ENGLISH SYLLABLE STRUCTURE AND VOWEL SHORTENING

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0 Introduction

The present thesis is mainly concerned with English prosodic structure, concentrating on what constituents syllables contain. Later, drawing on a radical approach to syllable structure, I will develop a new analysis for laxing / shortening[1] alternations such as the ones in (1).

(1) divine - divinity
meter - metric
decide - decision
keep - kept
five - fifth
vine - vineyard

The analysis alluded to above is based on Jean Lowenstamm`s (1996: 419) radical claim quoted in (2).

(2) Syllable structure universally, i.e. regardless of whether the language is templatic or not, reduces to CV.

This thesis is organized as follows: in Section 1 I give a sum-up of two theories of English syllable structure: that of generative phonology with the traditional syllabic constituents on the one hand, and that of Government Phonology with government, licensing and charm on the other. In Section 2 I summarize Lowenstamm`s findings and their consequences. Section 3 applies the statements listed in Section 2 to English, to which Section 4 adds my analysis of how *non-laxing* morphological processes take place. Section 5 presents my suggestion saying that the *laxing* processes found in English can be properly represented and understood in terms of (2), and then goes on to overview some of the previous analyses accounting for these phenomena. Then, in Section 6 I spell out the present claim and give a number of examples. Finally, Section 7 sums up the main points of the thesis.

[1] In Received Pronunciation (RP) and General American, the tense-lax distinction is accompanied by the long-short distinction. Although Chomsky and Halle (1968) regarded the phenomena in (1) as laxing processes, the emphasis has gradually switched to the change on the skeletal tier (cf. Section 5). Since the primary concern here is the quantitative change and not the qualitative one, differentiation between *lax* and *short* is irrelevant, therefore these terms are used interchangeably.

1 The English syllable

This section makes an attempt to give a brief account of some syllable structure theories: first a "standard" (generative) description of the usual syllabic constituents; then the account of government and licensing. A third challenge to standard syllabic theory is introduced in Section 2.

1.1 A standard account

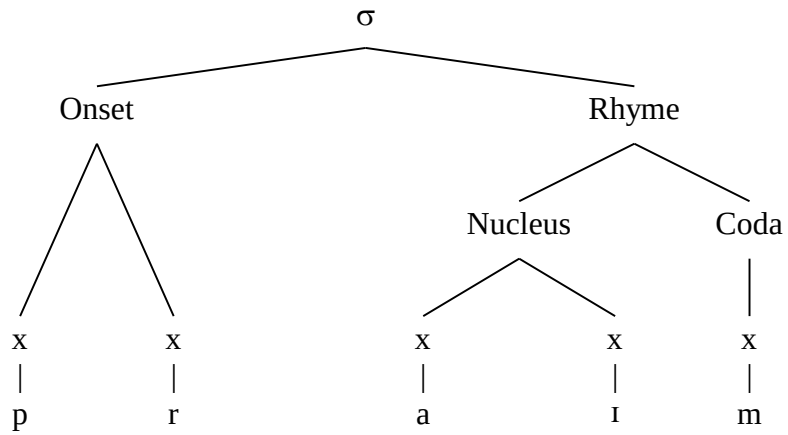
The following overview of English syllable structure is in most part based on Borowsky (1986). Its primary claim is that syllabification is governed by syllabification rules, which are, according to Borowsky (who draws on Steriade 1982), like other phonological rules. In earlier work syllabification rules were considered odd due to their ability to apply cyclically in non-derived environments. However, Borowsky, in agreement with Steriade, says that syllabification rules function as blank-filling/structure-building rules and thus can apply cyclically, moreover, certain syllabification rules may not operate at all levels of the lexical phonology. An example for this is Structure Preservation, which holds no later than level 1, i.e. it turns off before level 2 gets started.

The maximal core syllable[2] for English is shown in (3), taken from Borowsky (1986: 167). For Borowsky, tree structure is not significant; the labels of the constituents have been added by myself.

According to (3), an English syllable may contain at most one position following a long vowel, or two positions after a short vowel - there are three positions in the rhyme. The onset may contain up to two consonants. The basic syllabification rules are in (4).

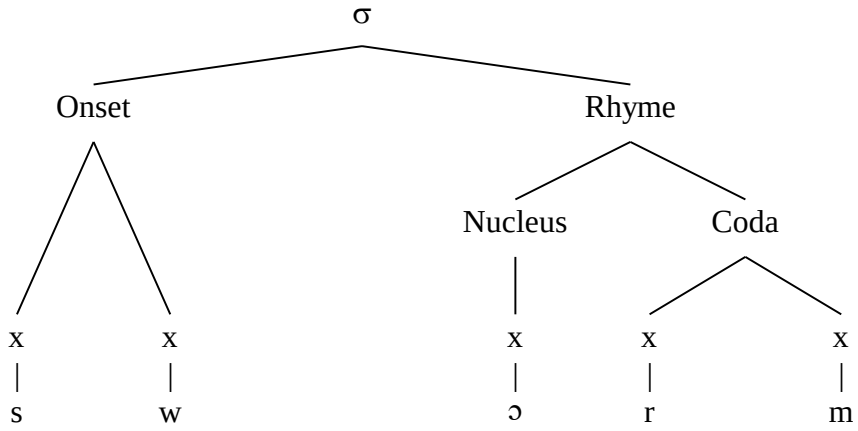
[2]core syllable: the syllable without the affix/appendix (Borowsky 1986: 167)

(3)[3] a.



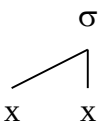
'prime'

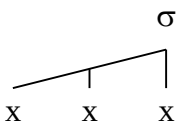
b.

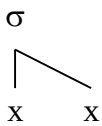


'swarm'

(4) Syllabification rules (Borowsky 1986: 168 based on Steriade 1982)

a. CV rule: 

b. Onset rule: 

c. Coda rule: 

In addition to the core syllable, further constituents, the so-called appendices (or affixes) can be formed. The appendix (or affix) is, by definition, a string of consonants which are:

- not normally allowed in medial position; or
- violations of sonority restrictions; or

[3] Throughout the thesis, the Gimsonian IPA symbols for phonetic transcription are employed unless otherwise indicated. This also means that at certain places the authors' original symbols have been changed. I used the *Longman Pronunciation Dictionary* (1990) for consultation.

- violations on other phonotactic constraints on syllable structure.

There are two appendix rules in English: one adjuncts a single consonant, always /s/, before the core syllable; the other adds a sequence of consonants, all coronals, after the core syllable. Accordingly, the English word has the structure in (5).[4]

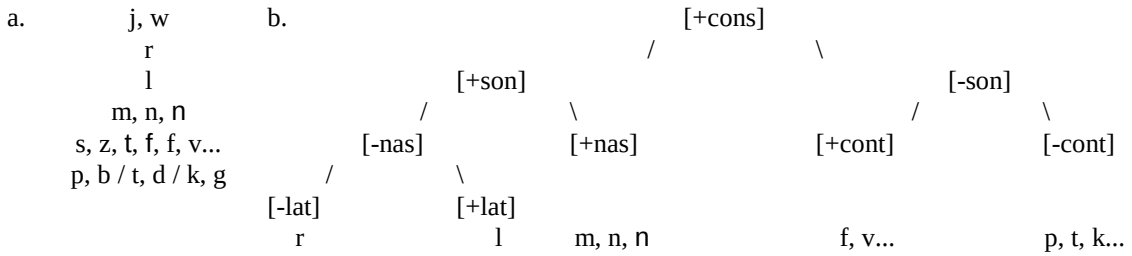
(5) $[(s)\ \sigma^*\ ([+cor])]_W$

1.1.1 The onset

The rules and constraints governing the build-up of the English onset are the following:

(i) Sonority must rise. In (6) the Sonority Scale for the English onset can be found, as well as its projection from the features [son], [nas], [lat] and [cont], set up by Borowsky (1986:173).[5]

(6)



Clusters are subject to a minimum sonority distance of three intervals.

(ii) There are some filters ruling out certain consonant clusters. Three of the filters (7a,b,d) (Borowsky 1986: 174, based on Clements and Keyser's Negative Syllable Structure Conditions) discard of sequences of (almost) homorganic consonants, and can be collapsed into a general filter (7e) as another instance of the Obligatory Contour Principle at work (Borowsky 1986: 175).[6]

(7) a. *[+ lab] [+lab] *bw, pw, fw

b. $*\begin{bmatrix} +\text{cor} \\ -\text{strid} \end{bmatrix}$ [+lat] *dl, tl[7]

---

[4] "*" indicates that any number of the expression can occupy the position in question.

[5] Certain authors consider sonority primitive (e.g. Selkirk 1982). In contrast, Borowsky derives it from features. (For a detailed discussion, see Clements and Keyser 1983)

[6] "*" indicates ungrammatical combinations.

[7] If /r/ is not considered a coronal, this filter can be rewritten as *[+cor] [+cor], says Borowsky (1986: 174) referring to J. McCarthy. However, /r/ needs to be a coronal in order for (7d) to work. Thus (7e) either incorrectly rules out sequences like /tr/ (if /r/ is +cor) or incorrectly allows for /sr/ (if /r/ is -cor).

c. $*\begin{bmatrix} -\text{son} \\ +\text{cont} \\ +\text{voice} \end{bmatrix}$ [+son] *vw, zv, vl, vw

d. $*\begin{bmatrix} +\text{strid} \\ +\text{cor} \end{bmatrix}\begin{bmatrix} +\text{cor} \\ +\text{low} \end{bmatrix}$ *sr

e. *[α F] [α F] (where F = place feature)

(iii) If we have a branching onset, the first member of the cluster can not be:

- a nasal. This is a natural consequence of the sonority constraint in (i). Nasals are too sonorous to be followed by another sonorant three intervals away on the sonority scale.

- /tt/ or /df/. An explanation for this is provided by Clements and Keyser (1983). They say that these segments are complex, therefore they cannot be combined with another segment in the onset.

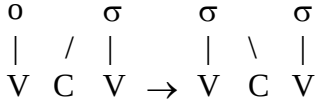
- /v/, which is considered by Borowsky an accidental gap (1986: 170). Although the three interval rule gets rid of clusters closer in sonority than /vr/ (cf. the Sonority Scale in (6)), the remaining clusters are also ruled out by filter (7c).

