

**English irregular verb roots = regular phonology:
No allomorphy, no readjustment rules, no delayed phase spell-out required***

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1. Introduction

The variations in the forms of English irregular verb roots (e.g., *sing-sang-sung*) must be derived phonologically, and not via allomorphy or readjustment rules. In brief, if a morpheme *X* were to trigger allomorphy/readjustment of the verb root, *X* and the verb root would have to be spelled out in the same PF cycle. T^0 cannot trigger allomorphy on the verb root in English, as T^0 and the verb root are never spelled out in the same PF cycle.

In §2 I present the theoretical assumptions behind the above statements. In §2.1 I demonstrate that Regular English Past Tense verbs give incontrovertible evidence that T^0 and the verb root are introduced in separate cycles/phases, and I then offer a CVCV Phonology account of their derivation. In §3 I describe a new classification of Irregular English verbs that offers insight into their phonological derivations. This new classification incorporates aspects of previous morphophonological accounts, discussed briefly in §4.

2. The challenge for English verb root allomorphy: the theoretical assumptions

The brief exposition in the introduction presumes that the syntax is spelled out in phases (Chomsky 2000, 2001). The literature on phases disagrees on many points, but the general consensus is that vP is a phase.¹ It is also the consensus in the literature that the verb in English does not raise out of vP (e.g., Pollock (1989)).

Given that the final position of the main verb in English is within the vP, but at or near to its edge, we can consider two possibilities. (A) The verb root does not raise out of the spell-out domain of the vP phase, and the vP transfers its spell-out domain to PF upon its

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¹See Newell (to appear) for an overview of different proposals related to the position of phases and the size of their spell-out domains.

completion (e.g., Chomsky (2000)'s PIC1): the verb is spelled out separately from T^0 . (B) The verb root either raises out of the spell out domain of vP , or the spell out is delayed and the verb root is spelled out in the same phase as T^0 (e.g., Chomsky (2001)'s PIC2).

The (B) proposal is appealed to in Embick (2010), who argues that the derivation of English Irregular verb roots involves Readjustment Rules (RR) triggered in the environment of what I will call the PA: the Past and the Participles (both Passive and Perfect). RRs must refer to both phonological and morphosyntactic/lexical information simultaneously: they are non-modular (see Newell and Sailor (to appear) for arguments in favour of modularity and criticism of RRs). While Embick argues that RRs are not subject to the same linear locality restrictions that apply to allomorphy (concatenation/linear adjacency²), he does argue the following:

- (1) Embick (2010:101)'s Readjustment Activity Hypothesis: A readjustment rule triggered by morpheme X can effect a Root- or morpheme-specific change only when X and the Root/functional head are in the same PF cycle.

However, the phonology of English gives evidence that T^0 and the verb root are not interpreted in the same PF cycle. This is clearest when examining English regular verbs (§2.1), while English irregular verbs adhere to restrictions that have been argued to indicate monocyclic derivations (§3). I lay out the relevant data in the following sections and then discuss the relevant conclusion: contra the previous analyses, both regular and irregular verbs must be computed in two phonological cycles.

2.1 The phonology of English regular verbs

Consider that the outputs of English monocyclic derivations evidence well-known restrictions (cf. the discussion in Kaye (1995)).³

- (2) Restrictions on English monocyclic / monomorphemic syllables
- a. Monocyclic domains must meet word minimality
be [bi:], *[bɛ]
 - b. Monocyclic domains must not contain superheavy syllables
stump [stʌmp], *[stu:mp], *[stuwmp]; *think* [θɪŋk], *[θi:ŋk], *[θijŋk]; *intervene* [ɪntɪvɪjn] vs. *intervention* [ɪntɪvenfən], *ɪntɪvɪjnfn]
 - c. Monocyclic domains only contain homorganic NC sequences
crimp [kɪɪmp], *[kɪɪmd]; *hunt* [hʌnt], *[hʌnp]; *think* [θɪŋk], *[θɪŋt]

²See Newell (submitted) for arguments that the vocabulary item inserted at T^0 in English is not always concatenated directly to the root. See also §3, below.

³Exceptions to (2a) arise only with reduced function words (e.g., *to* [tə]), and to (2b) only with coronal clusters (e.g., *fiend* [fi:nd]), onomatopoeia (e.g., *zoink* [zojŋk]) and a few place names (e.g., *the Hamptons* [hæmpʔənz]). For discussion of a few exceptions to the final coronal cluster restriction, and a conclusion that it is nonetheless a coronal cluster effect, see Pöchtrager (2021).

