

Posttonic stress in English⁰

Péter Szigetvári, Eötvös Loránd University, ORCID 0000-0001-6045-2859

Abstract There is disagreement on whether certain vowels are stressed or unstressed in English. This is because two notions, accent and stress are conflated. Clearly distinguishing them provides us with a neater framework, where stress is stable, accent is mobile. I argue that any vowel that is not reduced is stressed, but only some stressed vowels are also accented. Accent takes part in the organization of rhythm. Stress, on the other hand, is not related to rhythm at all, it is a segmental phenomenon. Vowels are lexically stressed or unstressed in English, and stress influences segmental processes, like consonant lenition, vowel elision, etc. It also follows that stress has no degrees (primary, secondary), a vowel is either stressed or unstressed.

Keywords word stress, accent vs. stress, stress patterns, English, vowel reduction

There is no consensus on what is and what is not stressed in English. Let us look at the [o]'s in the last syllable of *robot* or *apricot*, or that in the penult of *autopsy*. All three may be analysed, and therefore transcribed as stressed: [r^ówbòt],¹ [éjpríkòt], [ó:tòpsij] (as is done by, for example, Merriam-Webster (2019)).² Other dictionaries, mainly British ones, for example, Jones (1917), Gimson (1977), or Wells (2008), transcribe these words without indicating stress on the [o], they will only have the stress mark on the first vowels. Yet others, like Kenyon & Knott

⁰I would like to thank the anonymous reviewer for their useful comments and the organizers of APAP in 2019 for having me in Lublin. My work is partly sponsored by NKFIH grant #119863. I am grateful to George Soros.

¹For the sake of uniformity, I retranscribe data taken from dictionaries, only keeping their stress pattern. I use only the symbols [a], [e], [i], [o], [u], and [ə] to transcribe the vowels of (British) English. Readers may replace them with more fancy ones ([æ]/[ɑ], [ɛ], [ɪ], [ɔ]/[ɒ], [ʊ]/[ə]/[ɜ], [ʌ]/[ɐ], respectively) to their liking. Bloomfield supports this practice: “The shapes of the graphic symbols scarcely deserve discussion. The reader who prefers the symbol [æ] where I use [ɛ] does not need any factual basis to justify his preference” (1935:98). A brief introduction of the British English vowel system applied in this paper is provided in §2.

²Both *robot* and *autopsy* have a variant in which the second vowel is reduced and unstressed: [r^ówbət] and [ó:təpsij].

22 (1953), mark the [o] in [éjprəkòt], but not in [rówbot] or [ó:topsij]. The [o] in *Oc-*
23 *ttober* [òktáwbə] or *octet* [òktét] is not marked as stressed in any of the diction-
24 aries mentioned, but it is considered as such by, for example, Chomsky & Halle
25 (1968). The [o] in *monsoon* [mònsúwn] is marked as stressed by Wells (2008), but
26 not by Kenyon & Knott (1953), Gimson (1977) or Merriam-Webster (2019).³ The
27 disagreement arises from different interpretations of the term “stress”.⁴ What
28 causes confusion is the conflation of two different, but partly related phenom-
29 ena: one rhythmic, the other segmental.

30 The term “stress” is used, on the one hand, for a rhythmic phenomenon. The
31 rhythmic alternation of vowels and consonants creates a wave defined by the
32 periodical increase and decrease of sonority, a cycle of which is referred to as
33 a syllable (e.g., Sievers 1876, Lowenstamm 1981, Selkirk 1984). The rhythmic
34 alternation of “stressed” and “unstressed” vowels creates a further wave super-
35 imposed on the one created by sonority. A cycle of this latter wave is called
36 a foot. Some analysts who adopt this rhythmic interpretation of stress would
37 call the peaks of this wave not stress, but accent (e.g., Vanderslice & Ladefoged
38 1972, Gussenhoven 1991, Schane 1979, 2007). The argument is that since *robot*,
39 *apricot*, and *autopsy* are all single feet, their [o]’s are not accented, despite the
40 fact that they are not reduced, unlike in *Probert* [prówbət], *advocate* [ádvəkət],
41 or *leprosy* [léprəsij], where the nonfirst vowels are unstressed by all standards,
42 and of course unaccented too. I will use the term “accent” for ‘rhythmic stress’.
43 Accent in this paper is indicated by the acute accent mark.

44 But stress is also a segmental phenomenon. English supplies plenty of evid-
45 ence in support of this claim. Any member of the vowel inventory is available
46 in stressed position,⁵ but only a subset of the vowels may occur in unstressed
47 position. These vowels are referred to as reduced vowels. This means that a
48 nonreduced vowel (also called full vowel) is indicative of stress. At this point,
49 such a claim is circular, since we take vowel quality to be a symptom of stress
50 and vice versa. But as we are going to see in §5, vowel quality is but one of the
51 symptoms of stress, there are other segmental phenomena that are sensitive to it
52 and thus corroborate this stance. I am going to use the term “stress” only in this
53 latter, segmental sense. Stress is more common than accent, since the accented
54 vowel is (almost) always lexically stressed, but not all lexically stressed vowels
55 are accented. Stress that is not an accent is indicated in this paper by the grave

³All the same, Merriam-Webster (2019) do indicate the variant [mònsúwn].

⁴The problem is so severe that some authors explicitly decide to avoid using the term “stress” altogether, e.g., Cruttenden (2014:24f).

⁵This claim seems to be debatable, since most analyses of English would distinguish unstressed schwa and STRUT, leaving us with one member of the vowel inventory that cannot occur stressed. In Szigetvári 2018, I argue that this distinction is unnecessary, STRUT is stressed schwa. Fabricius (2007) provides phonetic evidence supporting this claim.

56 accent mark. Both the acute and the grave accent marks indicate stress.

57 In what follows, I will first show how stress and accent are different in §1. We
58 will then look at the vowels that occur in stressed and unstressed position. Since
59 different Englishes have rather different vowel inventories, we have to limit our
60 discussion to one variety, it will be Current British English. Earlier centring diph-
61 thongs have monophthongized in this accent, and HAPPY-tensing (Wells 1982:
62 257f) has gone through. A fuller description is provided in §2. Section 3 argues
63 that stressed vowels are lexically marked in English and do not ever become un-
64 stressed, nor do lexically unstressed vowels ever become stressed. It follows that
65 vowel reduction is not a phonological rule of present-day English, it is a histor-
66 ical relic, like velar softening or vowel shift. Some cases where a stressed vowel
67 cannot possibly be accented are discussed in §4. Section 5 lists five segmental
68 effects of stress: flapping (§5.1), syncope (§5.2), epenthesis (§5.3), and the loss of
69 the glides [j] (§5.4) and [w] (§5.5). All the possible stress (and accent) patterns of
70 two- and three-vowel English words are enumerated in §6. Conclusions end the
71 paper (§7).

72 1 Accent vs. stress

73 Accent and stress are partly related. An accent typically falls on a stressed vowel,
74 although contrastive accent may target an unstressed vowel too. Consider the
75 utterances in (1).

(1) Examples of contrast

- a. it's not working, but it's workáble
- b. she's not an employee, but an employér

76 In (1a) the normally unstressed second vowel of [wə:kábəl] and in (1b) the last
77 vowel of [emplojé:] bears an accent (the latter vowel is also lengthened, because
78 short stressed vowels may not occur word finally). The accent here highlights
79 the part of the word where the difference between it and its counterpart begins,
80 that is, its location is determined by the comparison of the phonetic forms of two
81 words. This situation only arises when words, more precisely, morphemes are
82 contrasted, that is, for phonology-external reasons. It will be ignored here.