(iv) If we have a non-branching onset, its single consonant cannot be:

- /ŋ/, which is not surprising, as it is not an independent phoneme but emerges from the assimilation of a nasal and a velar.

- /ʃ/. Its restricted distribution can be attributed to the fact that it is not a "native" segment but borrowed mostly from French. Apparently, it does occur word-internally in onset position, in words such as *azure* or *measure*, but in all of these cases resyllabification (8) pulls it into the coda of the preceding stressed syllable. Thus Borowsky (1986: 172) offers an idiosyncratic constraint on the distribution of /ʃ/: *[$_{\sigma}$ ʃ

(8) Resyllabification (Rubach 1996: 218)



(v) As stated earlier, there are at most two positions in the onset.

1.1.2 The appendix

I have already defined the concept of the appendix (or affix) in the English syllable. The fact that appendices are not part of the syllable at all, or not part of it in the

same way as the constituents of the core syllable are, can be best supported by their ability to violate each of the constraints both on the onset (cf. 1.1.1) and the coda (1.1.3). We could, of course, weaken the constraints and increase the number of possible positions in the syllable, thus get rid of appendices altogether, but then we would lose the answers, available within the appendix theory, to these questions:

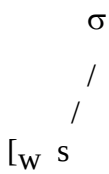
- Why does /s/, and only /s/, violate all syllable structure constraints word-initially, and only word-initially, and never medially?

- Why do coronals, and only coronals, violate all syllable structure constraints word-finally, and only word-finally?

Therefore the obvious approach is that these exceptional segments are odd because they are outside the core syllable, and only later do they become part of either the syllable (Borowsky's standpoint) or the word (Steriade's standpoint) by stray segment adjunction.[8]

In English we have two appendix rules: adjunction of initial /s/ on the one hand (9a), and that of final coronal clusters on the other (10a). The latter rule is iterative. (9b) and (10b) represent Steriade's approach.

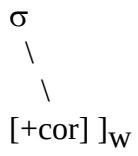
(9) a. Adjunction of /s/ to the syllable (Borowsky 1986: 179)



b. Adjunction of /s/ to the word (Steriade 1982 in Borowsky 1986: 179)

$[_W$ s σ*]

(10) a. Adjunction of final coronals to the syllable (Borowsky 1986: 180)



b. Adjunction of final coronals to the word (Steriade 1982 quoted in Borowsky 1986: 180)

$[_W$ σ* [+cor]*]

[8]For initial *sC* clusters, some authors (e.g. Selkirk 1982) offer a different account, saying that these are single complex segments (cf. Borowsky 1986: 177).

In Borowsky's view, the two appendix rules are prevented from applying before Level 2 by Structure Preservation.

1.1.3 The rhyme

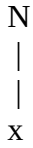
The rules and constraints governing the build-up of the English rhyme are the following:

(i) Sonority must decrease from the nucleus outwards. The coda can be characterized by the same sonority scale used for the onset in (6). The difference here is that there are no restrictions on the sonority interval within the cluster on condition that there is a sonority fall.

(ii) There are maximally three positions in the rhyme - i.e. at most two positions in the coda: a liquid plus any consonant of lesser sonority.

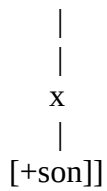
(iii) The Rhyme Rules include the Nucleus Rule (11) and the Coda Rule (14) (Borowsky 1986: 184).

(11) The Nucleus Rule:



At level 1 of the lexical phonology the Nucleus Rule only applies to vowels since there are no underlying syllabic consonants in English. At level 2, when Structure Preservation does not hold any more, word-final sonorants may occupy the nucleus position by Sonorant Syllabification (12a) (Borowsky 1986: 185).

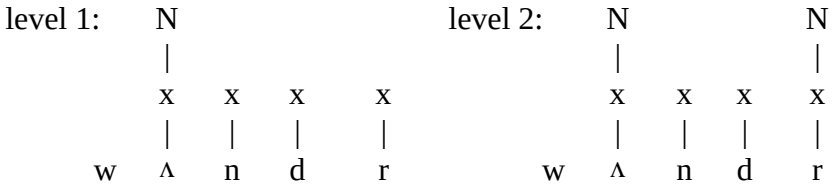
(12) a.



b. [+son] → [+syll] / C__ #

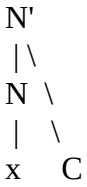
However, neither rule (12a) nor the standard formulation in (12b) is enough to determine the circumstances of Sonorant Syllabification: it should be pointed out that syllabic sonorants are created when there is no adjacent segment of greater sonority (cf. Borowsky 1986: 188). As an illustration, the assignment of nuclei in the word "wonder" is given in (13) taken from Borowsky (1986:186). At level 1, the only vowel [ʌ] becomes a nucleus, and the word-final sonorant [r] must wait as long as level 2 for syllabification.

(13)



At the level when segments are “phonetically” interpreted, the Nucleus Rule may make any segment syllabic, like [k] in "c'pacity" or [s] "s'nority". However, cases such as "damn" (why is /n/ deleted and not syllabic?) and "sign" (why is /n/ incorporated at level 2 and /g/ deleted?) suggest that the Coda Rule (14) applies first, and Sonorant Syllabification only takes place when nothing else can (cf. Borowsky 1986: 189).

(14) The Coda Rule:



(iv) There are some constraints on clusters in the coda, although they are less severe than those on the onset (e.g. there is no restriction on the minimum sonority distance between adjacent segments). The table in (15) gives a summary of the possible consonant clusters with some examples.[9]

The combinations marked with a minus sign are unattested due to the sonority condition (cf. 1.1.3.(i)). Asterisks denote accidental gaps. The box with a shading has to be referred to Voiced Obstruent Deletion (16). /s/ as the first member of the coda is affected by lexical voicing assimilation, so no /s/ + voiced obstruent clusters occur.

[9] The table has been constructed on the basis of Borowsky (1986). The examples have been added by myself. Borowsky’s description lacks dealing with nasal + nasal clusters, so the minus sign in the relevant cell has also been supplemented by myself. In addition, affricates are missing, too, again due to Borowsky’s incomplete treatment of the topic. As for affricates, I assume that they have to be preceded by a sonorant as in *bulge, march, change, lunch*.

(15)

2nd member 1st member	liquid	nasal	coronal fricative	other fricative	coronal stop	other stop
liquid	OK *earl*	OK *arm*	OK *else*	OK *dwarf*	OK *art*	OK *harp*
nasal	-	-	OK *mince*	*	OK *ant*	OK if -voice *limp*
fricative (other than /s/)	-	-	OK *fifth*	*	OK *lift*	*
/s/	-	-	*	*	OK *best*	OK *grasp*
stop	-	-	-	-	OK *apt*	*

The rule of Voiced Obstruent Deletion (16) explains tautosyllabic *g/b* deletion in cases like the suffix *-ing* or words e.g. *comb*. Since in the English syllable all syllable-final coronals are in the appendix, they are not deleted by (16).

(16) [-son, +voice] $\rightarrow \varnothing$ / N __ $]_{\sigma}$

Another piece of evidence for the coronal appendix is provided by the fact that there are rather few constraints on the appearance of coronals in the second slot of the coda - in fact, there are no constraints on coronal stops. As to coronal fricatives, they can only be rejected due to sonority, or a form of homorganic "distraction": /s/ "does not like" other coronal fricatives. All these facts suggest that at level 1 final coronals are not part of the coda but are independently linked to either the syllable or the word as an appendix. Thus, the coronal column of table (15) is irrelevant, at least at level 1. In addition, at level 1 no fricatives and stops can occupy the first position in a coda cluster, owing to sonority, coronal appendices and accidental gaps.

Since Borowsky's main concern is American English, the present analysis must be supplemented with a look at /r/: in RP it cannot constitute a coda alone, since each coda must be followed by the onset of the next syllable (cf. (v) below), and it is automatically deleted before a consonant. For the same reason, it cannot occupy the first position in a coda cluster; and the sonority restriction prevents it from appearing as the second member of a cluster.

(v) Any consonant is only syllabified into the coda at level 1 if it is followed by an onset; otherwise, it goes into the onset (according to the onset Maximization Principle), or if it is in a word-final position, it is extrametrical. Extrametrical final consonants are associated to the syllable at the word level by the Coda Rule (14). Therefore, all final consonants as well as all appendices are extrametrical (unless marked as non-extra-metrical).

1.1.4 The Coda Condition

Borowsky (1986: 205) assumes that the third position of the English rhyme is constrained by the Coda Condition (17a) at level 1. (17b) gives the same condition, as expressed by Itô (1989).

(17) a. English Coda Constraint

*x x x] $_{\sigma}$

|

[+cons]

b. Coda Filter

*C]$_{\sigma}$

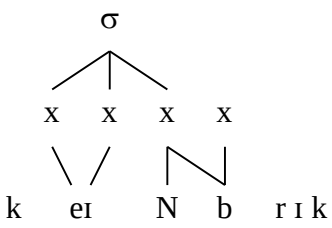
|

[PLACE]

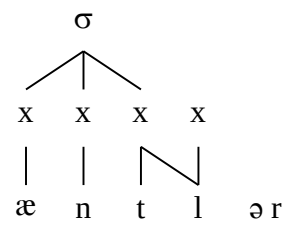
According to (17), singly linked consonants are banned from syllable-final position at level 1. Thus, not only does a coda have to be followed by an onset but they also have to share the place node. Borowsky (1986: 207-8) gives some examples. 'cam.bric' (18a) and 'ant.ler' (18b)[10] are okay since in both words the final consonant of the first syllable is homorganic with the onset of the following syllable (labial, and coronal, respectively). However, 'arc.tic' (18c) is a counterexample as /k/ is not homorganic with /t/.

(18)

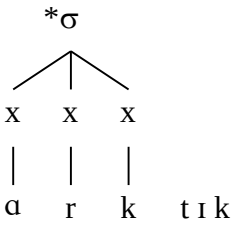
a.



b.



c.