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English regular verbs are clearly not monocyclic, as they may consist of a superheavy syllable (3), and may end in pseudo-clusters (4).

- | | | | | | |
|-----|----|---------------------------------|-----|----|--|
| (3) | a. | <i>zoomed</i> [zuw md] | (4) | a. | <i>zoomed</i> [[zuw m] d] |
| | | <i>peaked</i> [pij kt] | | | <i>peaked</i> [[pij k] t] |
| | b. | <i>clanged</i> [klæŋ d] | | b. | <i>clanged</i> [[klæŋ] d] |
| | | <i>stubbed</i> [stʌ bd] | | | <i>stubbed</i> [[stʌ b] d] |

As the forms in (3) are grammatical, the suffixal consonants in bold in (4) must be introduced in a separate phonological cycle from the verbal base. This regular pattern is agreed to be bi-cyclic (or involving a representational domain boundary) everywhere in the phonological literature. In SPE *-ed* is separated from its base by a #-boundary (rather than a +) (Chomsky and Halle 1968). Kaye (1995) argues that the regular *-ed* affix is *analytic*, meaning that it spells out in a separate cycle from its base ([[root]_{Cycle1} tense morpheme]_{Cycle2}). Within theories that adhere to the notion of morpheme stratification it is proposed that regular *-ed* attaches outside of the stem; it is affixed at the word level (Halle and Mohanan 1985, Burzio 1994, and Giegerich 1999, among many others) or at Level 2 in the Lexical Phonology and Morphology literature (Kiparsky et al. 1982, Mohanan 1982).

In terms of phases, what the above implies is that the verb root, sitting somewhere in the verbal domain, is spelled out within what is normally called the vP Phase, which crucially excludes the tense affix. In the structure in (5) the vP is a spell out domain.⁴

- (5) The vP phase: [_{CP} [_{TP} [_{DP} *The class*] *-ed*]_{T0} [vP √ZOOM]]

One might wonder if the *-ed* suffix could be spelled out in the domain of the root, but somehow maintain its phonological independence from it. That this cannot be the case has been demonstrated amply in the literature (see Marvin 2002; Newell 2021, among others). Consider the derivations in below. As noted in Marvin (2002), the gerund *twinkling* in (6) is bisyllabic: the [kl] sequence is syllabified as the onset of the second syllable. This results from a mono-cyclic derivation. The nP phase is the only cycle of phonological computation and the root and *-ing* undergo spellout and the separate morphemes undergo syllabification together. In the progressive reading in (7), where the verbal structure (vP cycle) is present, *twinkling* emerges as trisyllabic. In the vP phase only the root undergoes interpretation: the [l] is syllabified in the nucleus following the regular syllabification algorithm/phonotactics of English. In the outer CP phase, *-ing* is interpreted, and leans on its

⁴Note that the exact syntactic position of the verb root is not pertinent here. The phonological facts require that the verb root and the *-ed* suffix are not realized within the same cycle. This means that the root is transferred to PF by the head of a higher projection (e.g., vP, VoiceP, AspP, (not pictured) as in, for example, Bjorkman 2011; Harwood 2015; Sheehan and Cyrino 2024). More details on the exact position of the verb root within the verbal domain and its phasal spell-out can be found in the companion paper to this one: Newell (submitted.)

base, without triggering resyllabification.⁵ Note that syllabification is a cyclic operation, but is only applied when motivated by phonological structural considerations (see §3).

(6) [twɪŋ.klɪŋ]

(7) [twɪŋ.kl.ɪŋ]

$[_{nP} \sqrt{\text{TWINKLE}} -ing]$

$[_{CP} [_{vP} \sqrt{\text{TWINKLE}} - \emptyset_{v^0}] -ing]$

Morphemes that are spelled out together within the same cycle are *always* syllabified as a unit; they are treated as a monomorphemic string by the phonology (6). This is true even if they are *not* syllabified with their base when spelled out separately (7). The pattern in (6-7) is consistent for all non-cohering/Level 2 affixes (Giegerich 1999, Newell 2021). It is therefore not possible that the regular PA morpheme *-ed* is interpreted in the same cycle as the root. The phonology of English would treat the root+affix as a monomorphemic string and would require the resultant superheavy syllable to be repaired (by closed syllable shortening Rubach (1996), as evidenced in e.g., *heal/health* [hi:l]-[hɛlθ], *intervene/intervention* [ɪntəˈviːn]-[ɪntəˈvɛnʃən]).⁶

