Chapter 7: Word Stress and Related Issues

In this chapter, we’ll examine the stress pattern of English words. We’ve already discussed word stress to some extent in Chapter 6, where the basic nominal and verbal stress patterns were introduced and explained with reference to syllable weight. We are going to look at this issue in more detail now. Also, we’ll discuss phenomena which are related to stress, notably Syncope (mentioned in the previous chapter, too), Syllabic Consonant Formation, and the classification of English vowels according to whether they occur in stressed or unstressed syllables.

To start with, word stress in English is quite variable: some words are stressed on their first syllable (e.g.,  síster, décorate, Árabic), some are stressed on the second (e.g., presént, arcáne, América, atténtion), some on the third (e.g., décorátion, historicity, referéée), some on the fourth (e.g., exasperátion), etc. As opposed to this, there are many languages in which the place of stress is fixed on a given syllable. In Hungarian, Slovak, Czech, Finnish, etc., stress is always initial: it falls on the first syllable of the word. In some languages, stress falls on the penult, as in Polish and Swahili, for instance; in some others, it always falls on the antepenult (e.g., Macedonian). Stress placement in these languages, therefore, is not particularly interesting in itself.

In a number of languages, such as Russian, Slovene, Sanskrit, etc., there are no rules at all for stress placement. Instead, on which syllable stress falls must be learnt individually for each word. Moreover, it also happens that stress varies in different inflected forms of the same word. In Russian, for instance, the word meaning ‘window’ is final-stressed in the Nominative Singular (oknó) as well as the Genitive Singular (okná), but in the Nominative Plural, it has initial stress (ókná). Note that the last two forms are differentiated by stress alone!

In English, as we have seen, stress placement is not entirely random: nouns, for instance, are typically stressed on the penult or the antepenult, depending on the weight of the former. That is, there is a certain degree of phonological conditioning in stress placement. As we’ll see, this is often overridden by morphological factors; for example, some suffixes, such as -ic, attract the stress on the immediately preceding syllable, witness pairs such as history — historic, photograph — photographic, etc.). Such suffixes are called pre-stressed — I guess the term is quite self-explanatory. Finally, some suffixes are never stressed and they do not alter the stress of the stem, either; examples include -ing, -ed, -ly, etc., e.g., décorate — décorating, décorated, colourful — colourfully, etc. Such suffixes are referred to as stress-neutral ones. Some suffixes attract stress on themselves, such as -ée, cf. referée, absentée; such suffixes are known as self-stressed. Some prefixes, then, may interfere with the stress of the stem. The prefixes per-, o-, com, for example, are basically unstressable, so verbs like per-mít, o-mít, com-mít, etc., are stressed on the ult, even though, as we saw in Chapter 6, verbs with a light ult are generally stressed on the penult, cf. the verbs limit, vómít, where li and vo, of course, are not prefixes but part of the stem. To sum up, stress placement often happens according to morphological conditioning, which often overrides phonological conditioning. Finally, some items are stressed irregularly. For example, the noun évént is stressed on the ult, although it contains no self-stressed suffix; cháracter, on the other hand, is stressed on the antepenult, even though the penult is heavy, and no morphological condition can account for why the antepenult is stressed, either. In such cases, we talk about lexical conditioning — a tricky term used by linguists to say that the word is simply irregular. (The term refers to the fact that stress placement is determined by the individual lexical item — i.e., it doesn’t follow a general pattern, but it’s irregular.)

Before we start our detailed investigation of stress placement itself, we need to examine the nature of stress first.
1 Primary and secondary stress

So far, we have been talking about what is called the primary or main stress of English words. Yet, as you may have noticed, many English words also have secondary stress, indicated in IPA transcriptions with a subscript vertical line (ʼ) placed before the stressed syllable. The word decoration, for instance, is pronounced as 'deka'refjan, with main stress on the penultimate and a secondary stress on the first syllable. Rhythmically, this word has a tå-tå-tå pattern: both the first and the third syllable are pronounced more strongly and with a somewhat higher pitch than the second and the last syllable, which lack stress. This is what we normally mean by stress in everyday life: rhythmic prominence. Then, what is the difference between primary and secondary stressed syllables?

In order to see this, we need to place words into a wider context: into sentences. Sentences are characterised by certain intonation patterns. Yes-No questions in English, for example, start with a high pitch, then the intonation falls, and it rises again, quite radically. This rise occurs upon the last primary stressed syllable in the sentence, as shown in (1a); in (1b), you can find the (non-existent) alternative, with the rise occurring on the first (secondary stressed) syllable of decoration (note the asterisk before it, showing ill-formedness):

(1) (a) [Diagram]

Do you like the decoration? ✓

*Do you like the decoration? ✗

After this, the pitch doesn’t fall but remains high till the end of the sentence (as opposed to Hungarian, in which there is a rise, too, but then, there’s a fall). If you now observe (1a), you can see that the rise characteristic of English Yes-No questions happens upon the third, primary stressed, syllable of decoration, rather than on the first (secondary stressed) one! This is indeed the difference between primary and secondary stress: primary stresses are intonationally prominent. To sum up:

(2) Rhythmic prominence? Intonational prominence?

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary stress</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary stress</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As we’ll see shortly, a third degree of stress is also found in English, called (not surprisingly) tertiary stress. To distinguish primary and secondary stress from tertiary, we use the collective term major stress to cover both primary and secondary stress. A major stressed syllable, whether primary or secondary, is then characterised by rhythmic prominence.

In many instances, we indicate stress on traditionally spelt forms — we have already used the acute accent mark to show primary stress, placed on the stressed vowel letter, as in ámbly, history, presént, América, etc. To indicate secondary stress, we use the grave accent (pron. græv), so, for example, référrée, décorâtìón, âstrológìcal, blâckbìrd, etc. May I note, finally, that when we talk about word stress we mean primary stress, in fact.
2 The vowels of unstressed syllables

If you observe the primary and secondary stressed syllables of English, you will notice that they may contain any vowel except schwa: e.g., référencé, astrological, astralón gyrkal, nôtification, nautif'kefàn ~ nauto'fo'kefàn, etc. The schwa, therefore, is never stressed, it is confined to unstressed syllables. It is, however, not true that all unstressed syllables contain a schwa. Altogether, those vowels which are found in unstressed syllables are collectively known as weak or reduced vowels, as opposed to full vowels, which are not found in unstressed syllables. Observe the following words, where the pronunciation (or alternative pronunciations) of the underlined unstressed weak vowels is shown:

(3) The vowels of unstressed syllables

<table>
<thead>
<tr>
<th>Examples</th>
<th>Transcription</th>
<th>Abbreviated transcription</th>
<th>Abbr. transcription: example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) évént, éléct, illúsion, irrátional</td>
<td>i</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2) city, háppy, régáct, vídeo</td>
<td>i ~ i:</td>
<td>i</td>
<td>'siti, riækts</td>
</tr>
<tr>
<td>3) pálace, fámíly, váníty</td>
<td>i ~ ã</td>
<td>ã</td>
<td>'pælæs</td>
</tr>
<tr>
<td>4) unite, gráduál, régülation</td>
<td>o ~ u:</td>
<td>u</td>
<td>ju'nart, grædzual</td>
</tr>
<tr>
<td>5) particular, régülar, crédulous</td>
<td>o ~ ã</td>
<td>ã</td>
<td>po'tikjələ</td>
</tr>
<tr>
<td>6) válue, ávenue, cúrfew</td>
<td>u:</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>7) ago, occásion, énery</td>
<td>ã</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

As you can see, there is variation in most instances. Yet, we can generalise and say the following:

(4) English weak vowels are (i) schwa, (b) high vowels, i.e., i, ã, o, u.

Some notes on the occurrence of the individual weak vowels and the variation between them:
1) Schwa is by far the most frequent weak vowel, but note that it is never found in prevocalic position.
2) The weak vowel i can be replaced
   i) by a schwa, if it stands before a consonant (cf. pálace, also fámíly, résent, etc.). This is generally abbreviated using the symbol ã (= either i or ã).
   ii) by i:, if it stands before a vowel and word-finally (cf. city, régáct, also háppy, médijáton, etc.). This is generally abbreviated by the use of the symbol i in transcriptions, cf. city, réact 'siti, riækts. It is important to note that the symbol i doesn’t denote a short i (this vowel is always long in English (= i:)); it stands for “either i or ã”.
3) The weak vowel u can be replaced
   i) by a schwa, if it stands before a consonant and the following syllable is unstressed (cf. particular, also monumént, régülar, Pórtugal, etc.). This is generally abbreviated using the symbol ã (= either o or ã).
   ii) by u:, if it stands (i) before a consonant and the following syllable is stressed, (ii) before a vowel (no matter whether the following syllable is stressed or not) — cf. unite, régülation (before C, following syllable stressed), gráduál, gráduación (before V, following syllable either unstressed or stressed). This is generally abbreviated by the use of the symbol u in transcriptions, cf. unite, gráduál.
ju'nait, 'grædʒuəl. It is important to note that the symbol u doesn’t denote a short u (this vowel is always long in English (= uː)): it stands for “either o or ui”.

4) Word-finally, o isn’t possible, so an unstressed final back high vowel is always uː (cf. value).

5) In some cases, only i is possible. We’ll return to this later.

Note that of the weak vowels, schwa never occurs in stressed syllables, but the other four can, cf. the words bit (i), bush (ou), feed (iu), rule (ui). In other words, these four vowels can behave both as full and weak. We’ll analyse them as full if and only if they occur in a major stressed syllable; if the syllable bears neither primary nor secondary stress, we’ll analyse them as weak. The schwa is always weak.