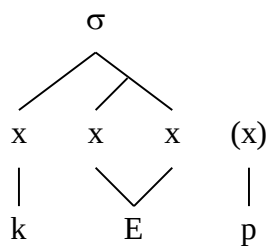
The coda condition does not hold: (i) after level 1 (since Structure Preservation is not in force any more); (ii) of word-final positions (final consonants are extrametrical and therefore not available on the first cycle). Thus, in a word like 'keep', the final /p/ cannot be syllabified at level 1 due to the coda condition as well as extrametricality (Borowsky 1986: 210) (19a). However, at level 2 Structure Preservation (and at the same

[10] The representation of *antler* is misprinted in Borowsky (1986: 207) as **an.tler*.

time the coda condition) is turned off, and the syllabification of the final consonant is possible (19b).

(19)

a.



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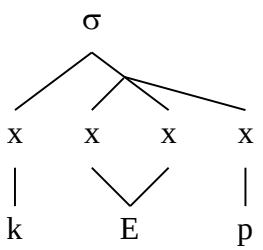


1.2 Syllabic constituents in Government Phonology

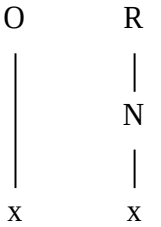
The following account is based on Kaye, Lowenstamm and Vergnaud (1990) (henceforth KLV), Harris (1990) and Charette (1992).

1.2.1 Government and charm

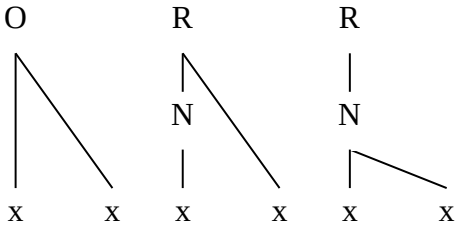
In Government Phonology some drastic changes have occurred. First, the syllable ceased to function as a constituent. Instead, there is a tier consisting of onsets and rhymes. The third syllabic constituent is the nucleus. (The coda is not a constituent, either; the post-nuclear rhymal position exists but does not have the status of a constituent.) All syllabic constituents are governing domains[11] and therefore maximally binary. Thus, the possible configurations of syllabic constituents are given in (20) (KLV: 199).

(20)

a. Non-branching:



b. Branching:

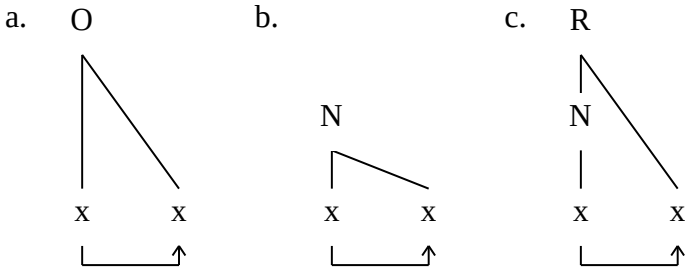


The melodic content of the constituents is determined by the governing and licensing relations holding between them. Governing relations are established at three levels of structure (cf. Harris 1990: 271):

[11]Government = binary, asymmetric relation holding between two skeletal positions (KLV: 198)

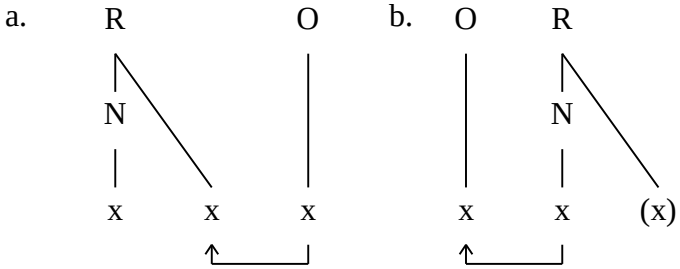
(i) within constituents. Constituent government is strictly local (i.e. the governor is adjacent to the governee) and strictly directional (head-initial). It can be found in the following cases:

(21)



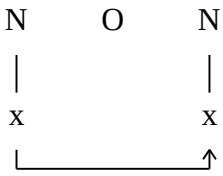
(ii) between constituents. Interconstituent government is strictly local and strictly directional (head-final):

(22)



(iii) between the nuclear heads of constituents (at the level of nuclear projection). This is local, though not strictly local: nuclei are adjacent on their projection only. The directionality of this kind of relation is parametrically defined and reflected in phenomena like tone, stress, harmony and syncope.

(23)



Government Phonology operates with unary melodic elements, which have charm values to designate their potential place in the syllabic hierarchy (see (24) based on Harris 1990: 264). Charmed segments may occupy governing (but not governed) positions (positively charmed segments go into nuclear, negatively charmed segments go into non-nuclear positions), whereas charmless segments can occupy governed positions, too.

(24) Salient properties[12] of elements

A^+ (non-high) U^0 (labial) I^0 (palatal) ɪ^+ (ATR) v^0 (*none*)

N^{+13} (nasal)

R^0 (coronal) $?^0$ (occluded) h^0 (noise)

H^- (stiff vocal cords) L^- (slack vocal cords)

Thus, (25a) is a well-formed branching nucleus conforming to (21b), whereas (25b) is not since it has a positively charmed element (A^+) in a governed position.

(25)

a. aɪ b. *ɪa

1.2.2 The Complexity Condition

The Complexity Condition was originally introduced for cases where charmless segments are in both the governing and the governed positions. Later Harris (1990) extended it to all segments, irrespective of their charm values. It is given in (26) (Harris 1990: 274).

(26) Complexity Condition

Let α and β be segments occupying the positions A and B respectively. Then, if A governs B, β must be no more complex than α.

---

[12] I.e. the marked properties of the elements which they contribute to the expression when they are fused with other elements as operators.

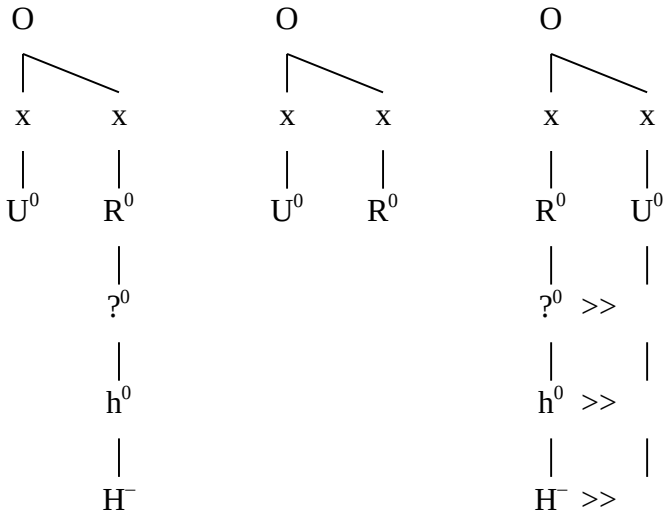
[13] The charm value of the nasal element (N) is not straightforward in the literature. Harris (1990), on which the present summary is based, says it is positively charmed, which contradicts the assumption that charmed elements can occupy governing positions only. Although Harris makes use of "+" and "-" values in the same way as they are employed in e.g. electric polarity - i.e. identical values distract each other (for example, this is why fully low ATR vowels are absent in the world's languages), this is also problematic since it incorrectly predicts that the element A cannot combine with N (i.e. low vowels cannot be nasalised). The problem is therefore raised by the distinction between positive and negative charm: since N can occupy both nuclear (in nasalised vowels) and non-nuclear (in nasal consonants) positions, we encounter contradiction either it is negatively or positively charmed. Kaye (1995: 309), on the other hand, says it is charmless, which is supported by the fact that N can occupy governed positions, too (see (28a)). Perhaps this problematic nature of charm theory motivated Harris (1990) to replace it with the Complexity Condition (cf. 1.2.2).

1.2.2.1 Branching onsets

In branching onsets, (26) requires a downward complexity slope (equal complexity disallowed) and the governee can contain no more than two elements. In addition, there is a limit on shared segmental material: the segments can be bound for at most one element. Accordingly, (27a, b and c) are ungrammatical because of an upward complexity slope, equal complexity, and too many shared elements, respectively.

(27)

a. *wt- b. *wr- c. *tp-

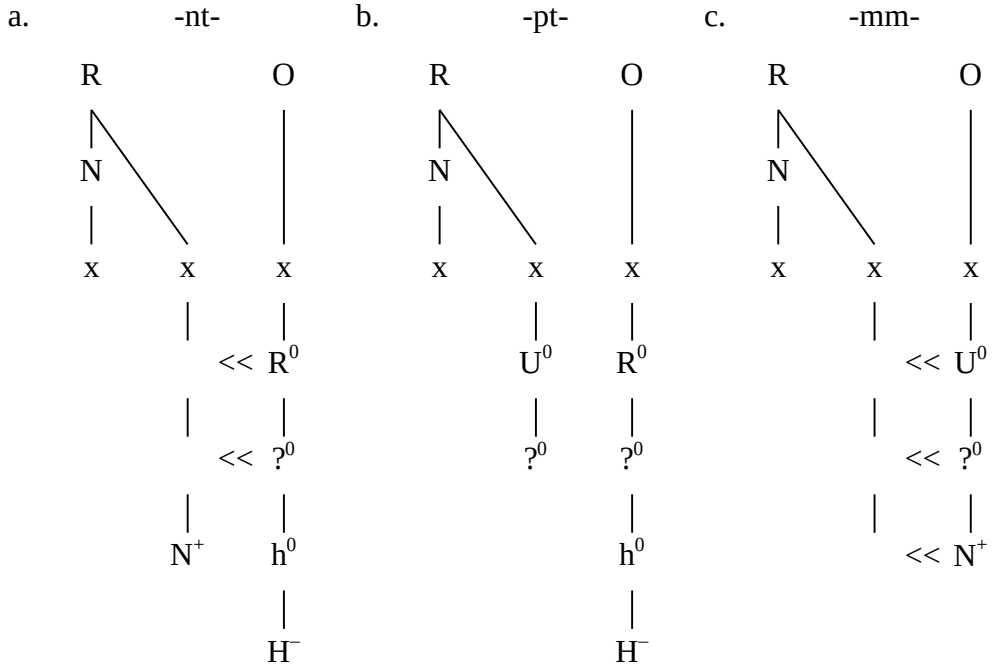


(27c) shows that the two constraints (the limit on shared material and the ban on equal complexity) often overlap each other since *tp-* is rejected by both.

