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English Word Stress and the Guierrian School

Quentin Dabouis, Jean-Michel Fournier, Pierre Fournier and Marjolaine Martin

0 Introduction

At the end of the sixties, Lionel Guierre had been studying English stress for a number of years in view of a French doctoral dissertation when Chomsky and Halle published *The Sound Pattern of English* (henceforth *SPE*), a truly revolutionary view of the workings of English stress, though its actual concern was more likely to have been linguistics and phonological theory than English stress *per se*. In view of what he considered a momentous scientific event, Lionel Guierre took the rare decision to re-start his analysis from scratch by resorting to computer analysis, which was becoming more easily available to scientists at the time. Let us recall that at the time, the challenge was daunting: each entry of Jones's *English Pronouncing* dictionary (12th ed.) had to be transferred on to a punched card, with an appropriate and efficient coding transfer, even before attempting any kind of systematic analysis. Lionel Guierre finally succeeded in completing his analysis of the very first computerised corpus of English pronunciation by the end of the seventies, when he presented his doctoral dissertation which allowed him to become the first Professor of English pronunciation in the history of French university.

Except for a few specialists around the world, his dissertation remained mostly unknown, however, as it was never published as such: unlike Chomsky and Halle's book, its scope was strictly limited to English stress and pronunciation, with no linguistic theoretical ambitions. Lionel Guierre's work is best known through his *Drills in English Stress-Patterns* (1984 new ed.), a book aimed at students of English as a foreign language, but with a foreword by A. C. Gimson himself:

L. Guierre has carried out a computer analysis of the stress-patterns of the majority of words in the Jones *English Pronouncing Dictionary* and has been able to derive from this analysis sufficient rules of general validity to be of great practical help for the foreign learner. [...]

The tendencies of word-stress which have emerged are likely to reflect the underlying rules which the native English speaker has as part of his linguistic generative capability [...]

Because of the very nature of his corpus, Lionel Guierre integrated the written form into his analysis, arguing that a 'grammar of the reader' was as relevant as a 'grammar of the speaker' (purely oral rules) in the case of most English speakers, and should be taken into account when endeavouring to understand the stress system of English. A key illustration of this is the behaviour of consonant geminates, which share certain features with 'actual' consonant clusters.¹ Generally speaking, the written form adds clues to a purely oral grammar: thus penultimate stress in words such as *vanilla* can be accounted for within a grammar of the reader but is exceptional from an oral point of view.

Similarly, he adopted the dictionary view of stress as a rhythm (and intonation) marker, and thus worked with three levels of stress, namely primary, secondary and unstressed,² even though the latter might contain a full vowel. Contrary to Chomsky and Halle's work, his large-

1 See section 2.1 below. See also Chapter 4 (this volume).

2 In this paper, we will use the following notation: /1/ for primary stressed syllables, /2/ for secondary stressed syllables, /0/ for stressless syllables, and /(-)/ for optional syllables.

scale empirical study led him to seriously question the relationship between syllable weight and stress placement and to look for other parameters as viable explanations.³

Though he never actually founded any kind of ‘school’, his students, including Jean-Michel Fournier and his own students in turn, have endeavoured to refine and expand Guierre’s analysis: the aim of the present paper is to summarise the views on English stress we have developed over the years. This approach can be defined through five main characteristics, which will be detailed in the course of this paper:

- It is an empirical approach which favours the use of large datasets, often from computerised pronouncing dictionaries;
- Orthographic information is taken into consideration, unlike most phonological theories which tend to ignore it;
- The morphological approach which is adopted is distinct from mainstream practice in analyses of English phonology in that we assume that semantically opaque constituents play a role in stress assignment (and other phonological processes);
- The role of syllable structure in stress assignment is assumed to be more restricted than assumed in generative analyses;
- We assume that English phonology includes a number of different subsystems which correspond to different lexical strata of borrowings (or words perceived as such).

We will start by discussing the first characteristic of this approach, the use of large corpora (section 1), before we turn to the analysis of English stress developed within this framework (section 2). We will then turn to another characteristic of the Guierrian approach: the assumption that English phonology is not monolithic but rather a dynamic system of interactive subsystems (section 3). Another expansion of Guierre’s analysis was to compare Standard British English, on which Guierre based his work, to other varieties of English around the world. This will be discussed in section 4.

1 An Empirical Approach

At the dawn of generative phonology, Chomsky and Halle (1968: ix) defined English phonology in a way that has dominated most phonologists’ approaches to the field ever since:

Given the goals of the research reported on here [universal grammar], exceptions to rules are of interest only if they suggest a different general framework or the formulation of deeper rules. In themselves they are of no interest.

Therefore, they seemed to justify the absence of a systematic empirical enquiry, which would be the only way to obtain full lists of exceptions, on the grounds of their interest in universal grammar. We would certainly agree with their view on exceptions, as they can indeed provide useful evidence of areas of conflicts within the phonology as well as useful data in which other researchers might perceive a regularity where the original authors did not. However, we can hardly see how an interest in more ‘general principles’ could justify the absence of an endeavour to empirically confirm those principles.

In recent years, however, this issue has been drawing increasing attention. Collie’s (2007: 3) remarks in the introduction of her dissertation on stress preservation that ‘up until now, stress preservation has simply been assumed to occur in English, with no support from any serious and extensive empirical investigation’; Wenszky (2004: 12) notes in the introduction of her

³ See Chapter 5 (this volume) for an analysis of stress placement in English verbs. For a general discussion on the nature of stress see Dabouis (2020).

book on secondary stress: 'My last general remark about some of the stress theories that I reviewed is that it seemed that the stress rules in them were developed on the basis of the analysis of some typical words, but not whole classes of words'. This criticism has also been extended to one of the last general books on English phonology, Hammond (1999); McMahon's (2001) review reads as follows:

At no point [...] does the author tell us which databases [he used], and how they were and can be accessed. This seems unacceptable. For one thing, courtesy in scientific enquiry involves ensuring that your results can be repeated by other investigators, and without knowing where the sample comes from, that isn't possible; it is true that linguistics has not always lived up to that high aim, with its concentration on intuition and introspection.

This seems to be a major issue in English phonology: the same example words are used over and over again without any discussion about the representativeness of these examples. One striking case is the use of Amerindian names in the literature on English stress,⁴ as these words clearly are borrowings, which implies that there is no guarantee that they can be used to illustrate general principles of native English phonology, on top of being proper nouns, which often behave distinctly from regular words (see section 3 and Guierre 1979: §1.4.5; Raffelsiefen 1993: 90-93). However, the Guierrian School has a rather different approach.