The vowels of English, then, can be classified as follows according to whether they can appear in unstressed syllables:

(5) English vowels

<table>
<thead>
<tr>
<th></th>
<th>In unstressed syllables</th>
<th>In stressed syllables</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEAK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ə</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i:ou)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All other vowels</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 Tertiary (minor) stress

The careful reader will have noticed that what I’ve said seems not to be true on closer inspection. After all, words like décorate, mánifest, ánecdote, ámplify — i.e., 'dekorət, 'mænɪfest, 'ænəkdəut, 'æmpləfu — have an unstressed ult, yet, the vowel in it is a full one!

While this observation appears to be correct, such syllables behave in several ways as stressed ones. Recall note 3) above on the variation between o ~ uː and o ~ ə, repeated here as (6) for convenience:

(6) The weak vowel o can be replaced

i) by a schwa, if it stands before a consonant and the following syllable is unstressed (cf. particular, also mónument, régular, Portugál, etc.);

ii) by uː, if it stands (i) before a consonant and the following syllable is stressed, (ii) before a vowel (no matter whether the following syllable is stressed or not) — cf. unɪte, rėgulā́tion (before C, following syllable stressed), grādual, grāduation (before V, following syllable either unstressed or stressed).

What is important for us is point (ii). Further examples are found in (7a). Observe also the words in (7b), where the same variation is found — even though the syllable after the unstressed o seems to be unstressed:

(7) Words with variable o ~ uː, o not replaceable by a schwa

(a) régulá́tion, lʊmənɪtɪ, ʃtɪdɪtɪ, rɛgʊləritɪ, Pɔrtʊɡəzɛ, mɔnməntəl
(b) rɛgʊleɪt -ɛt, mɪnɪpuleɪt -ɛt, cɛləluɪd -ɔd, pɔrˈkjuːpɪn -əm, ˈkɒnəbɪn -əm
The fact that the replaceability of \( \text{o} \) with \( \text{u} \): really depends on whether the following syllable is stressed or not is shown by word pairs such as régular - règulärity, mònument - mònuméntal, Pòrtugal - Pòrtuguése, etc. In each case, the first member of the pair has initial stress and the syllable following the \( \text{o} \) is unstressed, hence the \( \text{o} \) cannot be replaced by \( \text{u} \): (but it can be replaced by a schwa); in the second member of each pair, stress moves to the syllable following the \( \text{o} \) due to suffixation, and the \( \text{o} \) can be replaced by an \( \text{u} \): (but not a schwa, just as expected). What is curious is the behaviour of \( \text{o} \) in (7b): it is followed by an apparently unstressed syllable — yet, it is replaceable with \( \text{u} \); rather than a schwa!

It seems, then, that syllables with a full vowel, even when they do not have a major (primary or secondary) stress, behave as stressed syllables. Therefore, we’ll treat them as such, admitting that they do differ from major stressed syllables:

(8) **Syllables which have a full vowel, but do not bear major stress, will be considered to be tertiary stressed.**

Tertiary stress (also called minor stress) then differs from major stresses in that it is not characterised by rhythmic prominence, but it is characterised by **articulatory prominence**: the vowel of a tertiary stressed syllable is not weak, but full. To sum up, then:

<table>
<thead>
<tr>
<th></th>
<th>Articulatory prom.?</th>
<th>Rhythmic prom.?</th>
<th>Intonational prom.?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary stress</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Secondary stress</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Tertiary stress</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Lack of any stress</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

Tertiary stress is not indicated in IPA transcriptions. This is because any syllable which lacks a major stress but contains a full vowel is predictably tertiary stressed. If we want to show tertiary stress on words quoted in their traditionally spelt forms, we use a **macron**, e.g., régulâte, pórcupîne, etc. (REMEMBER that we analyse \( i/i/u/u \) as weak (= unstressed) if they do not have a **major** stress — in other words, \( i/i/u/u \) **cannot** be tertiary stressed!)

Later on, we’ll find further arguments for positing tertiary stress on syllables which have no major stress. Let us now turn our attention to how primary stress is assigned to English words.
4 Phonological conditioning of English primary stress
We have already seen how nouns are stressed. The examples and the patterns are repeated here for your convenience.

**Nouns**

<table>
<thead>
<tr>
<th>(10)</th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>table</td>
<td>'tei(bal)</td>
<td>aroma</td>
<td>'rau(ma)</td>
</tr>
<tr>
<td>survey</td>
<td>'sə(vəi)</td>
<td>tomato</td>
<td>'mau(təu)</td>
</tr>
<tr>
<td>finance</td>
<td>'faɪ(nəns)</td>
<td>horizon</td>
<td>'rai(zən)</td>
</tr>
<tr>
<td>weather</td>
<td>'we(ðə)</td>
<td>potato</td>
<td>'tei(təu)</td>
</tr>
<tr>
<td>city</td>
<td>'sɪ(tɪ)</td>
<td>veranda</td>
<td>'ræn(ə)</td>
</tr>
<tr>
<td>habit</td>
<td>'hæ(bɪt)</td>
<td>utensil</td>
<td>'ten(əl)</td>
</tr>
</tbody>
</table>

(11) **The phonological nominal stress rule**

a) Start scanning the noun from the end. Neglect the ult: it’s not stressable.
b) Check the penult. If it is heavy, stress it.
c) If the penult is light, stress the antepenult.

Some exceptions: *évěnt, pərədə, tərrəɪn, chərəktər, ánəcədət*, etc. A useful practice task: explain why these items are irregular.

**Verbs**

Let us sum up what we have seen so far; in fact, we’ll need to supplement this to account for stress placement in polysyllabic verbs with a heavy ult.

<table>
<thead>
<tr>
<th>(12)</th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>delay</td>
<td>dɪˈleɪ</td>
<td>answer</td>
<td>ˈaːn.ə</td>
</tr>
<tr>
<td>allow</td>
<td>əˈlau</td>
<td>discover</td>
<td>ˈdɪskər.və</td>
</tr>
<tr>
<td>maintain</td>
<td>mɛnˈteɪ(n)</td>
<td>deliver</td>
<td>ˈdɪˈli.və</td>
</tr>
<tr>
<td>insist</td>
<td>ɪnˈsɪst</td>
<td></td>
<td></td>
</tr>
<tr>
<td>protect</td>
<td>ˈprəʊˈtek(t)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(13) **The phonological verbal stress rule**

a) Start scanning the verb from the end.
b) Check the ult. If it is heavy, stress it.
c) If the ult is light, stress the penult.

Now, consider the following verbs:

<table>
<thead>
<tr>
<th>(14)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>decorate</td>
<td>ˈdɛkərə(t)</td>
<td>amplify</td>
<td>ˈæmplɪfai</td>
</tr>
<tr>
<td>monopolise</td>
<td>məˈnɒpəlai(z)</td>
<td>manifest</td>
<td>ˈmænɪfest</td>
</tr>
<tr>
<td>constitute</td>
<td>ˈkɒnstətʃuː(t)</td>
<td>implement</td>
<td>ˈɪmpləmənt</td>
</tr>
</tbody>
</table>

How do we account for stress placement in these verbs?

Note that all of them are polysyllabic verbs and they are stressed on the antepenult. Furthermore, they all have a heavy ult, either because it contains a complex Nucleus or else because it has a simplex Nucleus and a Coda. (Remember that final C’s are Onsets, hence they
do not count for determining the weight of the ult!) Now, the verbs in (12a) have a heavy ult, too, and, according to (13), the ult is stressed. Why isn’t the ult stressed in the verbs in (14)?

These verbs, as we’ve said, are stressed on the antepenult. Note that polysyllabic verbs with a light ult are stressed on the penult. In fact, only verbs like the ones in (14) — polysyllables with a heavy ult — are stressed on the antepenult!

Notice also that — even though the ult isn’t stressed, it always has a full vowel, that is, it is tertiary stressed. Compare now the noun *graduate* and the verb *(to) graduate*. The noun is pronounced *‘gradu30at*, the verb, however, is *‘gradu30et*. In the noun, the last — unstressed — syllable has a schwa, as expected; the ult of the verb, however, does not: it has a diphthong *et*, i.e., the noun’s ult is unstressed, while the verb’s ult is tertiary stressed. This difference is rather striking, because both the noun and the verb are stressed on the first syllable, i.e., the antepenult. How can we explain the difference between them?

Note that nouns are regularly never stressed on the ult. Our noun, *graduate* (*‘gradu30at*), therefore, is stressed on the antepenult, as the penult is light. The ult of verbs, on the other hand, is stressable, as we’ve seen. Therefore, we can assume the following scenario. The phonological verbal stress rule (cf. (13)) checks the ult of the verb *graduate*. As it is heavy (it has a complex Nucleus), the rule will place the stress on it, yielding *graduáte*. The same is valid for all verbs with a heavy ult, including disyllabic ones (12a) and polysyllabic ones (14), too.

English, however, generally avoids final stress in long — polysyllabic — words¹. As a result, if the phonological verbal stress rule assigns primary stress to the ult in a polysyllabic word, a phonological process is activated:

(15) The Alternating Stress Rule (ASR)

*If the phonological stress rule places primary stress on the ult of a polysyllabic word, the primary stress is moved to the antepenult, and the ult’s stress is reduced to tertiary.*

Therefore, the verbs in (14) have a full vowel in the last syllable — i.e., a tertiary stress — because the phonological stress rule places the primary stress on it; the primary stress is subsequently moved backwards to the antepenult by the ASR, but the ult still retains a certain degree of stress, in the form of tertiary stress. As the ult doesn’t become completely unstressed, its full vowel is retained.

As opposed to this, nouns are never subject to the ASR, as the phonological stress rule for nouns never places primary stress on the ult. As a result, the ult of nouns typically doesn’t bear any stress (not even tertiary), hence it contains a weak vowel. Compare now the following procedures, the differing stress placement in the noun *graduate* and the verb *graduate*. Of course, dots indicate syllable boundaries.

