[Review]

Subsidiary Stresses in English

By Eiji Yamada, Kaitakusha, Tokyo, 2010, xiv+330pp.

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1. Introduction

It is no exaggeration to say that investigating English stress played a role as the locomotive of generative phonology, that is, generative phonology was greatly advanced through the study of English stress patterns. Since the monumental publication of The Sound Pattern of English (Chomsky and Halle (1968); hereafter SPE), many influential works on (or dealing with) English stress such as Halle and Keyser (1971), Liberman and Prince (1977), Hayes (1980), Selkirk (1984), Halle and Vergnaud (1987), Idsardi (1992), Burzio (1994), Hammond (1999) among others have appeared and they have awakened greater interest in phonology. To our regret, however, the output of literature on English stress has been decreasing in the twenty-first century. In order to illustrate this tendency, I checked the number of papers on English phonology printed over the past forty years in Linguistic Inquiry which has provided an invaluable intellectual platform for academic theories of human language. In the following table, I show the number of papers discussing English stress per decade; the number of papers on English phonological topics other than stress is given in parentheses for reference.¹

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¹ I have classified such areas as segmental phonology, phonological feature geometry, syllable structure, intonation, and phonological analysis of malapropism into topics other than stress. By “English stress,” I mean not only word stress in English but also phrase or sentence stress in English. Needless to say, I have included papers on Old English stress in the table. Incidentally, in 4 of 5 articles in the 2000s, English data are examined partially along with data from other languages. Thus, the total amount of phonological discussion of English in Linguistic Inquiry is seen to have decreased sharply.
Table 1

|        | Articles | Remarks and Replies | Squibs and Discussion |
|--------|----------|---------------------|-----------------------|
| 1970–1979 | 8 (4)   | 0 (0)               | 4 (8)                 |
| 1980–1989 | 6 (5)   | 0 (0)               | 1 (2)                 |
| 1990–1999 | 5 (0)   | 2 (0)               | 0 (2)                 |
| 2000–2009 | 0 (5)   | 0 (0)               | 0 (1)                 |

To the extent that Linguistic Inquiry represents the trend, research on English stress has dwindled. I might add that also in the journal Phonology, in the twelve years from 2000 to 2011, only two papers discuss English stress and only one paper deals with poetic meter in English. With recent research tending toward language diversity and universals, typology, or conceptual issues, it is perhaps natural that linguistic research on data of a particular language (especially of English) has fallen off.

Under these circumstances, the publication of Subsidiary Stresses in English (henceforth SSE) which examines word stress patterns in English thoroughly was a great source of pleasure for us. For this rare body of research, Yamada was honored with a prize from the English Linguistic Society of Japan in 2011. As a phonologist and as his friend, I celebrate his receiving an award from the bottom of my heart. In the book, in order to account for subsidiary stresses in English words, Yamada proposes sixteen kinds of positional functions, naming his theory “Positional Function Theory.” His highly original system in which different kinds of functions interact is profoundly interesting. Of course while reading SSE many questions also arise, and in the following sections, reviewing Yamada’s views and proposals, I will point out drawbacks and insufficiencies in SSE and suggest some alternative analyses.

2. Data Reliability

As for the description of subsidiary stresses in English, we find the following statement in Kenyon and Knott (1953: xxiv):

Syllables more prominent than one or more others in a word, but less prominent than the strongest one in the word, have some degree of subordinate accent, which may or may not be indicated by the secondary accent mark (1) …. Since subordinate accent varies from nearly the weakest to nearly the strongest in words where it can occur, and varies moreover with innumerable styles of speech, no dic-
tionary can accurately mark all instances. (§ 50) Thus, the goal of getting adequate data for subsidiary stresses of English words is unattainable by consulting only one dictionary or only one native speaker. Accordingly, Yamada refers to five representative dictionaries and he establishes a method to determine the subsidiary stresses’ values using four parameters: Entry Count, Listed as First Variant, the Dominance Level, and the Type of Variant. His strict attitude and effort to gain reliable data are to be admired.

However, I can not necessarily agree with all of the stress values Yamada obtained. For example, to mono-morphemic (i.e. non-derived) long words which have a sequence of four light syllables before the main stressed syllable like Apalachicola, Yamada assigns (202010). Indeed Kenyon and Knott (1953), for example, give the first and third syllables of Apalachicola a secondary accent mark; but, as many phonologists point out (e.g. Kiparsky (1979), Halle and Vergnaud (1987), Halle and Kenstowicz (1991)), in Apalachicola the subsidiary stress on the first syllable is greater than that on the third, i.e., (203010) seems appropriate. As one piece of evidence for this stress contour, we can cite from Prince (1983: 44) the following example to which the so-called Rhythm Rule is applied:

(1) \[\begin{array}{cccc}
\multicolumn{4}{c}{\text{Apalachicola Falls}} \\
\hline
x & x & x & x \\
\hline
\end{array}\]

If the third syllable of Apalachicola has the same stress as that of the first syllable, then the metrical grid should move onto the third syllable. In fact, however, it lands on the first syllable because that syllable has the second greatest stress in the word. Probably the stress pattern “2–3–1” is one of the most eurhythmic patterns. Thus, three-letter acronyms such as BBC, FBI, CIA are also pronounced with 2–3–1 stress contour.