83 Not all stressed vowels carry an accent, stress may be taken to be a poten-
84 tial location for accent — like a vowel (as opposed to a consonant) is a potential
85 location for stress. Although there exist stressed “syllabic” consonants, they are
86 less common than stressed vowels. Likewise, accented vowels that are lexically
87 unstressed are an exception. Some segments are better, others are worse can-
88 didates for being a vowel or a consonant, but ultimately whether a segment is a

89 vowel or a consonant is lexically determined. Likewise, some vowels are better,
90 others are worse candidates for being stressed, but ultimately this is also lexically
91 determined. Compare, for example, the following word pairs: the words in (2a)
92 have stress and accent on their first vowel, but no stress on the second one, the
93 words in (2b) are segmentally very similar, and yet have accent on the second
94 vowel.

(2) Segmentally similar words with different stress patterns

- | | | | |
|----|---------------------------|----|----------------------------|
| a. | <i>ugly</i> [ʊglij] | b. | <i>agree</i> [əgríj] |
| | <i>Kennedy</i> [kénədij] | | <i>Kentucky</i> [kèntəkij] |
| | <i>colander</i> [kələndə] | | <i>Columbus</i> [kələmbəs] |

95 Accent is contextually determined. Take the words *Taiwan* and *Arizona*. Both
96 vowels in *Táiwán*, and two of the four vowels in *Árizóna* are stressed. When
97 pronounced at the end of an utterance, for example, if in isolation, the second
98 (last) stressed vowel is where pitch change occurs, so that vowel is accented in
99 each word (*Táiwán*, *Árizóna*). If followed by a word that itself bears an accent, the
100 first vowel will be accented: *Táiwán míracle*, *Árizóna désert*. And, of course, both
101 words may be uttered without any accent, as in *éven Jóhn went to Taiwan/Arizona*
102 (Gussenhoven 1991:5).

103 Every word must contain at least one stressed vowel, if a word lacks stress
104 altogether, it is not a word in the phonological sense, but a clitic. Some words
105 (like *Taiwan* or *Arizona*) contain more than one stress, but not necessarily all of
106 these are accented. That is, any word has at least one, often more than one stress,
107 but the number of accents in a word may be less, even zero. Accent is deletable.
108 As will be shown in §3, stress is not.

109 Stress is assumed to be relative, a vowel is stressed only in comparison to
110 another vowel (Gussenhoven 1991:1). This is why there exists a practice of not
111 marking stress in monosyllables (Jones 1917), though Merriam-Webster (2019) is
112 an exception in this regard. If, however, stress marks a potential accent, then not
113 marking it is based on a misconception: as it has just been stated, any word —
114 including monosyllables, of course — contains at least one stressed vowel, that
115 is, one potential accent. So while marking accent in a monosyllable may indeed
116 be deemed superfluous, marking stress is not. Kenyon & Knott, who also do not
117 mark anything in monosyllables, rightly call what they do mark in longer words
118 an accent (1953:xxiv). But it is not clear why a dictionary should mark accents,
119 which are strongly influenced by the context of the word. Stresses are marked in
120 the lexicon, dictionaries should also mark stresses. It is, nevertheless, necessary
121 to mark some accents. We will return to this issue in §6.

122 To summarize, the location of accents is partly lexically determined: an ac-

123 cent typically (though not exclusively) falls on a vowel that is lexically stressed.
124 To a large extent, however, where accents fall is determined by nonphonological,
125 more specifically syntactic and pragmatic factors. Stress, on the other hand,
126 partly depends on the phonological shape of the word and is to a large extent
127 lexical. This paper is about stress, not about accent. I assume that full vowels are
128 stressed, while reduced vowels unstressed. Therefore we need to examine the
129 vowel system of English before we proceed.

130 2 The vowels of British English

131 In some languages, English among them, the inventory of vowels that occur
132 stressed is different from those occurring in unstressed position. The view in
133 which some vowels (most notably schwa) may only occur in unstressed position
134 requires further explanation of why these vowels shun stress. Since the syllabic
135 portion of GOAT has fronted in British English, [ow] > [əw], and the NURSE mer-
136 ger has also created a sizable lexical set containing [ə:], it is not a tenable position
137 that schwa is not found in stressed position (Lindsey 2012b). Therefore, I take
138 schwa and STRUT to be the same vowel, that is, schwa is allowed in stressed posi-
139 tion: e.g., *bug* [bóg], *butter* [bátə]. Accordingly, unstressed vowels of English are
140 a proper subset of stressed vowels. Any vowel may occur in stressed position,
141 but some vowels only occur stressed. Only a limited set of vowels, the so-called
142 reduced vowels, may occur unstressed. Since stressed position is stronger, that
143 is, it allows a larger range of contrasts (Harris 1994:109), one expects exactly
144 this situation: stressed positions exhibiting the full range of vowels available,
145 unstressed positions only a narrower subset.⁶

146 2.1 In stressed position

147 The vowels occurring in stressed position in British English fall into three groups.
148 The membership of the first one of these groups is rather uncontroversial. While
149 every vowel may occur before a consonant, six of them occur exclusively here:
150 KIT [i], DRESS [e], TRAP [a], STRUT [ə], LOT/CLOTH [o], and FOOT [u]. These are
151 referred to as checked (Kreidler 1989) or lax vowels (Chomsky & Halle 1968).

152 Checked vowels may not, but all other vowels may occur word finally. Some
153 of them are diphthongal, others are monophthongal. The problem is that it is

⁶A reviewer suggests that stress is not (only) segmental if only some vowels may be unstressed. Note, however, that it is common to find segmental properties that are available only for a limited set of segments. The contrast in voicing commonly occurs only at the lower end of the sonority scale, for obstruents or, in Old English, only plosives. Likewise, stress is available only at the higher end, for vowels, in fact, as we are going to see, in English nonhigh vowels are obligatorily stressed.

154 not always trivial to tell which is which, categorizations of these vowels vary
 155 widely. I use a distributional criterion to separate the two groups: the vowels
 156 that may occur before another vowel constitute one group, I will refer to
 157 them as free vowels.⁷ Vowels of the other group may not occur before another
 158 vowel, they are long monophthongs and will be called R vowels. This set is
 159 in flux in current British English, it comprises five or six members: NEAR [i:],
 160 SQUARE [e:], START/BATH/PALM [a:], NURSE [ɜ:], FORCE/NORTH/THOUGHT [o:], and
 161 CURE [u:]. Many speakers merge CURE with either NURSE or with FORCE/NORTH/
 162 THOUGHT, and, as a result, have only five members in this set. Note that if we
 163 use simple vowel symbols for representing vowels, the R vowels appear to be
 164 the long counterparts of the checked ones, except that a contrastive long [u:] has
 165 disappeared for many speakers. Also note that some of these vowels are realized
 166 as two vowels, especially phrase finally: *it's near* [nijə] vs. *near you* [ni:jə]. Most
 167 other R vowels have become long monophthongs during the 20th century (Crut-
 168 tenden 2014): SQUARE monophthongized from earlier [eə] (Gimson 1989:144),
 169 FORCE from earlier [oə] (Jones 1960:116), CURE from [uə] (Gimson 1989:146).⁸
 170 In fact, there is a general tendency in English for diphthong+schwa sequences
 171 to turn into a long monophthong: *fire* [fajə] ~ [fa:], *child* [tʃajld] ~ [tʃajəld] ~
 172 [tʃa:ld], *vowel* [vawl] ~ [vawəl] ~ [va:l], *diamond* [dajmənd] ~ [dajəmənd] ~
 173 [da:mənd].

