seems to be unique in showing such voicing in the presence of a pronounced theme vowel; this may be linked to *house* having voicing as a verb, in which case the voicing in *houses* may not be due to plural -s directly.

Becker et al. (2012, 237) note that English 's never induces voicing; this may be due

the -s in *wolves* to be underlyingly voiced. This underlyingly voiced character of -s will in addition account for the fact that the English plural -s never induces devoicing of a stem-final consonant.

Of specific interest to the -t/-d question is the following generalization:

(44) (Contrary to plural -s) The past tense/participial morpheme never induces voicing of a stem-final consonant.

In fact, the past tense/participial morpheme occasionally, in the absence of any theme vowel, induces devoicing of a stem-final consonant (again, contrary to plural -s), as in *leave*, *left* and *lose*, *lost*.²²

9. Back to -t/-d

A further piece of evidence in favor of an underlyingly unvoiced past tense/participial -t comes from the contrast between *bend*, *bent* and *dent*, **dend*. There are verbs whose stem ends in -end and whose past tense/participial form ends in -ent:

(45) *bend*, *bent*; *send*, *sent*; *spend*, *spent*; *lend*, *lent*

There are also verbs whose stem ends in -ent:

(46) *dent*, *vent*, *rent*, *resent*, *consent*, *relent*

But none of these verbs have their past tense/participial form ending in -end:

(47) **dend*, **vend*, **rend*, **resend*, **consend*, **relend*

(Some of these may exist as other (combinations of) morphemes, but none are possible as forms of the verbs in (46).) The proposal now is that in *bent*, *sent*, *spent*, *lent* English is displaying the underlyingly unvoiced -t directly (and that with these verbs the stem-final -d is deleted).

The contrast between (45) on the one hand and (46)/(47) on the other would be surprising if the past tense/participial morpheme were underlyingly voiced, since in that case, we might well expect there to be some verbs showing the impossible pattern seen in (46)/(47). Put another way, the reason that past tense/participial -d never voices a stem-final consonant is that no such underlying -d exists at all.²³

With the verbs in (46), what does happen is that past tense/participial suffixal /t/ voices to /d/ following the theme vowel -e-, as seen in:

to greater hierarchical syntactic distance. More minimally different from plural -s is English verbal -s, which also never induces stem-final voicing, for reasons to be elucidated.

²²Cf. also:

i) You will definitely be supposed to have told the truth.

with *supposed* pronounced with /...zd/ and with the theme vowel present, vs.:

ii) You're supposta tell the truth.

with the theme vowel absent and the final consonant of *suppose* devoiced either by the participial /t/ or else by the /t/ of infinitival *to*, as happens in:

iii) You hafta tell the truth.

²³I disagree here with Halle and Mohanan (1985, 105ff.). On the other hand, they may well be right to take voicing assimilation + degemination to underlie the deletion of (devoiced) stem-final -d in *bent*, *sent*, *spent*, *lent*. That it is (arguably) the devoiced stem-final consonant, rather than the suffixal -t that is deleted might be due to the suffixal -t c-commanding the other at some point in the derivation.

(48) dented, vented, rented, resented, consented, relented
In obligatorily showing a theme vowel in their past tense/participial forms, the verbs in (46) contrast with those in:

(49) hit, put, let, set, wet

for which the past tense/participial form looks the same as the stem.²⁴

The verbs in (49) have in common with those of (46) that their past tense/participial forms cannot have their stem-final *-t* deleted before a bare past tense/participial *-d*. For example, there is no:

(50) **putd*, **setd*

and *hid*, *led*, *wed*, while possible, cannot be forms of *hit*, *let*, *wet*. As far as I know, (49) is representative, i.e. there are no verbs at all in English that would pair off as in (49) and (50). Again, this is expected if there is no underlying past tense/participial *-d*.

Returning to (43), we can note that *-t* also voices to *-d* when *-t* is immediately preceded (as the result of theme vowel deletion) by a voiced obstruent, as in *rubbed*, *bagged*, *budded*, *revved*, *buzzed*. More complex is the case of verb stems ending in a sonorant.²⁵ When a past tense/participial *-t* is immediately preceded by /r/, it invariably voices, as in *barred*, *heard*.²⁶ This, however, does not hold of nasals or of /l/,²⁷ for which we have contrasts like:

(51) hemmed vs. dreamt

(52) penned vs. bent

(53) felled vs. felt

For /m/, /n/, /l/, the generalization is as follows (for reasons to be discovered):²⁸

(54) Past tense/participial *-t* voices to *-d* when preceded by /m/, /n/, /l/ only in those cases where a theme vowel is (abstractly) present.²⁹

As in the discussion of (45), the proposal is that *dreamt* and *felt* are, just like *bent*, *sent*, *spent*, *lent* (cf. also *meant*), displaying this underlying unvoiced *-t* directly, as are *kept*, *crept*, *slept*, *leapt*, *swept*, *wept* in which the underlying past tense/participial *-t* follows a stem-final /p/. In all of these, no theme vowel has been merged.