In his 1979 dissertation, Guierre adopted an empirical approach; this was because he felt that a true description of English was still lacking, which was making it extremely difficult to conduct a rigorous evaluation of phonological theories (Guierre 1979: §1.4.1). He argued that exceptions should be extensively listed, enabling researchers to evaluate the efficiency of the postulated rules and to see whether these irregularities could be attributed to the fact that certain words belong to two or more classes governed by contradictory rules (Guierre 1979: §1.4.3). Other authors have carried on this mostly descriptive work, looking for the most efficient system to account for stress placement and the pronunciation of vowels, without claiming that such a system should be regarded as a model of the competence of an average or ideal speaker. Guierre's initial study consisted of a description of the 34,000 words corpus he had constituted using the 12th edition of Jones's EPD, and virtually all subsequent works in the Guierrian approach have used pronouncing dictionaries as their main data source. Dictionaries have qualities, and they have flaws. The criticisms addressed to Guierrian works often point out the limitations of pronunciation dictionaries but often fail in providing a viable alternative. We see the study of pronunciation dictionaries as one way to approach the issue of English stress, with its advantages and disadvantages, but we do not claim that this is the only way this issue should be studied. Indeed, nonce-word reading tasks (Domahs et al. 2014; Turcsan and Herment 2015) or grammaticality judgment tasks (Steriade and Stanton 2020) or the study of spontaneous speech (Hanote et al. 2010) are other valid ways to approach the issue.

The obvious advantage of studying pronunciation dictionaries is their size: they give us access to large numbers of words and allow us to assess the validity of rules in quantitative terms and not simply postulate their existence on the grounds of intuition, introspection or someone else's lists of examples. Aronoff (1976: 116) even argued that consulting a dictionary is 'the closest we can come to the lexicon of a speaker's language'. Therefore, the study of a dictionary could be argued to be the study of a form of an 'ideal' speaker's lexicon. If we are to use these dictionaries as our main data source, it is however essential to also acknowledge

4 For example, either one or both of the two words *Ticonderoga* and *Monongahela* can be found in Burzio (1994), Chomsky and Halle (1968), Collie (2007), Hayes (1982, 1984), Kiparsky (1982), Liberman and Prince (1977), Pater (1995, 2000), Schane (1979) and Selkirk (1980).

their limitations. As Dahak (2006) points out, the transcriptions, although closer to a phonemic representation, are neither truly phonological nor phonetic: the use they make of [ŋ], [i], [u] for instance clearly points towards a hybrid representation. Obviously, dictionaries contain mistakes (typing errors, missing symbols...). Dictionaries often describe 'standard' varieties of English, which should probably be described as a form of model towards which regional accents converge when they neutralize rather than as an English accent in itself.⁵ Dictionaries can also be reliable for certain things and not for others. For example, they are generally reliable for the position of stresses, but different dictionaries have been shown to employ different syllabification choices (Ballier and Martin 2010). This means that any use of the syllabifications in a given dictionary has to acknowledge that choice in the first place, as they will necessarily be biased by that choice. Finally, pronunciation dictionaries are often regarded as 'one man's works' as they are mostly based on the authors' speech and intuition. However, the most recent editions tend to display 'preference polls', and some recent works have endeavoured to verify certain dictionary transcriptions with native speakers (Martin 2011) or in spontaneous speech (Videau 2013) and have generally confirmed the dictionary data.

2 Main Stress Rules and the Role of Morphology

In this section, we present the system of stress placement, based mostly on J.-M. Fournier (2007, 2010b). We start by presenting the general principles governing stress placement (section 2.1), then discuss the importance of morphological factors (section 2.2) and segmental factors (section 2.3). Finally, we briefly discuss secondary stress (section 2.4).

2.1 General Principles

There are four general principles governing stress placement in English, which we reproduce from J.-M. Fournier (2007) in (1).

(1) General stress principles

1. Every lexical unit has one and only one major stress.⁶
2. There can be no sequence of two stresses within a lexical unit.
3. No lexical unit can begin with two unstressed syllables.
4. Syllables which receive neither stress /1/ nor stress /2/ are unstressed.

These principles can be found in other theoretical frameworks expressed in different ways, for example constraints on feet well-formedness in frameworks using feet, like Prosodic Phonology (Hammond 1999; Nespov and Vogel 1986; Pater 1995, 2000; Selkirk 1980) or Burzio (1994). In Optimality Theory, this is done through the use of constraints like PARSE- σ , FTBIN and *CLASH.

Guierrian authors also make use of the notion of functional consonant clusters (henceforth C₂), which play an important role in English phonology and are defined in (2).

(2) Functional consonant cluster (J.-M. Fournier 2010b: 28)

- <x>;
- Every cluster of at least two consonants, except <Ch>, <Cr> and <C + syllabic C>, including orthographic consonant geminates or pseudo-geminates (for example <tt>, <rr>, <gg> or <sc>).

5 Collie (2007: 118) speaks of 'artificial idiolects'.

6 Primary stress for words, secondary for prefixes. See section 2.2.1 below for a definition of these two types of lexical units.

These clusters are defined by their behaviour (see Guierre (1979: §3.4.1 - 3.5.11)):

- They tend to 'attract' stress when found in pre-final position (for example *colóssus*, *advántage*, *elíxir*);
- The vowels that precede them are short ⁷ (for example *acc[ó]mplice*, [*æ*]mber, *spagh[é]tti*);
- They forbid reduction when they follow an initial pre-tonic vowel ⁸ (for example [*ɔ:*]r*chéstral*, [*æ*]c*tivity*, c[e]n*sórial*).

The phonological behaviours here associated with the right-hand context of a vowel (the number of following consonants) are more widely described using syllable structure. However, syllable-based analyses oppose open syllables to closed syllables, a distinction which cannot capture the distinctions observed between C⁰ (absence of any following consonant, that is to say prevocalic or word-final positions), C (one following consonant, or non-functional clusters) and C₂. Crucially, C⁰ and C quite generally correspond to open syllables, but the behaviour of preceding vowels distinguishes these two structures: stressed vowels followed by C⁰ are always long while those followed by C may be long or short. Moreover, the definition in (2) includes /Cl/ clusters among functional consonant clusters but excludes /Cr/ clusters. This is based on the analysis of words in (-)VC₁V#, in which the stressed vowel is expected to be long unless it is followed by a C₂. Words with /Cl/ usually have short vowels (for example *ígloo*, *úgly*, *kibla*, *tábla*) while those with /Cr/ usually have long vowels (for example *cóbra*, *mícra*, *négro*, *zébra*), which suggests that /Cl/ clusters should be analysed as functional consonant clusters. However, these two types of C + liquid clusters are traditionally expected to behave in similar ways in most frameworks as they may both form branching onsets. It remains to be seen whether these distinctions can be captured by other theoretical devices such as feet, or in frameworks which do not use the notion of syllables such as CV Phonology (Scheer 2004) or theories using intervals (Hirsch 2014; Steriade 2012).

Let us now present the importance of morphological factors in stress assignment in English.

2.2 Morphological Factors

In this section, we discuss the three main morphological elements which influence stress placement in English. We start by discussing the different types of prefixation (section 2.2.1), then discuss suffixation and the role of strong endings (section 2.2.2) and conclude with compounding, which includes neoclassical compounding (section 2.2.3).