2.1.1 A CVCV account of Regular English Past Tense phonology

The phonological framework within which this analysis is situated assumes Autosegmental Phonology (Goldsmith 1976), Element Theory (Scheer and Kula 2017), and CVCV Phonology (Lowenstamm 1996; Scheer 2012). Note that in CVCV Phonology all syllables have the structure CV (the CV-tier). This leads to empty C and V positions, depending on the segmental makeup of the morpheme in question. Empty C positions are not subject to any systemic restrictions, but empty V positions are. Empty V positions internal to the string must be either *Governed* by filled V positions (indicated by *Gov* in the derivations to follow), or contained within a complex onset (indicated by \Leftrightarrow). Final empty nuclei (FEN) are parametrically permitted in languages that allow phonological outputs to end in a consonant, as is the case in English: they must be final in a syllabification domain. The relevant details of each structure will be highlighted below.

In the first phase of the derivation the verb root is sent to PF. There, it undergoes Vocabulary Insertion (VI). Regular verbs have only a single allomorph each, which is then subject to the regular phonology of English (e.g., ensuring conformity with phonotactics/syllable structure, assigning stress).

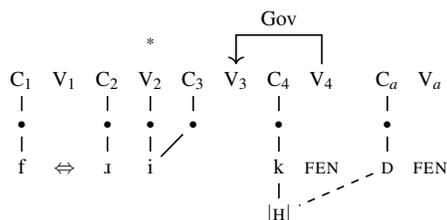
In (8) we see the output of the phonological computation of *freaked*: [[freak]_{vP} ed]_{CP}. The verb root is first sent to spell-out alone in the vP phase. In the second phase of the derivation the regular past tense morpheme undergoes Vocabulary Insertion and phono-

⁵What is meant by *leans* is a complex question. For varying phonological behaviours of different kinds of affixes and clitics see e.g., Selkirk (2014[1996]), Newell (2021). We will abstract away from this here, noting that *leaning* means that the affix does not constitute its own domain for stress or word minimality.

⁶On closed syllable shortening: e.g., the final C is extrametrical in *intervene*, but not in *intervention*, where it is no longer final and is therefore syllabified in the coda, triggering the shortening of the preceding V.

logical computation.⁷ The properties of the UR of the regular PA morpheme result in the output shown in (8). Note that the only role of the subscript numbers/letters in CVCV representations is to ease exposition, they have no theoretical standing.

(8) [fɪɪjkt] ‘freaked’



The notable aspects of the structure of *-ed* are as follows. First, the regular past tense morpheme must be underlyingly syllabified: it does not resyllabify with the domain it leans on (cf. the discussion of closed syllable shortening in §2.1). /D/ is therefore underlyingly linked to its segmental root node (•) and its C_a node on the CV-tier. As no resyllabification occurs, each domain may therefore contain its own FEN. In CVCV phonology underlyingly syllabified structure is argued to be typical of most root morphemes and also what are known in the literature as Level 2/non-cohering affixes: underspecification of structure (featural or syllabic) is typical of morphemes that demonstrate phonological alternations, as will be also seen in §3. Following this logic, the coronal segment in the *-ed* morpheme is underlyingly underspecified for voicing. This is indicated by representing /D/ in small-caps.⁸ The fact that the suffix and its base are not syllabified together does not mean that they do not interact: interaction at the subsegmental level is derives the voicelessness of the suffixal C via the spreading of the |H| element of [k].⁹ This cross-domain interaction at the segmental level demonstrates two things that deserve attention, which they will not get here due to space restrictions: (i) there is no Phase Impenetrability Condition (Embick 2014, Newell 2017), and (ii) different levels of the phonological representations of morphemes can interact without forcing their interaction at all levels (contra Strict Layering (Selkirk 2011)).

Now let us turn to the irregular verbs.

3. The phonological derivation of English irregular verbs

Assuming (i) that the syntax of regular and irregular verbs in English is identical, and (ii) that morphemes introduced in the same phase as their base cannot be independently syllabified, we will take the nested domains in §2.1 to be a strong argument that T^0 undergoes

⁷Note that there is no Phase Impenetrability Condition in the Phonology, and therefore this morpheme can ‘see’ and lean on the verb root in its complement. See Embick (2014), Newell (2017, 2025), ? for discussion of the non-existence of the PIC in the phonology, and how to derive its apparent effects.

⁸This underspecification is standardly assumed to be the source of the voicing assimilation that is evidenced in various places in English morphology: e.g., *cats* [kæts], *dogs* [dɔgz].

⁹Voicelessness in English is indicated by [ASP] in feature theories and |H| in Element theory, as English is an aspiration language, not a voicing language (see e.g., Cyran (2011)).

