English Irregular Verb Roots = Regular Phonology

No (Root) Allomorphy, no Readjustment Rules, no Delayed Phase Spell-Out required.

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Take Home Messages

- English verb roots undergo spell-out in the first, v(oice)P phase, T^0 undergoes spell-out in the second (CP) phase.

- It follows that no variation in the phonological realization of verb roots can be Tense-conditioned allomorphy/readjustment, and vice-versa.

- Variation in the pronunciation of verb roots in English is fully, and synchronically, phonological.

- English has synchronic ablaut. Ablaut vowels are theme vowels (TH); the realization of v^0. Theme vowels mediate allomorphy in the verbal domain.

Outline

1. The phonology of English regular verbs.

2. What the morpho-phonology of English irregular verbs cannot be.

3. The structure of and movement in English verb derivations.

4. English weak irregular verbs and the structure of English vowels.

5. English strong irregular verbs, the 3 major classes and what they tell us about the morphosyntax and phonology of English.

6. Conclusions.

Appendices:

References : Divided into analyses of English irregular verbs, and others.

A. **A distributional table of English Strong Irregular Verbs.**

Including the 6 weird ones that don't fit as nicely: *hold, sit, tell, sell, stand, shine*

B. **The sub-types of Class 1. (CVCV)**

Type 1: *drive-drove-driven*
Type 2: *fall-fell-fallen*
Type 3: *blow-blew-blown*

C. **The -ɔt forms**

bring-brought, buy-bought, teach-taught, think-thought, catch-caught, seek-sought

D. **The Real Irregulars**

be, do, go, make, have

E. **Dialect variation**

e.g., *take-took-tooken*

1. The phonology of English regular verbs.

- **The phonological derivation of English regular verbs is uncontroversially bi-cyclic.** (e.g., Kaye 1995)

- Super-heavy rhymes are disallowed within a single cycle in English.
  - *except coronal-coronal sequences, for independent reasons*

- Derivations like 'freaked' and the deverbal 'twinkling' demonstrate the same pattern. Some phonological structures cannot be derived in a single cycle.
  - (see e.g., Marvin (2001), Newell (2021) for discussion of how 'Level 2' affixes behave like 'Level 1' affixes when root-attached')
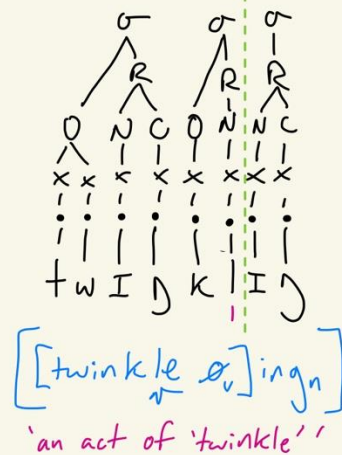
'twinkling'

'freaked'
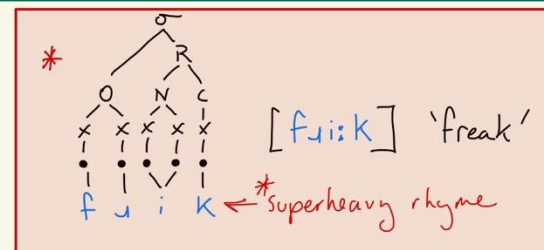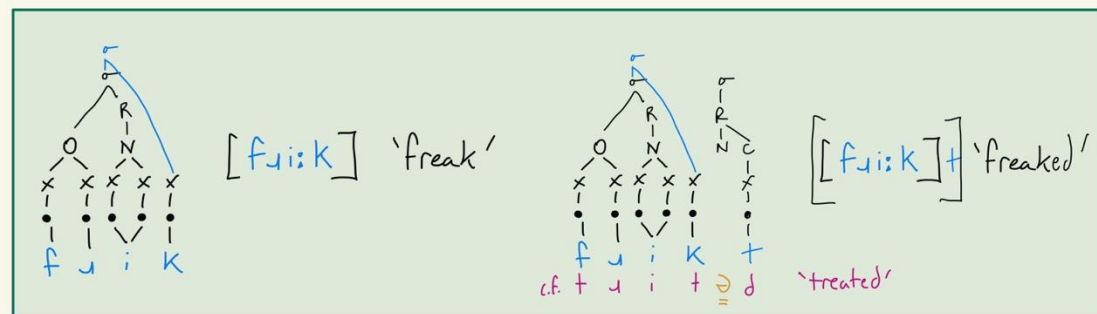
## 2. What the morpho-phonology of English irregular verbs cannot be.

Importantly, they can't be mono-cyclic.

- The syntax of regular and irregular verbs is identical.

- Allomorphy of a root cannot be conditioned by objects in a higher phase.

- **It then follows that**:
  - Irregular verb roots are spelled out low, in the first phase.
  - All v^0 and above heads are spelled out high, in a second phase.
  - No root allomorphy is possible in the Passive/Participle/Past (PA).

- We must also consider, modularity, or at least the 'piece assumption'
  - "All other things being equal, a piece-based analysis is preferred to a Readjustment Rule analysis when the morpho-syntactic decomposition justifies a piece-based treatment." (Embick and Halle 2005:60)
  - The derivations to follow will demonstrate that this is not just a conceptual/theoretical choice in the case of English.

They have spoken.

# 3. The structure of and movement in of English verb derivations.

- TH in v^0 determines the root's conjugation class. v^0 raises to check an V feature. Allomorphy of verbal suffixes is conditioned by TH (and vice versa).
    - The feature shared by the past/ participle/ passive = PA

- The root remains low, and is spelled out in the first phase

- Heads undergo VI from the inside out after movement : Here: $Asp^0 > voice^0 > v^0$

- Phases undergo spell out immediately after evacuation movement (no waiting until CP)
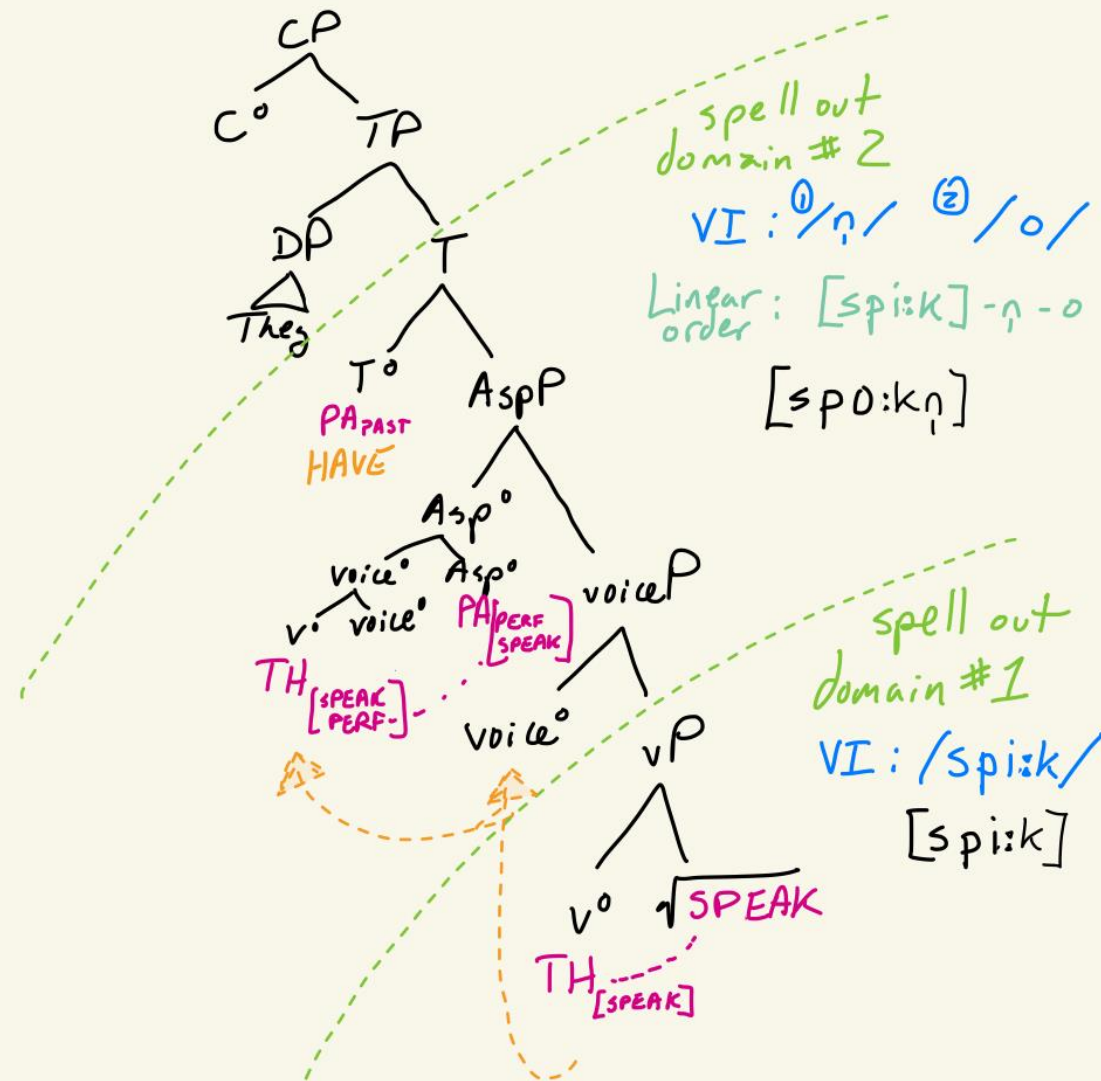
Deriving English Irregular verbs in the phonology