In some of these cases, there are doublets, in the sense that the form in *-t* coexists in English with a regular form in *-ed*. Of the verbs just mentioned, the regular form is impossible with **feeled*, **sended*, **spended*, **lended*, **meaned*, **keeped*, **sleeped*. But to one extent or another, it is possible with *dreamed*, *?bended*, *creeped*, *leaped*, *weeped*. From the present perspective, these doublets can be characterized as

²⁴Of these, *wet* allows a past tense/participial doublet *wet*, *wetted* reflecting the optional presence of the theme vowel with some verbs.

²⁵Perhaps related to the fact that sonorants show no voicing contrast (in English).

²⁶In those varieties of English that have /r/ in such contexts. Note that in *hurt* the *-t* is part of the stem.

²⁷Gillian Gallagher (p.c. to Chris Collins) suggests that the specificity of /r/ here might be related to its being unable in English to combine with /s/ in an onset cluster, e.g. **srack* vs. *slack*, *smack*, *snack*.

²⁸Left out here is the case of *told*, *sold* where the voicing to *-d* seems to be keyed to the length of the vowel, for reasons that need to be elucidated.

²⁹But see note 11.

involving the optional merger of the theme vowel. For example, the theme vowel is merged in *dreamed*, but not merged in *dreamt*.

In conclusion to these last four sections, the alternation between past tense/participial *-t* and *-d* is, as proposed in (33), phonological. No non-phonological allomorphy is at issue.

10. Back to **goed*.

In light of all of the preceding sections, let me sum up what we know about **goed*. If **goed* were possible, it would be a regular past tense/participial form composed of the stem *go* plus the theme vowel *-e-* plus the past tense/participial morpheme *-t/-d* (= underlying *-t*).

The fact that **goed* is impossible both as a past tense form and as a past participle is a single fact.³⁰ *Go* belongs to the class of English verbs that is incompatible with theme vowel *-e-* (in a way that is in part reminiscent of Calabrese (2015) on Italian). Put another way, *go* belongs to the class of English verbs that does not allow a theme vowel to be merged just above it. Perhaps better (cf. Kayne (2006) on gender), the theme vowel *-e-* negatively selects for a certain class of verbs that includes *go*.

There is some reason to think that the class of verbs that *-e-* excludes from its domain is not random. In particular, the following generalization looks to be worth pursuing:

(55) English light verbs are incompatible with a theme vowel in the past tense/participle.

Insofar as the notion of light verb is not entirely clear, it is difficult to judge the exact degree of validity of (55). Yet it is striking that the strongest candidates for being light verbs in English are all incompatible with *-e-*:

(56) *be, have, do, go, come, take, bring, put, get, give, make, let, say*, (plus the modals) *can, will, shall, may, must* as seen in:³¹

(57) **beed, *haved, *doed, *goed, *comed, *taked, *bringed, *putted, *getted, *gived, *maked, *letted, *sayed, *canned, *willed, *shalled, *mayed, *musted*

Thus the blocking approach to *went* and **goed* mentioned at the beginning of the paper not only misses the generalization that **goed* is unacceptable both as a past tense form and as a participle form, it also misses the generalization that **goed* is part of the broader fact about English illustrated in (56)/(57).³²

³⁰The fact also includes (see note 2) the passive:

- i) This question hasn't been gone/**goed* into enough yet.
- ii) That kind of doctor isn't gone/**goed* to except in emergencies.

³¹By this reasoning, English *cause* is not a light verb, which may correlate with *cause* being incompatible with particles:

- i) They're making/**causing* him out to be a liar.
- ii) We can't seem to get/**cause* the nail out.
- iii) That's what brought/**caused* about the revolution.

and with small clauses of the following sort:

- iv) That's making/**causing* them sad.

³²This fact will itself need to be explained, as Alec Marantz (p.c.) emphasizes; the Italian

11. *went*

The unacceptability of **goed* has been seen to revolve around the theme vowel -e-. The acceptability of *went*, although not as intimately tied to the unacceptability of **goed* as is usually thought, also involves the theme vowel, as follows.

