Does morphology make a mess of English primary and secondary stress?

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Stress shift and stress preservation

- **stress shift**
  - the derived word has a different main stress from the base word

- **stress preservation**
  - primary stress in the base is preserved as secondary stress in the derivative
  - the derived word has the same main stress as its base

stress shift

- **(main) stress not shifted**
  - propagánda ~ propagándaless
  - radiación ~ radiaciónless
  - mánager ~ mánagerless
  
  (Plag 2003)

- **(main) stress shifted**
  - párent ~ paréntal
  - compúte ~ computación
  - Japán ~ Japanése
  - pártial ~ partiáity
  
  (Bauer et al. 2013)

Stress preservation 1: secondary stress in the derivative

- main stress of the base is preserved as secondary stress in the derivative

- more specifically:
  - bases beginning with a weak syllable

- in cases of no preservation: secondary stress in the derivative is on the initial syllable (assumption: default secondary stress is word-initial)


  origináality

  original

  òorigináity
Stress preservation 2: main stress in the derivative

stress-preserving derivational processes

- propagánda ~ propagándaless
- radiátion ~ radiátionless
- mánager ~ mánagerless

Phonology-morphology interaction: Theories

- stratification
  - Lexical Phonology, Stratal OT
  
  (Kiparsky 1982a, b, Giegerich 1999, Bermúdez-Otero & McMahon 2006, Bermúdez-Otero 2012)

- lexical marking of (exceptional) stress
  - Correspondence Theory

  (Plag 1999, Pater 2000, Zamma 2012)

- stress is lexicon-based
  - ... in usage-based theories
  - so far: no systematic work on English complex work
  - cf. Domahs et al. 2013 for English monomorphemes

Problem: variability

Affecting main stress in the derivative:
a. failure of stress preservation to apply in stress-preserving processes
   - dóокумент ~ documéntable (Burzio 1995)
   - ánecdoté ~ anecdotist
   - triumph ~ triumphant

b. failure of stress shift to apply in stress-shifting processes
   - discipline ~ disciplinary, *disciplinary
   - anticipate ~ anticipatory, *anticipatory

Affecting secondary stress in the derivative:
c. failure of stress preservation to apply
   - original ~ originálity, originály

Problem: variability

- Evidence is so far often anecdotal.
- Most of the existing literature has a theoretical focus.
- Very few systematic empirical studies of the variation
  - main stress in derived words: Zamma 2012, but not explored systematically
  - secondary stress in derived words: Collie 2008a, b

- Empirical problem: Variation surfaces only in rare words
  - long words (Bauer et al. 2013 for main stress, Collie 2008a, b for sec. stress)
  - small numbers of data
  - => variation is often overlooked

- => Scope and determinants of the variability are largely unclear.
Variability and theories

• stratification in Lexical Phonology, Stratal OT
  – classic theories: no productive variability predicted
  - differences in behaviour & productivity between Class 1 and Class 2 processes predicted
    (Kiparsky 1982a, b, Giegerich 1999, Bermúdez-Otero & McMahon 2006, Bermúdez-Otero 2012)

• lexical marking of stress
  – Correspondence Theory
  – no predictions about variability
    (Pater 2000, Burzio 2007, Zamma 2012)

• stratification and input marking
  – fake cyclicity (Bermúdez-Otero & McMahon 2006, Bermúdez-Otero 2012, Collie 2008a, b)
  – variability is predicted to occur on stratum 1

Secondary stress variability: Collie 2008

• Stress preservation is variable
  – authority ~ authórítárian, àuthorítárian
  – décönsecrate ~ dèconsecrátion, accéptable ~ accèptability

Secondary stress variability: Collie 2008

• Stress preservation is
  „a gradient phenomenon, which is probabilistically predicted by word frequency” (Collie 2008: 505)
  – preservation is violated in ~ 30% of the data
  – significant predictors: base frequency, derivative frequency, relative frequency (Hay 2002, 2003)

• interpretation:
  – whole word vs. decomposition route
  – high (relative) base frequency favours decomposition
  – decomposition involves access to prosodified bases

Main stress variability: Zamma 2012

• Main stress placement is variable
  – Class 1 and Class 2 processes do not form homogeneous sets
  – Indications of some variation within processes, but scope and nature are unclear
Case studies: two adjective-forming suffixes

-able
• mostly considered to be stress-preserving
• highly productive
• of Latinate origin
• mostly attaches to verbal bases
  – some nominal bases (e.g. knowledgeable)
  – some bound bases (stem truncation of –at: e.g. educable)