2.2.1 Prefixation

In the Guierrian tradition, two types of prefixes are distinguished: separable prefixes and inseparable prefixes. Separable prefixes have a transparent meaning and are attached to a free base in such a way that the meaning of the prefixed construction can be directly deduced from the meaning of the prefix and that of the base (for example *re-do*, *unlike*, *ex-boyfriend*). Inseparable prefixes can be attached to either a free or a bound base, but the meaning of the prefixed construction cannot be deduced from the meaning of its parts even when they have an independent meaning (for example *below*, *recover*, *restrain*, *collect*). The classification of a prefix into one of these two categories must therefore be done in a given construction, so a

7 Except if they are orthographic digraphs, for example *áuction* [ó:], *acóustic* [ú:], *recéipt* [i:].

8 That last property knows two exceptions:

- When the first syllable is a prefix, it reduces regardless of the following consonantal structure;
- When the cluster is made of orthographic geminates, they do not block reduction as systematically as 'true' consonant clusters (for example *t[ɔ]rréntial*, *t[ə]rrífic*).

prefix may be separable in certain constructions and inseparable in others. Both of these types of prefixes have an impact on stress, which is discussed below.

Separable prefixes have a stress behaviour comparable to that of independent words: they often receive (generally secondary) stress, even if it contradicts principle 2 (see 0 above), for example *rè-dó*, *ìmpóssible*, *cò-wórker*.⁹ This observation leads J.-M. Fournier (2010b: 12) to define stress in English as an identifier of lexical units, lexical units being defined as semantically inseparable units. In English, he identifies two types of lexical units:

- Autonomous lexical units: words, which receive primary stress;
- Non-autonomous lexical units: separable prefixes, which receive secondary stress.

This means that principle 2 applies only within the domain of a lexical unit, as sequences of stresses are commonly attested for adjacent lexical units.

In fact, this stress behaviour can also be found in antonymic pairs¹⁰ such as *include* ~ *exclude* or *inflate* ~ *deflate* in which the prefixes have semantic and phonological properties comparable to separable prefixes (Raffelsiefen 1993, 2007, 2015) and for which J.-M. Fournier (1996) notes that 'the semantic opposition between prefixed constructions can virtually be brought down to that between prefixes.' Such a behaviour is occasionally found in words with transparent prefixes outside such pairs (for example *àcéphalous*, *décápite*, *dèsáline*), which suggests that the semantic motivation of the prefix can be sufficient to open the possibility of stressing the prefix, even when the base is bound (Dabouis 2016b).

Inseparable prefixes include what are traditionally known as 'Class-I' prefixes as well as historical prefixed constructions such as *preclude*, *obtain*, *insist* or *select*, which are a well-known problem in morphology (Anderson 1992: 55; Aronoff 1976: 12-15; Bauer et al. 2013: 15-16; Katamba and Stonham 2006: 23; Mudgan 2015; Plag 2003: 30-33), for the constituents of these constructions share a number of properties with morphemes but do not have any clearly identifiable meaning. Early generative phonology did make reference to these prefixes (Chomsky and Halle 1968: 94; Halle and Keyser 1971: 37; Liberman and Prince 1977), but they were abandoned on the grounds of their supposed unlearnability. However, there is ample evidence from psycholinguistics that speakers do access such opaque structures, as seen in lexical decision tasks (Forster and Azuma 2000; Pastizzo and Feldman 2004), reading studies (Ktori et al. 2016, 2018; Rastle and Coltheart 2000) and ERP studies (McKinnon et al. 2003). These structures are also associated with different phonological behaviours. Stress is one of them, as inseparable prefixed constructions other than nouns (and without strong suffixes or endings, see the following section) always receive primary stress on their root, never on their prefixes (for example *recéive*, *seléct*, *alóud*, *amóng*, *devélop*, *còntradíct*, *intervéne*), unlike non-prefixed words which follow the general rules detailed in section 2.3 (for more details, see Chapter 5, this volume). Inseparable prefixes also display a distinct vowel reduction behaviour in the initial pretonic position, as vowels in closed syllables usually do not reduce, unless they are part of such a prefix. This observation appears throughout the literature on English phonology (Chomsky and Halle 1968: 118; Halle and Keyser 1971: 37; Liberman and Prince 1977: 284-285; Guierre 1979: 253; Selkirk 1980; Hayes 1982; Halle and Vergnaud 1987: 239; Pater 2000; Hammond 2003; Collie 2007: 129, 215, 318-319) and has recently been empirically

9 Overall, separable prefixes correspond to so-called 'Class-II' prefixes (Siegel 1974) although they are defined mostly by their semantic and stress behaviour and therefore include prefixes like *iN-*, which can have a transparent meaning and receive stress (for example *ìmpróper*, *ináccurate*, *incúrible*). This is despite the fact that *iN-* undergoes nasal assimilation, a property generally restricted to 'Class-I' affixes (see Raffelsiefen 1999, for whom the difference between *un-*, which does not undergo nasal assimilation, and *iN-* is a segmental one).

10 That behaviour can also be observed in groups of more than two words, as long as they are still opposed only by their prefixes, for example *ìmpòrt* ~ *èxpòrt* ~ *dèpòrt* (Videau 2013: 21).

confirmed by (Dabouis and P. Fournier 2019). However, the issue of how speakers access such semantically opaque structures is still an open question.¹¹

2.2.2 Suffixation and Endings

In the Guierrian approach, two categories of suffixes are generally acknowledged: strong suffixes and neutral suffixes.¹² The expression 'strong endings' is generally preferred to 'strong suffixes' within the Guierrian School because endings, not just suffixes, may influence the location of primary stress.¹³ For example, *-ion* is a suffix in *location* because the morphological and semantic links between the verb *locate* and the noun *location* through a derivational process are obvious. On the contrary, in *Napoleon*, *-eon* actually belongs to the root and cannot be considered as a suffix. Nonetheless, the location of primary stress in both words (*location* and *Napoleon*) can be accounted for by the stress rule corresponding to the *-eon/-ion* ending¹⁴.

The category to which a given ending belongs is determined through a systematic comparison between the stress patterns of bases and their derivatives. If stress (or vowel) shifts are observed, they demonstrate the influence of the ending which is then classified as 'strong' since it can modify the original stress or vocalic pattern of the base. But if no stress shifts between bases and derivatives are attested, then the ending is considered as 'neutral'.

The derivational link between bases and derivatives is local and semantically¹⁵ constrained. The local nature of the process is illustrated by the words *history*, *históric* and *históricism*. The base of *históricism* is *históric* and the base of *históric* is *hístory*: *históricism* should not be derived from *hístory* because of the very existence of *históric*, as the morpho-semantic reference for the reproduction/imitation process of the 'Neutral Derivation Law' (J.-M. Fournier 2007).¹⁶ Of course, the base must be attested to play such a role: consider the word *theatrical* whose base is necessarily *theatre* because *°theatric* is not attested in contemporary English.¹⁷

In the following base-derivative pairs, no stress shifts are observed:

- (3) *abórtion* → *abórtionist*, *emótion* → *emótionless*, *cóLOUR* → *cóLOURful*, *fáte* → *fátal*, *intérpret* → *intérpreting*, *jóURNal* → *jóURNalism*, *relígiOUS* → *relígiOUSly*, *éSCalate* → *éSCalator*, *achieve* → *achievABLE*.

The adjunction of these suffixes does not modify the original stress patterns of the bases. Consequently, they are classified as neutral. These examples are representative of the Neutral Derivation Law

On the contrary, in the following pairs, stress shifts are attested:

11 For a general discussion of the issue of semantically opaque prefixes in English phonology, see Dabouis (2017).

12 This distinction is close to the distinctions put forward in other frameworks, eg. Class-I vs. Class-II (Siegel 1974), Level-I vs. Level-II in Lexical Phonology (Giegerich 1999; Kiparsky 1982) or stem-level vs. word-level in Stratal Phonology (Bermúdez-Otero 2018).