Went is a past tense form (and in some English also a past participle form)³³ that belongs to the set:

(58) *went, bent, sent, spent, lent*

corresponding to the stems:

(59) *wend, bend, send, spend, lend*

with the stem-final -d deleting before suffixal past tense/participial -t as discussed earlier starting at (45).

Of these verbs, three are sharply incompatible with the theme vowel -e-, as seen in:

(60) **sended, *spended, *lended*

This incompatibility is weaker with *bend*:

(61) ?*You should have bended it even more.*

With *wend*, the theme vowel is possible in:

(62) *They wended their way through the forest.*

which exists in addition to:

(63) *They went into the forest.*

Put in terms of the theme vowel, we can say that *bend* is marginally compatible with a theme vowel in the past tense/participle, though it normally occurs without one, as in *bent*. *Wend*, on the other hand, should be paired with *dream, creep, leap, weep, burn, dive, learn, light, spell, plead, smell, speed, spill, spoil, thrive, weave, wed*, each of which, for some set of speakers, displays a pair of doublets:³⁴

(64) *dreamt/dreamed, crept/creeped, leapt/leaped, wept/weeped, burnt/burned, dove/dived, learnt/learned, lit/lighted, spelt/spelled, plead/pleaded, smelt/smelled, spilt/spilled, spoilt/spoiled, throve/thrived, wove/weaved, wed/wedded*

In each of the pairs in (64), the first member has no theme vowel; in each, the second member does have a theme vowel. In other words, these verbs, for one set of speakers or another, allow optional merger of the theme vowel -e-.

Of course, *wend* differs from *bend* and from the verbs of (64) in that *went* (without the theme vowel) and *wended* (with the theme vowel) differ in interpretation, with *wended* having a more specific manner interpretation than *went* and a more limited set of possible contexts. In effect, *wended* matches *wend* in a straightforward way,

counterparts of these English light verbs usually do have a clearly visible theme vowel, at least in some forms.

³³On *should of*, see Kayne (1997). That *went* in (i) is a participle (for those who accept it) and not a past tense form is suggested by the impossibility in all English, as far as I know, of (ii):

i) *You should've went there sooner.*

ii) **You should've/should of/shoulda was there last week.*

³⁴Which would not be expected from a late insertion/competition perspective.

whereas *went*, at the same time as it fits into (59) and aligns with theme vowel-less *wend*, corresponds in interpretation to *go*.

This interpretive fact about *went* is an idiosyncrasy of English, but as always, and in particular as with other sorts of idioms, the question is how best to delimit and how best to express the idiosyncrasy.³⁵ We can do so in this case as follows. The interpretation of *wend* itself in (62) is identical to that of *go*, but in (62) and more generally, *wend* is accompanied by an additional (silent) phrase, call it X, that contributes a manner interpretation. This X is present in the syntax in (62), and is normally present with *wend*, except when *wend* is followed by past tense/participial *-t*.

Put another way, when *wend* is followed by a theme vowel, as in (62), this manner X must be present, given that *wended* is not possible with the simple interpretation of *go*:

(65) They went/*wended to China twice last year.

On the other hand, when *wend* is followed by *-t*, with no theme vowel merged, as in (63), then (the interpretive contribution of) X is not present; only the core interpretive contribution of *wend* appears, equivalent to that of *go*. In effect, the idiosyncrasy of English is that it allows a certain verb (*wend*) to occur, when *-t* but no theme vowel is present, without a manner phrase X that it normally must occur with.³⁶

The fact that this is allowed only in the past tense may have something in common with restrictions on *used to*, as in:

(66) He used to live in Philadelphia.

(67) *He uses to live in Philadelphia.

(68) *He will use to live in Philadelphia.

The fact that *wend* can do without X only if the theme vowel is not present may follow from the fact that without X *wend* (= *go*) is a light verb.³⁷ The reason lies in (55) above, repeated here:

(69) English light verbs are incompatible with a theme vowel in the past tense/participle.

When *wend* is a past tense/participial light verb, i.e. without its usual X, it must lack a theme vowel, as a special case of (69).

³⁵Of recent note, cf. Hladnik et al. (2016).

I am indebted to Chris Collins (p.c.) for helping to clarify the ideas on the interpretation of *went* in this section.

³⁶A possible alternative in the same general spirit, thinking of van Riemsdijk (2002) and Collins (2007, 26) on silent GO, would be to take *wended* to be:

i) [wend GO] -e- -t

and *went* to be:

ii) wend [GO -t]

with the interpretive contribution of 'wend' ignored in (ii).