4. English weak irregular verbs and the structure of English vowels.
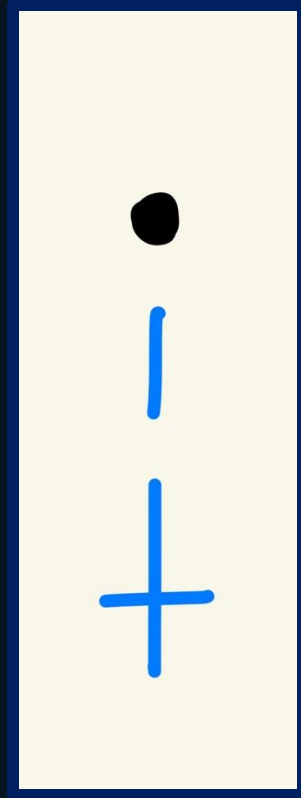
- The weak irregular pattern
  (nothing really new here, pattern-wise)

  - Specified for voicelessness
  - -t suffix causes shortening but never ablaut
  - -t will not be pronounced after another coronal consonant
    - but is there in the phonology (virtual geminate) and causes V-shortening.
    - e.g., bleed-bled-bled
  - Underspecified for a syllabic position (floating, liaison C), triggers resyllabification with and of its base.
    - -t will have 'Level 1 phonology even if inserted in a separate phase from its base.
    - See Newell (2021) for English, and any other autosegmental analyses of affixation, see Newell & Piggott (2014) for Phonological Merger.

A floating segment initiates a search into an adjacent domain and triggers resyllabification.

Both closed-syllable shortening and voicing assimilation in coda are part of the synchronic phonology of English.

There is no ablaut in weak irregulars in English, the vowel alternations are regular vocalic reduction.
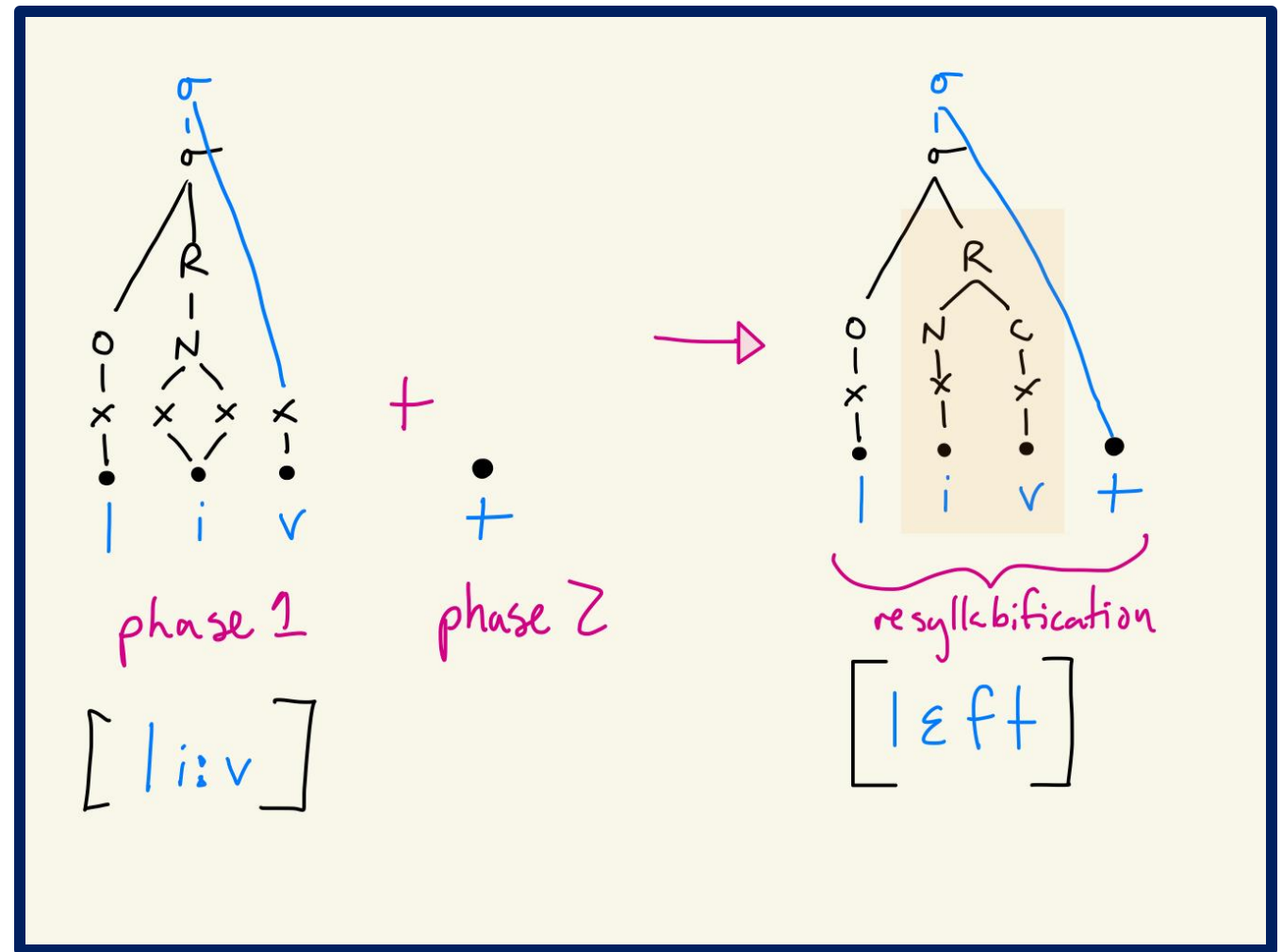
The structure of English vowels