13 This distinction between suffixes and endings appears to be relevant in a few cases, however, such as the words in *-ee*, which normally receive final stress. J.-M. Fournier (2010b: 24) points out that there are more exceptions to the rule when *-ee* represents an ending (for example *cóffee*, *tróchee*, *yánkee*) than when it represents a suffix (for example *réfugée*, *trainée*, *trustée*).

14 Actually the $\{-\{i,e,u\}+V(C_0(e))\}$ family of endings, characterized by two successive vowels. See Appendix.

15 For example, *ration* vs *rational*, *cult* vs *culture* where the semantic relationship is demotivated.

16 This is what Burzio (1994) calls 'Strong Preservation'.

17 However, Guierre (1979) posits 'potential bases' (noted preceded by °) to account for the stress pattern of some suffixed words (for example *°prócurate* (and not *procúre*) → *prócurator*).

- (4) *púlse* → *pulsáte*¹⁸, *réfuge* → *rèfugée*, *China* → *Chinése*, *thém* → *themséives*, *fóur* → *fourtéén*, *héro* → *heróic*, *ínstinct* → *ínstínctive*, *sphéroid* → *sphéroídal*, *sýllable* → *sýllábify*, *módern* → *modérnity*, *vólume* → *volúminous*, *spéctacle* → *spéctácular*, *túmult* → *tumúltuous*, *cóurage* → *courágeous*, *consíder* → *consíderátion*, *céremony* → *cèremónial*.

The stress shifts that can be observed between the stress patterns of the bases and their derivatives are the direct result of the influence of the endings. If an ending is associated with a set position of stress and can therefore entail stress shifts, then it is classified as a strong ending. In other words, strong endings compel us to ignore the relationship between base and derivative that is otherwise phonologically actualized through the Neutral Derivation Law. In the examples in (4), strong endings are classified according to the stress-patterns of the derived forms¹⁹ (stress is either on the final syllable, the penultimate syllable or the antepenultimate syllable). Strong endings are often called 'stress-imposing' endings in the literature, or described as such. This point will not be dealt with here in detail, but it has been demonstrated that the term 'stress-imposing' is not coherent with their role in the derivational process. They do not in fact 'impose' a specific and systematic stress pattern, but actually prevent any reference to the phonological properties of bases as concerns primary stress (J.-M. Fournier 1998).

Stress shifts are not systematic when dealing with the base / derivative stress comparison (examples: *vanílla* → *vaníllic*). Such cases are called non-relevant pairs and can be accounted for by the convergence of two different stress rules with the same resulting stressed syllable. The prefinal stress of *vanilla* is enough to justify the stress of *vanillic* through the Neutral Derivation Law. But the word *vanillic* would also be stressed on the penultimate syllable because of the *-ic* suffix. This suffix is a strong one, but its influence cannot be demonstrated in this pair. However, considering that the adjunction of *-ic* in *history* → *históric* and thousands of other base-derivative pairs triggers a stress shift whenever the Neutral Derivation Law contradicts the penultimate stress associated with *-ic*, *-ic* is classified as a strong ending and analysed as the cause of penultimate stress, even in the particular case of non-pertinent pairs; the analysis is identical for all strong endings.

The neutral / strong distinction is determined through a systematic analysis of the stress patterns of corresponding bases and derivatives. But it is also extended to suffixed words which do not have any attested base in English, as long as the semantic properties of the suffix are preserved. For example, *acóustic*, *ánxious*, *idéntity*, *sapónify*, are suffixed words with bound bases. However, the influence of the suffix is obvious, and the resulting stress patterns are identical to those of derived words, which are built with the same suffixes. Therefore, the strong nature is first determined through a stress comparison between bases and derivatives and then extended to suffixed words with bound bases (for example *acoustic*), as well as to words exhibiting the same ending which does not correspond to a morphological boundary (for example *Napoleon*), on account of the associated stress-pattern.

The category of neutral suffixes also has to be refined because one might think that the presence of a neutral suffix necessarily implies the principle of the 'Neutral Derivation Law' and a stress analysis directly based on the base. In some rare cases, words whose suffixes are neutral are attached to bound bases (for example *grateful*, *gormless*). In these specific cases, these items are not interpreted as derivatives as far as stress assignment is concerned.

18 This particular instance of stress shift is only found in Standard British English because disyllabic verbs ending in *-ate* are generally stressed on their first syllable in Standard American English.

19 The whole list of strong endings can be found in the diagram in the Appendix.

Morphological parameters are neutralized, and stress rules are based on segmental considerations such as the number of syllables.

Moreover, the segmental environment preceding a suffix may affect its behaviour. For example, *-ive* is neutral in *accúmulative*, where no stress shift is to be observed relative to its base *accúmulate*, even if it generates pre-antepenultimate stress just as all other words whose base ends with a single consonant. But when this suffix is used to create adjective derivatives and preceded by a consonant cluster, it appears that it becomes strong (for example *ínstinct* → *instínctive*).²⁰

As in other frameworks, an intermediate category of 'mixed' suffixes can be used. Indeed, certain suffixes show contradictory behaviours by being sometimes stress-affecting and sometimes not (for example *-able*, *-ist*, *-ory*, *-ly*). Such intermediate cases are discussed by Trevian (2007) and are often caused by ongoing change in the stress behaviour of the suffix, as shown by Castanier (2016).

2.2.3 Compounding

Compounds in English form another morphological class which obeys specific stress rules.²¹ If compounds are considered to be semantically inseparable units (= if they are lexical units), this implies that there is only one primary stress which is assigned to the whole, whether the two elements that constitute the compound be orthographically attached, hyphenated or separated by a space. According to Guierre (1979), compounds are usually stressed on their first element. However, this principle does not determine the location of the stressed syllable but rather indicates on which element stress assignment rules should apply. The first element is then subject to the same exact morphophonological rules that govern the rest of the lexicon. Here are some examples of compounds that are stressed on their first element:²²

(5) *bláckbird*, *létterbox*, *bláckmail*, *sérvice station*, *róad-test*, *Báker Street*, *machínegun*.

The few exceptions are neither numerous nor coherent enough to allow for sub-rules accounting for the stressing of the second element.²³

Neoclassical compounds constitute a specific sub-group of compounds in English because they are composed of elements of (mostly) Greek and Latin origin, often referred to in the literature as 'combining forms' (examples: *hetero-*, *hydro-*, *philo-*, *ortho-*, *-vor(ous)*, *-gene*). This specific vocabulary, which is either borrowed from Greek and Latin or directly created through English lexicographic rules, is in constant expansion especially because of scientific innovation. The English lexicological tradition is unclear concerning the status of these elements because no clear distinction is made between compounding and affixation (Bauer 1983, 2005, 2006; Katamba and Stonham 2006: 336; Plag 2003: 74). The frontier between these two notions is also quite unclear in lexicographic sources, and the *Oxford English Dictionary* may categorize as prefixes what seem to be representatives of the category of 'initial combining forms' (ICFs).²⁴ Concerning the stressing of neoclassical compounds, syllable weight is still considered to be the main factor in the literature.