VI and phonological computation in a separate phase from the root in all PA derivations. Therefore, the only logically possible analysis of English irregular verb roots is one in which their surface forms are derived phonologically: allomorphy or RRs cannot apply between T⁰ and a verb root.

Irregular verbs in English may undergo vocalic alternations not seen in regular verbs. These vowel changes may come with the addition of the irregular past-tense morpheme *-t* (9a), or not (9b).

- (9) a. *leave* [li:v]-[lɛft]-[lɛft] b. *break* [brɛ:k]-[brɔ:k]-[brɔ:kŋ]
 lose [lu:z]-[lɔst]-[lɔst] *sing* [sɪŋ]-[sæŋ]-[sʌŋ]

Let us examine each in turn.

3.1 The weak irregular past tense *-t*

In the case that *-t* is affixed in the PA, the addition of the suffixal consonant causes the shortening (and concurrent lowering and laxing) of the root vowel if it is underlyingly long (9a). If the underlying root vowel is already short, the vowel quantity is unaltered (10a). If a weak irregular verb root ends in a coronal stop, *-t* remains unpronounced in the PA. This surface pattern is due to the interaction of sequences of coronal stops in English, to be discussed below.¹⁰ The presence of the irregular *-t* is clear even when unpronounced, as it has the same effects on long root vowels as does overt *-t* (10b).¹¹

- (10) a. *burn-burnt* [bɹn]-[bɹnt] b. *feed-fed* [fi:d]-[fɛd]
 dwelldwelt [dwɛl]-[dwɛlt] *light-lit* [laɪt]-[lɪt]

The vowel alternations that accompany the affixation of weak irregular *-t* are predictable (11), and are identical to the alternations found in English in other environments subject to tri-syllabic laxing (TSL) or closed syllable shortening (CSS) (12).¹² We also see that *-t* devoices a preceding C when it is overtly realized (e.g., *leave-left*).

- | | | | |
|------|--|------|------------------------------------|
| (11) | Irregular verbs | (12) | TSL/CSS |
| | a. [i:]-[ɛ] <i>leave-left, flee-fled</i> | | a. [i:]-[ɛ] <i>serene-serenity</i> |
| | b. [u:]-[ʊ] <i>lose-lost, shoot-shot</i> | | b. [u:]-[ʊ] <i>fool-folly</i> |
| | c. [aj]-[ɪ] <i>light-lit, slide-slid</i> | | c. [aj]-[ɪ] <i>crime-criminal</i> |

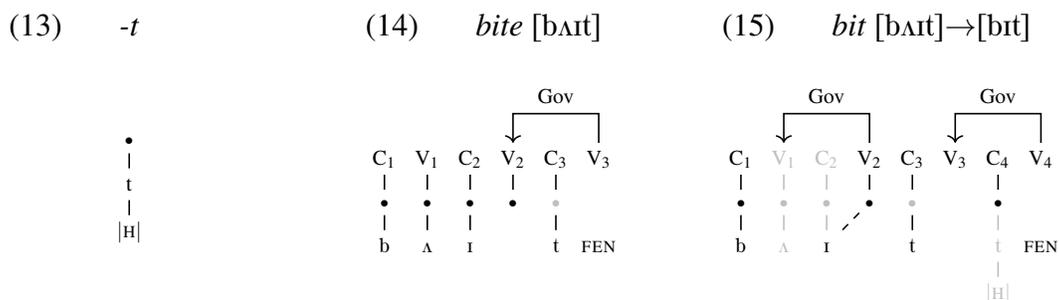
¹⁰They are proposed to be virtual geminates, long phonologically but short phonetically, in Lowenstamm (2023).

¹¹If the root contains a short vowel and a final coronal stop, no change is seen (e.g., *put*). If the final coronal is the second consonant in a cluster, it is devoiced (e.g., *spend-spent*), but there is no devoicing if the root coronal is not in a complex coda (e.g., *bleed-bled*). Space precludes a full discussion of this pattern here. See my website for a treatment.

