English stress is binary and lexical

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To John, my phonologist role model

Accounts of English take stress to be a scalar phenomenon, distinguishing three or even more degrees (eg, Halle & Vergnaud 1987, Wells 1990b, Giegerich 1992). In this paper I argue that while this may be justified at a phonetic level, it is unnecessarily detailed from a systematic point of view. Phonologically, stress is not scalar. It is a binary property in English: any vowel is either stressed or unstressed, and there are only these two "degrees" of stress. There is consensus that reduced vowels are all unstressed. Here I argue that any nonreduced vowel is stressed, in other words, foot initial.

The reason why several degrees of stress are distinguished in English is to make tonic placement automatic in the neutral reading of an utterance: the tonic is on the last "primary" stress, posttonic stress is subsidiary. Distinguishing several degrees of stress is simply a means of maintaining the generalization that the tonic is on the last ("real") stress. If we admit that the tonic may be earlier than the last stress, there remains no reason to distinguish different degrees of stress in posttonic position. In fact, in compound words (*this is a bláckbìrd*) and in utterances with contrastive tonic (*this bird is not white, it's a bláck bìrd*), the tonic may fall earlier than the last stressed vowel, so we are forced to allow this possibility.

Pretonic stress is claimed to be subsidiary because individual words are considered to be utterances in their citation form. In an utterance pretonic stress is less prominent than the tonic. But the prominence relations of the stressed syllables within a word are often not fixed: eg, *pòntóon, Pìccadílly* in isolation vs *póntòon brídge, Píccadìlly Círcus.* I conclude that both vowels marked in *póntóon* and *Píccadílly* are equally stressed. It is a postlexical phonetic effect if the first or the second stress is more prominent in a word.

In §1 I argue that, although there are certain segmental patterns that prefer certain stress patterns in English, stress is simply a lexical property of some vowels, and stress patterns in words are not derived by rule. The aim of §2 is to show that stress in English is stable: a lexically stressed vowel does not lose its stress (apart from a handful of words that potentially cliticize) and a lexically un-

stressed vowel does not get stressed (again with some marginal exceptions). This fact also supports the claim that stress is a lexical property of vowels in English. In §3 I show that words in English may contain one or more stresses, and the tonic may fall on any of these stresses (although there is a clear preference for it to fall on one of the last two). We will also see that morphologically simplex and complex words behave remarkably similarly with respect to tonic placement.

The relationship between stress and vowel quality is also categorical. One set of vowels occurs in unstressed and another one in stressed position. There are three types of views of the relationship of stress and the two sets of vowels: the set of vowels occurring in unstressed position may be complementary to that occurring in stressed position; the two sets may be overlapping; or the set of stressed vowels may completely contain the set of unstressed vowels. I will exemplify each of these views in §4. Finally, in §5 it will briefly be shown that the segmental effects of stress also support the view that there is no reason to distinguish degrees of stress beyond its presence vs absence.

1 Deriving stress?

There are accounts of English stress that try to derive the location of stress(es) in a word from the segmental pattern and the morphological category of the word (Chomsky & Halle 1968, Halle & Vergnaud 1987, Burzio 1994). Take, for example, the two semantically related words *academy* **əkádəmɪj** and *academic* **àkədɛ́mɪk**. If we compare the segments of these two words one by one, we can see that only half of them are identical (four out of eight, these are linked in figure 1): three of their vowels and one of their consonants[1] differ (these are indicated by "·" between them).[2]

Two such words could hardly be related by simple morpheme concatenation: the change of the last consonant is accompanied by the change of each of the vowels except for the last one.[3] The relationship of these two words resembles the ablaut in *sing* vs *sang*, the umlaut in *full* vs *fill*, or the vowel alternations we find in the templatic morphology of Semitic languages. Such relationships

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[1]It is a minority view that *academy* ends in a consonant. This makes no difference in the comparison though.

[2]An anonymous reviewer argues that just as the two **k**'s are phonetically not identical (the pretonic one in *academy* is has a much longer VOT than its nonpretonic counterpart in *academic,* that is, they are allophones), **a** and **ə** are also in an allophonic relationship. Therefore, the reviewer claims, it is unfair to mark their relations differently. However, these vowels contrast in, eg, *hat* and *hut*, and so do ɛ and ə in, eg, *beg* and *bug*, while the more and less aspirated plosives never do so. This justifies not linking the vowels, but linking the consonants.