20 See also Dabouis (2016a), who argues that the adjectival suffix *-al* is strong only in combination with other elements such as a preceding consonant cluster, certain suffixes or neoclassical roots.

21 The definition of compounding is indeed controversial because the boundary between syntax and the lexicon is not easy to identify. This issue has been widely discussed in the literature (see for example Bauer et al. 2013: 431 ff.), Giegerich (2004) and Plag (2003: 132 ff.)).

22 Compounding is the only case for which the Guierrian School accepts the possibility for a secondary stress to appear to the right of primary stress, much as dictionaries do.

23 Nevertheless, research was carried out (Moore-Mauroux 2002; Plag 2006) to try to account for these cases.

24 As opposed to the 'final combining forms' (FCFs) category (see Marchand (1969)).

The Guierrian approach uses an alphabetical representation of neoclassical compounds (Guierre 1975: 117), A+B(+C), which stands for both existing types: bound root + bound root + suffix (examples: *carni+vor+ous*) or prefix + bound root + suffix (for example *ana+log+ous*). It highlights the importance of morphological boundaries and in particular the one existing between the second element and a potential suffix. First, stress shifts are more frequently observed through a base / derivative stress analysis than for words with other morphological structures. Indeed, suffixes such as *-al* or *-ous* always behave as strong endings within neoclassical compounds (examples: *cárnivore* → *carnívorous*, *ísocline* → *isoclínal*). Second, some B roots, when suffixed, seem to have a certain degree of 'attractiveness' relative to the location of primary stress. Thus, neoclassical compounds with suffixed attractive roots are stressed in /(-)10/, whereas compounds with suffixed non-attractive roots are stressed in /(-)100/.²⁵

Finally, Guierre (1979: 740) claims that neoclassical roots are accentually invariant. This means that whenever they are not constrained by the stress patterns associated with strong suffixes or by clash avoidance, they tend to retain the same stress pattern. In non-suffixed neoclassical compounds, primary stress is normally assigned as it is assigned in 'normal' compounds: the first element receives primary stress and is stressed following the general segmental factors detailed in the following section.²⁶ This pattern of stress assignment can lead to extended stress lapses (for example *rádiograph*, *cínemascope*, *láparoscope*, *stéroscope*). Stress invariance, Guierre claims, also manifests in secondary stress placement, as the preferred stress pattern of a given root would be adopted, even if that contradicts stress preservation from its closest base. For example, the root *laryngo-* usually has penultimate stress (for example *larýngograph*, *larýngoscope*) and keeps its pen-initial stress in *larýngológical*, regardless of the fact that *làryngólogy* has initial stress. However, no systematic investigation of secondary stress placement in neoclassical compounds has yet been conducted to test this claim.

2.3 Segmental Factors

When morphological factors are neutralized and can no longer account for the location of stress, segmental criteria come into play with two distinct sub-parameters. The first sub-parameter is the number of syllables. Disyllables are stressed on their first syllable (for example *college*, *súrburb*, *párent*, *públish*, *fóllow*) and words of more than two syllables are stressed on the antepenultimate according to the Normal Stress Rule (NSR), which accounts for the stress-pattern of a large majority of long words in English:

(6) *álphabet*, *áttitude*, *spécimen*, *páradise*, *tólerance*, *ambássador*, *aspáragus*.

The NSR applies except for a (relatively) limited number of words where the second sub-parameter, the segmental characteristics of the end of the word, are regularly associated with penultimate stress. First, when a word contains a prefinal consonant cluster (that is to say a cluster found between the last two syllables):

(7) *appréntice*, *Novémber*, *intéstine*, *seméster*, *repúgnance*.

²⁵ See P. Fournier (2011) on neoclassical compounds ending in *-ous* for further detail and in particular stress variation which is particularly common in that part of the lexicon. See also Dabouis (2016a) for a similar discussion of neoclassical compounds ending in *-al*.

²⁶ However, neoclassical roots, like recent Latinate borrowings, show a clear sensitivity to the presence of a prefinal C₂.

However, as argued by J.-M. Fournier (2010a), this rule works best in recent Latinate borrowings from modern Latin (for example *pròpagánda*, *enígma*, *memento*) or languages such as Italian, Spanish or Portuguese (for example *anacónða*, *extràvagánza*, *dilettánte*). Its efficiency is far more limited in words which do not fall into that category (for example *sácristan*, *cáalendar*, *lávender*, *mínister*, *índustry*).

Second, when a word has the segmental characteristics of what Guierre dubbed the ‘Italian rule’ (words which ends with a <VCV#> structure, where the pre-final consonant is an alveolar (except <l> and <r>) followed by a non-mute monographic vowel (except <y>)):

(8) *banána*, *bikíni*, *potáto*, *armáda*, *mosquíto*, *kimóno*, *angína*.

The rule is named ‘Italian’ after the high number of Italian loanwords that it applies to, but it also concerns a number of Spanish, Portuguese, Japanese and Latin loanwords. Since the stressed vowel is usually long in this latter case, one could think that this part of the Guierrian analysis is quite close to the *SPE* conception of the role of syllable weight. In Guierre’s views, however, if consonant clusters do indeed seem to play some role in stress placement, the nature of the vowel in ‘Italian’ cases is actually *due* to the stress-pattern, and therefore in no way a factor of stress location as *SPE* proposed (see Chapter 4, this volume).

2.4 Secondary Stress

The position of secondary stress is mostly constrained by the general principles in 0 and stress preservation from the base in suffixed words. We have already discussed the secondary stress of separable prefixes in section 0, which is of a different nature, and will not comment any further here.

In non-derived words, secondary stress tends to be on the first syllable (for example *èlecampáne*, *càtamarán*, *àbracadábra*, *còriánder*, *ànacónða*), which is the only possible pattern for words with only two pre-tonic syllables, as principle 2 forbids adjacent stresses. There are a few non-derived words which may have secondary stress on their second syllable, for example *amòntilládo*, *Epìmanónðas*, *Monòngahéla*), which Dabouis et al. (2017) have found to be attributable to the closedness of the first two syllables and the presence or absence of an initial onset. Pen-initial stress was found to be more likely if:

- The word has no initial onset,
- The first syllable is open,
- The second syllable is closed.

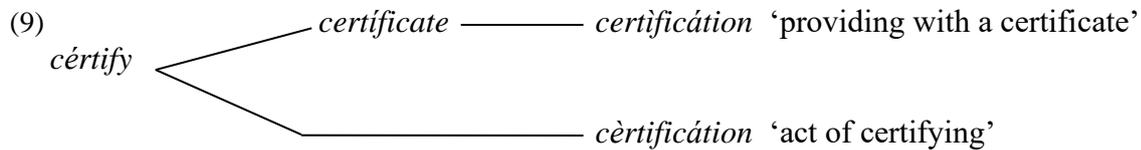
In suffixed derivatives, the position of secondary stress is determined by the position of stresses in the base, which is almost systematically preserved²⁷ (for example *nátionalist* → *nàtionalístic*, *spìritual* → *spìrituálistic*, *official* → *officialese*, *imáginé* → *imàginácion*, *instruméntal* → *instruméntálistic*) unless the resulting pattern would violate principle 2 (*morphology* → *mòrphològic*, (**morphòlògic*), *objective* → *òbjectívity* (**òbjectívity*), *deríve* → *dèrivácion* (**dèrivácion*)).²⁸

When a derivative has several embedded bases and primary stress shifts several times rightwards in the course of derivation, it is usually the stresses of the immediately embedded base which are preserved (for example *canál* → *cánalíze* → *cànalizácion* (**canàlizácion*),

27 Cases of (sometimes variable) non-preservation have been found to occur (for example *anticípate* → *ànticipácion* ~ *anticípácion*); see Collie (2007, 2008).