<table>
<thead>
<tr>
<th>(16)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonological stress rule:</td>
<td><em>graduate</em> (N)</td>
</tr>
<tr>
<td>Alternating stress rule:</td>
<td><em>graduate</em> (V)</td>
</tr>
<tr>
<td>End result (pronounced form):</td>
<td><em>‘gradu30at</em></td>
</tr>
</tbody>
</table>

Let’s explain what we have represented in (16).

The phonological stress rule stresses the noun on the antepenult, since the ult is disregarded (it’s not stressable), and the penult is weak. It does stress the ult of the verb, though, as the ult of verbs *is* stressable if it is heavy: in this case, it is. The ASR applies to the

¹ Note that we use the term *polysyllabic* to refer to words which are more than two syllables long. Also, one often finds polysyllables stressed on the ult, but these generally involve suffixed forms (e.g., *referée*, *picturêsque*, *kitchenëtte*, etc.), or recent loanwords and proper names (e.g., *kangaróo*, *Kalamazóo*, etc.).
verb, moving its primary stress to the antepenult. As the ult of the noun isn’t stressed by the phonological stress rule, the ASR can’t apply in this case. Finally, the vowel of the ult, being totally unstressed, is a schwa (a weak vowel) in the noun, but not in the verb, since here, it still bears tertiary stress.

To sum up, the fact that polysyllabic verbs with a heavy ult have primary stress on the antepenult is the result of the ASR: the basic phonological stress rule for verbs always places the primary stress on the ult if the ult is heavy, but the effects of the phonological stress rule may be modified by the ASR. Yet, the fact that the ult is originally stressed on the ult can still be seen on the pronounced form, which has tertiary stress — hence a full vowel — on the ult.

Adjectives
Adjectives have no phonological stress rule of their own. Instead, some of them are stressed like nouns, while others are stressed like verbs. Phonologists differ in how they classify adjectives with regard to stress placement — this difference reflects the ambivalent behaviour of adjectives in this respect. I will give a simplified account here, which seems to hold for the majority of adjectives.

Disyllabic adjectives are generally stressed like verbs, as shown by the examples below (remember that final C’s are Onsets, hence they do not make the ult heavy!):

(17)   
(a) cléver  'kle.və  
rigid  'rɪ.dʒɪ(d)  
jámous  'fɛ.ˈmə(s)  
néutral  'njuː.trə(l)  
(b) corréct  kɑ'rɛk(t)  
occúlt  ə'kɛl(t)  
abrúpt  ə'bɹɛp(t)  
distínct  dɪs'tɪŋk(t)  
(c) extrême  ik'striː(m)  
secûre  sɪ'kjʊə  
afráid  ə'fɾɛid  
minúte 2 maɪn'juː(t)  

As with verbs, the ult is stressed if it’s heavy: in (17b), it is heavy because it has a Coda; in (17c), it is heavy because it has a complex Nucleus. In (17a), it contains a simplex Nucleus, so it’s light; as a result, it fails to receive stress, so the penult is stressed.

There are, however, several exceptions, e.g., yéllow, móbile, fémale, hónest, pérfect, décent. The relatively high number of exceptions seems to pinpoint to the fact that adjectives behave like a “mixed” lot, half nouns, half verbs.

Polysyllabic adjectives, on the other hand, are generally stressed like nouns, as shown in (18):

(18)   
(a) définité  'de.fə(nət)  
similar  'sɪ.mɪ(ə)  
úsual  'juː.ʒuəl  
féminine  'fɛ.mɪ(nɪn)  
(b) treméndous  trə'mɛn(ðəs)  
objéctive  ə'bɛ'dʒɛk(tɪv)  
relúctant  rɪ'lekt(ənt)  
abúndant  ə'bɛnd(ənt)  
(c) impórtant  ɪm'pɔːr(ənt)  
cohérent  kəʊ'hɛrənt  
courageous  kə'rei(dʒəs)  
etérnal  ɪ'tɜːr(əl)  

As for nouns, the ult of polysyllabic adjectives is not stressable. In (18b), the penult is stressed, since it’s heavy by virtue of being a closed syllable; in (18c), it is stressed as well,

Note that this adjective (as shown by the transcription) is not the same as the noun minute! It means ‘kicsiny’. 

2
because it contains a complex Nucleus. In (18a), the penult is light (it is an open syllable with a simplex Nucleus), so the antepenult receives stress.

Again, there are exceptions, e.g., *explicit*, *intrépid*, *decrépit* (stressed on the penult though the penult is light), but far fewer than in the case of disyllabic adjectives.

**Other parts of speech**

Other parts of speech will not be discussed here. The reason for this is that prepositions, auxiliaries, determiners and pronouns, being grammatical words, include a small number of items (and most of them are monosyllabic, anyway); as for adverbs, the overwhelming majority of them is formed from adjectives with the suffix -ly, which doesn’t alter the stress pattern of the adjective, cf. *relúctant* → *relúctantly*, *rigid* → *rigidly*, etc. As for those adverbs which are not formed from adjectives, such as *here*, *there*, *now*, *today*, *tomorrow*, etc., we may note that many of them are monosyllabic; disyllabic and polysyllabic ones show a rather inconsistent stress pattern. Numerals, too, are complicated. All in all, the primary stress of words other than nouns, verbs, and adjectives will be considered as basically lexical (= must be learnt individually for each item), rather than being governed by some phonological stress rule. It is easier to remember for each item where it is stressed than to try to learn a general (and rather unreliable) rule for an entire class.

**5 Morphological conditioning of English primary stress**

As we have seen in the introductory part of this chapter, affixes often influence the placement of primary stress, sometimes producing stress patterns which contradict the phonological stress rules. We say that morphological conditioning may override phonological conditioning. For example, the suffix -ic generally attracts stress on the immediately preceding syllable. Consider the adjective *atómic* *átºmºk*. As you can see, it is stressed on the penult. This is, phonologically speaking, irregular: *atómic* is a polysyllabic adjective, and as such, it “ought” to be stressed like a noun. Yet, its penult is light (*tn*), so it shouldn’t be stressed (cf. the regularly stressed polysyllabic adjectives with a light penult in (18a)). Nevertheless, we cannot really consider it to be irregular, because the suffix -ic regularly attracts stress on the immediately preceding syllable. We can say that here, the morphological factors are more decisive than the phonological ones: this is what we mean by saying that morphological conditioning overrides phonological conditioning. Indeed, whenever morphological and phonological criteria are in conflict as regards primary stress placement, it is always the morphology which is stronger and has the final say in the battle.

Let us now see the influence of morphological structure on stress in detail.

**5.1. Suffixes**

Neutral suffixes have no influence on the place of stress, and they are not stressed themselves, either. To put it differently, words with a neutral suffix are stressed according to the following procedure: (i) disregard the suffix, (ii) determine stress placement in the remaining part (= the stem), (iii) primary stress will fall on the same syllable in the suffixed form, too. Example:

Consider the word *decorating*. It contains a neutral suffix, i.e., *-ing*. It is added to the stem — itself a complete, free word form — *decorate*³. Now, *decorate* *dºkºret*, according to the phonological stress rule for verbs, will receive ultimate stress, but as the verb is polysyllabic, the primary stress will be moved to the antepenult by the Alternating Stress Rule, so the verb is stressed as *décorate* 'dºkºret*. The neutral suffix *-ing* is added to this form,

³ Please remember that we’re not dealing with spelt, but pronounced forms: it is true that in spelling, the final <e> of *decorate* is dropped before *-ing*, but this has no relevance for pronunciation!
yielding *décorating* /*dékarettíŋ/, without any effect on the place of primary stress in the stem. Similarly: *amplify* - *amplifying*, *édit* - *éditing*, *presént* - *presénting*, etc.

Neutral suffixes are traditionally written with a # before them, to distinguish them from other (non-neutral) suffixes, so, for example, #ing; the suffixed form *décorating* can be represented as *décorat#ing*, to show that it contains a neutral suffix.

The most important stress-neutral suffixes are:

A. All regular inflectional suffixes (Hu *ragok*):

- #(e)d: limit - limit#ed, décorate - décorat#ed, présént - présént#ed  
- #ing: limit - limit#ing, décorate - décorat#ing, présént - présént#ing
- #(e)s: orange - orang#es, paradox - paradox#es (plural of nouns); orange’s, paradox’s (possessive; note the different spelling but identical pronunciation in the plural and the possessive); refúse - refús#es, généralise - générálise#s (3rd person verb forms).

B. Several derivational suffixes (Hu *képzők*):

- #able (V → Adj): décorate - décorat#able, publish - públish#able
- #al (V → N): arríve - arrív#al, refús#al
- #er/or (V → N): mánage - mánag#er, intérpret - intérpret#er, décorate - décorat#or
- #ful (N → Adj): báuty - báuti#ful, púrpose - púrpos#ful
- #hood (X → N): párent - párent#hood, bróther - bróther#hood, likely - likely#hood
- #ish (X → Adj): ámateur - ámateur#ish, yéllow - yéllow#ish
- #ism (X → N): módern - módern#ism, absénté - absénté#ism
- #ize (X → V): módern - módern#ize, cháracter - cháracter#ize
- #less (N → Adj): mércy - mérci#less, párent - párent#less, régárd - régárd#less
- #ly (Adj → Adv): báutiful - báutiful#ly, défínte - défínte#ly
- #ment (V → N): agréée - agréée#ment, encóurage - encóurage#ment
- #ness (Adj → N): cohérent - cohérent#ness, mérciless - mérciless#ness

It may, of course, happen that more than one neutral suffix is added to a stem. For example, the verb *regárd* can be suffixed with #less, yielding *regárd#less*; then, #ly can be added, forming *regárd#less#ly*. No matter how many neutral suffixes a word contains, the primary stress will be on the same syllable where it is in the form that remains when *all* neutral suffixes are removed — in this case, as in *regárd* /*řgäd/, stressed on the ult according to the phonological stress rule for verbs.