I cannot approve of Yamada’s stress value representation for words ending with -ity, either. For example, he assigns superiority the pattern (323103), that is, he gives this word three tertiary stresses. In The Random

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2 In this review, following Yamada’s representation, each number in parentheses means its stress value of each syllable: 0 = no stress, 1 = primary stress, 2 = secondary stress, 3 = tertiary stress.
House Dictionary of the English Language (Flexner (1987)), The American Heritage Dictionary of the English Language (Soukhanov (1992)), and Webster’s Ninth New Collegiate Dictionary (Mish (1988); WN for short), three of the five dictionaries Yamada consulted as his data-source, the third and last syllables of superiority are represented with the symbol /ē/. It is the consensus among phonologists to regard syllables with a full vowel as tertiary-stressed syllables even if they are not marked with a stress mark (cf. Halle and Clements (1983: 23)), which is probably why Yamada assigned the tertiary stress value to the syllables in question. However, in WN, /1ē/ or /1ē/ (namely, /ē/ with a stress mark) is used for stressed syllables as in beat, nosebleed, evenly, easy and in WN’s “Guide to Pronunciation,” there is mention of “/ē/ in unstressed syllables, as in easy, mealy.” Hence, in the numerical representation, the stress pattern of superiority should be (320100). Yamada’s assignment of tertiary stresses to words with -ity may be due to an oversight of descriptions in the dictionaries mentioned above. Incidentally, the reason why the vowels of the third and last syllables of superiority are non-reduced even though they are not stressed would be due to the so-called Tensing Rule: Non-low vowels become tense in prevocalic and word-final positions (cf. SPE). Similarly, Yamada’s 3’s in epistemology (020103), totalitarian (320130) / (230130), alienation (2010) / (23010), anticipatory (310023), for instance, should be corrected to 0’s: (020100), (320100) / (230100), (2010) / (20010), (310020), respectively.

It seems to me that Yamada has the firm belief that subsidiary stresses in English words should be and can be represented numerically, and we have to establish a theory which properly calculates the degree of stresses; and he has achieved the goal in his own way. However, in the light of the history of the development of generative phonology, the strict pursuit of assigning numerical stress values does not necessarily count as progress. In the distinctive feature system in SPE, all the phonological features except for stress are in a form of binary oppositions, i.e. [± α]. Only for stress features, are numerical values such as [1 stress], [2 stress], [3 stress], … adopted. This inconsistency was a defect in the SPE feature system. With the advent of Metrical Theory (hereafter MT), however, the features of stress can also be binary: [± stress]. (Moreover, by introducing the concept of foot, even [± stress] became dispensable.) Following the so-called Lexical Category Prominence Rule proposed in Liberman and Prince (1977) and their algorithm shown in (2) for deriving stress numbers, we can get the tree diagram for Apalachicola as shown in (3).
(2) If a terminal node \( t \) is labelled \( w \), its stress number is equal to the number of nodes that dominate it, plus one. If a terminal node \( t \) is labelled \( s \), its stress number is equal to the number of nodes that dominate the lowest \( w \) dominating \( t \), plus one.

(3)

The definition in (2) might seem to be a superficial technique for assigning stress numbers. To the contrary, however, it is not a makeshift approach, but a principled way to compute stress degrees. Figuratively speaking, to count the number of nodes that dominate a terminal node with \( w \) is to confirm how early in the derivation the node has lost in the game to get the greatest stress. Let us regard the above diagram as a list of wins and losses in a tournament. For ease of reference, in the tree diagram, I have added three lines, \( \textcircled{1}, \textcircled{2}, \textcircled{3} \), denoting the first game, the second game, and the final, respectively. Then, we can say that three syllables \( A, la, co \) won in the first game, \( la \) lost in the second game, and \( A \) lost in the final. Therefore, it is completely reasonable to consider that the degree of stress on \( A \) is greater than that of \( la \) and weaker than that of \( co \), viz., Apalachicola’s stress pattern is 2–3–1. With the development of MT, we are set free from the obsession with assigning correct (or absolute) stress numbers strictly because we can calculate relative degrees of prominence from metrical structures when needed. As a result, proper use of conventional symbols for primary, secondary, tertiary, and quaternary stresses has become less important. A distinction between a symbol (’’) for the secondary stress and a symbol (’’) for the tertiary stress such as Yamada adopts becomes unnecessary, and the use of only (’’) is enough for representing different kinds of subsidiary stresses. In a sense, Yamada’s stress on numbers seems to be retrogressive—even disastrous. As is well known, in the SPE system, all non-main stresses are weakened by one within a word. If we follow this convention in SPE, (203010) would have to be changed to (304010). Thus, representing degrees of stresses in numbers is a difficult and precarious task.
3. Relating to Yamada’s Criticisms of Previous Studies