-ory
• mostly considered to be stress-shifting
• productive
• of Latinate origin
• mostly attaches to verbal bases
  – some nominal bases (e.g. statutory)
  – bound bases (stem allomorphs, e.g. introductory)
  – extender, non-etymological – at: e.g. definatory

Stress preservation, stress shift

• is stress preserving
e.g. cértifiable, disciplinable

• often discussed: isolated examples of stress shift, mostly correlating with semantic opacity
e.g. compárable ~ cómprable
(e.g. Aronoff 1976, Giegerich 1999, Burzio 2002)

• stress shift observed in long derivatives with heavy base-final syllables
e.g. allocátable, analýsable
(Bauer et al. 2013: 186f., 297)

The data – CELEX (Baayen et al. 1995)

• long –able derivatives
  (length of bases ≥ 3 syllables)
  – pronunciation & stress variants

• 41 different types
coded for syllable weight and stress, yielding

• 50 different weight-stress configurations
The data – OED

- long –*able* derivatives (length of bases ≥ 3 syllables)
- 19th and 20th century neologisms – only few pronunciation variants given
- 104 different types coded for syllable weight and stress, yielding
- 112 different weight-stress configurations

Overview: Stress in the base and the derivative, CELEX data

Final stress is more widespread among derivatives than among bases.

Overview: Stress in the base and the derivative, OED data

Final stress is more widespread among derivatives than among bases.

Stress preservation? CELEX

Stress is preserved in 41 of 50 tokens, and not preserved in 9 tokens (= 18%).

<table>
<thead>
<tr>
<th>stress shift</th>
<th>alternative form preserving basal stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>certifiable</td>
<td>-</td>
</tr>
<tr>
<td>classifiable</td>
<td>clássifiable</td>
</tr>
<tr>
<td>justifiable</td>
<td>justifiable</td>
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<tr>
<td>notifiable</td>
<td>notifiable</td>
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<tr>
<td>verifiable</td>
<td>verifiable</td>
</tr>
<tr>
<td>recognizable</td>
<td>récognizable</td>
</tr>
<tr>
<td>reconcilable (2x)</td>
<td>réconcilable (2x)</td>
</tr>
<tr>
<td>disréputable</td>
<td>-</td>
</tr>
</tbody>
</table>
Stress preservation? OED

Stress is preserved in 87 of 112 tokens, and not preserved in 25 tokens (= 22%).

- **stress shift to the final syllable:** 22 of 25 tokens
  - canonizable
  - poetizable
  - verbalizable
  - isolatable
  - accommodatable
  - cultivatable
  - alkalifiable
  - exemplifiable
  - orientable
  - phagocytatable
  ...

- **stress shift to the penult:** 3 tokens
  - automatable, acclimatable, expéritable

Stress preservation by basal stress

=> stress shift mostly concerns bases with antepenultimate stress

Stress preservation vs. stress shift

- non-preservation: robustly $\sim 1/5$ of the data
- mostly stress shifts from the antepenult to the final syllable
- shift takes place only if the final syllable is heavy

Determinants of stress shift – weight of the base-final syllable

=> If the base-final syllable is light, stress is mostly penultimate.
=> If the base-final syllable is heavy, there is a substantial proportion of final stress and antepenultimate stress.
Determinants of stress shift – a segmental effect of the base-final rime?

• most frequent heavy rimes in the OED data
  - [air]/[ait]/[ai]: 47x
    proportion of stress shift: 11x (23.4%)
  - [eit]/[eiv]/[ei]: 20x
    proportion of stress shift: 8x (40%)
  - [ens]/[ent]: 5x
    proportion of stress shift: 1x

• open question: Do all rimes behave the same?

Weak retraction, long retraction, preservation

  - weak retraction (Hayes 1982: English stress rule):
    The base-final syllable is stressed if it is heavy. If it is light, stress falls onto the penultimate syllable.
  - long retraction:
    Stress on the antepenult of the base; mostly with bases ending in –at (Liberman & Prince 1977)

• ’[...] the stress pattern of the base is almost always retained with –ory’ (Bauer et al. 2013: 301)

The data – CELEX (Baayen et al. 1995)

• long –ory derivatives
  (length of bases ≥ 3 syllables)
    – pronunciation & stress variants
  • 44 different types
    coded for syllable weight and stress, yielding
  • 79 different weight-stress configurations

=> stress is much more variable for –ory than for -able

• a problem for coding stress preservation: unclear bases (cf. below)
The data – paradigmatic problems