Neutral suffixes, then, are added to forms which already have their own stress, and these suffixes cannot change it. As we’ll see, such suffixes behave quite neutrally in relation to the stem in other respects, too.

Self-stressed suffixes are primary stressed themselves. They will be marked with a hyphen (e.g., -ee). The most important ones are:

- -ade: lémone-áde, éscap-áde, par-áde
- -aire: quésitionn-áire, million-áire, dóctrin-áire
- -ee: réfer-ée, nómín-ée, degr-ée
- -ese: Jápán-ése, Pórtugu-ése, Chin-ése

---

4 It does not matter whether -(e)d functions as a past tense or a past participle suffix: in both cases, it’s neutral.

5 I show the part of speech changes in parantheses, so, for instance, (V → N) means that the given suffix forms nouns from verbs. X means that the given suffix attaches to more than one part of speech (usu. N and Adj).

6 Note: -er and -or are but spelling variants of the same suffix, pronounced as -ə.

7 Also spelt -ize; in North America, this is the general spelling, while in Britain, both variants are found. This has no bearing on the pronunciation: whatever the spelling, the suffix is pronounced ariz.
Notice that self-stressed suffixes very often attach to **bound stems**, i.e., forms which are not words on their own, cf. *par-áde, degr-ée, cass-éte*, etc. In many cases, as shown by Portuguese (*Portug*) and *nominee* (*nominate*), a part of the stem (underlined in the examples) is deleted when the self-stressed suffix is added. This behaviour contrasts sharply with the way neutral suffixes behave — the latter generally being attached to free stems (= full, independent word forms) and not changing the stress pattern of the stem, either.

**Pre-stressed suffixes** attract primary stress on the syllable which precedes them. They are all derivational suffixes; we’ll mark them with a + sign, e.g., +ic. The most important ones are:

+ic: heró+ic, histór+ic, démocrát+ic, semánt+ic
+ial: tutór+ial, impér+ial, controvérs+ial
+ián: Hungár+ián, mATHématíc+ián, Canád+ián
+ion: dècorát+ion, ôpósít+ion, rebéll+ion, opín+ion
+iouS: luxúr+ious, prestíg+ious, victór+ious

Note: the last four suffixes are variably pronounced with -ιος -ιον. e.g., *opinion*: οπινιόν ~ οπινιόν, Canadian: ko’neidιon ~ ko’neidjιon, except if a palato-alveolar obstruent precedes them, when they are all pronounced with an initial schwa (= without ι or ι), e.g., *opposition* = οπoζιόν, never *,οποζιόν or *,οποζιόν.

**Pre-stressed or not? — Integrated suffixes**

Several authors treat suffixes such as +ity, +ual, etc., as pre-stressed. In fact, there is no need to regard them as such. Primary stress placement in nouns and adjectives ending in these suffixes can be beautifully explained with reference to the phonological stress rules. Take a noun in +ity, such as *simplicity*. Its stem is *simple*, with stress on the first syllable. The noun *simplicity* is stressed on the antepenult. We can, it is true, explain this by saying that +ity is a pre-stressed suffix. Yet, if we consider the word in question from the point of view of the phonological stress rule for nouns, we come to the same conclusion. The noun is pronounced *simplícity* = [símpliːsiti]. In either case, since it’s a noun, its ult is not stressable (shown by the parantheses), so the weight of the penult is considered. As it is light (= ια), the antepenult will receive stress, just like in *Amèrica* ο’me.ri(ka), where there’s no suffix. Therefore, we will not treat such suffixes as pre-stressed. Instead, we’ll say that words with these suffixes are stressed as if they didn’t contain a suffix at all. Accordingly, suffixes of this kind will be called **integrated suffixes** — because they are, for purposes of stress, literally integrated into the body of the word, and words including an integrated suffix will be stressed just like unsuffixed ones. Put differently, the stress rules treat a word containing an integrated suffix in the same way as an unsuffixed word of the same part of speech. Integrated suffixes (for reasons to be discussed later on) will, for the time being, marked with the same + symbol as pre-stressed ones — especially because their effect on primary stress placement, quite accidentally, is often the same as that of pre-stressed ones. The most important English integrated suffixes are listed below:

+al/+ar: origin+al, fundamént+al, particul+ar, famíli+ar
+ance/+ence: signific+ance, résid+ence, rélev+ance, cohér+ence
+ant/+ent: signific+ant, résid+ent, rélev+ant, cohér+ent

---

8 Pronounce -esk.
+ible: divisible, permissible, compatible, accessible
+ical: historical, economical, grammatical, phonological
+ify: identify, solidify, personify, syllabify
+ity/+ety: historicity, variety, publicity, serendipity
+ive: conservative, positive, elective, decisive
+ual: eventual, intellectual, individual, habitual
+uous: continuous, ingenious, conspicuous, promiscuous

NOTES:
♀ +ance/+ence, +ant/+ent, +ity/+ety are but spelling variants: whatever the spelling, they are pronounced ans, ant, ëti, respectively.
♀ In several words, +ance/+ence is “extended” with an -y, e.g., présidency, currency, prémonancy — cf. résidence, rélevance, cohérence. In such words, the stress is assigned in exactly the same way as if the -y “weren’t there”: présidency is stressed, for example, as if it were *présidence. Note that we would expect it to be stressed *pre.si.dén.cy, since the penult is heavy. We’ll regard nouns with +ancy/+ency as irregularly stressed.
♀ There is a high number of words with +ive which are stressed irregularly, e.g., qualititative, imaginative, operative, illustrative, communicative, etc., stressed one syllable earlier than expected.

5.2. Prefixes
Prefixes fall into two classes: (i) neutral prefixes, (ii) integrated prefixes. (The latter group shows an interesting, ambivalent behaviour as regards stress placement, as we’ll see.) As English never uses prefixation for inflectional purposes, all prefixes are derivational.

Neutral prefixes
As suggested by their name, such prefixes — similarly to neutral suffixes — do not interfere with the stress pattern of the stem. Nonetheless, they differ from neutral suffixes in a significant way. Recall that neutral suffixes are not stressed. As opposed to this, neutral prefixes are stressed; they bear secondary stress (for a regular exception, see below). As a result, they always contain a full vowel. We’ll use the # symbol after them.

The most important neutral prefixes are:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Pron.:</th>
<th>Examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>de#</td>
<td>ði:</td>
<td>dë#ice, dë#magnetise, dë#frost</td>
</tr>
<tr>
<td>dis#</td>
<td>ðis</td>
<td>dis#like, dis#agréé, dis#interest</td>
</tr>
<tr>
<td>ex#</td>
<td>ðeks</td>
<td>èx#président, èx#lover, èx#chairman</td>
</tr>
<tr>
<td>mis#</td>
<td>ðms</td>
<td>mis#understand, mis#hear, mis#read</td>
</tr>
<tr>
<td>out#</td>
<td>ðaut</td>
<td>ðout#sing, ðout#dò, ðout#bid</td>
</tr>
<tr>
<td>over#</td>
<td>ðuvæ</td>
<td>ðover#täke, ðover#dò, ðover#shádow</td>
</tr>
<tr>
<td>pre#</td>
<td>ðri:</td>
<td>prè#suppoése, prè#påy, prè#wår</td>
</tr>
<tr>
<td>pro#</td>
<td>ðræo</td>
<td>prò#British, prò#Catholic, prò#ÉU</td>
</tr>
<tr>
<td>re#</td>
<td>ðri:</td>
<td>rè#write, rè#täke, rè#réad</td>
</tr>
<tr>
<td>sub#</td>
<td>ðub</td>
<td>ðub#editor, ðub#standard, ðub#culture</td>
</tr>
<tr>
<td>un#1</td>
<td>ðen</td>
<td>ðun#natural, ðun#English, ðun#likely (Adj → Adj)</td>
</tr>
<tr>
<td>un#2</td>
<td>ðen</td>
<td>ðun#lock, ðun#dò, ðun#button (V → V)</td>
</tr>
<tr>
<td>under#</td>
<td>ðanda</td>
<td>ðunder#cöver, ðunder#lie, ðunder#täke</td>
</tr>
<tr>
<td>up#</td>
<td>ðip</td>
<td>ðup#hold, ðup#märket, ðup#grädë</td>
</tr>
</tbody>
</table>

105
As mentioned above, there’s a regular exception to the stress pattern “secondary on the prefix - primary on the stem”. Nouns formed with a neutral prefix added to a monosyllabic stem have the primary stress on the prefix, and secondary stress on the stem:

óut#pòst, óut#brèak, under#gròund, ré#fìll, pré#vièw, èx#wife

Note that some of these words can also function as verbs, in which case the stress pattern is “secondary + primary”, e.g., (to) ré#fìll, (to) pré#vièw, etc.

In case the stem is longer than one syllable, the stress, again, is the usual “secondary + primary”, e.g., èx#président (vs. èx#wife).

**Integrated prefixes**

These will be indicated with a + symbol after them. They are rather different from neutral prefixes in several ways. Firstly, in most cases, they have no clear and independent meaning: for example, the prefix o+ in o+mit doesn’t quite mean anything (and neither does the stem, in fact): it is the entire word which means something, not the individual morphemes. Secondly (connected to the above), they often attach to bound stems, stems which are not words on their own, as in the case of o+mit, cf. also per+ceive, con+tain, etc. Thirdly, they interfere with the basic phonological stress rule for verbs. This requires some discussion.