³⁷Paul Portner (p.c.) has noted that *wend* is compatible with a toward-the-speaker interpretation, as in:

i) He wended his way toward us

whereas *went* is not, to the same extent that *go* is not. This might have to do with the presence vs. absence of the X associated with *wend*; alternatively (or in addition), as Chris Collins (p.c.) has noted, *go* itself may well be complex in having its own syntactically present deictic component.

It is to be noted that for some (younger) speakers of English, (62) is not possible, i.e. there are speakers who have *went*, but for whom *wend* never appears as such. For these speakers, *wend* (with the interpretation of *go*, as above) is never accompanied by X. Despite this, the speakers in question otherwise have the same constraints on *wend* as other (older) speakers. For all speakers, *wend* without X is possible only in the past tense,³⁸ in a way that may be related to (66)-(68). For all speakers, *wend* without X, since it is then a light verb, occurs without a theme vowel, yielding *went* (parallel to *bent*, *sent*, *spent*, *lent*).

12. More on English theme vowels

The facts of (65) indicate that in the past tense the interpretation of *wend* as pure *go* (i.e. without manner X) depends on the absence of the theme vowel. Yet the interpretation as *go* is not available even in:

(70) *They often wend to China.

despite the apparent absence in (70) of any theme vowel. Let me conclude that, although the theme vowel can be absent in past tense/participial cases with a certain class of verbs, it can never be absent in English anywhere else,³⁹ i.e. the theme vowel is always present (even though not pronounced) in the present tense (as well as with non-finite forms of the verb other than the past/passive participle). Therefore, in (70), the theme vowel is necessarily present (though deleted) and the interpretation of *wend* as *go* is impossible.

The idea that the non-merger of the theme vowel is possible in English only in past tense and past/passive participial forms, which plays a role in limiting the interpretation of *wend*, is linked to questions of form, as in (16), repeated here:

(71) The theme vowel *-e-* protects the stem from being affected by *-d*.
which had to do with the fact that past tense/participial forms in English show no stem alternations with *-ed* (i.e. with theme vowel *-e-* plus past tense/participial *-d*).

Let me now generalize (71) to:

(72) The theme vowel *-e-* shields the verb from all stem alternations.
If the bare present tense form, as in (70), is necessarily accompanied by a (deleted) theme vowel, it should follow that bare present tense forms in English will never show stem alternations of the sort that we find (with a certain class of verbs) in the past tense or with past/passive participles. This is clearly correct, and the same holds straightforwardly of infinitive forms, since they are bare in English, too (apart from the unpronounced theme vowel).

Even more striking are *-ing* forms, which, despite having a visible suffix, never show any stem alternations. This can now be taken to follow from their always containing a theme vowel, as illustrated in:⁴⁰

(73) go - e -ing; keep - e -ing; etc.

³⁸But see note 32.

³⁹This seems very close to Calabrese's (2015) characterization of Italian (and related languages), with his 'perfect' corresponding to 'past tense'. Ultimately, we will need to understand why theme vowels can fail to be merged only in certain cases.

⁴⁰Recall that (69) disallows theme vowels with light verbs only in the past tense/participial cases.

with -e- not pronounced.⁴¹

More complex are non-bare present tense forms. These fall into two subtypes. One involves the forms of *be*:⁴²

(74) *am, is, are*

Let us say that *be* is exceptional in English in lacking a theme vowel even in the present tense.⁴³

The second subtype is the more general case of English present tense forms in -s. Given (72), plus the proposal above in the discussion of (70) that present tense forms always contain a theme vowel, we are led to the expectation that present tense forms in -s will never show stem alternations. This is correct for almost all verbs. Although there are on the order of 200 English verbs with stem alternations in the past tense/participial forms, there are only 4 that show alternations in the present tense with -s. One of these is *be/is*, which may fall under the proposal a few sentences back concerning *be*.

The other three are *does, says, has*. A surprising fact about *does, says, has*, is that the stem change seen with -s here is in none of them specific to the -s form (cf. *done, said, had*). The vowel of *does* is that of *done* (despite the orthography) and the vowel of *says* is the vowel of *said* (despite the orthography). The generalization can be stated (setting aside *is*) as follows:

(75) If a verb has a stem change in the -s form, that stem change is identical to a stem change found in the corresponding past/passive participle.

Why this generalization holds remains to be completely understood. In effect, these three light verbs (*do, say, have*) can exceptionally fail to have a theme vowel with the -s of the present tense in a way parallel to the way that they fail to have it in the participle.