- unclear bases: Does –ory suffixation involve stem truncation or extenders (or both)?
- stem truncation assumption: bases are exclusively nouns ending in –ion
  - CELEX, inter alia
  - exceptions: e.g. adulatory (base: adulate)
- extenders assumption: bases are mostly verbs, -at is an added element (terminology in Bauer et al. 2013: ‘extender’)

<table>
<thead>
<tr>
<th>derivative</th>
<th>base option 1</th>
<th>base option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>consolatory</td>
<td>console (v)</td>
<td>consolation (n)</td>
</tr>
<tr>
<td>contradictory</td>
<td>contradict (v)</td>
<td>contradiction (n)</td>
</tr>
<tr>
<td>anticipatory</td>
<td>anticipate (v)</td>
<td>anticipation (n)</td>
</tr>
</tbody>
</table>

Stress retraction?

Base vs. derivative stress, verbal bases

- Stress in the verbal base, counted WITH extension if applicable, N = 79
- Stress in the base, counted WITHOUT the suffix, N = 79

bases: => majority has antepenultimate stress
derivatives: => more penultimate and final stress as compared to the bases
=> differences in stress profiles! There IS stress shift!

Weak Retraction?

predictions of the Weak Retraction rule:
If the final syllable is heavy, stress must be final.

This is only a tendency here! Unexplained: antepenultimate stress

- If the final syllable is heavy, stress is final or antepenult (anticipatory ~ anticipatory, satisfactory, circumlocutory)
- If the final syllable is light, stress cannot be final (*inhibitory)

The Weak Retraction rule is violated by 34.18% of the data

Stress preservation?

- Stress is preserved in 47 of the 79 items (59.5%)
There is stress preservation in –ory derivatives!
- Final stress is always preserved
- The majority of items with penultimate stress have the same stress as their bases
- Antepenultimate stress can be preserved
- Stress shift mostly occurs if stress in the base is antepenultimate

⇒ antepenultimate stress is mostly, but not exclusively, stress preservation
    (exceptions: cóminatory, obligatory, respiratory)
⇒ penultimate stress is mostly stress preservation
⇒ final stress is mostly a result of stress shift

Stress shift vs. stress preservation
- non-shift: ~ 1/3 of the data
- mostly stress shifts from the antepenult to the final syllable

Summary of the case studies
- -able: There is stress shift in stress-preserving processes
- -ory: There is stress preservation in stress-shifting processes
- Both processes show the same effects, but to different degrees
  - antepenultimate stress is avoided
  - most stress shifts: antepenultimate stress in the base becomes final stress in the derivative
  - final stress is constrained by syllable weight
  - Those stress shifts that are discussed in the literature turn out to be extremely rare (of the cómparable ~ comparáble type)
Variability

- Collie (2008): There is systematic variability in secondary stress assignment in derived words.
- This study: There is systematic variability in main stress assignment in derived adjectives ending in
  - *able* and *-ory*.
- Both main stress and secondary stress variability is an interaction of two types of effect:
  - Stress preservation
  - Phonological wellformedness
- These factors are gradient, not categorical.
- Alternative stress patterns arise especially where stress shifts still guarantee the survival of the rhythmic structure of the base (antepenultimate – final stress)

Variability – theoretical implications

- Retraction and preservation are commonly viewed as processes that are independent of each other
  - This does not seem to be the case: Shifts to the antepenult are frequent, shifts to the penult are rare (potential explanation: preservation of rhythmic structure)
- *-able* and *-ory* are commonly viewed to show different morphophonological behaviour
  - The difference is a gradual one
- Stress preservation effects seem to be much more systematic than is often assumed
  - Not restricted to stratum 2 suffixes
  - Systematically constrained: by phonological properties of bases

Variability – lots of questions

- Further testing of extent and scope of stress variability is needed.
- What determines speakers’ choices between alternative stressing possibilities?
  - Frequency effects? (Parallel to Collie’s study of secondary stress)
  - Effects of stress patterns in the lexicon / segmental effects?
- Weight effects: Do all heavy final syllables behave alike or is there an effect of the segmental makeup of that syllable?
- What is the prosodic role of stem truncation (*-able*) and extenders (*-ory*)?
  - Both lead, in effect, to penultimate stress

Thank you very much for your attention!

For comments and questions please don’t hesitate to contact me:
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References


Zamma, Hideki. 2012. Patterns and Categories in English Suffixation and Stress Placement: A Theoretical and Quantitative Study: PhD Dissertation : University of Tsukuba