28 Violations of principle 2 actually do occasionally occur (for example *collèctívity*, *elèctóral*, *enchrústácion*) and are discussed by Dabouis (2019).

person → *persónify* → *persònificátion* (**pèrsonificátion*)), except in rare cases where the two patterns of secondary stress are associated with different meanings, as in the example in 0 taken from Guierre (1979: §4.1.3).²⁹



For an overview of recent empirical studies regarding secondary stress, see Dabouis (2021).

3 Several Phonologies in English?

English is a ‘hybrid’ language because its phonological system is the result of a fusion process between Romance and Germanic principles (J.-M. Fournier 2007; Minkova 2006), which follow different logics when it comes to stress assignment. In Romance languages, stress is assigned from the right edge, whereas in Germanic languages, it is assigned from the left edge and is normally root-initial (which often translates into word-initial stress; also note that prefixes are not relevant, as far as primary stress assignment is concerned). Such a situation leads to the idea of several co-existing phonologies in contemporary English and, more generally, of several subsystems associated with different parts of the lexicon, each with phonological, graphophonological, morphological and semantic specificities.

The English lexicon proper, mainly of French and Germanic origins whose stress rules are governed by Romance and Germanic principles, is the first category. As we have seen previously, morphological considerations play a crucial role in the stress system of contemporary English, which stands in stark contrast to Romance and Germanic phonologies; indeed, while attested bases play no role in Romance phonology, since its rules are indifferent to their morphology, the exact reverse holds true for Germanic phonology where suffixation has no impact on stress-patterns established relative to the beginning. For opposite reasons, derivation is thus a parameter in neither of the two systems: once combined, however, suffixes acquired a role they did not have before, where Romance suffixes (‘strong endings’) signal independent stress-rules as opposed to Germanic suffixes (‘neutral suffixes’) that are stress preserving (the Neutral Derivation Law).³⁰ Although these two subsystems can still be distinguished, they are strongly intricated and overall follow the same generalisations.

The second lexical category that must be distinguished from the rest of the English lexicon is loanwords that constitute at least two subsystems within the English stress system. French loanwords constitute a distinct subsystem because their behaviour is distinct from that of other loanwords. The reproduction of the French final demarcative stress has led the way to the creation of a final stress pattern which is clearly associated with words of French origin today in English (for example *nobléssé*, *gazétte*, *chandeliér*, *balláde*, *liquéur*, *uníque*). As for other subsystems, this stress specificity is correlated to non-phonological properties (for example

²⁹ Dabouis (2016b) also reports two cases of possible stress preservation from a non-local base where no such semantic distinctions are found:

académy → *àcadémic* → *academician* /020100/ ~ /200100/
aróma → *àromátic* → *aromaticity* /200100/ ~ /020100/

³⁰ However, these differences in stress behaviour need not necessarily be attributed to the Germanic/Romance distinction and may have to do with the segmental makeup of Germanic suffixes (which tend to be consonant-initial) and Romance suffixes (which tend to be vowel-initial), as argued by Raffelsiefen (2015).

'prestige' semantics, specific graphophonological correspondences such as silent final consonants).

Other loanwords in English mainly come from Italian, Spanish, Portuguese, Arabic or Japanese. They generally share semantic characteristics and are restricted to specific semantic areas such as food, arts, leisure, clothing, law or scientific glossaries. But they also often exhibit one of two common segmental structures: either <-VCV#>, with final <a,e (non-mute),i,o,u> (examples: *martíni, peséta, karáte, Medina, Iráqi, màcchiáto*), or <-VC₂V(C₀(e))#> (examples: *anténna, aráchnid, referéndum, andánti, piménto, vanílla*) with a distinctive preferential stress pattern for primary stress on the penultimate syllable.³¹ This specific stress pattern seems to be a strong indicator of the foreign origin of these loanwords.

Finally, another subsystem which can be identified is that concerning learned words, many of which are neoclassical compounds. The latter are best identified through their stress behaviour, as argued by Guierre (1979: 740), and they have several specificities when it comes to stress (compound-like stress assignment, penultimate stress in words with a prefinal consonant cluster, stress invariance), but also non-phonological properties (specific morphological constituents, specialised semantics, certain graphophonological correspondences).

Therefore, we argue that English phonology should not be viewed as a monolithic system, but rather as a dynamic system composed of several interacting subsystems, each with its own phonological, graphophonological, morphological, segmental and semantic specificities. This idea is developed at length in Dabouis and P. Fournier (to appear).

4 Variation between English Varieties

4.1 Lexical Stress Intervarietal Variation in the Literature

The topic of lexical stress variation between standard varieties of English was studied by Martin (2011) based on extensive data-supported research in line with the Guierrian approach. She specifically worked on Standard British English (SBrE), Standard American English (SAmE) and Standard Australian English (SAusE). Other works of note include Collins and Mees (2008), Cruttenden (2014), Duchet (1994), Mitchell and Delbridge (1965) and Peters (2007) regarding this issue, bearing in mind that they do not always agree:

- for Collins and Mees (2008) the variations are significant:

There are some significant differences between British and American in (1) allocation of stress, (2) the pronunciation of unstressed syllables.

Collins and Mees (2008: 154)

- whereas Duchet (1994) states that:

There are few systematic differences between the British stressing system and the American one.

Duchet (1994: 118)

For most of these authors the differences mainly occur in dissyllabic verbs ending in *-ate* which tend to be stressed on their final syllable in SBrE rather than on their initial syllable and in nouns and adjectives ending in *-ative*, *-ary*, *-ery* and *-ory* for which a penultimate secondary

31 For a complete analysis of the sensitivity of the English language to the phonological properties of source languages and its interaction with the penultimate stress pattern as an indicator of 'foreignness', see P. Fournier (2016).

stress can be observed in SAmE (for example *military*, *arbitrary*, *mandatory* being stressed /1020/ in SAmE and /100(0)/ in SBrE according to Collins and Mees (2008)).

Using all the 148 items given in the references cited above regarding SBrE, SAmE and SAusE, Martin showed that all had at least one variant with a stress pattern present in at least one of the other two varieties (see Martin (2011: 111-114)). This result shows a greater stress stability than what is usually assumed, and it led Martin to conduct a larger investigation of intervarietal stress variation.