13. Back to *went* and back to **goed*.

If the preceding is on the right track, the acceptability of *went* and the unacceptability of **goed* do not constitute one two-sided fact. *Went* does not block **goed* (nor does late insertion need to be invoked⁴⁴). Past tense **goed* is excluded for exactly the same reason as participle **goed*, and that reason has nothing directly to do with *went*. The unacceptability of **goed* is part of a broader generalization concerning the impossibility of -ed with light verbs (and some others) that crucially never distinguishes past tense from past participle. So tying **goed* narrowly to *went* is a mistake.⁴⁵

⁴¹Recall that the theme vowel is usually not pronounced in past tense/participial forms, either, except in cases like *rebutted, ended*; as for a *four-footed animal*, the -e- in *footed* might be a theme vowel, if such forms are associated with a silent verb, as Chris Collins (p.c.) has pointed out to me. Cf. also note 5.

⁴²In the past tense forms *was, were*, there is presumably no theme vowel, in a way that is unsurprising for the past tense.

⁴³Possibly, there's a link here to Postma's (1993) idea that *be* is or contains a pronoun.

⁴⁴As Alec Marantz (p.c.) reminds me, late insertion would not be expected to be relevant here if roots in general are not subject to it; cf. Embick (2015, 8).

⁴⁵A partially separate question is what excludes something like **ging* (parallel to German *ging*) as an irregular past tense form of *go*, without the theme vowel. Possibly, *go* has the idiosyncratic property suggested to me by Chris Collins (p.c.) that it is excluded from being in the immediate domain of -t/-d (or of the zero counterpart of -t/-d

At the same time, the very availability of *went* itself reflects the confluence of multiple factors, including the link between *wend* and *send*, *spend*, *bend*, *lend* (i.e. *went* is to *wend* (apart from the interpretive difference) as *spent* is to *spend*, and the same for *send/sent*, *lend/lent*, and *bend/bent*),⁴⁶ the syntax and phonology of the theme vowel, and the idiosyncratic ability of English to drop the manner component of *wend* when the theme vowel is absent.

14. Suppletive allomorphy in general

Given that the case of *went* and **goed* is by consensus not a case of phonologically determined allomorphy, the term suppletive allomorphy is in a sense appropriate, but only if that term is taken to be a purely informal, descriptive term⁴⁷ that, in the case at hand, actually hides a rich set of phonological and morphosyntactic properties that underlie each of *went* and **goed*. The analysis developed here concludes from this that there is no direct blocking relation between *went* and **goed*.

The question now arises as to how representative the case of *went* and **goed* is. Will all cases of suppletive/non-phonological allomorphy turn out to be best understood in terms of multiple properties of each of the two (or more) items involved, without any need to invoke blocking?

Assume that the case of *went* and **goed* is representative of suppletive allomorphy. If so, then the language faculty will not need to allow recourse to blocking in such cases. This in turn leads to the possibility that the language faculty turns its back on blocking in a general way. But rather than address the general status of blocking, let me instead turn to the related notion of late insertion, as clearly discussed in Embick (2015). The question is whether late insertion (whether limited to non-roots or not⁴⁸) is available to the language faculty. (Certainly, it has not been required anywhere in the preceding discussion of *went* and **goed*.) More specifically, we can wonder:⁴⁹

(76) Why would the language faculty have turned its back on late insertion (if it has)?

A possible answer based on discussions with Chris Collins is strict cyclicity. There is a redundancy that has to do with vocabulary insertion in Embick (2003, 161), where vocabulary insertion on a root cycle precedes vocabulary insertion on an outer cycle, in a way that mimics the syntax yet is separate from it. Embick (2010, 42) has this as an “‘inside-out’ kind of cyclicity” formulated as:

(77) Vocabulary Insertion applies first to the most deeply embedded node in a structure and then targets outer nodes successively. This ‘inside-out’ order of vocabulary insertion operations is redundant with the ‘bottom-to-top’ order of syntactic operations in bare phrase structure, in a way that would seem to be an artifact of late insertion.

that this paper is setting aside). (Note that the exclusion of **goed* is keyed, rather, to the theme vowel.)

⁴⁶Possibly, this link underlies the absence of *went* in other Germanic languages.

⁴⁷Cf. Anderson (2011, sect. 2).

⁴⁸Cf. note 42.

⁴⁹I thank Chris Collins for numerous discussions on the status of late insertion leading to the ideas in this section.

15. Merge and bundling.

Although (77) does introduce a redundancy into the overall theory, it can (obviously) be stated. A stronger position to take would make (77) unstateable to begin with. This could be accomplished if syntactic structure could in principle not be built up in a phonologically-free way.