- Element/Particle Theory/GP2.0
  (Structures based on work by Schane 2001, Szigetvári 2016, Pöchtrager 2015, Polgárdi 2015)

- The English Tense-Lax distinction is also Long-Short.
  Reduction of vowels leads to loss of structure (see Pöchtrager 2018, 2024)

- English has identical V alternations in
  - Tri-syllabic laxing *serene-serenity*
  - Closed syllable shortening *intervene-intervention*
    - Irregular verbs *leave-left*
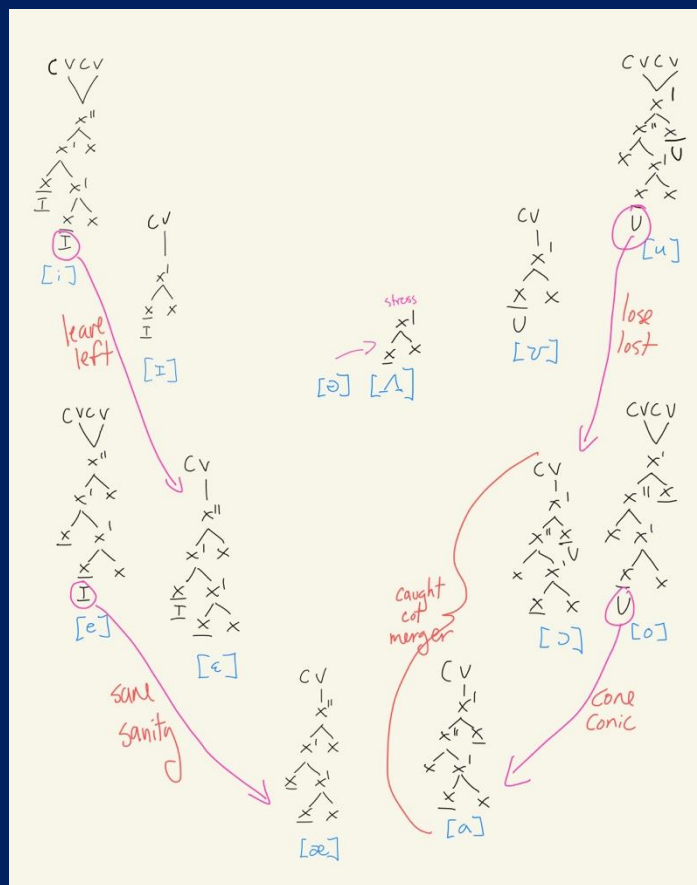
English length and aperture (low) have the same structure, but length requires additional elements.

leave-left
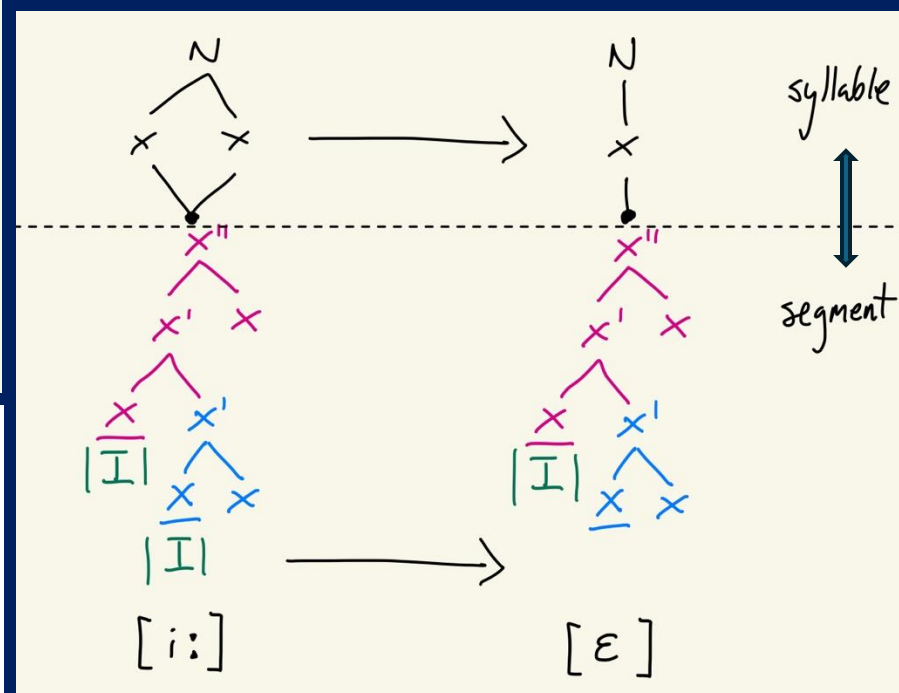
5. English strong irregular verbs, the 3 major classes and what they tell us about the morphosyntax and phonology of English.

- All strong verbs take -n in the PA+Part
- All verbs that take -n in the PA have ablaut in the PA

- But sometimes the phonology intervenes.

Class 1:
In which the ablaut vowel is blocked in the Participle

(Full list and 3 sub-classes in Appendix A, along with their derivations, but in CVCV phonology, in Appendix B)

- E.g., drive-drove-driven, take-took-taken, throw-threw-thrown
- The common patterns in this class:
  - The ablaut only appears in the past, not in the participle.

  - Ablaut may modify either the quality (features) (e.g. eat-ate, blow-blew) or quantity (length) (e.g. take-took, fall-fell) of the vowel.

  - These verbs revert to their base vowel in the participle.

  - The -n affix is pronounced in the participle, and the verb roots end in non-nasal Cs or glides.

The structure of the -n suffix, and the full-vowel ablaut allomorphs of v^0

- The **-n** Vocabulary Item is a nasal C specified as syllabic.

  - It triggers resyllabification of final Cs into its onset, fusing it with the structure of its base (like -t).

- The **ablaut** allomorphs in Class 1 are selected for by one or more roots

  (7 different TH vowels. See appendix A).

  - These are full vowel suffixes with a root node.
  - These vowels must replace a vowel or a diphthong and cannot replace a syllabic consonant. They replace the stressed vowel. (c.f. Zdziebko (2017) for Old English)
  - These vowels may be underlyingly specified as long or short. This is a structure-changing (not a structure-filling) process.

Phase 1 : Cycle 1 of all derivations

'take'
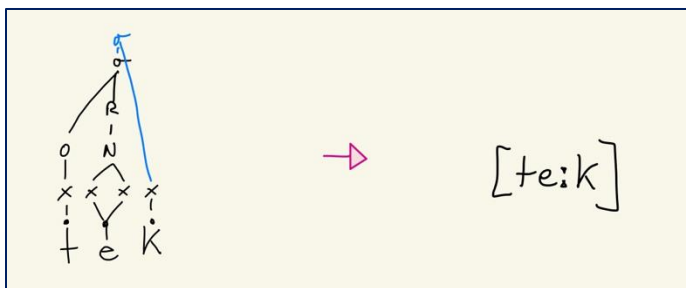
$\rightarrow$ $[\text{te:k}]$

Past tense : Phase 2

'took'
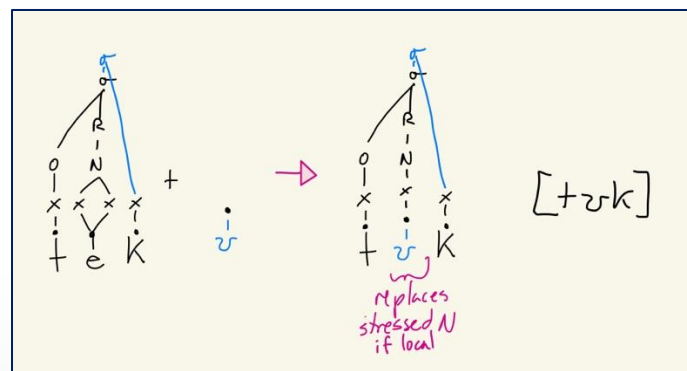
$[\text{t}\upsilon\text{k}]$

replaces stressed N if local

Ablaut vowel replaces V that was stressed on a previous cycle.