1.2.2.2 Interconstituent government

Between two constituents, an upward complexity slope is needed, without any limit on shared material (28). Zero complexity differential accompanied by complete identity yields geminates (rare in English, on the surface at least, cf. 3.2) (28c).

(28)



1.2.3 "Coda" licensing

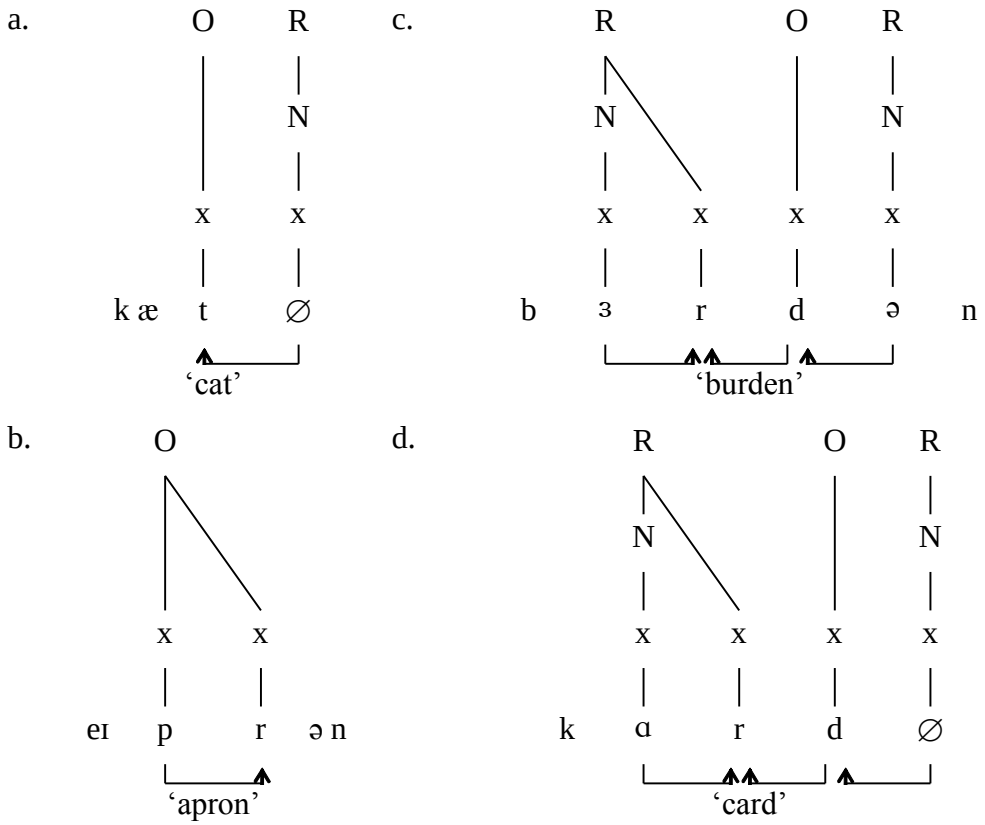
Harris (1990: 272), repeating the original concept by Kaye (1990), writes: "A post-nuclear rhymal position must be licensed by a following onset." This statement is similar to Borowsky's (see 1.1.3 (v)). Its essence is that the position previously called "coda" cannot be filled unless it is followed by another consonant, which is the onset of the following syllable. Therefore, a single consonant in an intervocalic position goes into the onset of the syllable whose peak is the second vowel (Onset Maximization Principle) (29).

(29) Syllabification of 'atom'

ætə(m) → æ.tə.(m)

A single consonant in a word-final position constitutes the onset of an empty nucleus. Empty nuclei are direct government licensers in English, i.e. they can give licence to their onsets to govern melodic material (cf. Charette 1992). A word like 'cat' is syllabified 'ca.t'; the syllabic structure and government relations are presented in (30a) (only the relevant information is indicated).

(30)



(30b) and (30c) show the possibilities for consonant clusters. If government (based on charm and/or complexity) advances from left to right, i.e. the first consonant governs the second one, we have a branching onset (30b). If, however, the second consonant governs the first one, it is a single onset, licensing a "coda", i.e. a post-nuclear adjunct (30c). This consonant cluster may be found word-finally as well; in this case, the governor of the onset is an empty nucleus (30d).

The concept of word-final onsets has been supported by various arguments coming from the similar behaviour of word-internal onset positions and word-final consonants (for a detailed analysis, see e.g. Harris 1992).[14]

2 A summary of Lowenstamm`s claims and what follows from them

For ease of reference, statement (2) is repeated in (31).

[14] The standard account (see 1.1), however, does not predict such a similarity.

(31) Syllable structure universally, i.e. regardless of whether the language is templatic or not, reduces to CV. (Lowenstamm 1996: 419)

(31) has a number of consequences, some of which Lowenstamm himself mentions in his article:

(i) A language which does not tolerate empty segments will exhibit regular alternances of consonants and vowels; a language which does tolerate empty segments will have apparent consonant clusters and geminate consonants straddling an empty V position as well as long vowels and diphthongs straddling an empty C position. (Cf. Lowenstamm 1996: 420ff.)

(ii) Syllable structure for all languages becomes extremely universal.

(iii) Syllable structure for all the words in a language becomes identical. Therefore, the notion of resyllabification loses its relevance (cf. Lowenstamm 1996: 423) and the requirement of prosodic structure preservation, given in (32), is fulfilled.

(32) Prosodic Structure Preservation (Harris 1992: 366)[15]
Conditions on prosodic structure holding of lexical representation also hold of derived representations.

Accordingly, all syllables in the words of a given language have one and the same syllable template, CV, both in lexical and derived representations.

(iv) Lowenstamm (1996: 431), in the course of his reasoning, arrives at the prediction repeated here as (33):

(33) If a language has long vowels, it has geminate consonants, and vice versa.

Although this statement might seem improbable in the case of languages like English, which have long vowels but no phonetic basis for assuming geminate consonants, even Lowenstamm (1996: 432) points out that in such languages geminates must have virtual status.[16]

[15] It is not to be confused with the standard interpretation of Structure Preservation, the essence of which is that a transformation should not be able to create or destroy structure, but only to move material around.
[16] Virtual status means latency, i.e. the segment in question surfaces in certain environments but does not in others.

(v) Not only a member of a geminate consonant, but also single consonants can occupy a C position virtually. (Cf. Lowenstamm 1996: 435)

(vi) The standard principles of Government Phonology are no longer appropriate to license the increased number of empty positions. A proper description of the relations between the constituents is, however, beyond the scope of the present analysis.

3 English as a CV language

If we assume that all the syllables in English words have the structure CV, i.e. a non-branching onset plus a non-branching nucleus, then we have to prove that the following claims, based on (i)-(v) above, hold of English, too:

(a) On the basis of (i) above, since English does not exhibit strict alternances of consonants and vowels (i.e. it has consonant clusters and long vowels), it must tolerate empty segments.

(b) On the basis of (i) and (a) above, English must have empty V positions straddled by consonant clusters and geminate consonants (for the latter, see (c)) as well as empty C positions straddled by long vowels and diphthongs.

(c) On the basis of (iv) above, since English has long vowels, it must have geminate consonants as well. These may be virtual geminates.

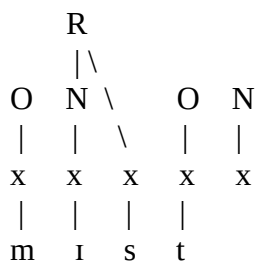
(d) On the basis of (v) above, there can be single latent (virtual) consonants in English, in addition to virtual geminates.

In this section, I take these points, i.e. empty segments, virtual geminates and single latent consonants in English, one by one.

3.1 Empty segments in English

Empty nuclei play an important part in Government Phonology. In English, domain-final empty nuclei are licensed and are direct government-licensers (Charette 1992; Harris 1992, cf. 1.2.3). Thus, a word like *mist* is represented as seen in (34).

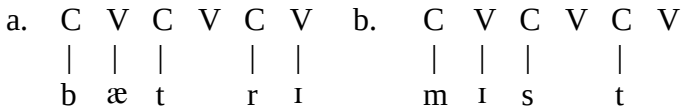
(34)



(Harris 1992: 369)

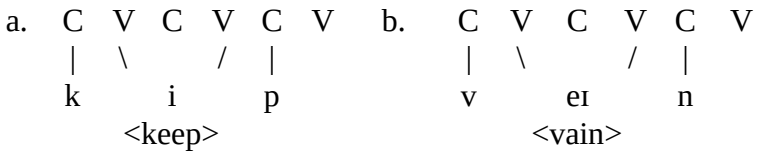
There has also been some evidence in other fields of phonology, not treated explicitly by Government Phonology, that all English words end in a vowel. For example Burzio (1994), a challenger of Metrical Phonology, states that all words that end in a consonant on the surface have a final empty nucleus. Therefore, the only radical claim here as to empty nuclei is that they also exist word-internally *after each consonant*, and not only in fast speech effects like <batt`ry> where ` indicates an empty nucleus (cf. Harris 1992: 374), see (35a). Accepting this view, we can represent the word *mist*, analogously with Lowenstamm`s examples, as in (35b).

(35)



As far as empty C positions are concerned, they are direct consequences of Lowenstamm`s representation of long vowels, which is adapted to English long vowels and diphthongs in (36). In this paper I treat diphthongs analogously to long vowels. Without paying attention to their inner structure, I only emphasize that they occupy two V positions. Accordingly, (36b) is a representation similar to (36a).

(36)



3.2 Virtual geminates in English

Several authors have realized that English has underlying geminates which surface as single consonants. These scholars were in most cases motivated by the

anomalies of stress placement in English. In SPE, Chomsky and Halle conclude that words like *cerebellar, morbillous, medullar, armadillo, vanilla, umbrella* etc. contain geminate /ll/ (as spelling indicates), and a special rule of the grammar of English simplifies geminate sequences of consonants (which they give as Rule (67) on p.46 and Rule (156) on p.148).