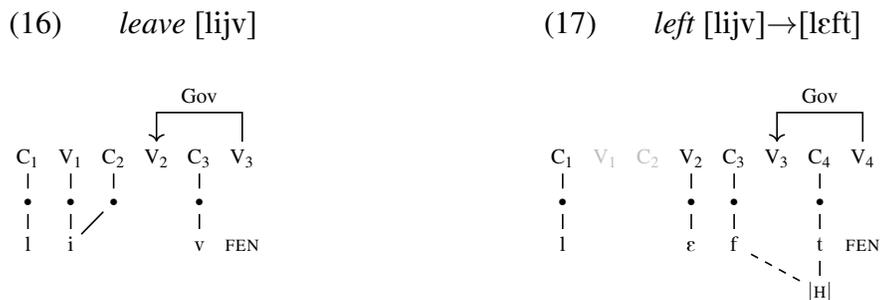
¹²An exception to this pattern on the verbal side is *say-said* [se:]-[sɛd], which can be explained by positing an underlying short [ɛ] in the verbal root, that lengthens/glides to meet word minimality requirements. The TSL/CSS pattern also includes the alternations [o:]-[ɑ] *phone-phonetic* and [e:]-[æ] *sane-sanity*, not found in the verbal system.

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The phonological behaviour of weak *-t* is derivable from its UR (13). First, *-t* is underlyingly specified for $|H|$ (it is voiceless). Second, it is underlyingly unsyllabified: It is a liaison/floating consonant with a root node but is not linked to the CV tier.¹³ A liaison consonant is such that it will probe into adjacent domains searching for a position in which it can be syllabified. The operation of probing places the liaison consonant in the syllabification domain of its host (leading to what is called domain non-isomorphism in the phono-syntax interface literature). In (14) we see the vP phase that derives the verb *bite*. In (15) we see the output of the phonological computation of the past tense *bit*, explained below.



In (15), the *-t* suffix probes into the domain of the previous phase looking for a syllabic position in which to link, but does not find one. The phonology of English is such that it then inserts an epenthetic empty syllable (C_4V_4) to host the liaison *-t* rather than deleting it (Newell 2021, Cavarani 2022). As the suffix has already probed into the domain of the verb, this empty CV is epenthesized inside of said domain, and therefore only one FEN can appear in the structure. The melodic structure of *-t* is deleted under adjacency to another coronal C, the root node (in C_3) associated with *-t* remains. It causes shortening of the preceding vowel when applicable (see Halle and Mohanan (1985), Lowenstamm (2023) for alternatives that perform the same function). In (15) the FEN governs V_3 , allowing it to be empty. If the diphthong of *bite* were to remain in its UR position, V_2 would be empty and ungoverned; an illicit structure. The diphthong (vowel and glide) therefore delink in order to repair the structure. The glide [ɪ] shifts to the V_2 position, allowing it to govern, and permit the non realization of V_1 . This gives the [ʌɪ-ɪ] alternations in CSS environments. In (17), below, we see a derivation where the *-t* is realized after a non-coronal C, and where it therefore spreads its $|H|$ element.



¹³Liaison consonants are well-known in the literature on French, but are not restricted to any particular language. See Newell (2021) for a proposal that English contains more liaison segments.

In (17) the vowel also delinks to move to the rightmost ungoverned V position (V_2), leaving it no room to spread onto a following C (as in (16)). In both (15) and (17) we see the deletion of illegal empty VC structure, following Gussmann and Kaye (1993).

The above derivations represent the normal phonology of English, specifically the repair of ungrammatical syllabification structures. The weak *-t* suffix exhibits a phonosyntactic non-isomorphism: it does not undergo Vocabulary Insertion in the same phase as the verb root, but it then subsequently merges into the phonological syllabification domain of the root due to its underlying representation (much like a Tone morpheme may). This allows us to maintain identical syntactic structures for the regular and weak irregular verbs, while offering a clean explanation for their phonological differences. It is of note that all of the operations proposed here to account for the weak irregular verbs are independently motivated in the literature.

Now, let us turn to the strong irregulars.

3.2 The strong irregular past tense verbs

The vowel alternations seen in the strong irregular derivations in English are not due to CSS. In this section I will demonstrate, however, that the best explanation for their patterning is a regular phonological process: ablaut. This allows for a complete unification of the syntax and phonology of the English PA verbal system. The ablaut patterns in the strong irregular verbs give positive evidence for being derived phonologically, and therefore cannot be argued to be due to the application of RRs. There is therefore no motivation for an analysis that requires T^0 and the verb root to be sent to PF in the same phase.

I propose here that the strong irregular PA verbs can be divided into three main groups with regards to their vocalic alternations.¹⁴ This proposal itself - that there is a phonological account that better captures the patterns seen - constitutes novel evidence for a non-allomorphy/RR analysis of irregular verb root alternations.

The first group of strong irregulars, Class 1, have a vowel change in the past tense but not in the participle (18a). The vowel change in this class can affect vowel quality or quantity.¹⁵

The second group, Class 2, maintains its vowel change in the past and the participle (18b). These modifications always involve a change in quality to a back, round, mid vowel [o/ɔ], and, importantly for the analysis to follow, never involve a change in quantity.