174 Vowels with the freest distribution occur not only before consonants and
 175 word finally, but also before another vowel. Most of these vowels are analysed
 176 (and transcribed) as diphthongs: FACE [ej], GOAT [əw], PRICE [aj], MOUTH [aw],
 177 CHOICE [oj].⁹ Two further vowels belong here, because they also occur prevoc-
 178 ally: FLEECE [ij] and GOOSE [uw]. Interestingly, these were transcribed by
 179 Sweet (1900) in exactly the same way as they are here, only to be reinterpreted
 180 as long monophthongs, [i:] and [u:], by Jones (1917), at least in transcription. The
 181 diphthongal pronunciation of both vowels is mentioned by Jones (1960:65f, 85)
 182 and Gimson (1989:101f, 121). However, it is not their phonetic realization, but
 183 their distribution that clearly groups both FLEECE and GOOSE with diphthongs,
 184 not with long monophthongs. Therefore we had better return to Sweet's phon-
 185 ologically, distributionally viable analysis.

186 The vowel inventory of current British English briefly depicted above is sum-
 187 marized in (3). We can see that the range of environments where the three sets
 188 occur gradually widens from “only preconsonantly”, (3a), through “preconson-
 189 antally and word finally”, (3b), to “anywhere”, (3c). It must be noted that while

⁷I use the label “free vowels” more restrictively than Kreidler (1989), who applies it to the complement set of checked vowels.

⁸Also see Szigetvári 2015 for a summary and further references.

⁹Like Lindsey (2012a), I use the consonantal symbols j and w to represent diphthongal offglides for reasons to be revealed in §2.2.

190 stressed schwa is a checked vowel, unstressed schwa occurs word finally too,
191 hence it is an R vowel.

(3) The vowel inventory of current British English

- a. checked vowels (___C): i e a ə o u
- b. R vowels (___{C,#}): i: e: a: ə: o: (u:)
- c. free vowels (___{C,#,V}): ij ej aj aw əw oj uw

192 **2.2 In unstressed position**

193 The checked vowels may be organized in three pairs of a nonlow and a nonhigh
194 vowel, front, central, and back, as shown in (4).

(4) The checked vowels

	front	central	back	
nonlow	i	ə	u	stressed and unstressed
nonhigh	e	a	o	only stressed

195 Of these three pairs, the more sonorous, nonhigh members, located in the
196 bottom line of (4), may occur only in stressed position. Unstressed positions only
197 license the less sonorous nonlow ones (as well as some even less sonorous con-
198 sonants): *panic* [pánik], *paddock* [pádək], *educate* [édzukejt] or [édzəkejt] (un-
199 stressed [u] alternates with [ə] in practically all its occurrences), *prism* [prízɪm] (~
200 [prízəm]). This is not an unexpected arrangement, many other languages featur-
201 ing distinct stressed and unstressed vowel inventories are also seen to restrict
202 the latter to high and/or central (here nonlow) vowels (Crosswhite 2004).

203 There is a correlation between syllable weight and stress: long vowels (VV)
204 are more prone to be stressed than short vowels. This is because a syllable con-
205 taining a long vowel is heavy, and weight attracts stress. An open syllable with
206 a short vowel (V) is light. The vowel of a light syllable may also be stressed:
207 *léper*, *Agríppa*, but unstressed vowels are more common in a light than in a
208 heavy syllable. A closed syllable containing a short vowel (VC) may pattern
209 with long-vowelled (heavy) syllables, or with light syllables cross-linguistically
210 (Hayes 1995:52). In English this kind of syllable indeed exhibits both kinds of
211 behaviour, they may be stressed: *contéstant*, *Clarínda*, *redáctor*, or unstressed:
212 *prótestant*, *Clárendon*, *cháraction*.

213 The set of diphthongs is split similarly to checked vowels: some of them may
214 occur in unstressed position, others may not. This is odd because diphthongs are
215 traditionally taken to be similar to long vowels in their representation (Harris

216 1994:63ff), and, as we will see below, long vowels do not occur unstressed at all.
 217 Even more telling is the fact that if we categorize these vowels according to their
 218 first half using the same groups as for checked vowels in (4), we get the same
 219 distribution. This is shown in (5).

(5) The free vowels

	front	central	back	
nonlow	ij	əw	uw	stressed and unstressed
nonhigh	ej	aj aw	oj	only stressed

220 The diphthongs of the second line, beginning with [e a o], may not turn up
 221 in unstressed position, those of the first line may do so: *volley* [vólɪj], *wallow*
 222 [wóləw], *value* [váljuw]. That these vowels are indeed unstressed will be justified
 223 in §5.

224 Looking at the distribution of unstressed diphthongs, we find that all three
 225 occur word finally (as in the examples above) and before a vowel: *atrium* [éjtrɪjəm],
 226 *Genoa* [dʒénəwə], *influence* [ínfluwəns]. In preconsonantal position, unstressed
 227 [əw] and [uw] do occur, but for one thing, never if the following vowel is un-
 228 stressed, for another, the [w] may be deleted in both cases (see §5.5 for details):
 229 *obese* [əwbíjs],¹⁰ *stimulation* [stímjuwléjʃən] (vs. *stimulus* [stímju(*w)ləs]).¹¹ Un-
 230 stressed [ij] does not occur before a consonant at all, which is odd, since this is
 231 the only environment where any vowel of English (perhaps any language?) may
 232 occur.

233 These peculiarities gain an explanation if we assume that diphthongs are
 234 sequences of a checked vowel and a glide, that is, they are vowel+consonant
 235 clusters. From this assumption, it follows that if [i], [ə], and [u] may occur in un-
 236 stressed position, [ij], [əw], and [uw] may occur there too, if there is no difference
 237 between [ij] and other [i]+consonant, [əw] and other [ə]+consonant, or [uw] and
 238 other [u]+consonant clusters. Furthermore, the fact that unstressed diphthongs
 239 are less common before a consonant is also expected if they are not diphthongs
 240 but vowel+consonant clusters. We have already seen that heavy syllables are
 241 more prone to be stressed, and accordingly, light syllables to be unstressed. A
 242 word-final or prevocalic vowel+consonant sequence constitutes a light syllable,
 243 therefore the occurrence of unstressed [ij], [əw], and [uw] here is expected. But
 244 unstressed [əw] and [uw] are rare in preconsonantal position (where they con-
 245 stitute a heavy VC), in fact, the [w]-less variants [əbíjs] and [stímjuléjʃən] are
 246 also possible in all such cases. Unstressed [ij] is downright impossible in this

¹⁰If the first vowel in *obese* were stressed, the stress pattern **óbese péople* would be possible, but it is not.

¹¹Grammaticality judgements here and below come from Wells (2008).

247 environment. So unstressed [ij] seems to be the only vowel in English that
 248 never occurs in preconsonantal position. This is because it is not a vowel, but
 249 a vowel+consonant cluster. This means that word pairs like *Polly* [pólɪj] and
 250 *polish* [pólɪʃ] only differ in their final consonant.

251 Thus I conclude that English “diphthongs” are combinations of a checked
 252 vowel and a glide. This is not an unprecedented assumption, it follows the ana-
 253 lysis of Trager & Bloch (1941) and Trager & Smith (1957), which has prompted the
 254 tradition of transcribing diphthongs as [iy], [ow], etc. by American linguists. A
 255 larger set of arguments supporting this stance, also for “diphthongs” in stressed
 256 position, is offered in Szigetvári 2016.

257 The long monophthongs, i.e., the R vowels, do not occur unstressed. This is
 258 not surprising, given that VV syllables universally count as heavy in languages
 259 that distinguish syllables by their weight in the first place. It has been men-
 260 tioned above that “diphthong”+schwa sequences of English often vary with a
 261 long monophthong: *idea* [ajdɪjə] ~ [ajdɪ:], *mayor* [méjə] ~ [mé:], *fire* [fájə] ~
 262 [fá:], *pure* [pjúwə] ~ [pjú:] ~ [pjó:] ~ [pjó:]. Such monophthongization, how-
 263 ever, is impossible when the sequence is unstressed: *India* [índɪjə] ~ [índjə],
 264 *[índi:], *usual* [júwʒuwəl] ~ [júwʒwəl], *[júwʒu:l]. The reason is obvious: long
 265 monophthongs, that is, R vowels, do not occur unstressed. In fact, the unstressed
 266 vowels in *India* and *usual* are all in light syllables.