[3]In a popular analysis of British English, even the last vowels are different: **i:** vs **ɪ**, eg, Wells (1990a).

ə	k	a	d	ə	m	ɪ	j
·	|	·	|	·	|	|	·
a	k	ə	d	ɛ	m	ɪ	k

Figure 1: *academy* and *academic* compared

between morphemes can hardly be created by phonology.

Yet, in many accounts of English, *academic* would be derived from *academy,* and the two words are taken to be phonologically related. This is achieved by assuming that the two words share a common stem, something like **akadɛm-**. To this we add the suffix **-ɪj** or **-ɪk**, and work out that stress is on the antepenult in the first, but on the penult and the first syllable in the second case. Once we have got that we reduce the unstressed vowels, thereby reaching the desired surface forms. To add to our surprise, even *academia* **ákədíjmɪjə**, with its novel sound string between the **d** and **m**, would be derived from the same stem. In effect, such accounts replay several centuries of the history of not only English, but also other languages, like Old French or Latin. What obviously makes such accounts desirable in English is the aim to derive very different surface forms from one underlying form and the fact that the spelling of these three words is so similar. In fact, this looks like simple concatenation: *academi* (with *y* only because it's word final) + *c* or *a* yields just the right results, followed by some phonological readjustments. But of course this is because the spelling does not mirror the result of several centuries of phonological development.

Such derivations are best known from Chomsky & Halle (1968) and were taken to the extreme by Lightner (1978, 18f). However, they have been discredited by later critics (eg, Kaye 1995). If we exclude such derivations from phonology, we find that stress is lexically determined and constant in English. Simple concatenative morphology, like the suffixation of **-ɪŋ**, **-z**, or **-d**, or the prefixation of **ən-** (spelled as *un-*) never affects the distribution of stressed and unstressed vowels, hence it does not affect the quality of vowels. As a consequence, there is no place for vowel reduction among phonological rules: vowels are lexically reduced or unreduced.

This does not entail that stress could not vary in the same form of a lexical item. For example, some speakers would have *direct* as **dəɾɛ́kt** or **dɪɾɛ́kt**, with stress only on the last vowel, others as **dɑ̀jɾɛ́kt**, with stress on both vowels. Such variation of stress vs no stress, however, is not systematic: eg, *return* is **rətə́:n** or **rɪtə́:n**, but not ****rìjtə́:n** or ****rɑ̀jtə́:n**.[4] So we conclude that words like *direct*

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[4]Note that we get **ɑj** under stress in *direct,* but we would expect **ɪj** in *return,* were it stressed. This is an unrelated issue due to historical causes.

have a lexical form with both syllables stressed and another one with stress only on the last syllable. This is similar to words like *either* (**ájðə** or **íjðə**) or *apricot* (**áprəkɔt** or **ɛ́jprəkɔt**), which have phonologically arbitrary vowel variations.

2   Stress stability

Apart from certain interjections like **pst** or **ʃ:** or **ft** — which are probably not linguistic elements to begin with — any utterance in English must contain a stressed vowel. A word pronounced in isolation is an utterance, hence it must contain a stressed vowel (eg, *birds* **bə́:dz**, ***bədz**).[5] But a word must contain a stressed vowel even when it is pronounced together with other words in an utterance (eg, *blackbirds* **blákbə̀:dz**, ***blákbədz**, *birds sing* **bə̀:dz síŋ**, ***bədz síŋ**).[6]