Let me begin with a digression into the notion of bundling, as the term is used when speaking of the bundling of syntactic features into a lexical item. This notion of bundling is partially incompatible with a proposal made in Kayne (2005, Appendix) and called there a principle of decompositionality, which reads as follows:

(78) UG imposes a maximum of one interpretable syntactic feature per lexical item.

If we strengthen (78) by dropping the word 'interpretable', as in:⁵⁰

(79) UG imposes a maximum of one syntactic feature per lexical item.
then we have a decompositionality principle that in effect says that there is no bundling of syntactic features into a single head.⁵¹ But if that is the case, the question is, why not? That is, what would lead the language faculty to have the property expressed in (79)?

The answer that I would like to propose runs as follows. Taking a cue from discussions with Chris Collins and thinking of Agbayani and Ochi (2014) and references cited there, bundling must be an instance of Merge.⁵² Now let me add to this an idea from Kayne (2011, sect. 4), to the effect that every instance of Merge must be associated with a precedence relation. If so, then bundling (= merging) two syntactic features together must result in one preceding the other, in a way that wouldn't fit with the usual interpretation of the term lexical item.⁵³

16. Merge and phonology.

What is important in the preceding section for the idea that syntactic structure cannot in principle be built up in a phonologically-free way is the assimilation of bundling to merge, insofar as that kind of assimilation can be extended to phonology. Consider the fact that morphemes are not atomic, insofar as they are composed of (a syntactic feature associated with) phonological segments,⁵⁴ in turn composed of phonological features. Assume now that composition, in this sense, is also not distinct from merge.

If so, then the language faculty will have phonological features merging to form segments, and segments merging to give the phonological form of a morpheme, which

⁵⁰Thinking in particular of Shlonsky (1989) on the splitting of agreement features into separate heads, extending the line of thought of Pollock (1989).

⁵¹Cf. Caha (2015); also Kayne (1994) on the absence of multiple specifiers, and Cinque & Rizzi 2010.

⁵²Cf. Chomsky (2001, 10), going back in part to Chomsky's (1995, sect. 4.4.4) 'move feature' idea.

⁵³Though there is a point in common here with Starke (2009).

⁵⁴Some morphemes may be monosegmental.

Kayne (2016) argues that syntactic features are linearly separated from the associated phonology.

would then merge with that morpheme's syntactic feature.⁵⁵ That would mean that phonology is syntax-like in a significant way.⁵⁶ Such resemblance, though, is not sufficient for our purposes. We need to assume further and more specifically that there is and can be just one single 'merge engine', i.e. that bottom-to-top bare phrase structure-type derivations (as in Chomsky (1995, 249)), must in fact start with phonological features, continue on up through the phonology and only then reach the syntax.

A resolutely bottom-to-top derivation of this sort that starts with the phonology would by definition preclude late insertion⁵⁷ and would thereby eliminate as a matter of principle the redundancy in (77) that late insertion leads to.

If the language faculty has a single merge engine in the preceding sense, then that constitutes a straightforward solution to the externalization problem discussed by Chomsky (2009, 386).

⁵⁵I set aside the question of semantic features; for relevant formal discussion, see Collins and Stabler (2016).

⁵⁶Cf. work in government phonology, as in Pöchtrager (2006) and references cited there, as well as Dobashi (2003) and Nevins (2010); for an enlightening discussion of the syllable, see Goldsmith (2014).

I leave open the question of possible mismatches between phonological and syntactic constituency, as in Myers (1987), as well as the question of autosegmental phonology.

The kind of mismatch involving relative clauses discussed by Chomsky and Halle (1968, 372) in terms of readjustment rules rests on the assumption that in the syntax the relative 'head' and relative clause can form a derivation-final constituent; for discussion questioning that assumption, suggesting in effect that relative clause 'extraposition' always holds (with relatives of the postnominal sort), see Kayne (2000, 319), bearing on Taraldsen (1981).

⁵⁷Both in the DM sense, as in Halle and Marantz (1993), and in the sense of nanosyntax, as in Starke (2009). Also precluded will be late insertion in the manner of generative semantics and related work, as in, for example, Gruber (1967, 939), McCawley (1968), Geis (1970, 19ff.), Postal (1970) or Lakoff (1971), with the alternatives arguably involving silent elements of the sort discussed in Kayne (2005).

