Appendix to:

Newell, Heather. 2025. English irregular verb roots = regular phonology: No allomorphy, no readjustment rules, no delayed phase spell-out required. In Duygu Demiray, Roger Cheng-yen Liu & Nir Segal (eds.) *Proceedings of NELS 55*. GLSA Publications.

Note that this appendix is brief and contains preliminary thoughts that will be expanded into multiple articles. Comments are more than welcome. Section and example references that point to the article that the following is an appendix to will be *italicized*. Non-italicized example numbers refer to examples within this appendix.

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Contents:

1. When Weak Irregular *-t* does and does not devoice a preceding C

When Weak Irregular *-t* merges inside the domain to its left, it triggers CV-epenthesis because it does not find a host (*§??)*. It does not find a host (an empty C) because English words are overwhelmingly C-final, and therefore their final C positions are already filled.[1] When CV-epenthesis/resyllabification occurs, this may result in a domain-final sequence of two consonants. Notably, these sequences trigger closed syllable shortening. Also, this sequence does not trigger schwa epenthesis, as in Regular PA verbs (e.g., *bead-beaded*). It appears that the operation of inter-coronal epenthesis only occurs when the coronals are syllabified in separate domains.

Vowels shortening is not the only operation triggered in these derivations. We also see various voicing patterns, and the resolution of CC sequences. The Weak Irregular derivations have the following pattern in English.

[1]This final C can be a consonant (*cat* [kæt]) or an off-glide (*ski* [skij]). See Newell (2021) for further discussion of CV epenthesis upon affixation in English.

(1)

a. After a non-coronal obstruent
leave-left [lijv]-[lɛft]
creep-crept [kɹijp]-[kɹɛpt]

b. After a short V-single coronal
wed-wed [wɛd]-[wɛd]
put-put [pʊt]-[pʊt]

c. After a long V-single coronal
read-read [ɹijd]-[ɹɛd]
meet-met [mijt]-[mɛt]

d. After a lateral or a nasal
deal-dealt [dijl]-[dɛlt]
mean-meant [mijn]-[mɛnt]

e. After a CC cluster
spend-spent [spɛnd]-[spɛnt]
hurt-hurt [həɹt]-[həɹt]

f. After a rhotic or glide
hear-heard [hijɹ]-[hɛɹd]
flee-fled [flij]-[flɛd]

In (1a) we see the overt pronunciation of *-t* and the devoicing of the adjacent C. We also see closed syllable shortening. Note that there are no Weak Irregular verbs with underlying short Vs and non-coronal codas, and so we cannot ascertain the behaviour of voiced non-coronals in that environment. See Part 4 of this appendix for a list of all irregular English verbs.

In (1b,c) we see that a single coronal coda will retain its underlying specification for voicing. If the root contains a long vowel, it will undergo closed syllable shortening. This shortening constitutes evidence for the presence of *-t*, even though it is not pronounced.

In (1d) we see that after a lateral or nasal C *-t* surfaces faithfully; it is not deleted. This indicates that the deletion rule in ***§??*** is sensitive to the distinction between obstruents and sonorants. As sonorants do not devoice in English, *-t* does not spread |H|. If the root contains a long vowel, it will undergo closed syllable shortening, as expected.

In (1e) we see that a final coronal stop in a CC cluster is devoiced when affixed with *-t*. This could be a devoicing of the stem-final coronal, or a deletion of the stem-final coronal and the pronunciation of the affix. To distinguish those two possibilities, we can look to (1f).

In (1f) we see that in *hear-heard* on the one hand, and *flee-fled*, *shoe-shod* on the other, the *-t* itself is voiced. We know that the suffix here is an exponent of Weak *-t* and not Regular *-ed* as is triggers closed syllable shortening. This shortening is somewhat of a conundrum in the case of *flee-fled* and *shoe-shod* as a long V followed by a single word-final C should not trigger CSS. I will have nothing further to say about these two outlying examples at this time, but note that regardless of their exceptional nature, my intuition is that the pattern is predictable. It is of note, however, that if *-t* undergoes voicing after /ɹ/ then the alternation in (1e) must be due to the devoicing of the stem-final coronal in the presence of *-t*.

We can summarize the above pattern as follows:

(2)

a. If *-t* is overt, it is voiceless. (c.f. (1f))
b. Overt *-t* triggers devoicing of obstruents but not sonorants.
c. If *-t* is deleted after a single C, it has no effect on that C.
d. If *-t* is affixed to a CC cluster, the second C is devoiced.
e. *-t* always triggers closed syllable shortening.