In recent research this view has again reemerged, e.g. in Burzio (1994). Since he is also dealing with English word stress, his reason for introducing latent geminates is to yield metric feet that are well-formed in his system, i.e. bisyllabic feet in which the first syllable is heavy[17]. In this way, he obtains syllabifications like (map.p∅) for *map* or ber(lin.n∅) for *Berlin*.[18] His derivation of irregular past tenses is demonstrated in (37).

(37) a. (kee.p∅) + d∅) → (keep.d∅) → assimilation plus shortening → (kep.t∅)

b. (hi:.de) + d∅) → (hi:d.d∅) → shortening → (hid.d∅)

In the present essay I only make use of latent (virtual) geminates in irregular past tense forms such as in (37). In that case, the presence of the past tense suffix -d can explain shortening in morphological terms, too. Thus, the shortening of the vowel takes place as a "closed syllable shortening" phenomenon, as it has been defined in the classic terminology[19]. In all the other words like *map* or *Berlin*, no such justification for geminates is available.

3.3 Single latent consonants in English

The only latent consonant I am treating here is word-final and preconsonantal *r*, which is always pronounced in the rhotic accents of English, but only prevocalically in the non-rhotic ones. Of course, these *r*`s are only latent in the non-rhotic accents, especially Received Pronunciation, which is my primary concern. Evidence for the latent *r*`s in word-final (*hear*, 38a) and preconsonantal (*heard*, 38b) positions is provided by

[17] Burzio denies the existence of monosyllabic feet.
[18] Brackets indicate foot boundaries, ∅ stands for null-vowels. Burzio uses a combination of spelling and phonetic transcriptions; here I follow Burzio's practice of representation.
[19] A similar analysis can be found in Myers (1987: 491-4).

the rhotic accents[20] on the one hand and by prevocalic "linking" (*hearing*, 38c) on the other.

(38) a. CVCVCV b. CVCVCVCV c. CVCVCVCV

\ / |	\ / | |	\ /| | |
h ɪə (r)	h ɜ (r) d	h ɪə r ɪ ŋ

In the following account, for ease of representation, latent /r/'s are omitted in words like (38a,b) and they are only given where they are realised in RP (cf. 38c).

The existence of other latent consonants in English (e.g. the so-called "intrusive *r*", or /p/ in words like *assumption*, cf. Myers 1987: 489) is a matter of further examination and lies beyond the scope of the present paper.

4 A description of regular (non-laxing) processes in English

By regular (non-laxing) morphological processes I mean all the suffixations which change neither the quantity nor the quality of the stressed stem vowel. As it is normal with linguistic phenomena, the examples of this regular pattern are much more numerous, this implementation is much more productive than the irregular one. To represent the regular processes, I have chosen a consonantal suffix (the regular past tense -<u>d</u>), a suffix which begins with a vowel (-<u>ing</u>) and two compounds (*courtyard* and *notebook*). The analytic application of these suffixes and compounding result in a simple attachment without any modification in the stem, shown in (39).

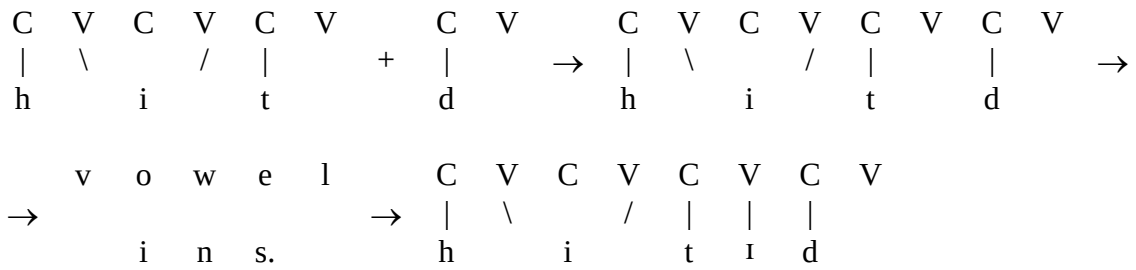
(39) a. step + -d

C	V	C	V	C	V		C	V		C	V	C	V	C	V	C	V					
|		|	|	|		+	|		→	|		|	|	|		|		→		
s		t	e	p			d			s		t	e	p		d						

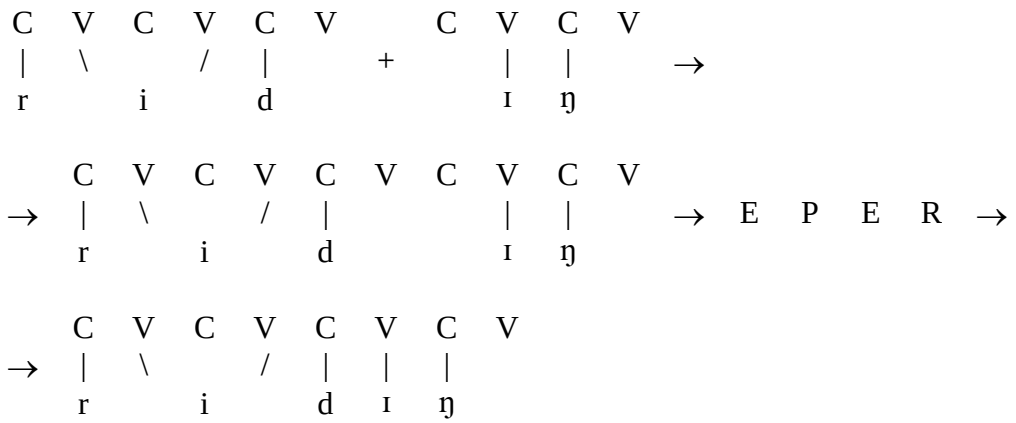
	v	o	i	c	e		C	V	C	V	C	V	C	V								
→						→	|		|	|	|		|							
		a	s	s.			s		t	e	p		t									

[20] Although the question whether we can use arguments from one accent in describing another makes it weak evidence.

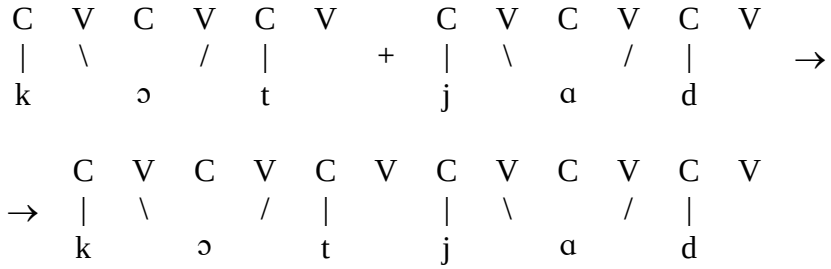
b. heat + -d



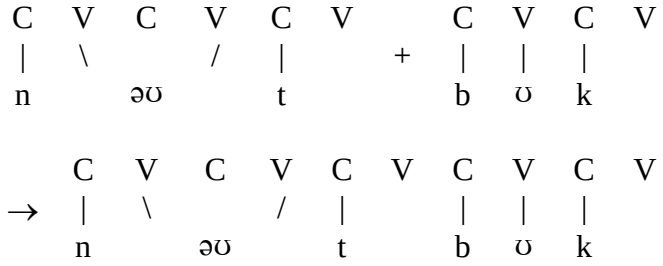
c. read + -ing



d. court + yard



e. note + book



In (39a-b) the use of the regular past tense suffix is represented, together with some of the accompanying phenomena, obstruent voice assimilation and vowel insertion (this latter is, in the present framework, the melodic realisation of the existing V

position. The conditions under which these accompanying phenomena occur are beyond the scope of the present thesis.) (For a further example of regular past tense, see (38).) In (39c) we can see -ing suffixation. Notice that when a suffix beginning with a vowel (i.e. with an empty C position) is attached to a stem ending in a consonant (i.e. in an empty V position), two empty positions meet. In this case stray erasure, defined in (40), gets rid of them.

(40) Empty Position Erasure Rule (EPER)[21]
Two or more adjacent empty positions, regardless of whether they are C or V positions, are deleted.

(39d-e) show compounds.

However, a remark is in order here. Suffixes can be classified into three groups according to their behaviour. The first group is that of the non-laxing (or rather "never-laxing") ones, a good example of which is -ing (39c). We can say that these are analytic suffixes[22]. The second group comprises suffixes that are either regular or irregular, the choice being random and stored in the lexicon. For instance, the past tense marker is in most cases regular (cf. (39a-b)), however, the lists in English dictionaries and coursebooks show that there are quite a few examples of irregular, "strong" verbs, and in a number of these cases we have shortening (see (59b-d))[23]. The evident solution for this group of suffixes is, as adapted to the past tense, that in fact we have two -d's, -d_1 and -d_2, where -d_1 is non-analytic and causes shortening, -d_2, on the other hand, is analytic and has no effect on the stem vowel. (For the attributes of non-analytic suffixation (e.g. floating segments) and the principles accompanying it (e.g. No Sharing) see Section 6.)

The third group, of course, includes suffixes that are always irregular, with the classic -ic as an example. All of these are non-analytic suffixes.

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[21] If we assume the principles of Government Phonology to hold in the present framework, EPER (40) violates the Projection Principle, defined by KLV: 221 (60). However, (40) is not the only rule to do so; Kaye (1995: 317) also mentions a case where adjacent empty skeletal positions (an empty nuclear position together with the following onset) are deleted.

[22] In the sense used in Kaye (1995).

[23] Kaye (1995) says that irregular past tense forms (except for a small set including *sold, told, dreamt*, which he says are analytic past tense forms, cf. Kaye 1995: 330 Note 25), as well as other shortening phenomena in English, cannot be derived but the alternating pairs of words are stored in the lexicon as separate entries; non-analytic morphology is invisible to the phonology. This contradicts the stance taken in the present analysis.

5 Laxing processes in English

The main point of this thesis is an assumption given in (41) aiming to explain the laxing processes found in English in terms of Lowenstamm`s CV framework.

(41) All the laxing processes in English are cases of suffixation, where the suffix occupies, in an irregular manner, the last syllable of the stem, thus tucking it into a shorter string of syllables, which results in delinking, i.e. shortening/laxing.