There is a set of morphemes that look like words, but there is reason to believe that they have two allomorphs, one of which is a word, but the other one is not a word, in the phonological sense — it is not a free form (cf Anderson 2011, 2004). They include some one-syllable auxiliaries, determiners, prepositions, conjunctions, and pronouns like *is, can, the, of, and, you,* etc. For one thing, these morphemes may occur without a stressed vowel, and some of them even without a vowel in an utterance: *John's a great thinker* **dʒɔ́n z ə grɛ́jt θíŋkə**, *John can make it* **dʒɔ́n kən mɛ́jk ɪt**, *the boy sleeps* **ðə bój slíjps**, *two of three* **tʉ́w əv θríj**, *rock and roll* **rɔ́k n̩ rə́wl**, *what do you think?* **wɔ́t dʒ ə θíŋk**. For another, apart from pronouns, these morphemes never form an utterance in themselves. It is true that the set of morphemes that cannot be an utterance in themselves is larger — transitive verbs for example usually need to be complemented by other morphs — but auxiliaries, determiners, many prepositions, conjunctions are certainly very odd as a full utterance. In any case, phonologically only these allomorphs may lack the stress of their vowel, even their vowel itself, whereby they are not words. Such allomorphs can only survive by cliticizing to an adjacent word. The cliticized forms are also known as the "weak forms" of these words. The "weak" and "strong" forms of such words must both be listed in the lexicon (eg, *your* **jə**, **jo:**), since it is not even predictable if a one-syllable function word has a weak form at all (eg, *my* is only **mɑj** in Standard British English, but it has weak forms too in other varieties).

So apart from the handful of morphemes in English that have weak forms, no vowel may ever lose its lexically assigned stress. If this happens in a diachronic change, the word becomes a clitic, suffix, or simply loses its morphemehood, like

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[5]In rhotic accents a syllabic **r** will also do, eg, *birds* **bŕ̩dz**, but it must be stressed.

[6]Following a widespread convention, I use the acute accent for phonetically more prominent stress, the grave one for phonetically less prominent stress. Vowels without any accent mark are unstressed. The difference between more and less prominent stresses, I claim, is not lexical.

the second part of *postman* **pə́wstmən** or *cupboard* **kə́bəd**, as opposed to *snowman* **snə́wmàn** or *blackboard* **blákbò:d**, which are compound words. The opposite also holds: vowels that are lexically not assigned stress will not normally acquire stress later. (We will mention a special case below.) In other words, vowel reduction cannot be undone, vowel reduction is not a phonological rule, and reduced vowels are lexically specified as such. What is stressed will always remain stressed, what is unstressed will always remain unstressed, phonology does not manipulate the location of stress in any way. Let's refer to this phenomenon as STRESS STABILITY.

3   Words with multiple stresses

We have seen above a word with more than one stress: both syllables of the compound word *blackbird* **blákbə̀:d** are stressed. Such a pattern is not only available for compound words like this one, but for single morphs too: *adverb* **ádvə̀:b**, *Antwerp* **ántwə̀:p**, *expert* **ɛ́kspə̀:t**, etc. Crucially, within an utterance the behaviour of words with this stress pattern is the same irrespectively of their morphological structure.

The difference between *blackbird* 'Turdus merula' and *black bird* (eg, a raven) is that in the first case the two words form one word, which is at the lexical level, it is N^0, in the second case they do not, this structure is managed by the syntax, it is N^1 (or N'). This difference could be represented by bracketing each word as in figure 2.

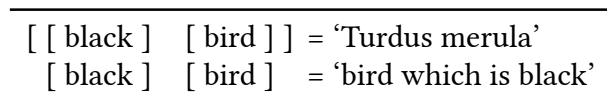| [[black]   [bird]] | = 'Turdus merula' |
| [black]   [bird] | = 'bird which is black' |

Figure 2: lexical bracketing of *blackbird* and *black bird*

Note that the second, nonlexical structure is not enclosed by a pair of brackets, ie, these brackets are lexical, not syntactic. They enclose what Government Phonology calls a phonological domain (Harris 1994, Kaye 1995). As we have seen earlier, there is at least one stressed vowel between each pair of brackets (ie, in each word). Some pairs of brackets, however, contain more than one stress. This is either lexically so (as in *adverb*), or because they enclose further brackets (ie, they are compound words, like *blackbird*).

In the neutral reading of an utterance the stress that is in the domain closed by the last closing bracket is phonetically the most prominent, this is the TONIC. The tonic is the most salient part of the intonation contour, and is where the

significant pitch change is located. The tonic in [*black*] [*bird* **]** is located in the second half, *bird*, as this is the string that the last, emboldened bracket encloses. Since in the default case the last stress is the tonic, there is no need to distinguish any previous stress from it. That is, both halves of *black bird* are equally stressed. The prominence of the second half is automatic in the neutral reading of an utterance. In [[*black*] [*bird*] **]**, on the other hand, it could be in either half, since the last bracket encloses the whole string *blackbird.* As it happens, it's in the first half, *black.* This is the pattern in many compound words.