As we have put aside (1f), the only puzzling pattern in the above is the distinction between (1e), where the final coronals are not devoiced, and (1b,c), where they are.

The direction of this pattern is not surprising. In CC clusters, it has been argued that only one of the Cs can be fully specified (for an overview see e.g., Yip (1991)), and it has also been argued that final Cs are extrametrical (Côté 2011)). We know from the patterns discussed in ***§??*** that final coronals in coronal-coronal final clusters in English are treated as though they are not fully incorporated into the syllable structure to their left.

Although I will have to leave a detailed analysis of the technicalities of final devoicing in (1e), I suggest here that its solution will be found in the already-established weakness of the final Cs in these examples. The final Cs in (1b,c), however, are not in a cluster, and are therefore not in a weak position, leading to the retention of their underlying internal structure.

2. Irregular *-ɔt* verbs

The verbs ending in *-ɔt* are as follows:

(3) *bring-brought-brought, buy-bought-bought, fight-fought-fought, teach-taught-taught, think-thought-thought, catch-caught-caught, seek-sought-sought, wreak-wrought-wrought*

The special puzzle these verbs pose is not that they have both ablaut and *-t*. This would be an abnormal pattern, but one allowed for by the system in the paper this is an appendix to, and its companion (Newell submitted). Note that a root that selected for *-t* and ablaut in the PA (rather than *-n* and ablaut) would not see ablaut blocked in the participle, as *t* is not syllabic. This is consistent with the pattern in (3).

The real puzzle here is why the verbs in (3) lose all consonants aside from their onsets.[2]

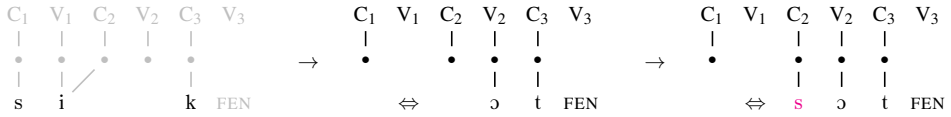
There are a few potential phonological options available for accounting for these forms. Any analysis of them will be unique to these verbs: they are therefore Class 4 (c.f. ***(??)***). Logically, either there is something special about the phonology of these roots, or there is something special about the affix(es) that they select for.

They do not all share a rhyme in their Present/root forms, so the relevant property, if it is shared by the roots and is phonological, is covert. For example, their final clusters could be weakly extrametrical, as in the discussion of the final C the CC-cluster verbs in the previous section. The affixation of *-t* could trigger the loss of these Cs. Then the ablaut V /ɔ/ could link as normal. Halle and Mohannan (1985) propose an underlying velar continuant in the coda of these forms and a companion deletion rule. See their discussion for complications.

If the relevant distinction in Class 4 is that the affix these roots select for is 'special', its special property could be the imposition of a template; it could be composed of an empty onset (allowing enough space for complex onsets) and a pre-specified vowel-coda sequence. The template would copy the onset of the verb stem, and the uncopied segments would be overwritten/lost.

[2]One other non--*ɔt* verb that loses a C in the PA is *stand-stood-stood*.

(4) *sought* [sɔt]



An alternate option would be the infixation of the entire [ɔt] sequence into the stressed V position, which would then displace the final Cs. This infixation would create final consonant sequences that are illicit. If they were repaired by deletion, the correct outputs would be obtained.

(5) *seek-sought*

a. [sijk] + -ɔt → b. [sɔtk] → c. [sɔt]

Unfortunately, I am not aware of any independent evidence for the above accounts. But, nor and I aware of any independent evidence for any readjustment rules that have been proposed to account for the *-ɔt* pattern. What this brief discussion serves to show is that there are autosegmental analyses of this class available that are equally as plausible as a readjustment rule account. Under modular assumptions, however, where readjustment rules are not permitted, and given a syntax that disallows allomorphy of the root triggered by the PA (see *§??*), only an autosegmental analysis along the lines laid out above is available to account for this pattern.

3. The *real* irregulars

As in the above sections, here we have some preliminary thoughts on the patterns evidenced in the 'real' irregulars, and some musings about how one would account for these in an autosegmental framework.