In addition, late insertion as in Freeze (1992) and Kayne (1993), with respect to the spelling out of 'P+be' as 'have' will be precluded. An alternative would have *have* in various languages require or reflect P-incorporation. Relevant is the possible decomposition of *have* as *ha+ve*, with *-ve* a P, and *ha-* the same as the non-negative portion of *ain't*. This would maintain *have* as non-transitive (differing from Myler (2016a,b)); if *have* is V+P, rather than P+V, and if Kayne (1994) is correct in having adjunction invariably be to the left, then P here will need to be merged above VP, as in Kayne (2002; 2004).

For evidence against (certain instances of) morphological operations of the DM sort, see Kayne (2010b); for a reply to that paper, see Arregi and Nevins (2016).

If (temporal) precedence is an integral part of phonology, and if merge encompasses in a uniform way both phonology and syntax, then the antisymmetry-based claim that precedence is an integral part of (narrow) syntax is reinforced.⁵⁸

17. Merge and phonological features.

If phonological features are brought together by merge, and if it holds with complete generality that the output of merge is, as in Kayne (2011, sect. 4.2), associated with precedence/temporal order,⁵⁹ then the expectation arises that phonological features within a segment must always be temporally ordered (in addition to being hierarchically arranged⁶⁰). Such ordering has actually already been suggested for particular cases, by terms like ‘prenasalized stop’⁶¹ or ‘prestopped nasal’⁶², with the first indicating that the nasal feature precedes the feature(s) responsible for the stop character of the segment, and the second the reverse.⁶³

In a similar vein, Elizabeth Zsiga (p.c.) has noted the existence of post-aspirated stops, while pointing out at the same time that precedence seems to be inappropriate for many pairs of features. On the other hand, she has also noted that voicing often starts ‘late’,⁶⁴ which from the present perspective might indicate that (in such cases) the

⁵⁸The contrary idea, namely that precedence should be factored out of syntax, goes back to the advent of X-bar theory in Chomsky (1970).

Kayne (2011) tried to show that an understanding of the very existence of antisymmetry could be achieved only if precedence is part of narrow syntax.

⁵⁹Although the elements directly merged with one another have a temporal order imposed on them, in that proposal, no ordering statement is comparably given that involves subparts of either of those elements. In other words, if a complex phrase ‘[_A C D]’ is merged with B, then either AB or BA must hold, but nothing is immediately said about CB or BC; this may bear on questions of intervention effects (on which, see Rizzi (2009)).

⁶⁰From the present perspective, we would expect antisymmetry to be respected both intrasegmentally and intersegmentally. The latter case will tie in to questions of syllable structure, for which ‘onset-nucleus-coda’ may match the ‘specifier-head-complement’ arrangement of Kayne (1994; 2011); in addition, the antisymmetry-based prohibition against multiple Specs recalls phonologists speaking of complex onsets, rather than of multiple onsets.

⁶¹Cf. Maddieson (1989); also Chomsky and Halle (1968, 316) and references cited there.

⁶²Cf. Turpin et al. (2014) and Round (2014).

⁶³Taken together, these two cases would seem to constitute an example of identical features yielding distinct segments by virtue of distinct segment-internal temporal order.

⁶⁴Cf. Hock (1991, 121) on “aspiration as delayed voicing onset”; also the very notion of an affricate as a single segment consisting of a plosive followed by a fricative. Hayes’s (2009, 79) discussion of a ‘delayed release’ feature (cf. Chomsky and Halle (1968, 318)) may belong here, too (even if that feature were to turn out to be too complex to be a plausible primitive).

place of articulation feature(s) must precede the voicing feature.⁶⁵

18. More on merge and phonology.

A counterpart for phonology of Chomsky's (1995, 225ff.) notion of numeration would presumably just be those features and segments that lead up to the lexical items chosen. It would seem that the most straightforward interpretation of phonological numeration would not include epenthetic segments. If so, then Chomsky's (1995, 228) inclusiveness condition, extended to phonology, would arguably exclude epenthetic segments completely, i.e. would prohibit recourse to phonological epenthesis. This would have the desirable effect of shrinking the space of possible analyses that the phonological learner has to cope with; for example, the learner of Polish would not need to (or be able to) entertain an epenthesis-based account of Polish jers, and would be therefore be obliged to adopt an abstract analysis (involving deletion) of the sort discussed (along with epenthesis) by Hayes (2009, chap. 12).⁶⁶

In a different vein, Dominique Sportiche (p.c.) has pointed out that if bottom-to-top derivations start with phonological features, as I have suggested in the preceding two sections, then we might expect the interpretive component to see such features, just as it sees higher level constituents. Although discussion is well beyond the scope of this paper, this might lead to a possible integration into grammatical theory of the tradition of phonetic symbolism.⁶⁷

19. Phonology, syntax, and cyclic rule application.

In Chomsky's (1965, 143) words, "Given a generalized Phrase-marker, we construct a transformational derivation by applying the sequence of transformational rules sequentially, "from the bottom up"". This principle of the transformational cycle, while arguably correct,⁶⁸ was not otherwise grounded in the architecture of UG. The advent of "bottom-to-top" derivations in Chomsky (1995) grounded this cyclic principle more deeply. Transformational rules, as instances of internal merge, proceed "from the bottom up" because all instances of merge, both internal and external, proceed in that way.