267 The scale in (6) shows that at the top of the sonority scale segments are ob-
 268 ligatorily stressed, at the the bottom they are obligatorily unstressed. Nonlow
 269 vowels constitute the frontier between the two groups, where the set of stressed
 270 and unstressed segments overlap. Here stress is optional. The consonant [r] is
 271 split off from other consonants in this scale because in some varieties of English
 272 it may also occur stressed (e.g., *bird* [bɪrd], *hurt* [hɜrt]), that is, in these varieties [r]
 273 is in the intersection of the stressed and the unstressed set, together with non-
 274 low vowels. This arrangement in English corroborates the view that stressability
 275 may be a function of sonority (cf. Kenstowicz 1997).

(6) The stress hierarchy of English

long vowels	i: e: a: ə: o: u:	always stressed
nonhigh vowels	e a o	always stressed
nonlow vowels	i ə u	may be stressed
	r	never stressed
other consonants	l m n s t...	never stressed

276 Accordingly, the five or six long vowels in (3b) and the six checked vowels
 277 in (3a) constitute the full vowel inventory of British English. Of these only [i],
 278 [ə], and [u] turn up in unstressed position. There is a tendency for unstressed

279 [i] and [u] to be replaced by [ə]. This may be blocked by the following word-
 280 final consonant, which thus has a preserving effect on [i] and [u]. [i] remains
 281 before palatal and velar consonants: *punish* [pəniʃ], *manage* [mænɪdʒ], *money*
 282 [məni], *panic* [pænɪk], *Charing* [tʃəriŋ]; while [u] remains before labials: *value*
 283 [vəljuw], *volume* [vóljuwm] or [vóljum]. Note that preconsonantal loss of the [w]
 284 normally entails the substitution of [ə] for the unstressed [u]: *fortune* [fó:tʃuwn]
 285 or [fó:tʃən], *stimulation* [stímjuwleɪʃən], [stímjuléɪʃən], or [stímjələɪʃən].

286 3 Vowel reduction

287 It is well known that several vocalic contrasts are neutralized in unstressed pos-
 288 sition. For example, *man* [mán] and *men* [mén] are a minimal pair, but *postman*
 289 and *postmen*, both [pəwstmən], are homophonous. This type of neutralization
 290 is not a synchronic process. The word *postman* and its plural form are not com-
 291 pound words, since if they were so, there would be no vowel reduction in them,
 292 as witnessed by *taxman* [táksmàn] and *taxmen* [táksmèn]. In *postman*, [mən] is
 293 a suffix, which has no other allomorph. Deriving the suffix *-man* [mən] from the
 294 free stem *man* [mán] is not a case of phonological derivation, but a reproduction
 295 of the etymology of the suffix, that is, its historical evolution.

296 Such historical playback gained great popularity in the generative approach
 297 to phonology. The ideal was to derive all surface allomorphs of a morpheme
 298 from the same underlying form. The problem is that many of the processes that
 299 have to be hypothesized to get the idea working are sound changes that took
 300 place hundreds, in some cases thousands of years ago, and are clearly not active
 301 in the present-day language. The words *toxic* [tóksɪk] and *toxicity* [tɒksɪsətɪj],
 302 for example, are semantically related, therefore it is assumed that the latter is
 303 derived from the concatenation of the morphemes TOXIC (the source of the word
 304 *toxic*) and -ITY, and applying phonological rules to the result: [tóksɪk]+[ətɪj] →
 305 [tɒksɪsətɪj]. However, in order to create a phonological relationship between the
 306 two words, generativists also have to assume two sound changes, both left un-
 307 marked in the standard orthography. The final [k] of [tóksɪk] has to be converted
 308 to [s], and the unstressed [ɪ] has to become stressed. Both of these assumptions
 309 are problematic.

310 The velar plosives, [k] and [g], underwent “softening” more than a millen-
 311 nium and a half ago in another language, Late Latin. The sound change occurred
 312 before vowels that were front at that time, short and long [i] and [e]. The words
 313 affected were later adopted into English, in many cases the triggering front vow-
 314 els have changed to a back or central quality, or were simply lost: *foci* [fəwsaj]
 315 (cf. *focus* [fəwkəs]) or *reduce* [rɪdʒúws] (cf. *reduction* [rɪdʒkən]). This means that
 316 for a “velar softening” rule to work, one also needs to revert the following vowel

317 to what it was centuries ago.

318 Worse still, velar softening fails to occur in a significant number of cases:
319 *stomach* [stámæk] ~ *stomachic* [stámákik] (cf. *silica* [sílikə] ~ *silicic* [silísik]).
320 That is, the analyst either posits different “underlying” [k]’s in *stomach* and *silica*
321 (which undergo complete neutralization, since the two [k]’s are phonetically
322 identical) or declares *stomachic* “irregular”. The latter solution is equivalent to
323 claiming that both [stámæk] and [stámákik] are entries in the lexicon. Looking
324 at words ending in *-ic* and having a stem that ends in [k], we find that there are
325 fewer with velar softening (*borax* ~ *boracic*, *silica* ~ *silicic*, *thorax* ~ *thoracic*),
326 than without (*-archy* ~ *-archic*, *Bacchus* ~ *Bacchic*, *psyche* ~ *psychic*, *stomach* ~
327 *stomachic*, *synecdoche* ~ *synecdochic*, *Turk* ~ *Turkic*). The [k] ~ [s] alternation
328 is a remnant of a Late Latin sound change, not an English one. But it is not even
329 relevant which language some sound change took place in: the [k] ~ [tʃ] alternations
330 that remain from an Old English sound change (*cold* ~ *chill*, *bank* ~ *bench*,
331 *speak* ~ *speech*, cf. Minkova 2014:86) can hardly be seen as a generalization that
332 must not be missed. One can dig up even earlier splits resulting in alternations
333 in present-day English, like [p] ~ [f] in *piscine* ~ *fish*, *paternal* ~ *father*, *penta-*
334 ~ *five*, *pyre* ~ *fire*, *port* ~ *ford*, etc. The decision to exclude the [p] ~ [f] or the
335 [k] ~ [tʃ] alternation, but not [k] ~ [s] is arbitrary (Lightner 1978:18).

336 Kaye (1995) argues at length against treating velar softening, vowel shift, the
337 merger of the vowels of *verse*, *dirt*, and *nurse*, etc. as phonological processes of
338 any type. He claims that all these processes are typical of nonanalytic morpho-
339 logic, in which phonology has no role to play. That is, lexical or level 1 phono-
340 logical rules are not phonological rules, they are patterns that can be observed
341 in the lexicon, which preserve earlier sound changes. Both members of word
342 pairs like *toxic* and *toxicity* or *stomach* and *stomachic* are present in the lexicon,
343 neither is derived from the other by phonological rules.