The *real* irregulars are considered here to be the following:

(6) *be, have, make, do, go*

For the main part of this discussion we will ignore *went*. We will return to it at the end of this section. If we look at the remaining forms of these five verbs we notice a few patterns.

First, no form is irregular in the participle. Assuming the URs in (7), the participles in (8) are unremarkable. Consonants between angled brackets are proposed to be floating segments. The underlying vowels in most forms are argued to be short, and will be subject to lengthening to meet word minimality requirements (more on both of these proposals below).

(7) a. Underlying representations

be	[bɪ]
have	[hæ<v>]
make	[me<k>]
do	[dʌ]
go	[gɔ]

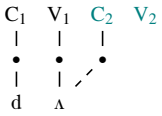
(8) a. Participles

be	[bɪ(i)n]
have	[hæd]
make	[me(j)d]
do	[dʌn]
go	[gɔn]

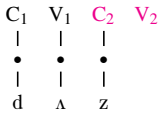
Second, the distinctions in the present tense between *do/have* and *go/make* are consistent with main verbs being computed in two cycles, and auxiliaries in one. This is both intriguing and problematic. It is intriguing because of its regularity (as *do/have* are typical auxiliaries) and it is problematc because *do/have* display the same phonological behaviour when they are the only, lexical, verb in a sentence. Consider the following:

If *do/have* are always spelled out in the same cycle as their suffixes (as they might if they raised to T^0), then the following derivations would be predicted:

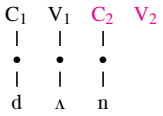
(9) [duw]



(10) [dʌz]



(11) [dʌn]

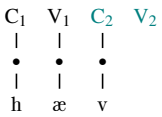


The short, lax vowel in the UR of *do* branches onto an epenthetic CV in (9) in order to meet word minimality requirements. Note that V-lengthening is therefore not the mirror image of V-shortening in English: /ʌ/ → [uw], but /uw/ → [ɔ]. These alternations will be the subject of a future paper.

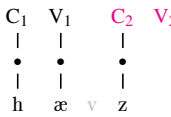
The vowel of *do* does not lengthen when followed by a suffix consonant. No word-minimality repair is triggered.

Now consider *have*:

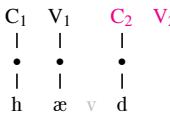
(12) [hæv]



(13) [hæz]



(14) [hæd]

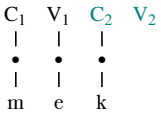


In the above derivations, if we again take them to be mono-cyclic, we have the same pattern as with *do*. In (12) we have epenthesis of a CV for word-minimality purposes. The floating /v/ links, bleeding V-lengthening. In the derivations of *have/had*, the suffix allows the forms to meet word minimality, so there is no epenthesis of a syllable. The /v/ is unpronounced as it has nowhere to link. CV-epenthesis does not occur to 'save' /v/. Why might CV-epenthesis for the linking of floating segments be triggered in the *-t* derivations and not here? One solution is that this epenthesis is triggered by the *probe* operation, which only occurs when a segment in one domain probes into another. As the above derivations are monocyclic, probing cannot occur.

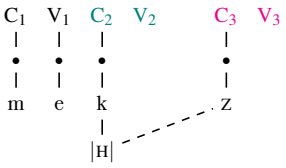
As mentioned above, the above derivations are unproblematic if *do/have* are auxiliaries which have raised to T^0, but they do not give the predicted outputs if the roots of the verbs are spelled out in a separate phase from the suffixes when they are lexical verbs (e.g., when they are below vP adverbs, as in *She often has pie, I often had pie*), as we might expect word-minimality lengthening to systematically occur in the lowest phases, giving the outputs [duwz, duwn], and [hævz, hævd] (but see Piggott (2018) for discussion of variable timing in the application of word minimality repairs). Solving this problem will not occur here.

Turning to *make/go*, their derivations are predictable if they are bi-cyclic in the present, and mono-cyclic in the PA. Consider the following:

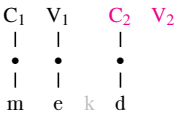
(15) mek



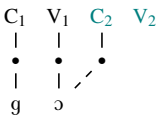
(16) [meks]



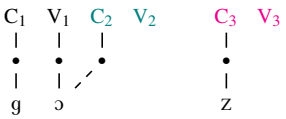
(17) [med]



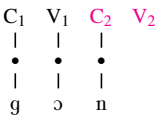
(18) [gow]



(19) [gows]



(20) [gɔn]



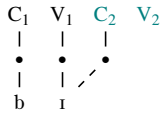
These derivations are also regular. In the unsuffixed, non PA forms word-minimality repairs can again be invoked. In the 3SG the verbs stays low, and word-minimality repairs are triggered in Phase 1, and then the *-s* is inserted in Phase 2. In the participial forms, the suffixes behave as though inside the phase with the root.