The third group, Class 3, has the vowel [ʌ] in the participle regardless of the vowel in the root or in the past tense (18c) Although variation in the quality and quantity of the vowels in this class is limited, it is not predictable, and both may be altered (e.g., *c[ʌ]me-c[ej]me-c[ʌ]me* vs. *r[ʌ]n-r[æ]n-r[ʌ]n*).

¹⁴Verbs that pattern with *bring-brought* [bɪŋ]-[bɹɔt], a few verbs that defy the classifications below, and the light verbs *be, do, have, go, make* are discussed in the Appendix to this article.

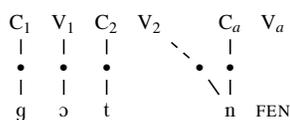
¹⁵The short vowel [ɪ] in the verbs of the *ride-rode-ridden* type is due to shortening, as discussed in (15).

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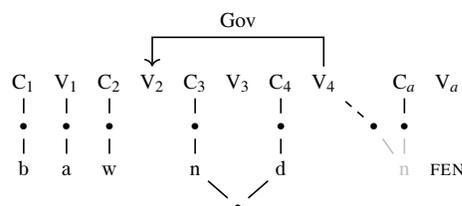
(18)	a. Class 1: Past-only	b. Class 2: Past+Part	c. Class 3: Part=[Λ]
	<i>give-gave-given</i> [gɪv]-[geɪv]-[gɪvŋ]	<i>bind-bound-bound</i> [baɪnd]-[baʊnd]-[baʊnd]	<i>swim-swam-swum</i> [swɪm]-[swæm]-[swʌm]
	<i>eat-ate-eaten</i> [iɛt]-[eɪt]-[iɛtŋ]	<i>break-broke-broken</i> [breɪk]-[brɔʊk]-[brɔʊkŋ]	<i>fling-flung-flung</i> [flɪŋ]-[flʌŋ]-[flʌŋ]
	<i>slay-slew-slain</i> [sleɪ]-[sluː]-[sleɪn]	<i>get-got-gotten</i> [gɛt]-[gɒt]-[gɒtŋ]	<i>come-came-come</i> [kʌm]-[keɪm]-[kʌm]

Before explaining the pattern in (18), we must discuss the participial *-n* suffix. Strong irregular verbs overwhelmingly take the *-n* suffix in the participle. One might wonder if this actually is true, given that it is never pronounced in the verbs in (18c), and is not pronounced after NC clusters in (18b). I argue here that the *-n* suffix is always present, and it is central to the explanation of the vowel alternations in English irregular strong verbs. It undergoes the same process of deletion that is seen above for the weak irregular *-t*. Note that *-n* is never pronounced after a verb that ends in a nasal C or an NC cluster. As NC clusters are partial geminates (sharing segmental structure: place), we can generalize the pattern: *-n*'s featural structure is deleted after a C that is linked to a [NAS] feature. Another important aspect of *-n* is that it is specified to be syllabic: it branches on a preceding vocalic position. To do so it probes into the domain to its left, merging into the syllabification domain of the root, as *-t* does. The derivations below demonstrate the structure of *-n* when pronounced (19), and when not (20).¹⁶

(19) *gotten* [gotŋ]



(20) *bound* [baʊnd]



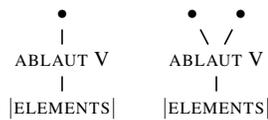
3.2.1 The ablaut vowels are not all full vowel segments

Returning to the discussion of the patterns in (18), we need to establish one more group of URs before turning to the derivations of ablaut: the ablaut vowels themselves. The groups in (18a) and (18c) have overt ablaut only in the Past and the modifications made may affect vowel quantity. As vowel quantity is not a property of segmental features, but rather of syllabification, the ablaut vowels in these two classes must be fully-specified segments linked to one (short V) or two (long V) root nodes (21). The pattern in (18b), however, leads to the conclusion that the ablaut in this class is triggered by subsegmental features/elements

¹⁶*-n* is not phonetically syllabic after a glide (e.g., *fly-flew-flown*), but is still phonologically syllabic, as evidenced by the ablaut patterns discussed below.

that are not themselves linked to a root node. These elements are represented in (22). The floating elements |AU| (c.f. [+back, +round, -high, -low]) will link to the internal structure of the vowel they modify, giving the alternations [ej/ij/uw]-[ow], [ɛ]-[ɔ], and [aɪ]-[aw]. Quantity will not be affected in this class as no modifications to the number of root nodes can be affected by floating elements.