In most cases, the tonic of an utterance falls on the first half of *bláckbìrd* and on the second half of *blàck bírd,* that is, on the last word of the utterance: recall, *blackbird* is a word, surrounded by a pair of brackets, *black bird* is not (as their spelling also suggests). There are, however, departures from the regular patterns, governed by the information structure or the morphological/syntactic structure of the utterance. Imagine, for example, that there is a chance for someone to misunderstand our *blackbird* for *blackboard.* In this case, we would say *it's a blàckbírd,* neutralizing the contrast between the compound noun (N^0) and the phrase (N^1). Another case of neutralization is created by a regularity called STRESS SHIFT: *a bláckbìrd's nést* is homophonous with *a bláck bìrd's nést.* Note that in the view of this paper, stress shift is a misnomer: stress does not shift, the prominence of the stress on the vowels of *black* and *bird* is subject to superficial adjustments conditioned by the context of these words. Lexically the vowels of these words are stressed just the same in both contexts.

There exist monomorphemic words that mirror the stress pattern of *black bird* too. These words have two stressed syllables of which the second is more prominent in isolation (eg, *pòntóon, sàrdíne*). This is because a word pronounced in isolation is an utterance. Phonologically both vowels of such words are equally stressed, just like in *bláck bírd.* So, as expected, they undergo "stress shift" in just the same way: *póntòon brídge, sárdìne spréad,* etc, thus the stress pattern of these phrases is the same as that of *Ántwèrp béer, éxpèrt tíme,* where the first part has more prominent stress on the first vowel in isolation too. In the same manner, the stress patterns of the noun *tórmènt* and the verb *tòrmént,* which differ in isolation, are neutralized if followed by a stressed word: *tórmènt dáys, tórmènt míce.*

As predicted by stress stability, the tonic may only fall on a vowel that was stressed in the first place. Accordingly, we find no "stress shift" in *lagoon bridge, the moon bridge, abuse mice,* or *to use mice.* This is because only the second vowel is stressed in *lagoon* and *abuse,* whereas both vowels of *pontoon* and *torment* are stressed. The clitics *the* and *to* are also not stressed in the neutral reading of utterances. So stress can "shift" only onto a vowel that was already stressed anyway.

To summarize: in their stress patterns monomorphemic words may resem-

ble both compounds (in *adverb* and *blackbird* both syllables are stressed and in a neutral setting the first of the two stresses is more prominent) and structures larger than a word (in *sardine* and *black bird* the second of the two syllables is stressed more prominently). In the former case, the two stresses are only different in that in a neutral reading the tonic is located on the first of the two: the tonic can only fall on a stressed vowel, but not automatically on the last stressed vowel.[7] In the latter case, there is no reason to distinguish the two stresses: their prominence follows from the environment. If followed by stress these two stress patterns are neutralized.

Not only two- but also three-syllable words may have stress on all of their vowels, but of course the longer the word, the less common such stress patterns are. Just as for the two-syllable words above, the tonic falls on one of these stresses. It will fall on the first in some words, the second in others, and the last in yet others. In the following words stress is not marked, since each vowel is stressed. The default tonic is marked by double acute accent.

1. ắdumbrate, Ắnglophile, dĕ́marcate, dĕ́odar
2. asbĕ́stos, diŏ́xide, Ojĭ́bwe, transvĕ́stite
3. chimpanzĕ́e, expertĭ́se, flageolĕ́t, Mozambĭ́que

We see that the neutral location of the tonic may be on the first, the second, or the third vowel. In many cases the location of the tonic varies with speaker (Giegerich 2004, 6): one way of Anglicizing words of group 3 is moving the default place of the tonic from the ult to the antepenult,[8] or, if that is not available, the penult. Examples are *champagne, vaccine, jubilee, magazine, manatee,* as well as many other words that had final tonic originally, but have lexicalized with earlier tonic, eg, *city, virtue, pardon, avenue,* etc. In cases that vary today the tonic must fall on one of the vowels that are lexically stressed.