4.2 An extended study on a specific corpus

Since no extended corpus dedicated to intervarietal lexical stress variety was available in any of the studies mentioned above, Martin specifically put together such a corpus (approximately 3700 words) divided into four subsets:

- 2550 disyllabic verbs (complete class): *alter*, *bury*, *follow*, *injure*, *lament*, *scavenge*...
- 370 prefixed multicategorical words: *access*, *account*, *believe*, *offer*, *record*, *transport*...
- 542 exceptions to the rules of word-stress assignment as described in J.-M. Fournier (2010b), for example exceptions to the rule according to which disyllables are stressed /10/: *cigár*, *canál*, *degréé*, *diséase*, *hotél*, *políce*, *routíne*...
- and 280 borrowings from Aboriginal languages³²: *billabong*, *boomerang*, *didgeridoo*, *dingo*, *koala*, *paddymelon*, *wombat*...

It is crucial to emphasize that these 3742 items were chosen on purpose: indeed, they are words which specifically tend to show word-stress variation in contemporary English. Exceptions to stress rules and variation are often the manifestations of unresolved conflicts in the phonology (J.-M. Fournier 1990; Guierre 1982). Therefore, we could expect such conflicts to evolve in different ways in different varieties. The different sets which were selected were retained precisely for this reason³³:

- **Disyllabic verbs:** according to the pronunciation dictionaries used for Martin's study, fifty percent of disyllabic verbs are initially stressed, while the other fifty percent bear stress on their final syllable.
- **Prefixed multicategorical words:** they undergo a tension between the verbal logic in which the prefix is ignored to determine the position of stress (/01/) and the substantive logic in which it is taken into account (/10/) (see section 2.2.10)
- **Exceptions:** they constitute obvious areas of conflict between the preservation of their exceptional stress patterns and regularisation.
- **Aboriginal loanwords:** they could also be problematic in terms of stress because of their inherent foreign status.

32 Martin's study first aimed at focusing on SAusE. P. Fournier (2013) also conducted a study on the stress pattern of French loanwords in SBrE and in SAmE and found that the proportion of French loanwords stressed on the final syllable was higher in the latter than in the former (73% compared to 58%).

33 It is of course also important to note that the three varieties at stake in the study are all stressed-timed and can therefore undergo the same tests in terms of stress assignment: 'While BrE, AmE, AusE and NZE are stress-timed, the Caribbean Creoles, most West African varieties, most dialects of SAfE, StHE, and all Asian Englishes and Pacific contact varieties (including Maori English and AbE) display a strong tendency towards a syllable-timed rhythm.' (Schneider 2004: 1126)

Martin’s approach follows Guierre’s and offers a dictionary treatment in which the elements of the corpus are studied using the data of the *Longman Pronouncing Dictionary (LPD3, 2008)*, the *Cambridge English Pronunciation Dictionary* (hereafter *EPD17*, Jones 2006) and the *Macquarie Dictionary* (hereafter *MD online*, Delbridge et al. 2009), all reference books on English pronunciation.

In order to consolidate the dictionary data, Martin led a number of oral tests on specifically chosen elements of the corpus (following a protocol similar to that which is applied in the first part of the *Phonologie de l’Anglais Contemporain* project).³⁴ She also used frequency data extracted from the *Corpus of Contemporary American English* (<https://www.english-corpora.org/coca/>). The figures given in the present chapter are not the ones consolidated by the oral test which Martin undertook in her study. Indeed, this will allow the reader to falsify her work using LPD3, EPD17 and MDonline. For more details on the oral data, see Martin (2011).

Overall, Martin showed that SAusE, SBrE and SAmE contain a high level of accentual intervarietal stability. Table 2.1 gives a detailed quantitative account for each subset and for the corpus as a whole (for a more detailed account, see Chapter 6, this volume).

Table 2.1. Intervarietal variation in Martin (2011)

	Disyllabic verbs	Multicategorical prefixed words	Exceptions to stress rules	Aboriginal loanwords	Total
No attested difference	2397 (94%)	264 (71%)	467 (86%)	44 (94%)	3172 (90%)
Variant in one or two varieties	Not studied	76 (20%)	36 (7%)	2 (4%)	114 (12%)
Identical main pronunciation	2397 (94%)	340 (92%)	503 (93%)	46/47 (98%)	3286 (94%)
Total	2549	370	542	47	3508

The results in Table 5.2.1 confirm Martin’s initial result that intervarietal variation is indeed much more restricted than is commonly assumed. 90% of all the words in the study have exactly the same stress pattern in all three varieties, that is to say that both the main pronunciation and the variants (if any) are strictly identical. If only the main pronunciation is considered, then that proportion rises to 94%. These results confirm Cling’s (1984) hypothesis that ‘the prosodic traits (and mainly the stress system) must be retained as fundamental invariants of any English accent variety’.³⁵ This study has limitations, of course, notably the fact that the subset dealing with exceptions to stress rules is based on previous work dealing with SBrE only. This implies that there could be words which are exceptional in SAmE and in SAusE but not in BrE but which are not included in this study.

Martin’s study has provided us with an initial valuable insight on the subject of intervarietal stress variation, even though much work remains to be done to reach a greater understanding of the issue.

34 This decision also follows Guierre’s wish to extend the study of English stress beyond pronouncing dictionaries and to work on oral data (Guierre 1984).

35 This has been translated from French: ‘*les traits prosodiques (et principalement le système accentuel) doivent être retenus comme invariants fondamentaux de toute variété d’accent anglophone.*’

5 Conclusions

The Guierrian School shares a number of assumptions with contemporary theories, such as the importance of morphology in stress assignment or the importance of stress preservation, but it also diverges in key issues such as the role of endings, the marginal role we attribute to syllable weight, the recognition of semantically empty or obscure morphological units or the relationship between orthography and phonology. Guierre (1979: §1.4.6) saw generative formalisms in *SPE* and the works that followed it as being mostly premature as a lot of empirical work was yet to be done and more caution should have been applied. A lot is still to be done, but empirical work in the Guierrian tradition has allowed us to show that some commonplace assumptions about English phonology, such as the neglect of opaque prefixation (see Chapter 5, this volume), the extent of intervocalic variation (see Chapter 6, this volume) or phonologists’ lack of consideration of orthographic information (see Chapter 4, this volume), were (at least partly) incorrect. A criticism which has been addressed to the Guierrian School is that, while it proposes accurate descriptions of accentual and vocalic patterns, its scope is too restricted. Indeed, it does not offer any account of allophonic processes such as aspiration and flapping or of phonotactics and, therefore, there is still a lot of work to be conducted to widen the scope of Guierrian analyses. In recent years, Guierrian researchers have turned to new topics and methods, such as the diachronic evolution of stress patterns (Castanier 2016), the systematic study of vowel reduction (Dabouis and P. Fournier 2019)³⁶, the comparison of dictionary data and speech data (Arndt-Lappe and Dabouis submitted), the formalisation of certain regularities using Government Phonology (Dabouis et al. 2020) or the study of loanwords (P. Fournier 2016, 2018, 2021). Our knowledge of English phonology can still be advanced in a number of ways, and an extensive dialogue between different approaches, both empirical and theoretical, can only eventually lead to a better comprehension of English phonology.

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36 There were earlier exploratory works conducted within the Guierrian framework (Dahak 2011; Guierre 1979; Trocmé 1975) but none sought to clearly delineate the role of each factor influencing vowel reduction.