344 It is noteworthy that the stress pattern of a word may only be changed in
345 English by nonanalytic morphology. Thus, while the last vowel is unstressed in
346 *tóxic*, the related vowel is stressed in *toxícity*. This alternation of an unstressed
347 and a stressed [i] is a result of lexical suffixation, the “adding” of *-ity* to the stem.
348 Postlexical processes can only affect the location of accents: *Taiwán* vs. *Táiwán*
349 *míraclē*. Although this phenomenon is often called “stress shift” (Lieberman &
350 Prince 1977), this is a misnomer. Stress is not changed in any way here. Both
351 vowels in *Taiwan* and the first one in *miracle* are lexically stressed, and they all
352 remain so. It is not stress, but the accent that “moves” from the second vowel
353 of *Taiwán* to the first in *Táiwán míraclē*, or, alternatively, both vowels in *Táiwán*
354 start out with an accent, one of which is later deleted. Therefore it is evident
355 that nothing changes in a word whose first vowel is lexically unstressed: *Madríd*
356 *súmmit* [mædríd sémít]. If we indeed witnessed stress shift in *Taiwan*, it should
357 also work in *Madrid*. In reality, what we have here is accent shift, and accent

358 may fall only on a lexically stressed vowel, like the first vowel of *Taiwan*, and
359 unlike the first vowel of *Madrid*.

360 It is important to see that stress on a vowel that loses its accent (or, put al-
361 ternatively, does not get accented) is not affected in any way. The second vowel
362 in *Táiwán míracle* is not accented, but it is still stressed. Postlexical processes do
363 not touch stress, only accent. It is only lexical affixation (e.g., suffixation with
364 *-ese*) that may affect the stress of a vowel in English: e.g., the second vowel may
365 be unstressed in *Taiwanese* [tájwəníjz]. In the same way, postlexical processes
366 cannot add stress either. So the first vowel in *Madrid súmmit* will not acquire
367 stress, hence the accent cannot move to it.

368 This stability of stress brings about the stability of vowel quality too. The al-
369 ternation of a full and a reduced vowel only occurs (i) as a result of lexical affixa-
370 tion (*Japan* [dʒəpán] ~ *Japanese* [dʒápəníjz]); (ii) in the strong and weak forms of
371 function words (*of* [óv] ~ [əv]); or (iii) as free variation (*robot* [rəwbət] ~ [rəw-
372 bət], *direct* [dirékt] ~ [dàjrékt]). Postlexical processes do not influence vowel
373 quality, including changing a full vowel into a reduced one. That is, vowel re-
374 duction is not a phonological process in English.

375 4 Accentless stress

376 According to the definition of stress given in §1, it is a potential accent. So both
377 vowels of *Taiwan* are stressed, since either may bear the accent of the word, de-
378 pending on its context, but only the second vowel of *Madrid* is stressed, because
379 the first one cannot be accented.

380 However, eligibility for being accented cannot be the only criterion for stress.
381 There exist stressed vowels which for some reason or other may not bear an ac-
382 cent in any context. Of three adjacent stresses, the first and the last one are
383 accented in the default case, the middle one is not. Thus in *DNA* [dǐjènéj] or *KFC*
384 [kéjèfsǐj] the middle vowel, [e], will not be accented (unless, of course, these
385 words are contrasted with, say, *DMA* or *KSC*). The same will hold of a sentence
386 like *Dee sent Abe* [dǐjsèntéjb]. Here too the word *sent* is not accented, but it
387 does not lose its lexical stress. If it did, it would surface as [sɪnt] or [sənt] and
388 would not be considered a word any more, but a clitic, like in the phrase *D and*
389 *A* [dǐjənég] or in the name of a certain *St Abe* [səntéjb]. If the middle vowel of
390 *DNA* and *Dee sent Abe* is stressed, though never accented, the null hypothesis is
391 that the same holds for words like *chimpanzee* [tʃɪmpànzǐj] and *Vietnam* [víjèt-
392 nám], where the middle vowel is not reduced, but cannot be accented, because
393 the accent may fall either on the first or the last, but not on the middle vowel.
394 One could decide to mark the middle vowel as accented, and then always delete
395 that accent, or as unaccented, only stressed.

396 Or take the sentence mentioned in §1: *éven Jóhn went to Taiwan*. Here we
397 find two accents, one on the first, stressed vowel of *éven* and one on the only
398 vowel of *Jóhn*. With *John* as the focus of the sentence, the accents of *went* and
399 *Taiwan* are deleted. But again, all three vowels in these two accentless words
400 remain stressed, unlike the vowel of *to*, which, as that of many other function
401 words containing a single vowel, is unstressed. I claim that the same holds of the
402 examples we have started out with: *robot* [rəwbət], *apricot* [éjprɪkət], *autopsy*
403 [ó:tòpsɪj]. Since there is no context in which the accent on an earlier vowel
404 would be “pushed” towards the end of a word in English, the [o] in these words
405 will never be accented. Nonetheless, they are stressed.

406 The change in the accent of *Tàiwán* vs. *Táiwàn miracle* has been mentioned
407 several times. However, we do not find a similar change in *Òctóber síxth* (**Óctòber*
408 *síxth*). This fact may make one suspicious whether the first vowel of [òktəwbə] is
409 indeed stressed. This paper does not intend to discuss conditions on accent shifts,
410 but it must be noted that most three-vowel words with accent on the middle
411 vowel keep the position of their accent: *àmbition*, *Àndórra*, *càstràtion* (also see
412 §6). There exist some accent shifting examples, too: *sàlvàtion* ~ *Sàlvàtion Army*,
413 *àbnórmal* ~ *àbnòrmal cásé*. Analysing this as a difference between the “stressed-
414 ness” of the first vowels seems to me to be an ad hoc solution.

415 So far I have come up with a single symptom of “accentless stress”, vowel
416 quality. And even this is not an adequate indication of stress, since three vowels,
417 [i], [ə], and [u], may occur both stressed and unstressed. In a word like *ancestor*
418 [ánsəstə] we can identify the first two vowels as stressed: they are both vowels
419 that can only occur stressed. The last vowel can only be unstressed, since
420 stressed [ə] cannot be word final, it must be followed by a consonant. In *an-*
421 *chovy* [ántʃəvɪj], on the other hand, only the first vowel is stressed. However,
422 both of the other vowels could be stressed as far as their quality and position
423 in the word is concerned: cf. *carbuncle* [ká:bəŋkəl] or *absentee* [ábsənti:j]. In the
424 next section, I will discuss some segmental phenomena other than vowel quality
425 that distinguish stressed and unstressed vowels.

426 5 Segmental effects of stress

427 I claim that while accent is a rhythmic phenomenon, stress is segmental. It fol-
428 lows that stress should be sensitive to segmental conditioning (heavy syllables
429 are more likely to be stressed than light ones), and there should be segmental
430 phenomena that are sensitive to stress. This is indeed the case. In this section
431 I catalogue five such phenomena: flapping, syncope of unstressed vowels and
432 epenthesis of a plosive in nasal+fricative clusters, the elision of postconsonantal
433 [j], and the elision of preconsonantal [w]. Each of these segmental phenomena

434 is sensitive to stress.

435 5.1 Flapping

436 Flapping occurs in a number of English accents. It results in the neutralization
437 of the contrast of [t] and [d]: *utter* and *udder* may become homophonous, [ʔrə].
438 Within a morpheme flapping occurs only before an unstressed vowel, accent has
439 no role to play in this process. The [t] is not flapped in both *cartoon* [kɑ:túwn],
440 where the accent is on the vowel after it, and *cartoon network* [ká:túwnnétwə:k],
441 where an accent is on the vowel before it. This is because the vowel following
442 the [t] is stressed, lexically, in both cases.