As you will recall, verbs with a light ult are regularly stressed on the penult, cf. vómi(t), abòli (sh), ènswer, etc. However, if the verb contains an integrated prefix, the primary stress will fall on the stem, even if it is a light syllable. Look at the following words:

(19) o+mit, com+mit, per+mit, sub+mit, re+mit

These verbs are stressed on the ult, though it’s light; compare the verbs vómit, limit, where the mit part is not a morpheme: instead, vómit and limit consist of a single morpheme each, as opposed to the verbs in (19), which contain an integrated prefix + the bound stem -mit. A consequence of this is that the primary stress falls on the stem, although phonologically speaking, it ought to fall on the prefix. The morphology here overrides the phonological stress rule: integrated prefixes are never stressed by the phonological stress rule.

On the other hand, the Alternating Stress Rule can place primary stress on integrated prefixes — but it doesn’t always do so. Consider the following words:

(20) (a) intèr+rog+âte, rè+cogn+ïse, cóm+plic+âte
(b) inter+vèn, intro+dùce
(c) cor+re+spònd, re+pre+sènt

In (20), we have polysyllabic verbs with a heavy ult. We expect such verbs to be stressed on the ult by the phonological stress rule; then the Alternating Stress Rule comes in, and moves the primary stress onto the antepenult, as we saw in (14) and (16). However, it is only the verbs in (20a) which show the expected behaviour: the ones in (20b) and (20c) are stressed on the ult.

If you carefully observe the morphological structure of the verbs in question, you can find the answer. The root morpheme (i.e., the morpheme which remains when all affixes have been removed from the word) has been underlined in all verbs in (20). As you can see, the root morpheme is followed by an integrated suffix in the verbs in (20a), but it is the last morpheme in the verbs in (20bc). The difference between (20b) and (20c) is that in the former, a disyllabic integrated prefix is added to the root, whereas in (20c), two integrated prefixes are
added; the difference has no relevance for primary stress placement. In sum, verbs with the structure INTEGRATED PREFIX + ROOT + INTEGRATED SUFFIX are stressed according to the general stress rules for verbs. On the other hand, verbs with the structure INTEGRATED PREFIX(ES) + ROOT are always stressed on the root.

The most frequent integrated prefixes are (given in combination with a root):
- de(ceive), con(duct) (variants of con+: col(lect), com(mit), cor(rect)), a(rise), pre(vent), pro(vide), in(correct) (variants of in+: il(logical), im(possible), ir(rational)), re(ceive), sub(mit)

Some problematic cases: integrated or neutral?

There are several instances when a prefix appears to be sometimes integrated, sometimes neutral. For example, the prefix re- is neutral in rè#wríte, rè#táke, rè#réad, but integrated in re+sént, re+céive, re+pre+sént. However, this is only so in spelling: in the pronounced form, there is a clear difference. The neutral re# is always pronounced ri, and it bears stress itself. The integrated re+, however, is mostly unstressed, pronounced ri, as in re+céive, re+sént. If it is major stressed, as in rè+cogn+íse or rè+pre+sént, it is pronounced re, e.g., ‘rekaignaz, reprízent. It is never pronounced ri. In fact, since the neutral re# and the integrated re+ never sound identical, we have two different prefixes here, rather than one single prefix which behaves ambiguously: an integrated re/ri and a neutral ri. It is only the spelling which fails to distinguish them. This, however, is not at all unique in English: compare words such as read (infinitive) — read (past), thy ‘comb’ — thy ‘tied’, lead ‘vezet’ — lead ‘ólom’, bow ‘meghajol’ — bow ‘ij’. In each case, we have two different words, pronounced differently — but written identically. The case of the integrated re/ri and the neutral ri is similar: both are written <re>.

There are some other frequent neutral/integrated prefix pairs that have the same spelling, but not necessarily the same pronunciation; in some cases, the pronunciation is always different (as in the case of re# vs. re+), while in other cases, they may be identical:

(21)

(a) Neutral:
- prè#suppóse, prè#páy, prè#wár (always pri)
- dè#fróst, dè#ice, dè#magnetise (always di)
- prò#British, prò#Cátholic, prò#Búsh (always prao)
- dis#like, dis#agrée, dis#sátisfied (always dis)
- sùb#éditor, sùb#stándard, sùb#cúlture (always sub)

(b) Integrated:
- pre+sént, pre+páre, pre+vét (pri), prè+sent+átion (pre)
- de+fénd, de+céive, de+lète (di), dè+vast+átion (de)
- pro+dúce, pro+víde (pro), prò+pág+âte (pro), prò+téct (prao)
- dis+túrb (dis), dis+sént (di, before roots with initial s)
- sub+mít (sob), sùb+lim+âte (sub)

As you can see, the pronunciation of the integrated prefix is mostly different from that of the neutral prefix. In the case of re#, de#, pre# vs. re+ , de+, pre+, the integrated suffix never sounds the same as the neutral one. In other cases, such as dis# — dis+, they may sound identical, but not always. The neutral dis#, for example, is always pronounced with a final s, whereas the integrated dis+ loses its s if the root begins with an s: compare dis#sátisfied , dis#sátisfard with dis+sént di'sent.

Furthermore, they also behave differently in a morphological as well as a semantic sense. Morphologically, the neutral re#, pre#, de#, etc. attach to free stems, ones which are words on their own. As opposed to this, integrated re+, pre+, de+, etc. are most often added
to bound roots (e.g., -ceive, -sent, -fend, -tect as in receive, present, defend, protect) — roots which are not words on their own. (They can also attach to free stems, as in re+mind, but this is far less typical.) The point is that neutral prefixes are not added to bound roots. Semantically, neutral prefixes have a clear meaning: re#, for example, means ‘again, anew’, as in re#write, re#take, etc. Integrated prefixes either have a very vague meaning, or mostly no meaning at all: what does re+ mean in re+ceive, re+sent, re+duce? Nothing at all — actually, verbs with re+ hardly have anything in common semantically.

6 Secondary stress placement
We have seen that neutral prefixes are generally secondary stressed (e.g., ún#natural, dè#ice) — except if the word is a noun with a monosyllabic root, in which case the prefix is primary stressed, and the root bears secondary stress (e.g., under#ground, ex#wife). There are two other instances when secondary stress is regularly placed on a given syllable.

A. Compounds (szóösszetételek)
In compound words, the first element of the compound bears primary stress, while the second (third, etc.) element is secondary stressed. Examples (we’ll use the word boundary symbol, i.e., #, to separate the elements of compounds — quite logically, since compounds consist of words):

bláck#bird, séa#sick, théory#neutral, fáculty#mèmber, prógress#repòrt

In case the first element is an adjective and the second is a noun, the same elements are generally usable as an NP consisting of an attributive adjective plus a noun, as in the case of bláck#bird ‘feketerigó’ vs. black bird ‘fekete (színű) madár’, also White House ‘the residence of the US president’ vs. white house ‘fehér(re festett) ház’. In such cases, the NP is primary stressed on the noun, i.e., blàck bírd, whìte hóuse. (The same is true for Hungarian: cf. halott#kém ‘coroner’ vs. halott kém ‘dead spy’, with the primary stressed vowel underlined.)

B. Phonologically assigned secondary stress
In many long words — generally suffixed ones — primary stress falls on the third syllable or a later one, and secondary stress appears on the first or the second syllable, as in justification, irrégulárity, réformátion, etc. Let us see why.

Please look at the table below:

---

9 There is one exception to the rule, the integrated negative prefix in+, as in incapable, intolerable, invisible, which clearly means ‘not’. We will discuss this prefix later on, comparing it to another negative prefix, the neutral un#.

10 Remember that in English, compounds are very often written as two words, e.g., theory neutral, White House. Sometimes there is variation, cf. the alternative theory-neutral, with a hyphen.

The items in (a) are primary stressed either on the first syllable (Type A) or on the second (Types B and C). The words in (b) are derived from the words in (a) with the addition of a pre-stressed or integrated suffix. This causes the primary stress to shift away from the first or second syllable towards the end of the word, e.g., *justify → justificat-ion (with a pre-stressed suffix). This leaves the first syllable unstressed. However, there is a very strict rule of English phonology:

(23) The Early Stress Requirement: one of the first two syllables in an English word must bear a major stress.

That is, no English word may begin with more than one unstressed syllable: the maximum number of unstressed syllables word-initially is one, as in agó, évênt, assôciate, refôrm, etc.

The shift of primary stress found in the words in (22b) leads to a situation where the Early Stress Requirement (ESR) is violated. In order to ensure that the ESR is respected, secondary stress is placed on the first or the second syllable. But what determines whether the first or second syllable receives secondary stress?

In Types A and B, we can observe that the words in (22b) will have secondary stress on the same syllable which is primary stressed in the corresponding words in (22a). For example, *justify is primary stressed on the first syllable, so *justificat-ion will have secondary stress on the first syllable. On the other hand, *irrégular is primary stressed on the second syllable, which is why *irrégularité will have secondary stress on the second syllable. This type of secondary stress is called Derivational Secondary Stress, because it is derived from the primary stress of the stem (= the words in (22a)).

In Type C, however, this isn’t what we find: the words refôrm, acádemy are primary stressed on the second syllable, but the words derived from them, réformâtion, âcadémic have initial secondary stress: based on the Derivational Secondary Stress rule, we would expect *réformâtion, *âcadémic. As indicated by the asterisks, such forms do not exist. (Compare these words with the Type B ones.)

The reason for this is that forms such as *réformâtion, *âcadémic would produce stress clash, that is, two major stresses right next to each other. English dislikes stress clash:

(24) Stress Clash Avoidance (SCA)
In an English word, major stresses may not fall on adjacent syllables.