As before, the location of the place of the tonic in these words may also be modified by the context: *it's not a gorilla's, it's a chǐ́mpanzee's bone* or *it's not the Malawi coast, it's the Mŏ́zambique coast.*[9]

So it may be concluded that stress is stable in English. The location of the tonic is subject to the influence of the syntactic context and the information structure of the sentence uttered.

Finally, let us slightly contradict what we have said about the stability of stress. In certain quite marginal situations, in order to get contrast, a lexically

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[7] I must admit I do not have an account of exactly how the tonic is located.

[8] This is the Alternating Stress Rule of Chomsky & Halle (1968, 77ff).

[9] Some speakers accept the competing forms, *chimpanzĕ́e's bone* and *Mozambĭ́que coast.* This means that "stress shift" is not an obligatory element for all speakers of English in all potential cases.

unstressed vowel may become stressed. Imagine a conversation like this one: *What? John harasses students? No, no, I said John Harris's students!* The lexically unstressed second vowel of *Harris's* **hárəsəz** may here become stressed — **harísəz** — to distinguish it from the verb **hárəsəz**.[10] The quality of the vowel in such situations is probably inferred from the spelling, as if the speaker spelled the word to disambiguate it. In fact, in some cases the quality of the unstressed vowel remains: *it's not working, but it's workable* **-wə:kə́bəl**.

4   Stress and vowels

Like in many languages — and unlike in many others — stress and vowel quality are related in English. In all accounts of the language, vowels are split into two groups, those of REDUCED VOWELS (aka weak vowels) and nonreduced vowels, sometimes referred to as FULL VOWELS. Accounts differ in the relationship of these two sets.

One possible scenario is having two complementary sets. This is exemplified by Bolinger's (1986, 37) system, shown in figure 3. (The arrangement of the vowels in this and the following charts resembles that of a Jonesian vowel chart, but there is no message intended by deviations from it.)

FLEECE	**i**				GOOSE	**u**
KIT	**ɪ**	BEGIN **ɨ**	WILLOW **ɵ**		FOOT	**ʊ**
FACE	**e**	COMMA **ə**			GOAT	**o**
DRESS	**ɛ**				THOUGHT	**ɔ**
TRAP	**æ**	STRUT **ʌ**			PALM	**a**

Figure 3: Bolinger's vowels

Bolinger analyses the FLEECE–KIT, FACE–DRESS, GOAT–THOUGHT (or LOT for British English) GOOSE–FOOT contrasts as tense vs lax, so he has only three diphthongs: PRICE **aɨ**, MOUTH **aɵ**, and CHOICE **ɔɨ** (these could not be neatly fitted in the chart). The vowels framed in the middle of the chart occur exclusively in unstressed syllables; they are the reduced vowels. The other vowels are full, and they do not occur in unstressed syllables at all.[11]

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[10] Incidentally, the alternative form of this verb, **hərás**, is just as ambiguous.

[11] Note the symbol choice for the diphthongal offglides: these are the reduced vowel symbols, since the vowel symbol before them is the prominent, stressed portion of the syllable. The offglides are not stressed. In fact, the offglides of diphthongs are probably not even vowels. Using **j** and **w** for them, as elsewhere in this paper, is probably even more appropriate.

In a system using separate symbols for full and reduced vowels, marking stress is redundant, since the quality of the vowel (the symbol providently selected to represent the vowel) indicates which syllables are stressed and which are not. So we have the phonetically more variable unstressed ɨ in the first and the phonetically more stable stressed ɪ in the second syllable of *begin* **bɨgɪn**. This representation can be converted unambiguously into one with stress marking: **bɨgín**, and vice versa. We can do the same conversion between **bʌtə** and **bə́tə** for *butter*,[12] or **pʊtə** and **pʊ́tʊ** for *putto*.[13] In other words, in Bolinger's system ʌ is a special glyph for ə́, ɪ for ɨ, and ʊ for ó.

The Jonesian transcribing tradition (Jones 1917, Gimson 1962, Wells 1990a) and Kenyon & Knott (1953) provide hybrid systems, in which in some cases the stressed and unstressed versions of a vowel is indicated by distinct symbols (eg, *butter* **bʌ́tə**), while in other cases they are not (eg, *put* **pʊ́t** and *computation* **kɔ̀mpjʊtéjʃən**,[14] *begin* **bɪgín**). In a hybrid system of this sort, the stress mark is indispensable to distinguish the two vowels of *begin* or the ʊ's of *put* and *computation*, but it is redundant in *butter*, where the vowel symbol itself indicates which of the two vowels is stressed.