However, the Past form of *made* behaves like the low participle, even though the syntax predicts the root and *-ed* to be spelled out in independent cycles; a problem. This same problem is apparent in the derivation of *went* from *go* in the Past; it appears as though the root and Past must be in the same cycle to trigger the allomorphy of the root. Again, this is problematic given the argumentation in the paper that this is an appendix to. Exactly why these verbs are problematic in this way is a mystery.

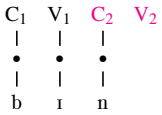
Before turning to a potential autosegmental account of *go-went*, let us consider *be*. This is another verb that is a typical auxiliary, and may behave as one positionally even when it is the only verb in the clause (e.g., *I was often Dorothy in the Wizard of Oz*). It is therefore less surprising to find suppletion with *be*; *am, are, is*. But remember, when *be* is unsuffixed or stays low (as a participle) it behaves identically to all of the other 'real' irregulars in that it is not suppletive and its phonology is regular.[3]

[3]Speakers with [bij]-[bijn] (also) have *be* with a tense/long UR vowel.

(21) [bij]



(22) [bɪn]



The above patterns pose problems, but pattern in a way that suggests a potential unification of the 'real' irregulars with the Strong and Weak Irregular verbs.

But, then there is the one 'real' problem: *went*. Every analysis proposes that the *go-went* alternation is derived via suppletion. It does appear to be the case. If it is, then either the domains for allomorphy have been extended just for this one verb in the Past (but not the other PA derivations), or something else is happening. If the overwhelming evidence from the syntax and the phonology of the regular and irregular verbs is pointing, as I suggest, to derivations in English where the PA morphemes and the roots are not local at spell-out, and therefore the PA cannot condition allomorphy of the root, then the learner will not be capable of positing an allomorphy/suppletion derivation for *go/went*. The derivation of *go-went* must therefore be phonological, and that calls for the Conan-Doyle quote attributed to Sherlock Holmes: "When you have eliminated all which is impossible, then whatever remains, however improbable, must be the truth."

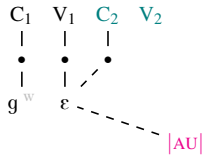
I offer this improbable yet potentially true derivation below, but first must note, as pointed out to me by Neil Myler (p.c.) that it recalls (but is not identical to) the Comrie (1978) joke article in *Lingua Pranca* entitled 'On the Go-Went alternation: A contribution (?) to the Generative Phonology of English'. Sometimes things are both funny and true.

(23) *go-went* postulates

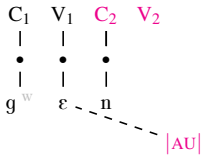
- The UR of *go* is /gʷɛ/ (it retains its PIE onset synchronically).
  - –/gʷ/ is not a permitted onset cluster in English, therefore only one of [g] or [w] may be realized in any derivation.
  - –/gʷ/ loses /w/ before o. (OCP)
  - –/gʷ/ loses /g/ when /w/ links.
- *go* is an ablaut verb, taking the |AU| sub-segmental ablaut in both the participle and the non-PA (independently), but not in the past, where it takes both the low PA *-n* and the high Weak Past *-t*.

The derivations are as follows:

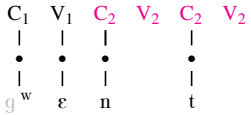
(24) [gow]



(25) [gɔn]



(26) [wɛnt]



The above discussion is clearly full of more questions than one would like, but if allomorphy is not possible between a low verb root and a PA morpheme, then the above constitutes a preliminary sketch of phonological facts that are problematic and in need of accounting for, as well as some suggestions on how to start getting to a solution. Of course, the more abstract the phonology gets, the harder it is for the learner to acquire (and for the linguist to accept). But, learning suppletion for just one form is also a non-pattern, one that must ignore the parallels between the *go* derivations and the other derivations in the PA. These parallels are (i) word-minimality lengthening in *go*, (ii) the presence of the affixes *-n* and *-t*, and (iii) the vowel [ɔ] in the participle alongside *-n*. One might argue that even if allomorphy were possible for *go-went* that a learner might find it just as complex as the phonological analysis above.