Let us consider first some of the previous solutions for laxing in English.

5.1 Laxing in SPE

The generative research on English was originally begun by Chomsky and Halle (1968, henceforth SPE). They assumed that the instances of shortening followed from three rules (42a-c), which could be collapsed as (42d).

(42) a. Trisyllabic Laxing

$$V \rightarrow [\text{-tense}] / \_\_ \; C \; (C_1+) \; [V, \text{-stress}] \; C_0 \; V$$

b. -ic/-id/-ish Laxing

$$V \rightarrow [\text{-tense}] / \_\_ \; C_0 + ic/id/ish$$

c. Cluster Shortening

$$V \rightarrow [\text{-tense}] / \_\_ \; CC$$

d. SPE Rule 19, page 180

$$V \rightarrow [\text{-tense}] / \_\_ \; C \quad \begin{cases} C_0 + k \begin{Bmatrix} k \\ d \\ t \end{Bmatrix} & \text{(a)} \\ (C_1+) \begin{bmatrix} \text{-stress} \\ V \end{bmatrix} C_0V & \text{(b)} \end{cases}$$

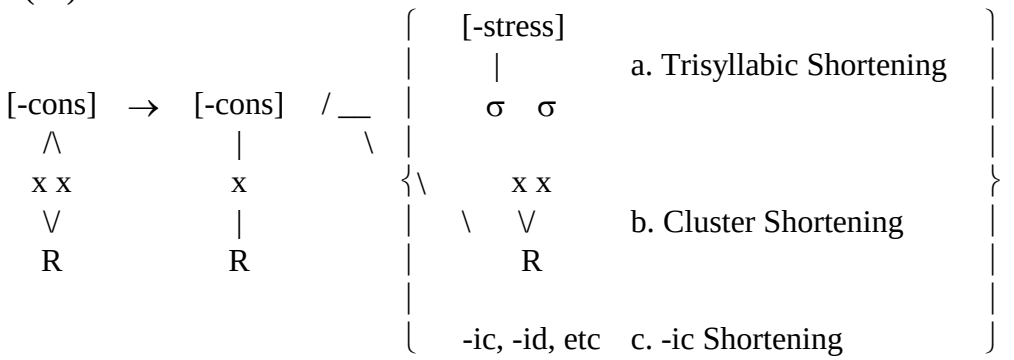
By these rules, a stressed vowel becomes lax before a stressless nonfinal syllable (42a) and before the laxing suffixes (42b). (42c) accounts for closed syllable shortening. However, these rules have two serious drawbacks. First, they lack the motivation for the change as well as the important generalization, discovered (although defined in different terms) by several authors ever since SPE, that all the examples of laxing result from a

common source. Second, the SPE rule of laxing fails to account for a number of cases such as *abundant* or *contrapuntal* (see (60a) below) listed by Chomsky and Halle themselves.

5.2 A revised version from 1985

Halle and Mohanan (1985: 77) have the same three-part rule (see (43)), though more emphasis falls on the quantitative change.

(43)



The significant recognition, that the three SPE-rules can be reduced to one general statement, came in 1987, when two independent works appeared, one by Moira Yip, the other by Scott Myers.

5.3 Yip's analysis

Yip (1987) discovers that the only vowel that can occur in a monosyllabic laxing suffix is /i/. Departing from this, she states that all shortening cases derive from Pre-cluster Shortening (44), with the vowels in the English suffixes being epenthetic.

(44) $V \rightarrow \varnothing / V \_\_ CC$

Thus the suffixes -ic, -id, -ish and -ity are represented underlyingly as in (45a), the derivations of the words *conic* and *divinity* are in (45b) and (45c), respectively.

(45)

a.
C	C	C	C	V
|	|	|	|	|
k	d	ʃ	t	ɪ

b.
C	V		V	C	C		C	V	C	C
|	\		/	|	|	→	|	|	|	|
k		əʊ		n	k		k	ɔ	n	k

c.
C	V	C	V		V	C	C	V		C	V	C	V	C	C	V
|	|	|	\		/	|	|	|	→	|	|	|	|	|	|	|
d	ɪ	v		i		n	t	ɪ		d	ɪ	v	ɪ	n	t	ɪ

The surface representations are then derived by Vowel Insertion. Since Cluster Shortening is cyclic, Yip can account for the lack of shortening as well: in cases like *chamber*, both consonants are morpheme-internal and so shortening cannot take place.

For -<u>ion</u> shortening, however, Yip's theory requires an extra rule, which is Unassociated V Shortening (based on Rubach (1984)'s /i/-shortening), resting on the following assumptions:

(a) -<u>ion</u> is underlyingly -<u>yon</u> (since it causes palatalisation),

(b) underlying /i/ is the totally unspecified vowel,

(c) -<u>ion</u> shortening only occurs if the target vowel is /i/.

Unassociated V shortening is given in (46)[24].

(46) $\underline{V} \rightarrow \varnothing \; / \; \underline{V} \_\_ \; C \; \underline{X} \; V$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad |$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad$ [-cons]

(46) does not only account for cases like *divide/division*, but also for other examples such as *Cyprus/Cypriot* (cf. Rubach 1996: 201). What Yip cannot explain is Pre-u Laxing and the similar phenomena, all of which are caused by vowel-initial suffixes with vowels other than /i/[25]. The basic problem for Yip is, however, raised by her vowel insertion rule. To avoid vowel insertion in words where it does not take place, e.g. *script, fifth, health, felt, meant*, a complex cooperation of several other rules (e.g. Voice Assimilation and Revoicing), expressed in an unnatural format, is needed. This

[24]Underlining denotes unassociated segments.

[25] This fact was not only pointed out by Rubach (1996) but as early as in Myers (1987: 510, Footnote 21), too.

adds to the complexity of the grammar, still, a number of data remain unaccounted for. (For a detailed description and evaluation, see Rubach 1996: 202-4.)

5.4 Myers's analysis

In contrast to Yip, Myers (1987) works in a syllable-based framework.[26] Apart from words such as *kept*, where closed syllable shortening is evident, Syllabic Shortening (47) takes place after Resyllabification (8) has taken effect, i.e. the onset consonant has been moved into the coda of the preceding stressed syllable. Thus, a word like 'di.vi.ni.ty' is resyllabified as 'di.vin.i.ty' - the stressed syllable is now closed and (47) is triggered.

(47) $V: \rightarrow V / \_\_ C]_{\sigma}$

However, some amendments are needed here, too. In addition to Final Extrametricality, Myers needs Suffix Extrametricality, to which the laxing suffixes are exceptions, to handle words like *tonal,* and Noun Extrametricality to handle *nature* and the like. In *tonal,* the syllable containing -al is extrametrical by virtue of Suffix Extrametricality and /n/ is extrametrical by virtue of Final Extrametricality, thus the remaining syllable (to-) escapes shortening. In *nature*, the final syllable is extrametrical by virtue of Noun Extrametricality, and again an open syllable is left over (na-). However, as Rubach (1996: 206) points out, this analysis fails to treat certain alternations, e.g. the suffix -ule in *grain/granule*. Although Myers assumes that -ule is an exception to Suffix Extrametricality in the same way as -ic is, this is not possible in RP since -ule has a long vowel in that dialect, so it must be extrametrical in order not to attract stress. In addition, -ion shortening is problematic for Myers, too.[27]

In sum, as Rubach (1996: 206) remarks, in Myers's theory stress (through extrametricality) and Syllabic Shortening function together, which he considers incorrect. As we will see in the next sub-section, in Rubach's view Syllabic Shortening is a level 1 rule, whereas Resyllabification (or rather Ambisyllabicity) is post-cyclic, operating at the word level.

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[26] Borowsky (1986: 213-336) adopts Myers's analysis of shortening.

[27] In the same way as Myers (1987) criticises Yip (1987) (see Footnote 25 above), Yip (1987: 467, Footnote 1) mentions Myers's analysis. What she misses is addressing the special behaviour of /i/, which I find quite a weak argument.

5.5 Rubach's analysis

Rubach (1996) benefits both from Yip (1987) and Myers (1987). He again makes an attempt to subsume the various environments of shortening under one single rule, adopting the special treatment of suffix-initial vowels from Yip, and the idea of working in syllabic terms from Myers. In his theory, suffix-initial vowels (subscripted in (48)) are floating matrices that lack x-slots and thus escape syllabification. In this way, they create the environment for (Myers's) Syllabic Shortening since the affected syllables are closed on the skeletal tier. They are turned into regular vowels after Syllabic Shortening has taken place, by a rule of Vocalisation. These floaters provide a better solution than Yip's epenthetic /i/ as they raise neither the problem of the quality of the epenthetic vowel nor the problems alluded to above (*fifth, felt,* etc).

(48) divin$_{i}$ty, deriv$_{a}$tive, con$_{i}$c, pall$_{i}$d, Span$_{i}$sh

Rubach (1996) does not connect shortening to Resyllabification/Ambisyllabicity because in his theory Syllabic Shortening occurs at level 1 but Resyllabification/ Ambisyllabicity is a word-level postcyclic operation, thus this latter cannot feed the former. In this way, Rubach loses the explanation for cases of the *Cyprus/Cypriot* type, which Myers (1987) could account for having Resyllabification available at level 1. Here Rubach needs a completely different solution, i-shortening, given in (49) (Rubach 1996: 216).

(49)

$$\text{i:} \rightarrow \text{ɪ} \;/\; \_\_\; C_{1} \quad \begin{matrix} \sigma \\ | \\ \mu \\ | \\ \text{ɪ} \end{matrix} \quad \text{[-cons]}$$

5.6 A summary

The table in (50) gives a summary of the shortening cases discussed by all three authors, Yip (1987), Myers (1987) and Rubach (1996). The pairs of words in the *Data* column are the typical representatives of groups of words, as listed in Rubach (1996: 200-1). The abbreviations refer to rules and principles used by the authors, most of which have been discussed in 5.3-5.5. Bracketed remarks are amendments clarifying the

relevance of the abbreviated notions. *OK*s with a bracketed question mark are cases the drawbacks of which have been pointed out by Rubach (1996).