Wells (1990a) uses two further symbols for vowels that only occur unstressed. They are **i**, which abbreviates the variation of ɪ and iː, and **u**, which abbreviates the variation of ʊ and uː. When these two symbols were first introduced, the idea was to show that in word final and prevocalic unstressed position older speakers had ɪ (KIT) and younger ones iː (FLEECE). So *happy*, pronounced as **hápɪ** or **hápiː**, was abbreviated as **hápi**, and *axiom*, pronounced as **áksɪəm** or **áksiːəm**, was abbreviated as **áksiəm**. Likewise, in prevocalic and pretonic unstressed position some speakers had ʊ (FOOT), others uː (GOOSE), so the transcriptions **káʒuəl** for *casual* and **junájt** for *unite* represented both **káʒʊəl** and **káʒuːəl**, **jʊnájt** and **juːnájt**, respectively. As Lindsey (2012b) shows, these two symbols often came to be very unfortunately misinterpreted as members of the vowel inventory. In any case, both **i** and **u** only occur unstressed in this tradition.

Wells' inventory is shown in figure 4, again excluding those diphthongs that only occur stressed. The vowels within the frames are again those that may occur unstressed; however, unlike in Bolinger's system, some of these vowels may also occur stressed. The ever-unstressed vowels are on a grey background. That is, in this model four vowels — KIT, FOOT, GOOSE, and GOAT — may occur both stressed and unstressed. GOOSE and GOAT may occur unstressed only word

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[12]Bolinger would also have an **r** at the end, or ə˞ as the last vowel, but that is beside the point.

[13]supposing that *putto* and *willow* would rhyme for Bolinger

[14]Our transcriptions reflect the system discussed only at the relevant portions, elsewhere we follow Lindsey (2012a). An anonymous reviewer points out that **jʊ** might be a vowel — a diphthong — which is not discussed here. There's more reason to think that this is a CV sequence than that is is a diphthong, cf, eg, Szigetvári 2016a.

finally, as in *value* and *motto*.[15] In English stressed KIT and FOOT only occur before a consonant, and in Wells' system they do not occur before a vowel or word finally either since unstressed **i** and **u** are used there.[16]

FLEECE	iː	HAPPY	i	UNITE	u	GOOSE	uː
		KIT	ɪ	FOOT	ʊ	THOUGHT	ɔː
DRESS	e	COMMA	ə	GOAT	əʊ	LOT	ɒ
TRAP	æ	NURSE	ɜː	STRUT	ʌ	PALM	ɑː

Figure 4: Wells's vowels

Compared to Bolinger's complementary sets of symbols, such transcription systems are hybrids in that they have three types of vowels: only stressed, only unstressed, and both stressed and unstressed. So the two sets overlap, but neither fully contains the other.

The third possibility is exactly this: the set of unstressed vowels being a proper subset of the set of stressed vowels. This is exemplified by the vowel inventory proposed by Lindsey (2012a), fine-tuned according to Lindsey (2012c), shown in figure 5.

KIT	ɪ	FOOT	ᵾ	THOUGHT	oː
DRESS	ɛ	STRUT	ə	LOT	ɔ
TRAP	a			PALM	ɑː

Figure 5: Lindsey's vowels

All of the vowels in this inventory may occur in stressed position, but only a subset, again those within the frame, KIT, FOOT, and STRUT, occur also in unstressed position. This makes sense: more — in fact, everything — is possible in a stressed syllable, but the options are curtailed in an unstressed syllable, exactly as predicted by Harris (1997). It would be odd to assume that an unstressed position could support a vowel, namely ə, that a stressed position could not.

The long monophthongs of Lindsey's vowel system can only occur stressed. This again is expected: the complexity of a long vowel presupposes a strong

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[15] I cannot tell if the first vowel of *November*, if əʊ, is stressed or not.