⁶⁵The question whether and if so how multiple place or manner of articulation features can be integrated is left open. How many features there are will depend in part on whether or not Hayes's (2009, 91) zero valued features can be reinterpreted as absent, in relevant cases; cf. note 11.

The features in question are phonological; they presumably impose boundary conditions on the phonetics, without themselves determining every last detail of the phonetics.

On the assumption that signed languages are strongly akin to spoken ones, we would expect the present discussion to carry over to the phonology (and syntax) of signed languages, at some suitable level of abstraction.

⁶⁶For a recent argument against *r*-epenthesis in Japanese, see Pellard (2016). Homorganic glide epenthesis of the sort suggested by Hayes (2009, 172) might be reinterpretable as involving in part feature movement.

⁶⁷Cf., for example, Shrum and Lowrey (2007) and the many references cited there.

⁶⁸For one extended argument based on French, see Kayne (1975).

The syntactic transformational cycle of Chomsky (1965) had a parallel in the phonological transformational cycle of Chomsky and Halle (1968, 15). But there, too, one could have asked why phonological rules would happen to apply in precisely that cyclic way.⁶⁹ A possible answer from the present perspective is the same as the one just given for syntax. This answer requires that phonological rules or operations be interpretable as instances of internal merge (including Agree, as in Nevins (2010, 192)),⁷⁰ in which case their bottom-to-top character will fall out of the bottom-to-top character of phonological merge in general, including external merge (both of features and of segments).

The notion of phonological cycle here will need to be fleshed out in terms of phases.⁷¹ If properly done, that might tell us why standard syntactic movement operations are insensitive to phonology, i.e. they appear never to 'see' the phonology. (For example, no syntactic fronting operation picks out phrases whose initial phonological segment is a glide.) The reason might be that, once the point of application of these syntactic operations is reached, the phonology will be too deeply buried, phasally speaking. Alternatively (or in addition) there may be a link to Fodor's (2009, 202) point that there is no syntactic fronting of specifically plural noun phrases; that is, that not even all morphosyntactic features are accessible to (A-bar) movement.⁷²

20. Conclusion.

I have proposed analyses of English *went* and of English **goed* that revolve around the notion of verbal theme vowel. These analyses do not invoke late insertion. It may be that late insertion is systematically unavailable. That may be due to the fact that merge-based bottom-to-top derivations start with the phonology, merging phonological features and then segments, before moving up to syntactic features; if so, phonology feeds syntax and should not be factored out of it.

*This paper (especially the first fifteen sections) has benefited very substantially from discussions with Chris Collins and would almost certainly never have seen the light of

⁶⁹This paragraph assumes the existence of phonological rules; for recent discussion of the rules vs. constraints question, see Odden (2014).

⁷⁰I agree with Nevins that Bromberger and Halle (1989) took the differences between phonology and syntax to be greater than they are. (Whether extrinsic phonological rule ordering is needed is an orthogonal question.) Internal merge with movement (i.e. not limited to Agree) might be appropriate for metathesis, for infixation and/or for non-concatenative morphology. Relevant in a general way is Chomsky's (1995, sect. 4.4.4) 'move feature' idea. Questions of locality arise - cf. Nevins (2010).

⁷¹On phases, see Chomsky (2001; 2008).

⁷²Fodor also points out that number sensitivity is, on the contrary, found in:

- i) How tall a man is he?
- ii) *How tall men are they?

Possibly, (ii) is excluded parallel to:

- iii) *How tall one man is he?

with the silent plural determiner in (ii) behaving as *one* in (iii), and with *a* in (i) being less complex than either of these; for relevant discussion, see Kayne (to appear).

day had we not had innumerable (e-mail) discussions about the English past tense over the last five years and had he not encouraged me to write it up. I am also grateful to audiences at UCLA and Georgetown University in Oct./Nov. 2016 for helpful comments and questions. Remaining errors are mine.

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