443 Flapping also fails to occur in words like *latex* [léjtèks], *levitate* [lévitèjt],
444 *Wotan* [vówtàn], *habitat* [hábitàt], *atoll* [átòl], *Minotaur* [májnetò:]. Although
445 the vowel after the [t] is never accented in these words, it is stressed in all of
446 them. We cannot simply make reference to the quality of the vowel: flapping is
447 attested in *city* [sírij], but not in *suttee* [sətij] (*[səri]), where the second vowel
448 is stressed, in fact, the word has a variant with accent on the last vowel: [sətij].
449 Such differences in the availability of flapping are abundant: *nautilus* [nó:riləs]
450 vs. *autism* [ó:tizəm], *magnetic* [màgnérik] vs. *magnetism* [mágnətizəm], *vanity*
451 [vánəri] vs. *manatee* [mánətij] (again [mànətij] being an option too), *mosquito*
452 [məskijrəw] vs. *ketone* [kíjtəwn].¹²

453 5.2 Syncope

454 An unstressed vowel may be elided in English subject to a number of condi-
455 tions. One of these is that the vowel to undergo elision (or syncope) must be
456 followed by a single consonant (in the vast majority of cases a sonorant) and an
457 unstressed vowel, a stressed one will not do: *memory* [mém(ə)rij] vs. *memorize*
458 [mém*(ə)rəjz].¹³ Another condition is that there may not be a rising-sonority
459 cluster before the elided vowel. So syncope is possible in *Hungary* [həŋg(ə)rij],
460 *victory* [víkt(ə)rij], *structural* [stráktf(ə)rəl], or *vulnerable* [váln(ə)rəbəl], but not
461 in *ignorant* [ígn*(ə)rənt] or *burglary* [bə:gl*(ə)rij].¹⁴

¹²The conditioning of flapping is more complex than it is described here. In some varieties it occurs only after a stressed vowel, not after an unstressed one (Bye & de Lacy 2008). It may also be subject to the influence of analogous forms in the paradigm (Withgott 1982). Nevertheless, stress, as defined here, clearly plays a role in where flapping is inhibited.

¹³Burzio (1994:61) says that syncope is impossible in *memorize* to avoid two adjacent stresses. However, syncope is also impossible in *radicalize* [rádik*(ə)lájz] (cf. *radically* [rádik(ə)lij]), where the result would be the common stressed–unstressed–stressed sequence, without any “stress clash”. So Burzio’s explanation is wrong.

¹⁴The likelihood of syncope is also affected by the frequency of the given lexical item. While Wells (2008) indicates the possibility of syncope in *memory* [mém(ə)rij], he does not do so

462 Syncope does not occur before a vowel that bears lexical stress, irrespective
463 of whether it is accented or not. We have just seen that the [i] in the suffix *-ism*
464 is stressed: flapping fails to occur before it in *autism* or *magnetism*. As expected,
465 syncope is also blocked in *barbarism* [bá:b*(ə)rizəm] (cf. *barbarous* [bá:b(ə)rəs]).
466 And while syncope is possible in *family* [fám(ə)lij] (in fact, it is the norm) or
467 *summary* [sám(ə)rij], it does not occur in *jubilee* [dʒúwb*(ə)lij] or *bummaree*
468 [bám*(ə)rìj],¹⁵ where the last vowels are stressed (as English spelling conveni-
469 ently shows).

470 5.3 Epenthesis

471 Many nasal+fortis fricative clusters have a variant pronunciation with an excres-
472 cent plosive between the two consonants. This plosive is homorganic with the
473 nasal. Examples include *prince* [prín(t)s], *glimpse* [glím(p)s], *month* [món(t)θ],
474 *warmth* [wó:m(p)θ], *length* [léŋ(k)θ], *anxious* [áŋ(k)ʃəs], *censure* [sén(t)ʃə], *infant*
475 [ín(t)fənt], *symphony* [sím(p)fəni]. In some cases the plosive may be deemed
476 “underlying”, but such judgements are based merely on spelling (like in the case
477 of *glimpse*, earlier spelled *glimse*) or perhaps also on etymology (in *anxious*).

478 This epenthesis is also sensitive to stress: it occurs word finally and before
479 an unstressed vowel, but it is not found if the following vowel is stressed. Ac-
480 cordingly, there is no epenthesis in *princess* [prínsés] or [prínsès], *insect* [ínsèkt],
481 *Gimsonian* [gìmsəwnijən] (cf. *Gimson* [gím(p)sən]), *nymphet* [nìmfét] (cf. the al-
482 ternatives [ním(p)fit] or [ním(p)fət]).¹⁶

483 5.4 Loss of [j]

484 The last two stress-sensitive segmental phenomena to be discussed in this paper
485 both involve the elision of a glide, which often occurs next to [u]. But this is
486 where similarities end. In one case, the palatal glide, [j], is dropped, in the other,
487 the labial [w]. The former is dropped after a consonant, the latter after a vowel,
488 the former before a vowel, the latter before a consonant, the former if the fol-
489 lowing vowel is stressed, the latter if both the preceding and the following vowel
490 are unstressed. Let us look at [j] first.

in *mammary* [máməri]. This corresponds to the fact that in English language pages of the web Google collects over 150 times more instances of the word *memory* than of *mammary* (over 2 billion against 13 million matches). Yet, unlike lay speakers, someone specializing in, say, gynecology is much more likely to have syncope in *mammary* [mámrij], as a number of informants in Youglish verify (<https://youglish.com/pronounce/mammary/english>).

¹⁵Both words have a variant with accent on the last vowel: [dʒúwbəlìj], [báməri].

¹⁶Merriam-Webster (2019) do not, but Wells (2008) does indicate a plosive in some words before a stressed vowel: *menthol* [mén(t)θòl], *samphire* [sám(p)fájə]. This detail remains a mystery to me. As a confirmation: Merriam-Webster (2019) do have *mentholated* [mén(t)θələjtəd].

491 The [j] of many former consonant+[j] clusters is deleted in accents of English.
 492 Historically these glides come from either an earlier falling diphthong, [iw] (e.g.,
 493 *new*) and [ew] (e.g., *dew*), which merge and switch syllabicity, becoming a rising
 494 diphthong/consonant+vowel sequence, [ju:], or French [y:] splitting into its com-
 495 ponents, [i] and [u], which ultimately also ends up as the same consonant+vowel
 496 sequence (e.g., *due*). These [j]'s have disappeared (or perhaps have never ap-
 497 peared) after a palatal consonant (in, e.g., *jury*, *chew*),^{17,18} and in General Amer-
 498 ican also after an alveolar or a dental consonant. The change is also in progress
 499 in British English, but [t] and [d], less commonly [s] and [z], coalesce with the
 500 [j], its palatality is thus retained: *new* [njúw] ~ [núw], *lute* [ljúwt] ~ [lúwt], *en-*
 501 *thus* [inθjúwz] ~ [inθúwz], *tube* [tjúwb] ~ [tʃúwb], *duty* [djúwtij] ~ [dzúwtij],
 502 *suit* [sjúwt] ~ [súwt], *presume* [prizjúwm] ~ [prizúwm] ~ [prizúwm].

503 This loss of [j], or more precisely, palatality, occurs before a stressed vowel,
 504 but not before an unstressed vowel. In some cases, we witness the absence of an
 505 explicit [j], in other cases, the absence of palatality: *voluminous* [vəlúwminəs]
 506 vs. *volume* [vóljuwm], *Danubian* [dən(j)úwbijən] vs. *Danube* [dánjuwb], *congrat-*
 507 *ulate* [kəngrátʃələjt] vs. *gratuitous* GenAm [grətúwətəs] (BrE [grətʃúwətəs]), *as-*
 508 *siduous* [əsídzuwəs] vs. *assiduity* GenAm [ásidúwətij] (BrE [ásidzúwətij]). The [j]
 509 remains before both stressed and unstressed [u] if it follows a labial or velar con-
 510 sonant (e.g., *ambiguity* [ámbigjúwətij], *ambiguous* [àmbigjuwəs]), and it is lost
 511 in both cases if it follows a muta-cum-liquida cluster (e.g., *inclusive* [inklúwsiv],
 512 *inclusivity* [ínkluwsívətij]).