[16] Actually, word finally Jones (1918) had FOOT as an option beside the more common GOOSE in eg, *value*, but his successors, Gimson (1962) and Wells (1990a), only have GOOSE, ie, **u:**, word finally. That is, beside the better-known HAPPY-tensing (the lengthening of nonpreconsonantal unstressed KIT to FLEECE) there seems to have been a parallel development, which could be called VALUE-tensing, and which was completed by the middle of the 20th century.

prosodic license. Interestingly, three of the diphthongs do occur unstressed. This is surprising, because diphthongs are supposed to be about as complex as long vowels. Even more intriguing is the fact that in unstressed position we find exactly those three diphthongs that begin with a vowel which may be reduced as short vowels, those with are framed in figure 5: ɪj (as in *happy* **hápɪj**), ʉw (as in *value* **váljʉw**), and əw (as in *putto* **pʉ́təw**). This is a rather clear indication that FLEECE is KIT+**j**, GOOSE is FOOT+**w**, and GOAT is STRUT+**w**. That is, there are no diphthongs in (Standard British) English. The "diphthongs" that occur in unstressed position are simply the reduced vowels followed by a glide (cf Szigetvári 2016b, and references there).

The fact that English vowels can be divided into two classes — reduced and unreduced/full — is yet another indication that stress is binary. If there was any significant difference between primary, secondary, and tertiary stress, one would expect this to show in the types of vowels occurring in these positions. But, in fact, the set of vowels occurring under any "degree" of stress is the same and it is different from those occurring unstressed.

5   Identifying stress

As we have seen, the symbols in Bolinger's vowel inventory clearly indicate whether a given vowel is stressed or not. This means that stressed vowels can be identified simply by looking at their quality. As opposed to this scenario, vowel quality in itself does not determine if a vowel is stressed in either the hybrid system of the Jones tradition or in that of Lindsey. For Jones ɪ and ʊ (i and **u** as he writes them), for Gimson and Wells also **u:** and perhaps **əʊ**, are ambiguous with respect to stress. In both systems **ə**, and for Wells also **i** and **u**, are vowels that only occur in unstressed position. In Lindsey's inventory any of the vowels may occur stressed, so all of the reduced ones, ɪ, ʉ, and ə are ambiguous.

Of course this does not mean that we could not tell in the latter frameworks if a vowel is stressed or not. In most cases, it is enough to construe an utterance in which the tonic falls on the vowel under examination. In *annul* **ənə́l**, for example, we know that the second vowel is stressed and the first one is not, because the tonic may fall only here: *this is the decision to annúl,* never on the first. Also "stress shift" is impossible in *annul goals* (****ə́nəl gə́wlz**). Note that this specific word would not be an issue for the Jones school, since — somewhat redundantly — it distinguishes these two vowels by using different symbols (**ənʌ́l**). Nevertheless, the same arguments would be needed in other cases like *distil* **dɪstíl** or *insist* **ɪnsíst**.

Another symptom of stress is the allophony — lenition or absence thereof — of the preceding consonant. Harris (2004) shows that these phonotactic con-

straints of English are defined in the domain of the foot, which is equivalent to distinguishing the environments before a stressed vowel (these are the foot-initial consonants) and before an unstressed vowel (these are the foot-internal consonants). In foot-initial position — ie, before a stressed vowel — processes like tapping, for example, do not occur. Before a stressed vowel, **t** does not become **ɾ**. In foot-internal position — ie, before an unstressed vowel — it does. It is important that this does not depend on the "degree" of the stress of the following vowel. Flapping does not occur in *atoll* **átɔl** any more than in *atomic* **ətómɪk** although in the first word the ɔ cannot be the tonic, and so, in a traditional view, it would be "less" stressed than in the second. Thus, the fact that Wells (1990a) does not mark the possibility of flapping in *autism,* while he does in *attic,* may be taken to indicate that the ɪ in **ó:tɪzəm** is stressed, but that in **átɪk** is not. (Or it may be an inconsistency in the dictionary.)

6   Conclusion

The view of stress presented in this paper is perhaps oversimplified. It is deliberately so. The aim is to see how far we can get with a minimalistic framework. The conclusion is that if there is a working algorithm for locating the tonic of an utterance then we can maintain that stress is binary and lexical: there are no degrees of stress (primary, secondary, etc) and being stressed or not is an unchangeable lexical property of vowels in English. The segmental effects of stress certainly point in this direction, but it looks like the prosodic complexity of utterances may also be managed by phonologically binary stress.

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