(49) Abbreviations: OK = accounted for
?? = problematic
CS = Cluster Shortening
FE = Final Extrametricality
NE = Noun Extrametricality
SE = Suffix Extrametricality
SS = Syllabic Shortening
? = Rubach's remarks

	Data	Yip	Myers	Rubach
a.	divine/divinity (-ity, -ify, -itude, -icide, -ison, -itive, -ifer, -inal, -ite)	**OK** CS (*i* not present)	**OK** SS (Resyllabification)	**OK** SS (*i* floater)
b.	derive/derivative divide/divisible mine/mineral	**OK** CS (V not present)	**OK** SS (Resyllabification)	**OK** SS (V floater)
c.	cone/conic (-ic, -id, -ish)	**OK** CS (*i* not present)	**OK** (exceptions to SE)	**OK** SS (*i* floater)
d. (i)	nature/natural (not productive)	??	**OK** NE	d. (i) and (ii) mutually contradictory - no account for both
d. (ii)	tone/tonal notion/notional (productive)	**OK**	**OK** FE, SE	
e.	grade/gradual line/linear vacant/vacuous	?? (no consonant clusters)	**OK** SS (Resyllabification)	**OK** SS (V floater, No Gap[28] yields closed syllable)
f.	fable/fabulous table/tabular	?? (no consonant clusters)	**OK** NE	**OK** SS (*u* floater, No Gap yields closed syllable)
g.	grain/granule		**OK** (? - RP?)	problem for all theories in RP
h.	proceed/ procession concede/ concession	**OK**	**OK** (?) (-ion = -yon, NE) (? *d* and *y* heterosyllabic?)	**OK** (-tion, syllable closed by sonority)

[28] The No Gap constraint requires contiguity of segments at the melodic tier. The floating vowel breaks this up and therefore the root-final consonant is forced into the preceding syllable, making it closed (Rubach 1996: 211).

i.	Cyprus/Cypriot divide/division (vs. Canada/ Canadian)	**OK** (Unassociated V Shortening)	**OK** (?) SS (Resyllabification -ion = -von, NE) (? Resyllabification level 1 rule?)	**OK** (i-shortening)
j.	relate/relative	??	**OK** (?) SS (Resyllabification) (? other dialects?)	RP: no shortening
k.	chamber, angel (lack of shortening)	**OK** CS not applicable (cyclic)	exceptions	exceptions
l. (i)	omen/ominous patron/ patronage	??	**OK**	mutually contra-dictory - no account for both
l. (ii)	nasalise titan/titanous	**OK**	??	
m.	nightingale (lack of shortening)	**OK** not environment of CS	exceptions	**OK** (open syllable, no shortening, ambisyllabicity not level 1 rule)

The analysis developed in the present paper and discussed in the next section can account for all the cases of shortening in (50) as well as the "standard" closed-syllable shortenings like *receive/reception, keep/kept, five/fifth* (see 6.5) missing from table (50) as these are straightforward for the three scholars' theories. In the classification below, (50a) and (b) go into 6.1; (50c), (50e, f) and (50h, i) can be found under 6.2, 6.3 and 6.4, respectively. I put (50g) into 6.6.

The contradictory cases (50d, l) are to be seen as described in Section 4: it is encoded in the lexicon whether shortening occurs or not. Treatment of (50j) is rejected since the primary concern here is RP and so the cases where shortening is not accompanied by, or rather caused by, vowel reduction are considered only. Also, I do not deal with (50k, m) as they are not derived.

6 Examining assumption (41)

According to (41), a word such as *vanity* can be derived from the word *vain* in the following manner: *vain*, in the present framework, is a trisyllabic word (cf. (52a)).

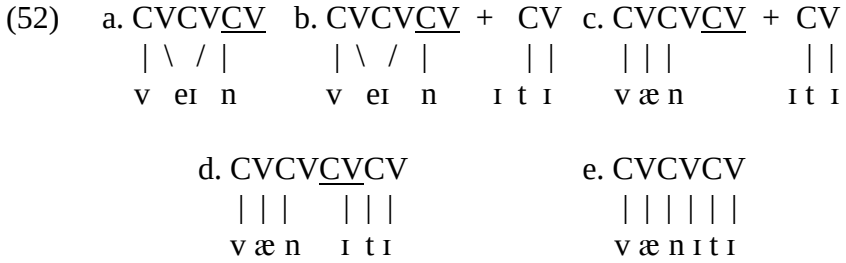
When the suffix -ity enters its domain, it requires/occupies the last (i.e. the third) syllable (indicated by underlining and henceforth called Derivational Syllable[29]) (52b). The Derivational Syllable can be characterised by the No Sharing Principle, given in (51).

(51) No Sharing Principle

Derivational Syllables cannot be occupied by melodic material coming from the stem *and* a floating segment coming from a non-analytic suffix at the same time.

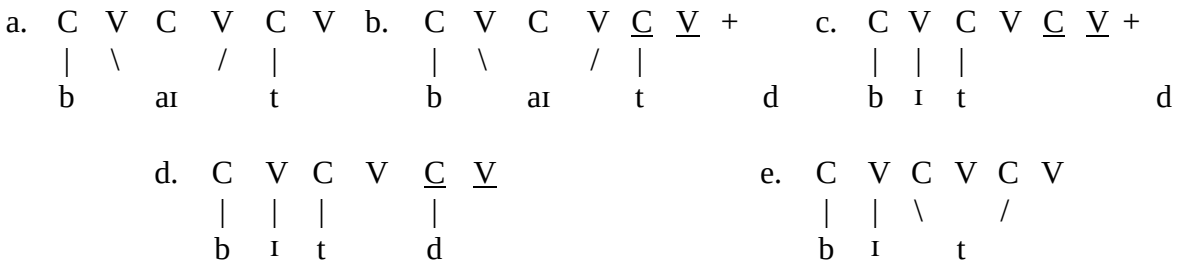
Having to do without its final syllable, the stem has to "de-branch" (i.e. shorten) its vowel in order to go into two syllables (52c). After the suffix has occupied the Derivational Syllable (52d), stray erasure (EPER (40)) gets rid of the empty prosodic structure left behind (52e).

(52)



As it can be seen in (52b-c), the irregular suffixes that cause shortening in the stem lack prosodic structure in their first syllables (similarly to the so-called "floaters") or, in the case of monosyllabic suffixes like irregular past tense -d, they lack prosodic structure altogether (see (53)). This very fact is responsible for the whole process described in (41): as they have more melodic material than prosodic structure, they take prosodic structure from the stem.

(53) bite - bit



The fact that the "shrinking" of the stem is realised as vowel shortening appears to be a language-specific feature. One reason for this may be that in English there is a

mechanism which says that losing part of a segment is better than losing all of it. Thus, vowel shortening, which is a defect on the skeletal tier only, is better than, say, consonant deletion, which means loss both on the skeletal and the melodic tiers, and results in the disappearance of a whole segment. Myers (1987: 515), while discussing shortening in *sanity* vs. lack of shortening in *falsity*, writes:

> The difference between the two cases is that deletion of timing units in [*falsity*] would also result in the deletion of a melody unit (i.e., a feature matrix), while in the vowel shortening cases the melody is preserved.

He therefore posits a well-formedness condition for English saying that a feature matrix must be associated with a timing unit, ruling out desyllabification in words like *falsity*, adapted for the present analysis as the Melody Preservation Principle (54).There might be languages where the process results in full deletion or some change in consonants (degemination or deletion).

(54) Melody Preservation Principle

In English, loss of material on the skeletal tier, due to some phonological operation, is preferred to loss of material on the melody tier.

In certain cases the stem, i.e. the syllable-losing domain, is a bound stem (e.g. *barb<u>a</u>r-ian/barb<u>a</u>r-ic*, *hist<u>e</u>r-ia/hist<u>e</u>r-ical*, *fl<u>o</u>r-a/fl<u>o</u>r-ist*, see (60b)). (The underlined vowel positions are the ones where alternation takes place.) In stems ending in a vowel, the hiatus rule[30] overrides (41) and so no shortening occurs (cf.*lay/laity*).

The present thesis is not concerned with loss of skeletal slots due to vowel reduction resulting from stress shift and destressing (e.g. *spont<u>a</u>neous/spont<u>a</u>neity, relate/relative* see (50j)). In both words of the pairs under examination here, the stress is in the same position, and what is in focus is the change of the stressed full vowel. Changes on the melodic tier (i.e. "Vowel Shift") are beyond the scope of this thesis, too, as well as the underlying representation of segments.

With the help of (41), a number of phenomena can be explained, including those in (50) (see 5.6) as well as some others[31]. The examples are given in three steps: (i) the

---

[29] Term borrowed from Lowenstamm and Guerssel (1997)

[30] "If a vowel stands before another vowel, it must be tense." (Nádasdy, 1989: 28)

[31] The examples are mostly taken from, and classified on the basis of, Nádasdy (1989: 21-23). The classification has been retained from Balogné (1997) instead of being replaced with (50). This latter

word with a tense/long vowel (cf. (52a)); (ii) the "loss" of the Derivational Syllable, indicated by underlining, resulting in shortening (cf. (52c)); (iii) the output, i.e. the suffixed word with a lax/short vowel (cf. (52e)).

6.1 Derived "Trisyllabic Laxing"

For this type, see examples in (52) above and (55) below.

(55) a. crime - criminal

```
CVCVCVCV        CVCVCVCV        CVCVCVCVCV
|  |\  /|   →    |  |||    →    |  |||||||
k  r  aɪ m      k  rɪm          k  r ɪmɪnəl
```

b. divine - divinity

```
CVCVCVCV        CVCVCVCV        CVCVCVCV
|||\  /|   →    |||||    →      |||||||||
d ɪv aɪ n       d ɪv ɪn         d ɪvɪnɪ tɪ
```

c. secret - secretary[32]

```
CVCVCVCVCV      CVCVCVCVCV      CVCVCVCVCV
|\  /| |||  →   ||| |||   →     ||| ||| ||
s  i  k rɪ t    s e k rət       s e k rət rɪ
```

d. derive - derivative

```
CVCVCVCV        CVCVCVCV        CVCVCVCVCV
|||\  /|   →    |||||    →      |||||||||
dɪ r aɪ v       d e r ɪv        d e r ɪvətɪv
```

Non-derivational examples of "trisyllabic laxness" (e.g. *animal*) are, in the theory being developed here, taken as lexically given. Notice that in the present framework the term "trisyllabic" is not appropriate since here the number of vowels and syllables does not correlate. Although in *divinity* the change still takes place in the third syllable from the right, this does not hold for all the words belonging to this group (cf. (55a,c)). Neither does it for lexical "trisyllabicity"; for example *animal* is composed of four syllables here (a.ni.ma.l).