(21) Segmental ablaut V:

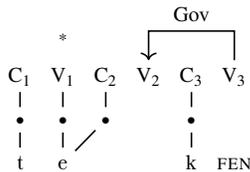


(22) Floating element ablaut V:

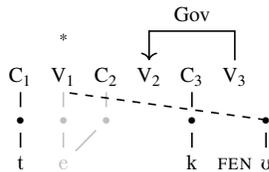
|AU|

Let us now consider the derivation of verbs in Class 1 (18a). The output of the vP phase is as in (23). In (24) we see the suffixation of the Past Tense ablaut V [ʊ]. Ablaut Vs are specified to link with the stressed V position, replacing the structure in the output of Phase 1 (this is therefore a structure-changing rather than a structure-filling operation). (25) demonstrates that this linking will be blocked if a filled V position intervenes between the ablaut V and its target. Note that Irregular verbs in English are all monosyllabic (ignoring prefixes), and therefore the stressed V is normally the closest filled V to the end of the word. The only time this will not be true is when the syllabic participial *-n* suffix has linked to the final V position. In (25) *-n* blocks linking of [ʊ], leading to the preservation of the Phase 1 vowel in the output of the participle.

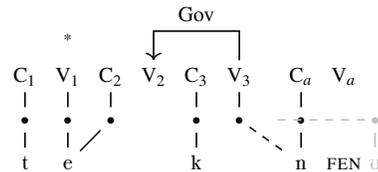
(23) /tejk/ → [tejk]
Phase 1



(24) [tejk] → [tʊk]
Phase 2/ Past

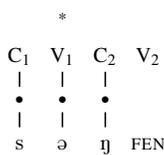


(25) [tejk] → [tejkŋ]
Phase 2/ Part.

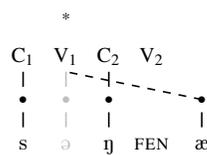


Class 3 verbs (18c), those that undergo ablaut in the PA and the Present, have identical derivations, save for one aspect. These verb roots are *zero grade*; they have no underlying vocalic segment. The derivation of *sing-sang-sung* is therefore as in (26-28). Note that the output of Phase 1 in (26) is [sʌŋ]. In the vP phase, no ablaut vowel is inserted (the /ɪ/ of *sing* will be inserted in T⁰_[PRES], not shown).

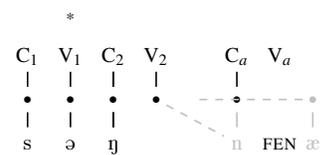
(26) /sŋ/ → [sʌŋ]
Phase 1



(27) [sʌŋ] → [sæŋ]
Phase 2/ Past



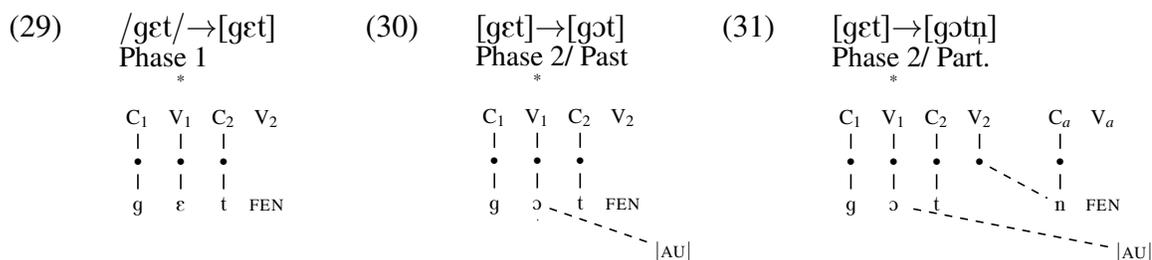
(28) [sʌŋ] → [sʌŋ]
Phase 2/ Part.



English irregular verb roots = regular phonology

To meet word minimality, the root in Phase 1 in (26) must be augmented with an epenthetic V; /ə/. As the only V in the string, it receives stress. In English, the phonetic realization of stressed schwa is [ʌ] (Pöchtrager 2015). The epenthetic schwa is inserted in (26), but is later overwritten in the Present and Past (27). It remains in (28) as the syllabic *-n* blocks the linking of the ablaut V. This blocking is not affected by syllabic *-n* being unpronounced (its segmental structure is deleted as it is preceded by a nasal C); its root node is not deleted and counts as an intervening filled V. This explains why all zero-grade roots have [ʌ] in the participle; they all take the *-n* participial suffix.