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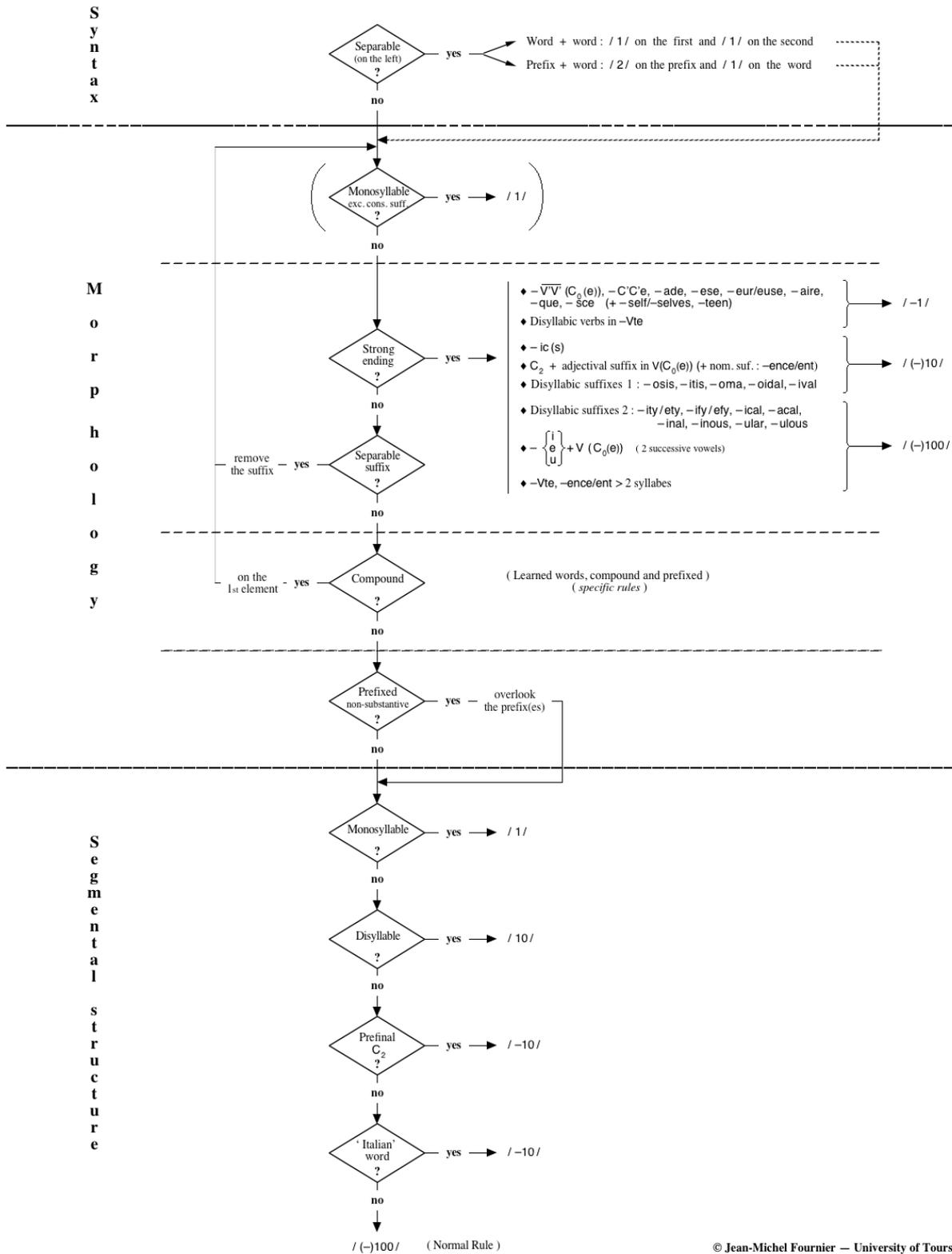
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Appendix

Where does primary stress fall?



This diagram is a simplified version of the stress system of English as it is analysed by J.-M. Fournier (2007, 2010b). The explanation on how it is to be read and what it represents is to be found below.

First, we have to make clear the fact that this representation is not meant to represent the stress assignment system of an average or ideal English speaker. This diagram represents a form of optimal organisation of the different rules, but we should expect it to differ from speaker to speaker depending on the vocabulary they know.

Second, the hierarchy in this diagram represents the relative domination of certain parameters over others. This hierarchy is represented in the form of questions for didactic purposes: at every step, one should ask whether the conditions for the application of that rule are met and, if they are, then the rule applies. If these conditions are not met, then one should proceed to the next rule and so on until all rules have been considered. What this means is that the different parameters for stress placement are hierarchically ordered and that, at every step, one of these parameters becomes neutralised. For example, at the step of the rule of the 'prefinal C₂', we have, on the one hand, words with a prefinal C₂ which all behave in the same way with regards to the phenomenon we are trying to predict (stress), and in that case they all have penultimate stress (for example *mémorándum, utensil, vanília*) - and, on the other hand, we have words with only one prefinal consonant which do not behave uniformly; they may have penultimate or antepenultimate stress (e.g. *tomáto, tornádo ~ álcohol, élephant*). What this means is that the parameter associated with a variable behaviour (here, one prefinal consonant) becomes neutral in the sense that it no longer determines the position of stress and that additional parameters are required to explain the remaining words. Therefore, at every step a part of the corpus is accounted for and the parameter under consideration is neutralised for the rest of the corpus.

The relative ordering of rules is based on the analysis of relevant cases, which are cases in which two contradictory rules may apply. If these relevant cases always behave in the same way, then it is their behaviour which will indicate which of the two contradictory rules dominates the other. For example, a word that has three syllables or more and a prefinal C₂ may follow the 'prefinal C₂' rule or the NSR. As the vast majority of these words have penultimate stress, we know that the rule of the prefinal C₂ dominates the NSR. In the case two rules are not contradictory, that is when they produce the same results, the principle of transitivity³⁷ may allow us to establish the whole ordering.

The diagram is divided into three main parts: syntax, morphology and segmental structure. They correspond to the three main conditioning factors which are hierarchically ordered according to the principles discussed above; we followed that ordering in our detailed presentation of the rules in this paper.

The part on syntax deals with determining the number of lexical units under consideration. As was pointed out in the paper, stress can be argued to be an identifier of lexical units, hence the first question to solve is obviously that of identifying the lexical units under consideration, as each should be considered separately.

The second part on morphology details the influence of morphological structure on stress, mainly (stress-affecting and stress-neutral) affixation and compounding.

Finally, the third part deals with the remaining items which are all, at this stage, morphologically simple (or behave as such). The rules in this part are of two kinds: length rules (number of syllables) and rules that refer to specific segmental structures.

Such a system can account for the vast majority of English words and all exceptions to these rules are listed extensively in J.-M. Fournier (2010b). However, as J.-M. Fournier (2007) underlines, the stress system of English should be seen as a dynamic system in which

37 This principle can be expressed as follows: if A > B and B > C, then A > C.

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contradictory forces are in conflict and that dynamism cannot be represented in such a diagram. To our knowledge, a formalism that would account for that dynamism has not yet been proposed.