---

classification puts emphasis on the less straightforward cases (from the point of view of closed-syllable shortening), and therefore is in a way too detailed and at the same time incomplete for the present analysis.

6.2 Laxing suffixes

The most frequent laxing suffix appears to be -ic (56a-b). Examples containing this type of suffixation can be found in (56).

(56) a. meter - metric[33]

```
CVCVCVCV        CVCVCVCV        CVCVCVCV
| \  / | | |  →  | | |  |   →  | | |  | | |
m  i  t ə(r)      m e t  r        m e t  r ɪ k
```

b. lyre - lyric - lyrical

```
CVCVCVCV        CVCVCVCV        CVCVCV
| \  |  / |  →  | | |        →  | | | | |
l  aɪə  (r)      l ɪ r           l ɪ r ɪ k

                                CVCVCVCV
                             →  | | | | | | |
                                l ɪ r ɪ k ə l
```

c. pale - pallid

```
CVCVCV          CVCVCV          CVCVCV
| \ / |    →    | | |     →    | | | | |
p eɪ  l         p æ l           p æ l ɪ d
```

d. Spain - Spanish

```
CVCVCVCV        CVCVCVCV        CVCVCVCV
|  | \ / |  →   |  | | |   →   |  | | | | |
s  p  eɪ n      s  p æ n        s  p æ n ɪ ʃ
```

(56b) demonstrates the special case when the stem vowel "overshortens", i.e. its only way to shorten leads to losing more than one syllable. The simple reason for this is that triphthongs cannot transform into diphthongs, only monophthongs, which results in a radical loss of "timing slots" (whatever framework we are in).

---

[32] Notice that we get the same result if the suffix -ary surfaces its initial vowel. The difference is that while in (55c) the whole suffix /rk/ is floating, in the other version it does have prosodic structure and only the suffix-initial vowel is floating.

[33] The question why the schwa in *metre* does not get realized in *metric* (although its V position is still available) is beyond the scope of the present thesis.

6.3 Pre-*u* Laxing

Most examples of this phenomenon are similar to C*i*V Laxing (see section 6.4) in that they contain a suffix with a prevocalic u added to a consonant-final stem (57a-b). Cases like *fable/fabulous* are also included here, in which, as I claim, the suffix -ulous is attached to the bound stem fab- (57c) (instead of saying that -ous is attached to *fable*). Although this way of analising this group of words is a bit shaky since most of them have a stem ending in an *l*, there are some counterexamples, including *acid/acidulous*, *creed/credulous* (this latter also shows that -ulous is in fact a laxing suffix).

(57) a. grade - gradual

CVCVCVCV	CVCVCVCV	CVCVCVCVCVCV
| | \ / | →	| || →	| ||\ / ||
g r eɪ d	g r æ d	g r æ d jʊ ə l

b. rite - ritual

CVCVCV	CVCVCV	CVCVCVCVCV
| \ / | →	||| →	||\ / ||
r aɪ t	r ɪ t	r ɪ t jʊ ə l

c. fable - fabulous

CVCVCV	CVCVCV	CVCVCVCVCV
| \ / | →	||| →	||\ / |||
f eɪ b	f æ b	f æ b jʊ l ə s

The representations in (57) raise several questions. One concerns the status of the string /jm/. Whether it is a single diphthong or a sequence of two phonemes is, to my best knowledge, still a matter of debate. As it can be seen in (57), I represent it as a diphthong.

6.4 C*i*V Laxing

In the majority of the examples, it accompanies *-ion* suffixation (see (58)).

(58) a. revise - revision

CVCVCVCV	CVCVCVCV	CVCVCVCV
||\ / | →	|||| →	||||||
r ɪ v aɪ z	r e v ɪ z	r e v ɪ ʒ ə n

b. decide - decision

CVCVCVCV	CVCVCVCV	CVCVCVCV
| | | \ / | →	| | | | | →	| | | | | | |
d ɪ s aɪ d	d ɪ s ɪ d	d ɪ s ɪ ʒ ə n

Since I am not concerned with qualitative alternations, it is only a hypothesis that the change of the stem-final consonants takes place between stage (ii) and (iii). To prove this, a more detailed description of the derivation would be needed.

6.5 Closed syllable shortening

In section 6.1 I have already pointed out that certain traditional terms (e.g. "trisyllabic"), at least in their literal meaning, are not appropriate in the present theory. This is also true for "closed syllable shortening" since there is no such thing as a closed syllable here. However, for the sake of better understanding, I retain the "old" names. Accordingly, this category consists of the following cases:

(a) "Classic" closed syllable shortenings e.g. *receive - reception* (59a)

(b) Certain other cases called "unmotivated" in Nádasdy (1989), including:

(i) irregular past tense forms of certain verbs e.g. *keep - kept* (59b). This is the point where virtual geminates come into the picture. When the suffix -d joins a stem ending in d, a virtual geminate is created. (59c-d) Then, at a later stage, degemination takes place.

(ii) irregular past participles of certain verbs e.g. *write - written* (59e)

(iii) suffixation with -th e.g. *deep - depth* (59f), *five - fifth* (59g)

(59) a. receive - reception

CVCVCVCV	CVCVCVCV	CVCVCVCVCV
| | | \ / | →	| | | | | →	| | | | | | |
r ɪ s i v	r ɪ s e v	r ɪ s e p ʃ ə n

b. keep - kept

CVCVCV	CVCVCV	CVCVCV
| \ / | →	| | | →	| | | |
k i p	k e p	k e p t

c. read - read

CVCVCV CVCV<u>CV</u> CVCVCV CVCVCV
| \ / | → | | | → | | | | → | | \ /
r i d r e d r e d d r e d

d. hide - hid

CVCVCV CVCV<u>CV</u> CVCVCV CVCVCV
| \ / | → | | | → | | | | → | | \ /
h aɪ d h ɪ d h ɪ d d h ɪ d

e. write - written

CVCVCV CVCV<u>CV</u> CVCVCV
| \ / | → | | | → | | | | |
r aɪ t r ɪ t r ɪ t ə n

f. deep - depth

CVCVCV CVCV<u>CV</u> CVCVCV
| \ / | → | | | → | | | |
d i p d e p d e p θ

g. five - fifth

CVCVCV CVCV<u>CV</u> CVCVCV
| \ / | → | | | → | | | |
f aɪ v f ɪ v f ɪ f θ

6.6 “Synchronically unmotivated” alternations

The cases belonging to this group are the most puzzling ones. On the one hand, I have suffixations here that are not normally laxing and cannot be explained as closed syllable shortenings (thus they fall out of the previous group). Scholars have always encountered problems with words like *abound* (60a) where there is a long vowel in a closed syllable and yet, it shortens in *abundant*, in the same closed syllable. On the other hand, (61) contains monomorphemic words with a short vowel that can be historically derived from a free stem with a long vowel.

(60) a. abound - abundant

CVCVCVCVCV CVCVCVCV<u>CV</u> CVCVCVCVCVCV
| | \ / | | → | | | | | → | | | | | | | |
ə b aʊ n d ə b ʌ n d ə b ʌ n d ə n t

b. flora - florist[34]

CVCVCVCV → CVCVCV<u>CV</u> → CVCVCVCVCV
| | \ / | → | | | | → | | | | | |
f l ɔ r → f l ɔr → f l ɔrɪ s t

c. grain - granule

CVCVCVCV → CVCVCV<u>CV</u> → CVCVCVCVCVCV
| | \ / | → | | | | → | | | \ | / |
g r eɪ n → g r æ n → g r æ n ju: l

(61) a. sheep - shepherd

CVCVCV → CVCV<u>CV</u> → CVCVCV
| \ / | → | | | → | | | | |
ʃ i p → ʃ e p → ʃ e p ə d

b. vine - vineyard

CVCVCV → CVCV<u>CV</u> → CVCVCVCV
| \ / | → | | | → | | | | | |
v aɪ n → v ɪ n → v ɪ n j ə d

7 Conclusion

The main purpose of this thesis was, after revising some of the previous analyses of English syllable structure and vowel shortening, to attempt to represent English words within Lowenstamm`s CV framework as well as to account for laxing processes as phenomena where the suffixes, by requiring the last ("Derivational") syllable of the stem, force the full vowels to "de-branch", i.e. to shorten/lax.

Some questions, however, remain unanswered. For example a closer study of latent consonants in English would probably lead to the realization of more such consonants apart from preconsonantal and word-final *r*, which, in the non-rhotic accents, is only realized phonetically when followed by a filled V position ("linking"). Moreover, yod-dropping should also be examined as a possible candidate for another "de-branching" process. A further insight that needs justification is that the process in (41) might be a universal pattern applying in all languages where shortenings occur.

[34] The stem is *flor*-.

Also, since Lowenstamm's CV framework deviates from standard Government Phonology, the principles set up e.g. in KLV should be revisited and adapted to fit the present analysis. One of the problems for standard Government Phonology raised by the increased number of empty positions is that Proper Government may not suffice to express licensing.

Finally, it needs to be emphasized that the process described in (41) and in Section 6 is irregular. Regular suffixation and compounding have no effect on the number of syllables the stem consists of, therefore no shortening takes place, as shown in Section 4.

Therefore, whether a suffix forces the stem to "shrink" or not, i.e. whether it is analytic or not, is unpredictable and determined in the lexicon: if it does, its behaviour is considered irregular; if it does not, we get the regular patterns. However, once it "decided" to shorten the stem, it follows the steps described in (41) - in this respect, its behaviour might be regarded as regular. All in all, we can say that while the procedure (how this happens) is the same with all the cases, the choice (whether it happens or not) makes the whole process irregular.

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