Participle : Phase 2

'taken'

$[\text{te:k}\eta]$

closest N is not stressed, stressed N is not local
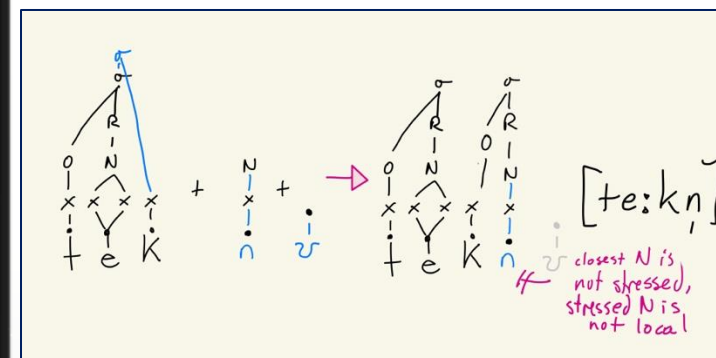
-n syllabifies with the base. Linking of the ablaut vowel is blocked : the syllabic C intervenes.

Class 2:
In which the ablaut is not a vowel, and so is not blocked in the Participle

(Full list in Appendix A)

- E.g., bind-bound-bound, break-broke-broken, get-got-gotten

- The common patterns in this class:
    - The ablaut always results in 'o' : [oː], [ɔ] or [aʊ]
      (There is only 1 TH vowel in this class)

    - The ablaut never changes the quantity (length) of the underlying vowel of the root.

    - The ablaut appears in both the past and the participle.

- All roots end in a single non-Nasal C, or in a Coronal NC-sequence
    - Coronal NC coda sequences are the only ones to behave as though they are mono-consonantal in English.
    - They may be preceded by a long vowel or diphthong : fiend vs *fiemp/fienk
    - The -n affix is pronounced in the participle, except after NC (see also Class 3)

The sub-segmental ablaut allomorph

- Class 2 ablaut consists of an underspecified feature bundle: the Elements |AU|.

- Linking these elements occurs internally to the structure of the base vowel as follows:
  - The local vowel is targeted (|AU| is suffixal) (only the glide of diphthongs is local)
  - |A| is added where possible
  - |U| too, and it replaces |I|

- This linking is not blocked by consonants, syllabic or otherwise, as it occurs strictly within the melodic/subsegmental tier.

|AU|

Phase 1 : Cycle 1 of all derivations

'break'

$[bɹeːk]$
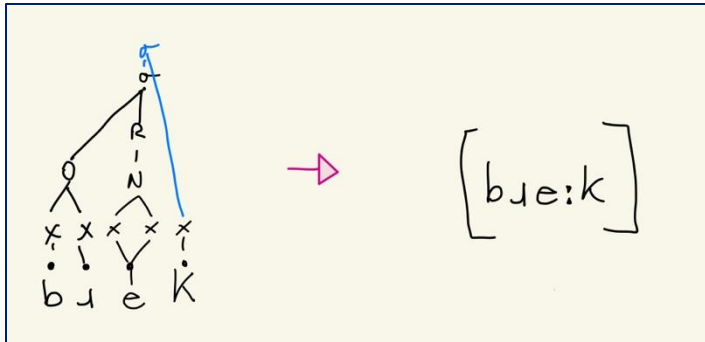
Past tense : Phase 2

'broke'

$[bɹoːk]$
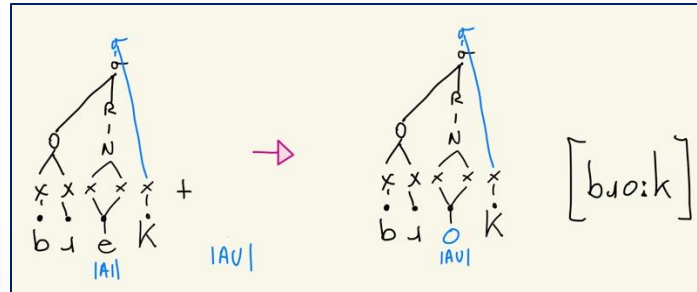
Ablaut features modify the V that was stressed on a previous cycle. Quantity is unaffected.

Participle : Phase 2

'broken'

$[bɹoːkn̩]$

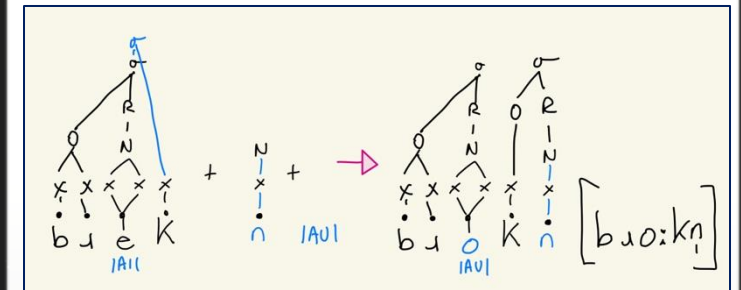-n syllabifies with the base. Linking of the ablaut features is NOT blocked. (c.f., vowel harmony)

Class 3:
In which the roots are zero-grade, and there is a stable default vowel (=no vowel) in the Participle

(Full list in Appendix A)

- E.g., come-came-come, sing-sang-sung, slink-slunk-slunk

- The common patterns in this class:
  - All roots that end in a $C_{[nasal]}$ or a non-Coronal NC sequence.

  - All but one of these verbs (come) have either [ʌ] or [æ] ablaut in the Past. Quantity may vary: come-came.
    (2 TH vowels in this class in the PA, [e:] and [æ], 2 in the non-PA [ɪ] and [æ])

  - All forms, regardless of their UR or ablaut vowels, have [ʌ] in the participle.
    - Note that unlike Class 1 and Class 2 verbs, these verbs do not revert to their UR vowel in the participle, nor do they maintain their Past ablaut vowel

  - The -n suffix is unpronounced … but it is there.
    - Preceding Nasal Cs and Coronal NC-sequences ([nd], [nk] or /ng/→[ŋ]) result in the lack of phonetic-realization of a following syllabic -n.
      - This is identical to the 'degemination' / non-pronunciation of -t after coronal-final stems (e.g., light-lit), and the non-pronunciation of -n in NC-final Class 2 verbs: e.g., find-found.