The Derivational Secondary Stress rule, then, would produce forms such as *réformâtion, *âcadémic, which contradict the SCA. In such cases, the secondary stress is moved back to the first syllable: réformâtion, âcadémic. This leftward movement process is called Iambic
Reversal, and secondary stress which is placed through this process is known as **lambic secondary stress**.

The careful reader will have noticed that there are many English words which seem to contradict the SCA: these include words with a neutral prefix (e.g., *ùn#nátural*, *dè#ice*, *rè#write*) and compounds (e.g., *bláck#bird*, *séa#sick*). Note, however, that these words all include an internal word boundary, a #, between the two major stressed syllables. The SCA will need a slight re-formulation:

(25) **Stress Clash Avoidance (SCA) - Final version**

In an English word without an internal # boundary, major stresses may not fall on adjacent syllables.

The words in (22b) do not have an internal #: *irrègulárity*, for example, is #ir+règul+ár+ity#, with an integrated prefix and two integrated suffixes. The word *ùnnátural*, on the other hand, is #ùn#nátur+al#, so that there’s a # boundary between the secondary and the primary stress. As a result, the SCA is respected.

### 7 Excursus: Syllable structure in words with an internal # boundary

Words which contain an internal word boundary (#) — e.g., *un#known*, *peep#ed*, *black#bird* — are syllabified in the following way: we take the parts separated by a #, and determine their syllable structure as if they were independent words; then we combine the result. Examples:

(26) (a) *un#known*

(b) *peep#ed*
In (26a), we have a word consisting of a neutral prefix (un#) and the free stem known. The syllable structure of un# is identical to any word which has an initial V and a final C: it begins with an empty Onset and (as all C-final words) ends in an empty Nucleus, which may remain empty because it’s final (it stands before #). Known also ends in a FEN (Final Empty Nucleus).

In (26b), peep — a free root — also ends in a FEN; to this, the suffix #ed (pronounced t here) is added, beginning with a filled Onset, followed by an empty Nucleus. The empty Nucleus at the end of peep may remain empty because it’s a FEN: note that if it weren’t followed by a #, it couldn’t be empty, since it’s followed by another empty Nucleus, and this is against the Empty Category Principle. But, as it’s final (= followed by a #), it can happily remain empty. Note that the first syllable in peeped is still not superheavy — it has no Coda, both the p (final in the free stem) and the t (final in the complete word form) are Onsets followed by a FEN!

We’ll make this matter more explicit later on.

8 Stress-related phonological processes
There are several phonological processes in English which are influenced by stress. In this part of the chapter, we’ll examine four of them: (i) Syllabic Consonant Formation, (ii) Syncope, (iii) schwa-deletion in word-initial syllables, (iv) the replacement of weak i/ʊ with iː/ʊː.

8.1. Syllabic Consonant Formation
We have already seen that in English, liquids and nasals can be syllabic, as in the words bottom, even, apple = ˈbɒtm, ˈɪvən, ˈæpl. What is the syllabic status of these consonants?

It may be suggested that they sit in a Nucleus — that’s what we mean by saying that they are “syllabic”. Such words, then, end in a Nucleus filled by a consonant rather than a vowel. This possibility is shown in (27):

(27) apple ˈæpl

\[
\begin{array}{cccc}
\sigma & \sigma \\
| & | \\
R & R \\
O & O & N & N \\
X & X & X & X \\
\æ & p & l
\end{array}
\]

Nonetheless, there are reasons for why we should reject this solution. Note the following remarkable facts about syllabic consonants in English:

★ They never occur in stressed syllables, only in unstressed ones. Why? If they can occupy a Nucleus, why can’t they do so in a stressed syllable?

★ Any word with a syllabic consonant can also be pronounced with a schwa + non-syllabic consonant, i.e., ˈbɒtm, ˈɪvən, ˈæpləl, to use the examples above.

The solution we adopt in this book is that syllabic consonants are the products of a phonological process, called Syllabic Consonant Formation (SCF). The lexical form of words like apple, bottom, even contains a schwa, which is optionally deleted, and its Nucleus is filled by the consonant after it. That is, apple will be represented as in (28):
(28) *apple* 'æpɔl → 'æpl

(a) \[\sigma \quad \sigma \quad \sigma\]
\[\begin{array}{ccc}
R & R & R \\
O & N & O \\
X & X & X \\
æ & p & l \\
\end{array}\]

(b) \[\sigma \quad \sigma \quad \sigma\]
\[\begin{array}{ccc}
R & R & R \\
O & N & O \\
X & X & X \\
æ & p & l \\
\end{array}\]

(c) \[\sigma \quad \sigma \quad \sigma\]
\[\begin{array}{ccc}
R & R & R \\
O & N & O \\
X & X & X \\
æ & p & l \\
\end{array}\]

(28a) shows the lexical form of the word, with the final l sitting in an Onset, as word-final consonants do, followed by a FEN. It is perfectly possible to pronounce it in this form. Yet, the schwa can also be dropped: this situation is shown in (28b). This structure, however, is ill-formed: the Nucleus from which the schwa has been removed (indicated with X) becomes empty. The following Nucleus is also empty, and this contradicts the Empty Category Principle, one criterion of which is that a Nucleus may only be empty if the following Nucleus is filled. As a result, the l spreads into the empty Nucleus, filling it with phonetic material: this is indicated by the dotted line in (28c). As the Nucleus is now filled, rather than empty, the structure in (29c) is well-formed.

This solution explains why words with a syllabic C can always be pronounced with a schwa + C, too: syllabic C’s are the products of a phonological process (= SCF) which is optional: the schwa may or may not be dropped. We also explain why syllabic C’s are never found in stressed syllables: because stressed syllables may not contain a schwa! As syllabic C’s derive from a schwa + C sequence, this is logical.
Conditions on SCF

It is, unfortunately, not always possible to form a syllabic C: sometimes, the schwa may not be dropped. So, for example, column, maggot can only be pronounced \( ^\text{t} \text{kul} \text{m}, \text{ma} \text{g} \text{t} \), never \( ^* \text{t} \text{kul} \text{m}, ^* \text{ma} \text{g} \text{t} \). Let’s see the reasons why.

As for maggot, the answer is easy to give: only liquids and nasals can be syllabic in English, obstruents cannot. Therefore, the \( t \) in maggot cannot spread into the vacated Nucleus. Condition number one on SCF is, then: the C after the schwa must be a liquid or a nasal.

The other instance, column, is more problematic, since \( n \) is a nasal. Similar words include common (always \( ^\text{t} \text{k} \text{om} \text{n} \), never \( ^* \text{t} \text{k} \text{om} \text{n} \)) and venom (always \( ^\text{t} \text{v} \text{e} \text{n} \text{m} \), never \( ^* \text{t} \text{v} \text{e} \text{n} \text{m} \)). Compare these with words such as bottom, even, camel, channel, in which SCF is possible: \( ^\text{t} \text{b} \text{o} \text{t} \text{m/} ^\text{t} \text{b} \text{o} \text{t} \text{m}, ^\text{t} \text{e} \text{v} \text{e} \text{n/} ^\text{t} \text{e} \text{v} \text{e} \text{n}, ^\text{t} \text{k} \text{æ} \text{m} \text{l/} ^\text{t} \text{k} \text{æ} \text{m} \text{l} \text{ } ^\text{t} \text{f} \text{æ} \text{n} \text{e} \text{l/} ^\text{t} \text{f} \text{æ} \text{n} \text{e} \text{l} \) and \( ^\text{t} \text{f} \text{æ} \text{n} \text{e} \text{l/} ^\text{t} \text{f} \text{æ} \text{n} \text{e} \text{l} \) are equally well-formed.

The answer lies in what consonant precedes the schwa. In even, bottom, camel, channel, the C before the schwa (underlined) is less sonorous than the C after the schwa; in column, common, venom, it is either more sonorous or has the same sonority level. Now, if the schwa is dropped in words like column, common, venom, and the final nasal C fills the vacated Nucleus, we’ll encounter a violation of the Sonority Sequencing Principle. Look at the representation of common if pronounced with a syllabic \( n \) — the astersik marks, of course, that this form isn’t possible:

\[
(29) \quad \sigma \quad \sigma \quad \sigma \\
\begin{array}{cccc}
R & R & R & R \\
O & N & O & N \\
X & X & X & X \\
\star & k & o & m & n
\end{array}
\]

The second syllable would start with an Onset nasal (\( = \text{m} \)), and the Nucleus would contain a nasal (\( = n \)), too. This contradicts the Sonority Sequencing Principle, which requires a rise in sonority from the Onset towards the Nucleus. Two nasals are of equal sonority, hence there’s no rise. In column, the situation is even worse, since \( l \) is more sonorous than \( m \), so sonority would fall from the Onset towards the Nucleus.

If you now check even, bottom, camel, channel, the final C is more sonorous than the preceding one. Look at camel in (30):

\[
(30) \quad \sigma \quad \sigma \quad \sigma \\
\begin{array}{cccc}
R & R & R & R \\
O & N & O & N \\
X & X & X & X \\
k & æ & m & l
\end{array}
\]
As you can see, the second syllable of *camel* begins with an Onset nasal (= m) followed by a liquid (= l) in the Nucleus. As liquids are more sonorous than nasals, the SSP is respected: sonority does rise from the Onset towards the Nucleus.

All this would be too simple, however. Unfortunately, there’s a liquid which misbehaves: r. If the consonant before the schwa is r, the following l or n can become syllabic. Examples: *barrel, barren = 'bæral/'bærl, 'bærən/'bærən*. Note that such forms violate the SSP, as sonority doesn’t rise from the Onset r towards the following consonant occupying the Nucleus. Here, the r appears to behave exceptionally. To sum up the conditions on SCF:

(31) In a sequence C₁οC₂, the schwa may be dropped and C₂ becomes syllabic if:
1. C₂ is a liquid or nasal,
2. C₂ is more sonorous than C₁, except if C₁ = r.