513 The presence of palatality thus indicates that the [u] is unstressed right after
 514 the accented vowel in *statute* [státʃuwt], *value* [váljuw], *venue* [vénjuw], *continue*
 515 [kəntínjuw]. The (potential) absence of palatality then indicates that the [u] is
 516 stressed when an unstressed vowel intervenes: *constitute* GenAm [kónstitúwt],
 517 *absolute* [ábsəlúwt], *revenue* [révənùw].

518 5.5 Loss of [w]

519 It has been mentioned in §2.2 that unstressed [uw], which may occur preconson-
 520 antally, often loses the glide. Loss of this glide is obligatory if the next vowel is
 521 unstressed, and optional if it is stressed, or (curiously) if there is no next vowel.

522 Accordingly, the [w] may survive in *stimulate* [stímjuwlèjt] ~ [stímjulèjt] ~
 523 [stímjələjt], *botulism* [bótʃuwlizəm] ~ [bótʃulizəm] ~ [bótʃəlizəm] (recall, the

¹⁷The palatal segment is retained in varieties where it remains vocalic, for example, in Welsh English: [tʃiw] (Penhallurick 2004: 107f).

¹⁸Palatality is also absent after a “muta-cum-liquida” cluster, in this case [pl], [bl], [fl], [kl], [gl]: *influence* [ínfluwəns], *inclusivity* [ínkluwsívətij]. Note that it may well be that the [u]'s of these words are stressed. I assume they are unstressed, because the sww and sswww stress patterns are more common than the ssw and sssww stress patterns, see §6.

524 [i] in *-ism* proved to be stressed in §§5.1 and 5.2, too), or *fortune* [fó:tfuwn] ~
 525 [fó:tfən], while it is obligatorily lost in *stimulus* [stímjuləs] ~ [stímjələs], *botulin*
 526 [bótfulin] ~ [bótfəlin], or *fortunate* [fó:tfənət] ~ [fó:tfnət] (where the loss of [w]
 527 also leads to reduction to [ə],¹⁹ which may then be syncopated). One may rightly
 528 wonder if there is any reason for assuming that these words contained [w] in the
 529 first place. Our examples are etymologically related, so this assumption is jus-
 530 tified. But in all other cases unstressed [u] comes from an earlier “long” vowel,
 531 i.e., [juw], the initial glide of which is also subject to deletion (as discussed in
 532 §5.4). Unstressed historical short [u] is always reduced to [ə], but in most varieties
 533 of English, it has lowered to [ə] in stressed position anyway: *august* [ò:gəst],
 534 *August* [ó:gəst].

535 6 Stress patterns in English

536 English words may come with practically all possible combinations of different
 537 stress patterns, though the frequency of these patterns varies widely. An ex-
 538 haustive list of patterns found in two- and three-vowelled words is given in (7)
 539 and (8). Recycling an old convention, I mark stressed (full) vowels by “s” and un-
 540 stressed (reduced) vowels by “w”. In words with more than one stressed vowel,
 541 I mark the accent of the citation form by the acute accent. In other contexts the
 542 accent may fall on a stressed vowel earlier, but not later in the word. (So *àntique*
 543 may be *ántique*, but *átoll* may not be **átóll*.) I also give rough estimates of the
 544 percentage of the words with the given stress pattern relative to all words with
 545 the same number of vowels: e.g., (7a) shows that 54% of all two-vowel items have
 546 the stress pattern sw.²⁰

(7) Stress patterns in two-vowel words

- a. sw (54%): átom [átəm]
- b. ws (9%): amók [əmók]
- c. ss (37%)
 - c1. śs (30%): átoll [átòl]
 - c2. sś (7%): àntique [àntíjk]

¹⁹Earlier (in §3) I said vowel reduction was not a phonological process in English. I must now refine that claim: the reduction of a full (= stressed) vowel into a reduced vowel is not a phonological process. Unstressed [u] and [i] may alternate with (metaphorically worded, be “reduced” to) schwa.

²⁰The percentages are based on Lindsey & Szigetvári (2013–), a database of more than 104K entries, including compounds too. There is at least one noncompound example for each pattern, as shown here.

547
548
549
550
551

Two-vowel words exhibit all logical possibilities: ww is impossible, since every word must contain at least one stress. Although each pattern has a reasonable share of the pie, words with initial stress and with initial accent constitute a clear majority, both in two- and in three-vowel words. The latter are presented in (8).

(8) Stress patterns in three-vowel words

- a. sww (28%): ábacus [ábəkəs]
- b. wsw (18%): abándon [əbándən]
- c. wws (0%)
- d. sws (26%)
 - d1. sww (20%): ácrobat [ákrəbət]
 - d2. sws (6%): àrabésque [àrəbésk]
- e. ssw (20%)
 - e1. ssw (9%): áncèstor [ánsètə]
 - e2. ssw (11%): àmbítion [àmbíʃən]
- f. wss (2%)
 - f1. wss (2%): amórtize [əmó:tàjz]
 - f2. wss (.07%): retùrnée [ritə:níj]
- g. sss (6%)
 - g1. sss (3%): ádùmbràte [ádəmbrèt]
 - g2. sss (1%): àsbéstòs [àzbéstòs]
 - g3. sss (2%): àdrèssée [àdrèsij]

552
553
554
555
556
557
558
559
560
561
562
563

In the case of three-vowel words, one pattern is missing: wws, (8c). This is due to what Schane (1979:488f) calls the Initial Constraint. He formulates it with respect to accent, not stress: word-initially two unaccented vowels (syllables for Schane) are not allowed. Schane mentions one type of exception to the Initial Constraint, words like *elèctricity* and *collèctivity*, which do not fit his claim that one of the first two vowels must bear an accent.²¹ Such words are here categorized not as (8c), but as (8f2), which is also a vanishingly rare pattern. In fact, Schane claims that all words beginning with the wss pattern have an alternative form in sww (or in our terms possibly also sww): *electricity* [ilèktrísətij] may also be [èlèktrísətij] or [èliktrísətij] too.²² Note that marking or not marking the accent(s) before the last accent is more or less a matter of taste: *àntique*, *àrabésque* are more faithful to the “surface” citation form, while *ántique*, *árabésque* could

²¹Schane cannot identify the stress on the second vowel of these words as an accent, because he believes that “accented syllables are separated by one or more unaccented syllables” (1979:486).

²²I have found two three-vowel words that do not have such alternative forms: *remittee* [rimitij] and *returnee* [ritə:nij].

564 be posited as “underlying” forms that undergo accent deletion, the first accent
565 being deleted in some contexts, the last one in others. Indeed, all three vowels
566 may be marked as accented in *áddrèssée*, where the middle accent is always de-
567 leted, as we have seen in the case of *DNA* or *Dee sent Abe* in §4. Since accents
568 depend on the context of a word, constraints (like the Initial Constraint) had bet-
569 ter be formulated with reference to stress, a lexical property of certain vowels in
570 a word.

571 It is noteworthy, that for almost all stress patterns where more than one
572 vowel is stressed, that is, (7c) and (8d–g), the one with accent on the earlier
573 stressed vowel is more common. There is one exception, the ssw pattern, (8e),
574 where sśw is slightly more frequent than śsw. It is exactly in the case of this pat-
575 tern that accent shift does not commonly occur: *Ôctóber síxth* (**Óctòber síxth*),
576 *àmbítion fréak* (**ámbítion fréak*). Further investigation of these patterns and their
577 frequency appears to be necessary.

578 7 Conclusion

579 Following Vanderslice & Ladefoged (1972), Gussenhoven (1991), or Schane (1979,
580 2007), I argue that we must make a clear distinction between stress and accent.
581 Accent is a rhythmic phenomenon, it may vary as required by the rhythmic pat-
582 tern a word is placed in. Stress, on the other hand, is segmental and lexical.
583 Whether a vowel is stressed is determined lexically and this cannot be changed
584 postlexically. Stress is a feature of certain vowels. I am not claiming that it must
585 be represented by some feature [\pm stress] in any given theory of phonological rep-
586 resentation, all I mean is that it is not a property that is influenced by external
587 factors, like the stress of adjacent vowels or the vowels of adjacent words.