Phase 1 : Cycle 1 of all derivations

'sung'
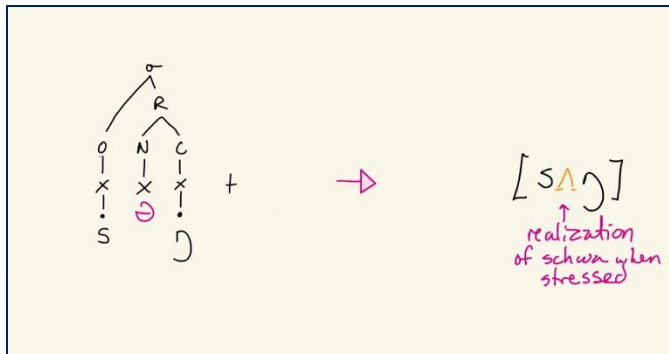
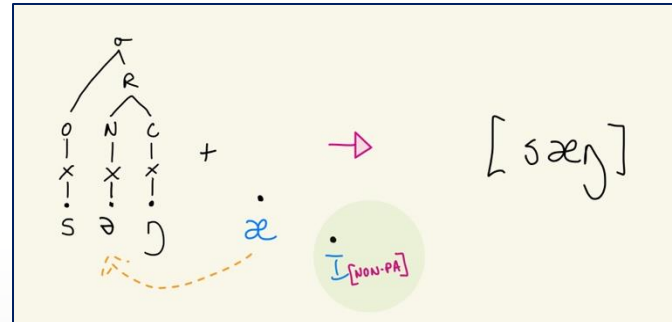Schwa is epenthesized.
Class 3 roots are zero-grade;
vowel-less
in their UR.
Stressed /ə/ = [ʌ]
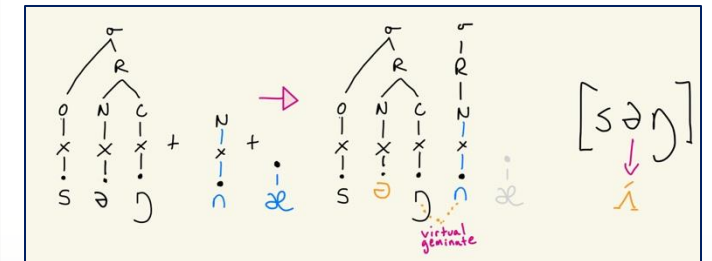(Pöchtrager 2023)

(non) Past tense : Phase 2

'sing' / 'sang'

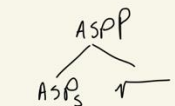Ablaut vowel replaces V that was
stressed on a previous cycle.

Participle : Phase 2

'sung'

-n syllabifies with the base.
-n is not realized phonetically
after a C[NASAL]
Linking of the ablaut vowel is
blocked : the syllabic C
intervenes.

Embick (2004:364)

ASPP
ASPₛ √
STATIVE
vs
ASPP
ASP XP
X √

Newell (Here & Now)

ASPP
ASPₛ √
STATIVE
vs
ASPP
ASP v⁰
v⁰ √

Root	Stative	Resultative	Eventive passive
√BLESS	bless-èd	bless-ed	bless-ed
√AGE	ag-èd	ag-ed	ag-ed
√ROT	rott-en	rott-ed	rott-ed
√SINK	sunk-en	sunk-Ø	sunk-Ø
√SHAVE	(clean)-shav-en	shav-ed	shav-ed
√OPEN	open-Ø	open-ed	open-ed
√EMPTY	empty-Ø	empti-ed	empti-ed
√DRY	dry-Ø	dri-ed	dri-ed
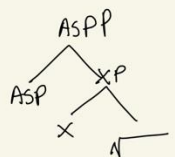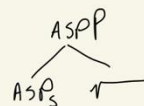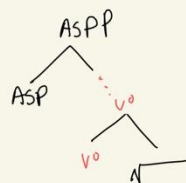
So, no verb roots undergo allomorphy, and none of the allomorphy of affixes in the PA is *directly* root-conditioned. But does the root *ever* condition allomorphy?

Yes.   E.g., 'sunken' [sʌŋkən]

- As argued in Embick (2003, 2004), there is root conditioned allomorphy of ASP (my PA).

- Embick proposes that ASP can be merged to the root or farther away.

- This analysis is consistent with the proposal that PA allomorphy is normally conditioned by v^0/Class, but in the stative is also conditioned by the root itself.
  - The èd/èn suffixes are allomorphs of ASP that contain a vowel in their UR.
    - The final NC of *sunk* and the nasal C in *-en* are therefore separated by an overt vowel and both are pronounced.

- **That root-conditioned allomorphy can select for distinct suffixes gives additional evidence that the PA allomorphs are not conditioned by the roots themselves in the non-stative derivations.**

Morpho-phonological Conclusions

- **Verb roots do not undergo suppletion and are not subject to readjustment rules.**

- **This account captures the patterns in the English Irregular system in ways that root-allomorphy/ readjustment rule accounts cannot.**
  - Syllabic –n blocks the attachment of ablaut vowels…
  - But does not block the attachment of ablaut *features* due to phonological locality.
  - We can 'see' it blocking ablaut just like we can 'see' -t causing CSS, even when they are not phonetically realized.
    - This is nice, as most people agree that Readjustment Rules should be, if not banned, a last resort (e.g., Embick & Halle 2005; Haugen & Siddiqi 2013)

- **There is no Phonological PIC**
  - Phonological Merger is triggered across cycles when warranted by the phonological URs of the morphemes involved.

Morpho-syntactic Conclusions

- **The verb root (in addition to not undergoing allomorphy itself) does not condition allomorphy of the (non-stative) PA - the theme vowel does.**
  - The ablaut vowels are the realization of verbalizing heads (e.g., Fabrégas 2017)
    - (There are 10 in the PA, 2 in the Non-PA)
  - All ablaut verbs are also -n verbs
  - The English system offers no evidence that the ''Root-attached''
    theory of contextual allomorphy is too restrictive." (Embick 2010:14)

- **The apparent *ABA eat-ate-eaten/AAB eat-eaten-ate pattern is due to phonology and not to root allomorphy.**

- **The account proposed here brings English into alignment with other languages in which the verb spells out low in the VP and Tense morphology is demonstrably in a separate syntactic and phonological domain.**
  - Ojibwe, Chukchansi Yokuts, Turkish, Cupeño, Malagasy, Chichewa….

References cited that propose analyses of the English PA (or some of it)

- Bloch, Bernard. 1947. English verb inflection. Lg. 23.399-418. [Reprinted in Martin Joos (ed.) *Readings in linguistics I*, 243-51. Chicago: University of Chicago Press, 1966.]

- Chomsky, N, and Morris Halle. 1968. *The sound pattern of English*. New Harper & Row

- Collins, C. 2018. The logic of contextual allomorphy. Ms., New York University.

- Embick, D., 2010. *Localism versus globalism in morphology and phonology* (Vol. 60). MIT Press.

- Embick, D., 2004. On the structure of resultative participles in English. *Linguistic Inquiry*, 35(3), pp.355-392.

- Embick, D., 2003. Locality, listedness, and morphological identity. *Studia linguistica*, *57*(3), pp.143-169.

- Embick, D. and Halle, M., 2005. On the status of stems in morphological theory. In T. Geerts and H. Jacobs eds. *Proceedings of Going Romance 2003,* John Benjamins.

- Halle, Morris and K.P. Mohanan. 1985. Segmental Phonology of Modern English. *Linguistic Inquiry* 16, pg. 57-116.

- Hoard, J.E. and Sloat, C., 1973. English irregular verbs. *Language*, pp.107-120.

- Kayne, Richard. 2016. What is Suppletive Allomorphy? On went and *goed in English. Ms., NYU.

- Lowenstamm 2023. The Segholate Verbs of English. In F. Breit, Y. Yoshida, & C. Youngberg (eds) *Elements, Government & Licensing: Developments in Phonology*. UCL Press.

- Zdziebko, S., 2017. Great Faith in Small Affixes: Subsegmental Affixation and the Old English Ablaut. In Aleksandra R. Knapik, Katarzyna Buczek, Piotr P. Chruszczewski, Richard L. Lanigan & John R. Rickford (Eds) *Ways to Religion vol. 1*. Wyższa Szkoła Filologiczna we Wrocławiu.

Other References

- Bjorkman, B.A.M., 2011. BE-ing default: The morphosyntax of auxiliaries (Doctoral dissertation, Massachusetts Institute of Technology).

- Bobaljik, Jonathan and Susi Wurmbrand. 2005. 'The domain of agreement' *Natural Language and Linguistic Theory* 23: 809-865.

- Bošković, Željko. 2007. 'On the Locality and Motivation of Move and Agree: An Even More Minimal Theory' *Linguistic Inquiry*, 38. 4: 589-644

- Bošković, Željko. 2014. Now I'm a phase, now I'm not a phase: On the variability of phases with extraction and ellipsis. *Linguistic Inquiry*, 45.1: 27-89.