4. The Irregular List

For some comments and organization within this list, see the various related handouts posted on my website. As this list has been updated, some of the forms here will be missing from those sources.

(27) Weak Irregulars (68) :

a. *bereave-bereft, bleed-bled, breed-bred, creep-crept, deal-dealt, dream-dreamt, feed-fed, feel-felt, flee-fled, hear-heard, keep-kept, kneel-knelt, lead-led, lean-leant, leap-leapt, leave-left, light-lit, lose-lost, mean-meant, meet-met, plead-plead, read-read, say-said, shoe-shod, shoot-shot, sleep-slept, slide-slid, speed-sped, sweep-swept, weep-wept*

b. Verbs that are in this class but have an underlying short V that can't undergo shortening/lowering:
bend-bent, bet-bet, bid-bid, build-built, burn-burnt, burst-burst, bust-bust, cast-cast, cost-cost, cut-cut, dwell-dwelt, fit-fit, hit-hit, hurt-hurt, knit-knit, learn-learnt, lend-leant, let-let, put-put, quit-quit, rid-rid, send-sent, set-set, shed-shed, shit-shit, shut-shut, slit-slit, smell-smelt, spell-spelt, spend-spent, spill-spilt, spit-spit, split-split, spoil-spoilt, spread-spread, thrust-thrust, wed-wed, wet-wet

(28) Class 1 (24), non-zero-grade verbs that only have ablaut in the Past :

a. Subtype 1, [aɪ]-roots:
bite-bit-bitten, drive-drove-driven, hide-hid-hidden, ride-rode-ridden, rise-rose-risen, shrive-shrove-shriven, smite-smote-smitten, stride-strode-stridden, strive-strove-striven, write-wrote-written

b. Subtype 2, roots with final glides:
blow-blew-blown, draw-drew-drawn, grow-grew-grown, know-knew-known, slay-slew-slain, see-saw-seen, throw-threw-thrown

c. Subtype 3, others:
eat-ate-eaten, fall-fell-fallen, bid-bade-bidden, give-gave-given, forsake-forsook-forsaken, take-took-taken, shake-shook-shaken

(29) Class 2 (18), verbs that take the |AU| ablaut :
bear-bore-born, bind-bound-bound, break-broke-broken, choose-chose-chosen, find-found-found, get-got-gotten, grind-ground-ground, freeze-froze-frozen, sheer-shore-shorn, speak-spoke-spoken, steal-stole-stolen, swear-swore-sworn, tread-trod-trodden, tear-tore-torn, wake-woke-woken, wear-wore-worn, wind-wound-wound, weave-wove-woven

(30) Class 3 (22), zero-grade verbs :
begin-began-begun, come-came-come, cling-clung-clung, drink-drank-drunk, fling-flung-flung, hang-hung-hung, ring-rang-rung, run-ran-run, shrink-shrank-shrunk, sing-sang-sung, sink-sank-sunk, sling-slung-slung, slink-slunk-slunk, spin-spun-spun, spring-sprang-sprung, sting-stung-stung, stink-stank-stunk, string-strung-strung, swim-swam-swum, swing-swung-swung, win-won-won, wring-wrung-wrung

(31) Class 4 (8), [ɔt] verbs :
bring-brought, buy-bought, fight-fought, teach-taught, think-thought, catch-caught, seek-sought, wreak-wrought

(32) Irregulars that defy ‘pretty’ categorization (21) :
dig-dug-dug, dive-dove-dived, fly-flew-flown, hold-held-held, lie-lay-lain, sit-sat-sat, tell-told-told, sell-sold-sold, stand-stood-stood, shine-shone-shone, thrive-throve-thrived, show-showed-shown, sow-sowed-sown, sew-sewed-sewn, sneak-snuck-snuck, stick-stuck-stuck, strew-strewed-strewn, hew-hewed-hewn, prove-proved-proven, shave-shaved-shaven, swell-swelled/swole-swollen

(33) ‘Real’ Irregulars (5) :
be, do, have, go, make

(34) Irregular conjugations that archaic for everyone (I think, therefore not counted in the analysis) :
gird, geld, gild, chide, beseech, cleave, heave, crow, stave, bode, saw, mow and lade

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