In non-rhotic accents of English, r in word-final position may not become syllabic. The reason for this is that in such accents — including RP — r must always be attached to an Onset followed by a filled Nucleus. Recall that we’ve analysed words such as *better, car* etc. as ending in a floating r. Consider now the word *better* 'beta':

In rhotic accents such as GA, a final r can happily become syllabic, as in *better = 'bɛtar/'bɛtr*. In these accents, final r is not a floating segment but, like any other final C, it occupies an Onset followed by an empty Nucleus. And, of course, in these accents, the r is not required to be followed by a filled Nucleus (it can even occupy a Coda, cf. *party = GA 'par.ti)*). The representation of the rhotic pronunciation of *better* is shown in (33):
As you can see, the schwa can be dropped, and the `r` is linked to the Nucleus.

**Preconsonantal SCF**

It often happens, too, that a schwa is dropped and the following liquid/nasal, followed by another consonant, becomes syllabic. In such cases, the liquid/nasal occupies a Coda position. Examples:

(34) *A Coda C becoming syllabic*

| penalty          | 'penəlti  ~  'penlti |
| cadence          | 'kædəns  ~  'kædns |
| relevant         | 'reləvənt  ~  'reləvŋt |
| continue         | kən'tinju:  ~  kəntinju: |

Taking *cadence* as an example, let’s see the representation of such a situation:

(35)

\[\begin{array}{ccc}
\sigma & \sigma & \sigma \\
\hline
R & R & R \\
O & N & O \\
X & X & X \\
k & æ & d \\
\end{array}\]

If the schwa is dropped, the following Coda consonant will spread into the Nucleus, filling it with melody. It is to be noted that the conditions for SCF stated in (31) still hold:

(36)

(a)  \( \text{cadence} = \ 'kædəns  \text{ or } \ 'kædns \)
(b)  \( \text{penalty} = \ 'penəl.ti  \text{ or } \ 'penlti \)
(c)  \( \text{Clarence} = \ 'klærəns  \text{ or } \ 'klæn.s \)
(d)  \( \text{herald} = \ 'həral.d  \text{ or } \ 'hərl.d \)
(e)  \( \text{valency} = \ 'vələnsi  \text{ but NOT } \ 'veilənsi \)
(f)  \( \text{adamant} = \ 'ədəmənt  \text{ but NOT } \ 'ədəmənt \)

In (36a), the consonant before the schwa is less sonorous than the one after it, so SCF is possible. In (36b), the consonant before the schwa is `r`, hence — no matter whether the following liquid/nasal is less sonorous than `r` — SCF can still take place. In (36c), on the other hand, the consonant before the schwa is *not* `r`, and the consonant after the schwa is not more sonorous, hence the schwa can’t be dropped and SCF isn’t possible.

Needless to say, in non-rhotic accents `r` isn’t possible in a Coda, hence we find no instances of a Coda `r` becoming syllabic, either. In rhotic accents (such as GA), however, it can occupy a Coda, and — provided all conditions on SCF are met — it can become syllabic, as in the
words perceive, *Albert* = GA *par'siːv* ~ *pr'siːv*, *ælbr̩.t* ~ *ælbr̩.t*. A representation of the GA pronunciation of *Albert* is shown in (37):

(37)

As opposed to this, in non-rhotic accents, *Albert* (= *ælbɔt*) is representable as in (38):

(38)

As there’s no *r* at all in the non-rhotic form of this word, there’s no consonant available for SCF (note that *t* is an obstruent, so, obviously, it can’t become syllabic).

**“Prevocalic” SCF — SCF before a filled Nucleus**

SCF can also take place before a filled Nucleus. This is traditionally called “Prevocalic SCF”. The term, however, is misleading, since it can also refer to SCF before another syllabic consonant (cf. the words in (39c)). The terms *vowel* and *Nucleus* have been strictly distinguished in this book: as we’ve seen, a Nucleus may be present but empty, and it is also possible that it is filled by a nasal or a liquid. Therefore, we’ll use the term “SCF before a filled Nucleus”. In such cases, the syllabic C occupies an Onset (since it is immediately followed by a filled Nucleus). It follows from this that *r* can be subject to SCF before a filled Nucleus in non-rhotic accents, too, since in such cases, the *r* is linked to an Onset followed by a filled Nucleus. Examples:
In (39a), the schwa is followed by a C + a filled Nucleus. As the C after the schwa is (i) a liquid or a nasal, and (ii) it is more sonorous than the one before the schwa, SCF can take place. In (39b), SCF isn’t possible, since the C after the schwa is not more sonorous than the one before it. Finally, in (39c), we find two instances of SCF: the second schwa stands before a final C (= Onset followed by a FEN), while the first schwa is before an Onset C followed by a filled Nucleus. Let’s now see some detailed representations.

(40) décorate

In both rhotic and non-rhotic accents, the r can spread into the vacated Nucleus (compare this to better in (32) and (33)), simply because it is linked to an Onset X followed by a filled Nucleus. Let’s now see federal, with two instances of SCF:

(41) federal

The l becomes syllabic in the same way as in apple (see (28)). Note that, although the r is not less sonorous than the l, SCF can still take place: it is always possible after a r (cf. (31)). The r, too, is preceded by a schwa, which can be dropped, the r being linked to the Nucleus left empty by the schwa, as the consonant before the schwa (= d) is less sonorous than the r. Note that again, the Nucleus after the r is filled, because it is occupied by the l.
8.2. Schwa-deletion: Syncope and Schwa-deletion in initial syllables
The term syncope (pron. sínkapi) refers to the deletion of a vowel in word-medial position. In English, it is the schwa — sometimes i, but only if replaceable by a schwa) which can be syncopated. We have already seen (in Chapter 6) some examples. For instance, history can be pronounced ˈhistɔrɪ or ˈhistrɪ, with or without a schwa; in fact, as we saw in (39a), it is also possible to pronounce it with a syllabic r: ˈhistrɪ. We will now examine the details.

8.2.1. Syncope
We have noted that history can be pronounced in three ways. Indeed, any word in which the schwa can be dropped can also be pronounced with a schwa or with a syllabic consonant. Further examples:

(42) 
(a) Schwa ˈsepərət ˈsepərət ˈsepərət
(b) Syllabic C ˈsɛməli ˈsɛməli ˈsɛməli
(c) Syncope ˈpoɪznəs ˈpoɪznəs ˈpoɪznəs

As you can see, the possibility of syncope implies the possibility of SCF. That is, if syncope is possible, so is SCF. We can safely assume, therefore, that the schwa-ful variants (cf. (42a)) are the lexical forms of these words. The schwa can be dropped in case the following conditions hold (= (31), repeated here as (43)):

(43) In a sequence C₁oC₂, the schwa may be dropped and C₂ becomes syllabic if:
1. C₂ is a liquid or nasal,
2. C₂ is more sonorous than C₁, except if C₁ = r.

According to (43), the Nucleus of the dropped schwa will be “re-filled” by the following nasal or liquid. This is what we find in (42b). However, it is possible to go even further, leaving the Nucleus vacated by the dropped schwa totally empty, without linking the following nasal/liquid to its X position. This is what we call syncope, shown in (42c).

As syncope implies SCF, it is no wonder that the conditions in (43) must also be met for syncope. For instance, no syncope is possible in vanity, since the t cannot be syllabic, so SCF isn’t possible. Therefore, if SCF is impossible, so is syncope.

Let’s now see a particular example for SCF and syncope, taking the adjective separate.
(44a) shows the schwa-ful, lexical form of the word. In (44b), the schwa in the second syllable is dropped, but its Nucleus is filled by the following r, exemplifying SCF. Of course, the schwa in the ult may not drop, since the t cannot become syllabic. Finally, in (44c), the Nucleus (indicated as X) isn’t filled: it remains empty. This shows syncope.

Now, recall that a Nucleus may only remain empty if the conditions of the Empty Category Principle (ECP) hold. We repeat it here:

(45) The phonological Empty Category Principle
A Nucleus may remain empty if
(a) it dominates only one X position,
(b) it is unstressed,
(c) it is separated from the following Nucleus by a single consonant,
(d) the following Nucleus is not empty,
(e) the Onset before the empty Nucleus is simplex (it dominates one X).

As you can verify, these conditions all hold for the Nucleus marked X in (44c). However, there are instances where SCF is possible, but syncope isn’t, because the syncopated form would violate the ECP. There are two situations where this is the case.
SCF possible, but syncope not: Case 1.
In ults (final syllables), syncope is always impossible, even if SCF can take place. Recall the ill-formed representation of the word *apple* in (28b), shown here as (46) for convenience:

(46) σ σ σ
    R R R
    O N O N O N
    X X X X X X
    * æ p l

The Nucleus marked X may not remain empty, since this situation would be against condition (d) of the ECP, saying that a Nucleus may not be empty if the following Nucleus is empty. Here, this is the case. If the l spreads into it, it becomes filled, so the ECP is respected. To sum up, syncope isn’t possible in ults, because it would violate the ECP.

Consider now the word *currency* ˈkurənsi ̈~ˈkəɾnsi (but not *ˈkəɾnsi):

(47) σ σ σ
    R R R
    O N O C O N
    X X X X X X
    * k e r n s i

This, as shown by the *, (47) is ill-formed. The reason for this is that the empty Nucleus is separated from the following Nucleus by more than one consonant, contradicting condition (c) of the ECP. Of course, SCF is possible here, too: if the n fills the Nucleus, it isn’t empty any more, so it is not subject to the ECP. Therefore, syncope is impossible in non-ults if the schwa is followed by more than one consonant. Note, however, that the situation depicted in (46) and (47) are but subcases of the same problem: in both cases, syncope would result in a violation of the ECP. We can, therefore, say that

(48) Syncope is impossible if it would result in a violation of the ECP.