- Cowper, E. 2005. The geometry of interpretable features: Infl in English and Spanish. *Language*, pp.10-46.

- Dolatian, H. and Guekguezian, P. 2023. Relativized locality: Phases and tiers in long-distance allomorphy in Armenian. *Linguistic Inquiry*, 54(3), pp.505-545.

- Fabrégas, A. 2017. Theme vowels are verbs. Rivista di Grammatica Generativa, 39(5), p.1.

- Guekguezian, Peter. 2017. Templates as the interaction of recursive word structure and prosodic well-formedness. *Phonology*, 34(1), pp.81-120.

- Guerssel, Mohand and Jean Lowenstamm (1994): Ablaut in Classical Arabic measure I active verbal forms. Paper presented at the second conference on Afro-Asiatic Languages, Nizza 1994. Also in: Lecarme et al. (1996):, 123-134.

- Harwood, W. 2015. Being progressive is just a phase: celebrating the uniqueness of progressive aspect under a phase-based analysis. *Natural Language & Linguistic Theory*, 33, pp.523-573.

- Haugen, J.D. and Siddiqi, D., 2013. Roots and the derivation. *Linguistic inquiry*, 44(3), pp.493-517.

- Lowenstamm, J., 1996. CV as the only syllable type. In Jacques Durand, Bernard Laks (eds.) *Current trends in phonology: Models and methods*, 2, pp.419-441.

- Merchant, J., 2015. How much context is enough? Two cases of span-conditioned stem allomorphy. Linguistic Inquiry, 46(2), pp.273-303.

- Newell, H., 2021. Deriving Level 1/Level 2 affix classes in English: Floating vowels, cyclic syntax. *Acta Linguistica Academica*, 68(1-2), pp.31-76.

- Newell, H. 2017. Nested Phase Interpretation and the PIC. In Newell, H., Noonan, M., Piggott, G. and Travis, L.D. eds., *The structure of words at the interfaces* (Vol. 68). Oxford University Press.

- Newell, Heather (2008). *Aspects of the Morphology and Phonology of Phases*. Diss. McGill University.

- Newell, H. and Piggott, G., 2014. Interactions at the syntax–phonology interface: Evidence from Ojibwe. *Lingua*, *150*, pp.332-362.

- Pöchtrager, M.A. 2015. Binding in phonology. In Nasukawa, Kuniya, Marc van Oostendorp, and Henk van Riemsdijk. (eds.) *Representing structure in phonology and syntax*, pp.255-275.

- Polgárdi, K., 2015. Vowels, glides, off-glides and on-glides in English: A Loose CV analysis. *Lingua*, *158*, pp.9-34.

- Schane, Sanford A. 2001. Two English vowel movements: a particle analysis." Kreidler, Charles W. (ed.) *Phonology: Critical concepts in linguistics*. Vol. 1. Taylor & Francis: 124-142.

- Scheer, T. 2004. *A lateral theory of phonology: What is CVCV and why should it be?* de Gruyter.

- Scheer, T. and Szigetvári, P. 2005. Unified representations for stress and the syllable. *Phonology*, 22(1), pp.37-75.

- Ségéral, P. and Scheer, T., 1998. A generalized theory of ablaut: the case of Modern German strong verbs. In Fabri, R., Ortmann, A. and Parodi, T. eds., *Models of inflection*, pp.28-59.

- Szigetvári, P. 2016. No diphthong, no problem. *Language, 17(3)*, pp.223-246.

- Ulfsbjorninn, Shanti. 2014. *A field theory of stress: The role of empty nuclei in stress systems*. SOAS University of London PhD dissertation.

Appendices

Appendix A:
A distributional table of English Irregular Verbs
(Including the weird ones that don't fit nicely)

UR-Ab-UR (phonological blocking)	underlying	surface
eat-ate-eaten (1)	[iː]-[eː]-[eː]	[iː]-[eː]-[iː]
bid-bade-bidden (2(1))	[ɪ]-[eː] (or [æ])-[eː] (or [æ])	[ɪ]-[eː] (or [æ])
hide-hid-hidden (2)	[aj]-[ɪ]-[ɪ]	[aj]-[ɪ]-[ɪ]
take-took-taken (3)	[eː]-[ʊ]-[ʊ]	[eː]-[ʊ]-[eː]
fall-fell-fallen (1)	[ɑː]-[ɛ]-[ɛ]	[ɑː]-[ɛ]-[ɑː]
drive-drove-driven (8)	[ai]-[oː]-[oː]	[ai]-[oː]-[ɪ]
draw-drew-drawn (1)	[ɑː]-[uː]-[uː]	[ɑː]-[uː]-[ɑː]
grow-grew-grown (4)	[oː]-[uː]-[uː]	[oː]-[uː]-[oː]
slay-slew-slain (1)	[eː]-[uː]-[uː]	[eː]-[uː]-[eː]
see-saw-seen (1)	[iː]-[ɑː]-[ɑː]	[iː]-[ɑː]-[iː]

UR-Ab-Ab (no phonological blocking)	underlying	surface
wake-woke-woken (5)	[eː]-[oː]-[oː]	[eː]-[oː]-[oː]
choose-chose-chosen (1)	[uː]-[oː]-[oː]	[uː]-[oː]-[oː]
freeze-froze-frozen (4)	[iː]-[oː]-[oː]	[iː]-[oː]-[oː]
get-got-gotten (2)	[ɛ]-[ɔ]-[ɔ]	[ɛ]-[ɔ]-[ɔ]
find-found-found (4)	[ai]-[aw]-[aw]	[ai]-[aw]-[aw]

UR-Ab-Empty (phonological blocking)	underlying	surface
come-came-come (1)	[ʌ]-[e]-[e]	[ʌ]-[e]-[ʌ]
drink-drank-drunk (9)	[ɪ]-[æ]-[æ]	[ɪ]-[æ]-[ʌ]
run-ran-run (1)	[ʌ]-[æ]-[æ]	[ʌ]-[æ]-[ʌ]
fling-flung-flung (10)	[ɪ]-[ʌ]-[ʌ]	[ɪ]-[ʌ]-[ʌ]
hang-hung-hung (1)	[æ]-[ʌ]-[ʌ]	[æ]-[ʌ]-[ʌ]

Weird	underlying	surface
hold-held-held, sit-sat-sat (non-o ablaut remains in participle) (1)		[o]-[ɛ]-[ɛ], [ɪ]-[æ]-[æ]
tell-told-told sell-sold-sold (ablaut + -D (mixed) (2)		[ɛ]-[o]-[o]
stand-stood-stood (behaves like the UR-Ab-Ab verbs, but loses N and the vowel is [ʊ]) (1)		[æ]-[ʊ]-[ʊ]
shine-shone-shone (ends in a nasal, but maintains ablaut in the participle, and it's not the expected [aw] of an UR-Ab-Ab verb) (1)		[aj]-[ɔ]-[ɔ]

Irregular verb count:
68 ablaut verbs (counting the 'weird')
54 weak irregular verbs (no ablaut)
5 'real irregulars' (Appendix D)
NB. that I am not counting prefixed forms unless it is the only one (e.g., bereave)

Full list of English Irregular verbs:

(not including prefixed verbs if the non-prefixed verb exists. e.g., speak, bespeak)