Now we can turn to the derivations of Class 2 verbs. These take the non-segmental ablaut V, |AU|. As a bundle of elements targets the structure internal to the stressed V (e.g., the V-Place node), its linking not blocked by the presence of the syllabic *-n*. This is why, in Class 2, ablaut persists in the participial forms. This persistence of ablaut in Class 2 is predicted by the fact that the vowel quantity (length) throughout the class is stable.



The above derivations capture a few patterns that have not been previously described in the literature: (i) the link between quantity and ablaut persistence in Class 2, (ii) the link between the presence of the root node of *-n* after Cs linked to [NAS] and the uniform vowel quality in the participle of Class 3 (zero-grade) verbs, and (iii) the role of *-n* in the Past (linked) vs. Participle (blocked) ablaut patterns in Classes 1 and 3.

4. A brief comparison with previous analyses of English irregular past tense phonology

The (morpho)phonology of English Irregular verbs has been subject to many treatments. In this short paper, I do not have time to go into the details of previous analyses. I would like to note, however, the following influential proposals: Bloch (1947); Chomsky and Halle (1968); Halle and Mohannan (1985); Hoard and Sloat (1973); Lowenstamm (2023).

The deletion rules for *-t* and *-n* proposed above have predecessors in the above treatments. For example, Halle and Mohannan (1985) propose a rule of degemination for *-t* (but state that *-n* suffixation is irrelevant to the ablaut pattern, which I argue above to be far from true). Lowenstamm (2023) proposes that some of the coronal sequences are virtual geminates, and undergo no deletion of structure (*bite-bit*, *read-read*), while others undergo simplification resulting in a voiceless final coronal (*dream-dreamt*, *build-built*). This may turn out to be true, but it remains to be seen if his account can be extended to the *-n* forms.

Some of the above also treat the different classes of verbs. They often attribute the different syllabification behaviours (cohering *-t* and non-cohering *-ed*) to the affixes being

attached at different ‘levels’ (e.g., Halle and Mohannan (1985), Bloch (1947)), notably in lexicalist frameworks. I discussed in §2 why this is a non-starter in a realizational framework; the syntax, and therefore the timing of VI of the T^0 morpheme, is identical for regular and irregular verbs in English. None of the above treatments divide the irregular verbs into the three classes in this article. They are therefore forced to propose rules that account either for the quality distinctions or the quantity, but they do not capture the link between them. A focus on capturing the widest number of quality alternations with the fewest number of rules even brings Halle and Mohannan (1985) to propose that some verbs have the present tense form as the input to ablaut rules, while others have the past. Again, this is hard to reconcile with a coherent account of the morphosyntax of English.

One thing that all of these treatments have in common, including the present one, is the underlying conviction that there are subpatterns in the irregular verb system of English that are derived synchronically, and that some amount of reference to specific roots must be appealed to. I have not, in this short paper, been able to treat the allomorphy of the ablaut vowels in detail. See Newell (submitted) for a discussion of how the suffix allomorphs, including the ablaut vowels, are derived.

5. Conclusions

I have argued here that a modular, realizational computational system can only permit a purely phonological account of the verb root alternations in the irregular verbal system of English. This is due to the fact that T^0 and the verb root do not undergo PF computation in the same phase. I have also shown that the phonological, ablaut V, derivations capture patterns not explained in any previous work, lending support to the cyclic, phase-based, phonological analysis herein. The ablaut pattern in the English PA system is an argument for the phonological derivation of these forms even if the verbs roots and their affixes were found to be spelled out in the same phase.

There are, of course, some irregular verbs that do not follow the patterns described above. In my inventory of the irregular verbs of English, I have counted (excluding prefixed versions of the irregular verbs; e.g., *came*, *became*), 93 ablaut verbs, 68 weak irregular verbs, 6 verbs that take [ɔt] in the PA (e.g., *bought*), and the 5 ‘real irregulars’ (*be*, *do*, *have*, *go*, *make*).¹⁷ Among those, 21 are ‘weird’ in that they evidence some combination of the properties discussed in the previous sections. These all require more complicated accounts of their affixal allomorphy, but notably not a single one is problematic for the phonological account. Specifically, none have a non-o ablaut combined with an *-n* Participle, and none have an irregular *-t* without CSS.

For a list of the irregular verbs, a discussion of the ‘real irregulars’ and the [ɔt] forms, and a detailed discussion of the derivation of the suffixal allomorphy in the English irregular verbal system, I point the reader to the [Appendix](#), and to the companion article to this one (Newell submitted).

¹⁷This list is an amalgamation of verbs from the sources in §4, with much-appreciated additions from Peter Svenonius (p.c.).

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