---

12 Taking the variant with a final ɪ rather than with a final ɪː — both pronunciations are possible.
SCF possible, but syncope not: Case 2.

Consider the following words, in which SCF is possible, but syncope isn’t:

(49)

<table>
<thead>
<tr>
<th></th>
<th>(a) Schwa</th>
<th>(b) Syllabic C</th>
<th>(c) *Syncope</th>
</tr>
</thead>
<tbody>
<tr>
<td>décoratión</td>
<td>dek'o'refən</td>
<td>dek'o'refən</td>
<td>*dek'o'refən</td>
</tr>
<tr>
<td>réfréue</td>
<td>ref'riː</td>
<td>ref'riː</td>
<td>*ref'riː</td>
</tr>
<tr>
<td>révélation</td>
<td>rev'lefən</td>
<td>rev'lefən</td>
<td>*rev'lefən</td>
</tr>
<tr>
<td>kitchenette</td>
<td>kitʃ'net</td>
<td>kitʃ'net</td>
<td>*kitʃ'net</td>
</tr>
</tbody>
</table>

Based on what we have seen so far, we would expect that syncope is possible in these words: in all cases, the ECP would be respected. Take referee, for instance:

(50)

\[
\begin{array}{c|c|c|c|c|c|c|c}
\sigma & \sigma & \sigma \\
R & R & R \\
O & N & O & N & O \\
X & X & X & X & X \\
\hline
r & e & f & r & i
\end{array}
\]

This form isn’t possible, although the ECP is respected (compare separate_{\textsc{Lj}} in (44c)): the empty Nucleus is followed by a single C, and the following Nucleus is filled. You are invited to check the other words in (50) — the situation is the same! The question is why, then, is syncope impossible?

You may have noticed that in all these words, the syllable after the schwa is stressed. Indeed, this is the reason: syncope isn’t possible if the following syllable is stressed. Let us now check the following items:

(51)

<table>
<thead>
<tr>
<th></th>
<th>(a) Schwa</th>
<th>(b) Syllabic C</th>
<th>(c) *Syncope</th>
</tr>
</thead>
<tbody>
<tr>
<td>décoraté</td>
<td>dekə'refət</td>
<td>dekə'refət</td>
<td>*dekə'refət</td>
</tr>
<tr>
<td>séparaté</td>
<td>sepə'ret</td>
<td>sepə'ret</td>
<td>*sepə'ret</td>
</tr>
<tr>
<td>páralise</td>
<td>pærə'laɪz</td>
<td>pærə'laɪz</td>
<td>*pærə'laɪz</td>
</tr>
</tbody>
</table>

In these words, syncope isn’t possible, either, though the last syllable seems unstressed. Recall, however, that we argued earlier that tertiary stress should be assumed on syllables which have no major stress but contain a full vowel. We pointed out that tertiary stressed syllables behave just like major stressed ones with regard to the replaceability of weak o with ð, which is only possible if the following syllable is unstressed, cf. (7), repeated here as (52):

(52) Words with variable o ~ u; o not replaceable by a schwa

(a) réputation, humánity, stupïdïty, régulártï, Pörtuguëse, mònumentál
(b) régulaté -eɪt, manipulaté -eɪt, cêlluloid -eɪd, pörçupine -eɪn, côncubine -eɪn
As you can see, the words in (52b) behave just like the ones in (52a): that is, the replacement of \( \mathbf{u} \) with a schwa isn’t possible before a full-vowelled syllable. This, we argued, shows that the ult of the words in (52b) does bear a certain degree of stress: tertiary.

The impossibility of syncope in the words in (51) also provides evidence for tertiary stress: such syllables behave exactly like major stressed ones. Before neither type is syncope possible.

### 8.2.2. Schwa-deletion in initial syllables

Especially in casual speech, schwa can be deleted in initial syllables. Words like *potáto, police, terráin, suppóse* are pronounceable with or without a schwa: \( p(\mathbf{a})'teta\o, p(\mathbf{a})'lis, t(\mathbf{a})'rein, s(\mathbf{a})'pouz, \) etc. Initial schwa-deletion is subject to less strict restrictions than syncope. For one thing, it occurs before a stressed syllable (note that syncope cannot), and it can take place before a wide variety of consonants, even those which cannot be syllabic (as in *potáto*). There are two important conditions on it. First, the deletion may not result in a violation of the ECP. Practically, this means that it is impossible if the schwa is followed by more than one consonant — recall that a Nucleus may only remain empty if it’s separated from the following filled Nucleus by a single C. E.g., the schwa cannot be dropped in words such as *contáin kon'tem* or *degréé dö'grì* (although SCF is possible in *contáin*, i.e., it can be pronounced *kn'tem*). Second, the schwa may not be preceded by a sonorant; e.g., it may not be deleted in *receève rə'sìv, Lorráine la'rein, madónna mə'doña*, etc.

### 8.3. Weak u/\( i: \) — heavy or light?

Recall that in certain cases, weak \( \mathbf{u} \) and \( \mathbf{i} \) can be replaced by \( \mathbf{u}t \) and \( \mathbf{i}t \), respectively. This replacement is possible (i) prevocally, (ii) for \( \mathbf{i} \), in word-final position, (iii) for \( \mathbf{u} \), preconsonantally if the following syllable is stressed. Examples:

\[
\begin{array}{|c|c|c|}
\hline
\text{city, fàncy, réáct, v Idaho} & \text{Transcription} & \text{Abbreviated transcription} & \text{Abbr. transcription: example} \\
\hline
i ~ i: & i & 'sìti, ri'æk \vspace{6pt} \\
\hline
unite, grádual, régulation & u ~ u: & u & ju'nait, grædzual \\
\hline
\end{array}
\]

In this section, we’ll examine these weak vowels with regard to length. Specifically, we’ll claim that such words contain a short \( \mathbf{u}/\mathbf{o} \) lexically, which is subject to an optional lengthening process.

Look at the verbs and adjectives ending in \( \mathbf{i} \sim \mathbf{u}: \) below:

\[
\begin{array}{|c|c|c|}
\hline
\text{VERBS:} & \text{A} & \text{B} \\
\hline
fàncy & 'fænsi & ~ & 'fænsi: \\
énvy & 'envi & ~ & 'envi: \\
càrry & 'kæri & ~ & 'kæri: \\
\hline
\text{ADJECTIVES:} & & \\
mèrri & 'mèri & ~ & 'mèri: \\
hápèpi & 'hæpi & ~ & 'hæpi: \\
sìli & 'sìti & ~ & 'sìti: \\
\hline
\end{array}
\]

\[122\]
You can see that primary stress in such verbs/adjectives falls on the penult. Recall that disyllabic adjectives are stressed like verbs; if the ult is heavy, it’s stressed, but if it’s light, the penult is.

Now, if you consider the pronunciations given in column A, these words are perfectly well-behaved: the ult ends in a short ɪ, so it’s light: therefore, the penult receives stress. If, however, we consider the alternative forms in column B, they appear to “misbehave”: as ɪː is long, the ult seems to be heavy, so it ought to be stressed. Yet, it isn’t: the penult is stressed. It seems that the final ɪ counts as “short”, i.e., light.

The situation is similar with words exhibiting the ʊ/ʊː variation. Consider, for example, the nouns in (55):

(55)

<table>
<thead>
<tr>
<th>NOUNS</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>gráduate</td>
<td>ˈgrædu.ət</td>
<td>ˈgrædʒu.ət</td>
</tr>
<tr>
<td>ritual</td>
<td>ˈritʃu.əl</td>
<td>ˈritʃu.əl</td>
</tr>
<tr>
<td>continuant</td>
<td>ˈkæntʃu.ənt</td>
<td>ˈkæntʃu.ənt</td>
</tr>
</tbody>
</table>

Remember that polysyllabic adjectives are stressed like nouns: the ult is neglected, and the penult is stressed if it’s heavy; if it’s light, the antepenult is stressed. Now, the forms in column A conform to this pattern: the penult (separated from the neglected ult by a dot in (55)) is light, because it ends in a short Nucleus. But the forms in column B appear to be “irregular”: the long ʊː ought to make a heavy penult, which, then, should be stressed. But it is the antepenult which receives stress!

The solution we adopt is that the lexical form of words with variable ɪ/ɪː and ʊ/ʊː contains a short vowel. That is, the lexical forms of words in (54) and (55) are the ones in column A. Stress rules apply to these forms, quite regularly. The forms in column B are the products of vowel lengthening process, which is optional:

(56) **High Vowel Lengthening (HVL)**

(a) Unstressed ɪ → ɪː, if it is
   1. prevocalic, or
   2. word-final.

(b) Unstressed ʊ → ʊː, if it is
   1. prevocalic, or
   2. preconsonantal and the following syllable is stressed.

It is very important that HVL applies after the stress rules — in fact, HVL makes crucial reference to the fact that short high vowels can only be lengthened if they are unstressed — a stressed short high vowel can never be lengthened (e.g., the first ɪ of silly or the ʊ in bush cannot be replaced by a long high vowel). Furthermore, the second condition under (56b) also makes reference to stress. We can now give two examples for how stress rules and HVL apply, taking the verb merry and the noun ritual:
As HVL applies after the stress rules, the stress placement in these words is determined on the basis of the lexical forms, which contain a short high vowel; as a result, the ult in *merry* and the penult in *gradual* is light, hence not stressed.