Weak Irregulars : *bereave-bereft, bleed-bled, breed-bred, creep-crept, deal-dealt, dream-dreamt, feed-fed, feel-felt, 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, sleep-slept, speed-sped, sweep-swept, weep-wept.* Verbs that are in this class vacuously because they have an underlying short V that can't undergo shortening/lowering: *bend-bent, bet-bet, build-built, burn-burnt, burst-burst, cast-cast, cost-cost, dwell-dwelt, hit-hit, hurt-hurt, learn-learnt, let-let, put-put, rid-rid, set-set, shed-shed, shit-shit, shut-shut, slit-slit, smell-smelt, spend-spent, split-split, spread-spread.*

Class 1 : Subtype 1: *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* Subtype 2: *blow-blew-blown, draw-drew-drawn, grow-grew-grown, know-knew-known, slay-slew-slain, see-saw-seen, throw-threw-thrown* Subtype 3: *eat-ate-eaten, fall-fell-fallen, bid-bade-bidden, give-gave-given, forsake-forsook-forsaken, take-took-taken, shake-shook-shaken*

Class 2 : *bear-bore-born, bind-bound-bound, break-broke-broken, choose-chose-chosen, find-found-found, get-got-gotten, grind-ground-ground, freeze-froze-frozen, speak-spoke-spoken, steal-stole-stolen, swear-swore-sworn, tread-trod-trodden, tear-tore-torn, wake-woke-woken, wind-wound-wound, weave-wove-woven*

Class 3 : *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.*

ɔt forms : *bring-brought, buy-bought, teach-taught, think-thought, catch-caught, seek-sought*

Irregulars that defy 'pretty' categorization : *hold-held-held, sit-sat-sat, tell-told-told, sell-sold-sold, stand-stood-stood, shine-shone-shone (see table on previous slide)*

'Real' Irregulars : *be, do, have, go, make*

Appendix B:
The sub-types of Class 1

Class 1 : Subtype 1

Verbs with a diphthong (always [aɪ]) and a single final C in their UR (e.g., drive-drove-driven)

- These verbs take an [o] or [ɪ] ablaut in the PA, and then undergo regular shortening of [aɪ] to [ɪ] in the participle (c.f. Tri-syllabic shortening: *deride-derisive*).

- Other verbs in this class: bite-bit-bitten, hide-hid-hidden, ride-rode-ridden, rise-rose-risen, shrive-shrove-shriven, smite-smote-smitten, stride-strode-stridden, strive-strove-striven, write-wrote-written

- The suffix is a branching (syllabic) [n] but must search for its syllabic/V position.
- Once probing/search applies at the segmental level, repair strategies (epenthesis, resyllabification) re-apply.

Phonological derivation

DRIVE

DROVE

DRIVEN

- Here we have 2 separate morphemes deriving the PA and PART.
- A syllabic nasal adds a syllable and shifts stress to the glide, causing it to delink from the C position.
- The short V-V hiatus is resolved by deleting the first V. (a-ɪ → ɪ)

Class 1: Subtype 2
Past-Ablauting verbs ending in a single C that don't have a diphthong in their UR and revert to their UR vowel in the Participle. (e.g., fall-fell-fallen)

- Ablaut in these verbs demonstrates no stability w.r.t. vowel tenseness/length is not stable here. The whole vowel is being replaced, but reverts to the lexical default in the participle:
  - long→short: [te:k] *take* ~ [tʊk] *took*
  - short→long [gɪv] *give* ~ [ge:v] *gave*

- These verbs demonstrate the same blocking of Ablaut in the -n forms as subtype 1.
  - The ablaut patterns here are : [i:]-[e:], [ɪ]-[e:] (or [æ]), [e:]-[ʊ], [ɑ:]-[ɛ].

- Other verbs in this class: beat-beat-beaten, bid-bade-bidden, eat-ate-eaten, give-gave-given, forsake-forsook-forsaken, take-took-taken, shake-shook-shaken

- Here we have 2 separate morphemes deriving the PA and PART.
- Why propose that the ablaut is there even in the passive/ participle? Because it is not always blocked (see Class 2).
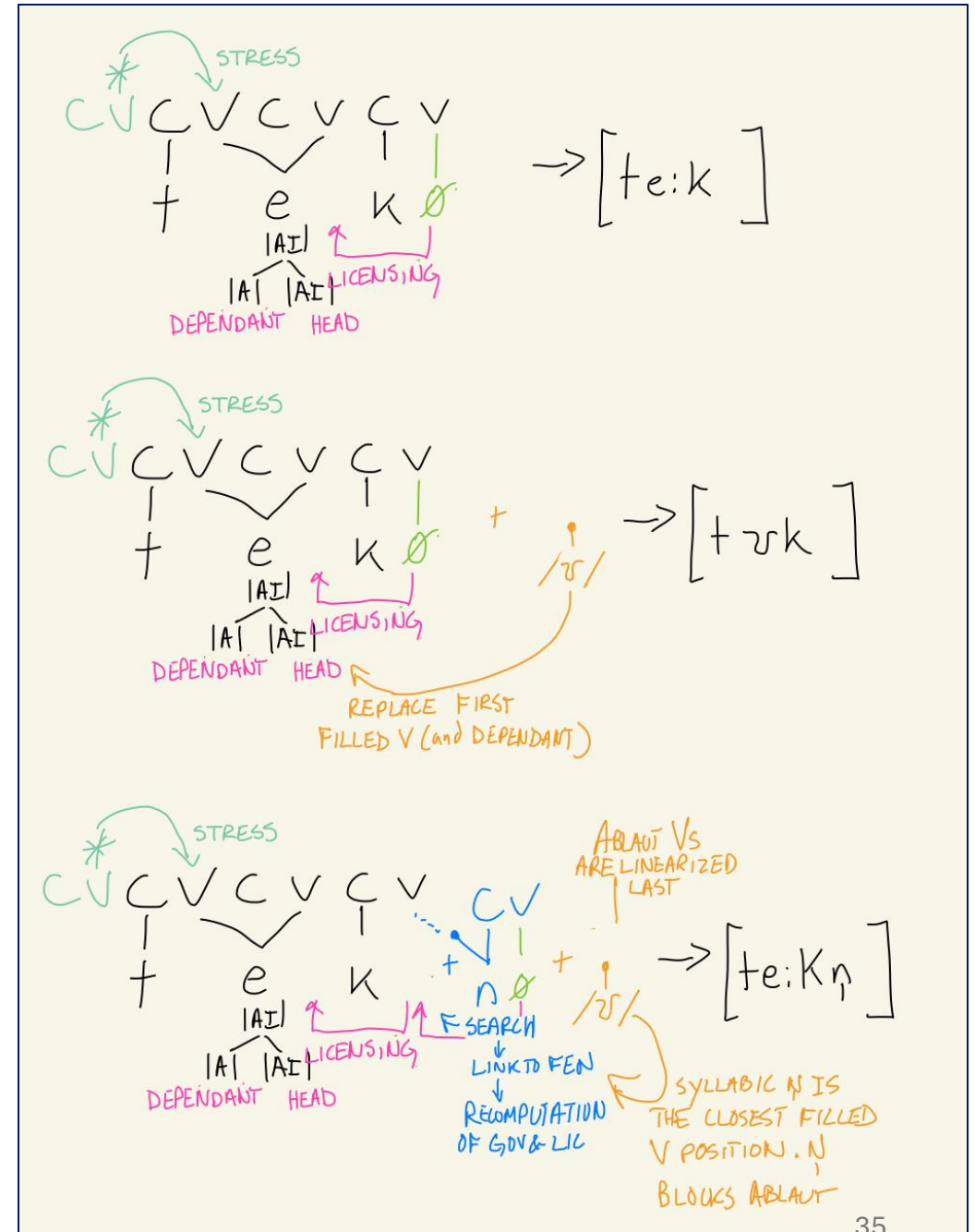
Phonological derivation

TAKE

TOOK

TAKEN

- Syllabic -n blocks attachment of the vowel, as it is the closest filled-vowel position that is targeted by the theme-vowel. The theme vowel cannot displace a consonant.