588 Stress is intimately related to vowel quality. Of the about dozen vowels of
589 English, only three, [i], [ə], and [u], may occur unstressed. The three other
590 checked vowels, [e], [a], and [o], as well as the long vowels only occur stressed.
591 Being a segmental phenomenon, stress is referred to by a large set of segmental
592 processes, some of which, flapping, syncope, epenthesis, and glide-deletion are
593 discussed in some detail in this paper.

594 If stress is interpreted in this way, the [o]’s in *robot* [rówbòt], *apricot* [éj-
595 prikòt], *autopsy* [ó:tòpsij], and *October* [òktéwbə] are all stressed, but not accen-
596 ted. The reason many analysts fail to recognize this is their failure to distinguish
597 stress and accent. To be fair, it must be admitted that the issue is to some ex-
598 tent terminological: one could use “stress” for the prosodic phenomenon here
599 referred to as accent and invent some other name (perhaps “vowel fullness”) for
600 the segmental phenomenon here referred to as stress. What matters is that these
601 are two distinct notions in phonology.

References

602

- 603 Bloomfield, Leonard. 1935. The stressed vowels of American English. *Language* 11. 97–116.
- 604 Burzio, Luigi. 1994. *Principles of English stress*. Cambridge: Cambridge University Press.
- 605 Bye, Patrick and Paul de Lacy. 2008. Metrical influences on fortition and lenition. In J. Brandão
606 de Carvalho, T. Scheer and P. Ségéral (eds.) *Lenition and fortition*. Berlin & New York:
607 Mouton de Gruyter. 173–206.
- 608 Chomsky, Noam and Morris Halle. 1968. *The sound pattern of English*. New York: Harper &
609 Row.
- 610 Crosswhite, Katherine M. 2004. Vowel reduction. In B. Hayes, R. Kirchner and D. Steriade (eds.)
611 *Phonetically-based phonology*. Cambridge: Cambridge University Press. 191–231.
- 612 Cruttenden, Alan. 2014. *Gimson's pronunciation of English* (8th ed.). London & New York:
613 Routledge.
- 614 Fabricius, Anne. 2007. Variation and change in the TRAP and STRUT vowels of RP: A real time
615 comparison of five acoustic data sets. *Journal of the International Phonetic Association* 37.
616 293–320.
- 617 Gimson, Alfred Charles. 1977. *Everyman's English pronouncing dictionary* (14th ed.). London:
618 Dent.
- 619 Gimson, Alfred Charles. 1989. *An introduction to the pronunciation of English* (4th ed.).
620 London: Edward Arnold.
- 621 Gussenhoven, Carlos. 1991. The English Rhythm Rule as an accent deletion rule. *Phonology* 8.
622 1–35.
- 623 Harris, John. 1994. *English sound structure*. Oxford: Blackwell.
- 624 Hayes, Bruce. 1995. *Metrical stress theory: principles and case studies*. Chicago: University of
625 Chicago Press.
- 626 Jones, Daniel. 1917. *An English pronouncing dictionary*. London: J. M. Dent & Sons.
- 627 Jones, Daniel. 1960. *An outline of English phonetics* (9th ed.). Cambridge: Cambridge University
628 Press.
- 629 Kaye, Jonathan. 1995. *Derivations and interfaces*. London & New York: Longman. 289–332.
- 630 Kenstowicz, Michael. 1997. Quality-sensitive stress. *Rivista di Linguistica* 9. 157–188.
- 631 Kenyon, John S. and Thomas A. Knott. 1953. *A pronouncing dictionary of American English*.
632 Springfield, Mass.: Merriam-Webster.
- 633 Kreidler, Charles W. 1989. *The pronunciation of English*. Cambridge University Press.
- 634 Liberman, Mark and Alan Prince. 1977. On stress and linguistic rhythm. *Linguistic Inquiry* 8.
635 249–336.
- 636 Lightner, Theodor. 1978. Generative phonology. In W. O. Dingwall (ed.) *A survey of linguistic*
637 *science*. Stanford, CT: Greylock Publishers. 1–32.
- 638 Lindsey, Geoff, 2012a. The British English vowel system.
639 <http://englishspeechservices.com/blog/british-vowels/>.
- 640 Lindsey, Geoff, 2012b. Strut for dummies.
641 <http://englishspeechservices.com/blog/strut-for-dummies/>.
- 642 Lindsey, Geoff and Péter Szigetvári, 2013–. CUBE: Current British English searchable
643 transcriptions. <http://cubedictionary.org>.
- 644 Lowenstamm, Jean. 1981. On the maximal cluster approach to syllable structure. *Linguistic*
645 *Inquiry* 12. 575–604.
- 646 Merriam-Webster. 2019. *Merriam-Webster.com dictionary*. Springfield, Mass.: Merriam-Webster

- 647 Inc.
- 648 Minkova, Donka. 2014. *A historical phonology of English*. Edinburgh: Edinburgh University
649 Press.
- 650 Penhallurick, Robert. 2004. Welsh english: phonology. In B. Kortmann and E. W. Schneider
651 (eds.) *A handbook of varieties of English*. Berlin & New York: Mouton de Gruyter. 98–112.
- 652 Schane, Sanford. 2007. Understanding English word accentuation. *Language Sciences* 29.
653 372–384.
- 654 Schane, Sanford A. 1979. Rhythm, accent, and stress in English words. *Linguistic Inquiry* 10.
655 483–502.
- 656 Selkirk, Elizabeth O. 1984. On the major class features and syllable theory. In M. Aronoff and
657 R. T. Oehrle (eds.) *Language sound structure: Studies in phonology dedicated to Morris Halle*
658 *by his teacher and students*. Cambridge, Mass.: MIT Press. 107–136.
- 659 Sievers, Eduard. 1876. *Grundzüge der Lautphysiologie zur Einführung in das Studium der*
660 *Lautlehre der indogermanischen Sprachen*. Leipzig: Beitkopf und Härtel.
- 661 Sweet, Henry. 1900. *A new English grammar: Logical and historical*. Oxford: Clarendon Press.
- 662 Szigetvári, Péter. 2015. The death of centring diphthongs in British English. In A. Bloch-Rozmej,
663 A. Bondaruk and A. Prazmowska (eds.) *Spotlight on melody and structure in syntax and*
664 *phonology*. Lublin: Wydawnictwo KUL. 287–303.
- 665 Szigetvári, Péter. 2016. No diphthong, no problem. In E. Cyran and J. Szpyra-Kozłowska (eds.)
666 *Phonology, its faces and interfaces*. Peter Lang. 123–141.
- 667 Szigetvári, Péter. 2018. Stressed schwa in English. *The Even Yearbook* 13. 81–95.
- 668 Trager, George L. and Bernard Bloch. 1941. The syllabic phonemes of English. *Language* 17.
669 223–246.
- 670 Trager, George L. and Henry Lee Smith. 1957. An outline of English structure, vol. 3 of *Studies*
671 *in Linguistics: Occasional Papers*. Washington: American Council of Learned Societies.
- 672 Vanderslice, Ralph and Peter Ladefoged. 1972. Binary suprasegmental features and
673 transformational word-accentuation rules. *Language* 48. 819–838.
- 674 Wells, John C. 1982. *Accents of English*. Cambridge University Press.
- 675 Wells, John C. 2008. *Longman pronunciation dictionary* (3rd ed.). Harlow: Pearson/Longman.
- 676 Withgott, M. Margaret. 1982. *Segmental evidence for phonological constituents*. Ph.D. thesis.
677 University of Texas at Austin.