Class 1: Subtype 3

These verbs all end in a vowel and therefore the syllabic -n is not realized as such phonetically (e.g., blow-blew-blown)

- Final vowels in English spread into a C position (weight-by-position)
  - Other verbs in this class: draw-drew-drawn, grow-grew-grown, know-knew-known, slay-slew-slain, see-saw-seen, throw-threw-thrown

- There is no phonetic syllabic [n] after a sonorant segment on the melodic tier
  - See also *born, sworn, torn* from Class 2.
    - N.B. that phonetic syllabic Cs can be derived from schwa-C sequences (ex. barren [bɛɹən]), but not from underlyingly syllabic C.

- This -n is syllabic in the phonological structure.

The truly irregular verbs seem to belong here as well: be-been, do-done, go-gone. See Appendix D.

- The -n in these forms *is* phonologically syllabic and blocks the attachment on the theme vowel.
- It is not phonetically syllabic after a glide.

Phonological derivation

THROW

THREW

THROWN

Appendix C:
-ɔt forms
(e.g., *SEEK-SOUGHT*)

Every account needs to say something special about these forms.
(special smecial)

- I will assume -ɔt is a templatic allomorph, with the morphosyntactic patterning of -D and -t.
  - The onset of the base is copied into the template.
    - It is possible that the template has only one onset position and that dependents are permitted to 'tag along'.
    - It is possible that the template does not include the -t, and that the ɔ-template is the PA and the -t is the weak irregular suffix.
  - Halle & Mohannan (1985), for example, propose URs that are historically-motivated and opaque.
    - Let's assume that synchronic surface phonological patterns that are easily-derivable are easily-derived.
    - Let us also assume that patterns that are not generalizable outside the PA are not process-driven. (c.f. vowel shortening)

- Verbs in this class: bring-brought, buy-bought, teach-taught, think-thought, catch-caught, seek-sought
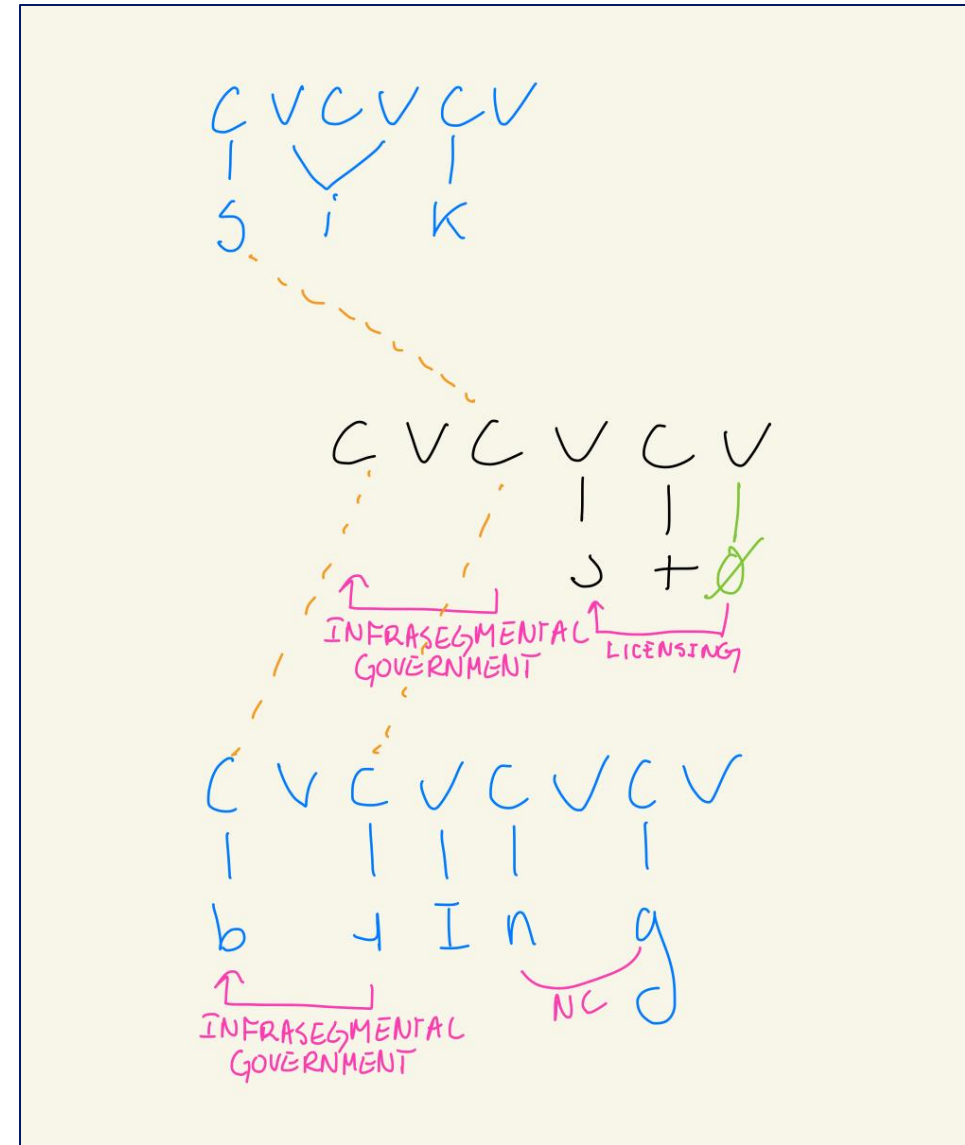
Appendix D:
The *real* Irregulars
(They are not that irregular, and demonstrate bi-phasal derivations)

be, have, make, do, go

(go is the only real problem wrt allomorphy in the entire system)

These verbs all conform to the 'revert-to-UR' pattern in the participle, and are only irregular in the Past

The distinctions in the present tense between go/do and make/have are consistent with main verbs being computed in two cycles, and auxiliaries in 1.

- **GO**-went-gone
  - real allomorphy in the past (so, very weird), regular participle.
  - [ɔ] in UR, lengthened when unaffixed because of word minimality = [oː]

- N.B. goes [goːz] vs does [dʌz] is an indication that goes is [[goː $_{vP}$]z $_{CP}$] and does is [dʌz $_{CP}$]

- **DO**-did-done
  - ablaut+ed in the past (so, weird), regular participle.
  - [ʊ] in UR, lengthened because of minimality in 'do' = [uː]

- **MAKE**-makes-made-made
  - -ed form (main)
  - floating /k/ in the UR of the root. Not really 'irregular'

- N.B. makes [meːks] vs has [hæz] is an indication that makes is [[meːk $_{vP}$]s $_{CP}$] and has is [hæz $_{CP}$]

- **HAVE**-has-had-had
  - -ed form
  - floating /v/ in the UR of the root. Not really 'irregular'

- **BE**-was/were-been
  - real allomorphy in the past, regular participle.
  - [ɪ] in UR, lengthened because of word minimality unaffixed forms.

Appendix E:
Dialect variation

Dialect variation?

- Dialect variation needs to be accounted for. Some is quite predictable:

- Take-took-tooken patterns are derivable in grammars where valuation of v^0's TAM feature is done via Agree rather than movement.
  - If v^0 is valued via Agree (a common process, so not hard for the learner to implement), it is spelled out closer to the root than the head where -n is realized. It is linearly closer to the root and cannot be blocked.

- Sing-sang-sang patterns are derivable if the Class 3 verbs are reanalized as taking a zero-morpheme in the PA rather than -n.
  - As -n is never pronounced in these forms, this is not a big leap for the learner.

Scratch paper