In Part II of SSE, Yamada reviews six previous studies in detail, three of which are from MT and the others are from non-rule-based theory or Optimality Theory (OT). For lack of space, I give only one brief comment on his analysis. The gist of his criticisms of previous studies is that for the main (or primary) stress pattern, both groups (i.e. MT and OT) were successful in their own way; however, for subsidiary stress assignment, the results of both approaches have been unsatisfactory. My criticism of SSE is the diametric opposite of his criticism of previous studies. In SSE, as the title shows, subsidiary stresses are discussed intensively; however, as for primary stress, there is no formulation put forth in SSE. And, in note 38 of Chap. 10, Yamada just states, “… an account of primary stress assignment is not our present focus, though it can also be accounted for by our Positional Function analysis, and must be left for future research.” In derivatives, subsidiary stresses usually originate in the position of primary stress of the base. In addition, primary accent rules can be applied even to such languages as Japanese, the words of which do not have subsidiary accent but have only primary accent. For example, even the famous Latin accent rule can be used for the explanation of accentuation in Japanese nouns. Therefore, rules for primary stress must be elucidated in any stress/accent theories (even in a subsidiary stress theory). I stress that the biggest deficiency in SSE is the lack of functions for assigning primary stress.

4. On the Positional Function Theory

Yamada proposes 16 positional functions, which we may consider as stress rules, and he classifies these positional functions into three types: 5 Intrinsic which assign “+” (or “−”), 8 Relative which assign “∗,” and 3 Adjustment. In order to grasp Yamada’s mechanism of stress assignment, let us survey the following figure (4) for information:

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3 It is my impression that most of these functions are formulated in a linear-phonology-like fashion; however, some of them are formulated in so-called non-linear phonology fashion because they refer to a binary constituent.
In the computational plane, each function gives us a value “+” or “*,” and then the results of the computation are mapped onto the stress plane. The abbreviation “h” means the Positional Function Heaviness, which assigns “+” to the heavy syllable. “f” is the abbreviation of the Positional Function Farness: Subsidiary stress is placed as far left as possible from the position of primary stress. “t” is the Positional Function Trace, which assigns “+” to a position of stress given on an earlier cycle. “r” is the Positional Function Rhythm, whose role is to activate the leftmost syllable if the syllable immediately preceding the primary stressed syllable bears stress. To assume these functions (or rules) seems to be plausible. In other stress theories too, the same or similar type of rules or principles will be needed. By the way, although Yamada classifies Rhythm as a Relative Positional Function, it assigns not only “*” but also “+.” Thus, his system and classification are complicated and somewhat arbitrary.

Let us now survey Yamada’s most important assumption in determining the difference between tertiary stress and zero stress. In information, the second syllable is unstressed, i.e. (2010). As illustrated in (4), the stress value of the first syllable is “four” because it has four stress grids, and that of second is “two.” Thus, Yamada assumes that when the stress grid dif-
ference between contiguous syllables is “two,” the weaker syllable’s stress value becomes zero. However, why does the difference “two” in stress grid cause zero stress? His assumption is just a stipulation and not an explanation.

For condensation (2310), we can apply the same functions as those in (4). Then, it yields the wrong stress pattern (2010). In order to avoid this result, Yamada proposes another function Alveolar Consonant Sequence (ACS). (He names this function noting the sequence of alveolar consonants as in condensation.) With ACS, the stress value in the second syllable is augmented by one as shown in (5a) below:

\[
\begin{array}{c|cccc}
\text{a.} & * & * & x \\
+ & + & * & x \\
+ & + & + & x \\
\text{condensation} & + & + & x
\end{array}
\]

Still, Yamada’s assumption seems to have a serious problem. As I mentioned in the preceding section, he does not formulate the functions for primary stress, and he just assigns a vertical line on the primary stressed syllable. However, it is quite reasonable to assign the greatest value to the primary stressed syllable. Then, as illustrated in (5b), with the x’s the grid difference between the second and the third syllables becomes “two.” This means that also den should become unstressed. Therefore, in Yamada’s system, I guess quantifying primary stress becomes taboo.

Moreover, I want to indicate another type of contradiction in Yamada’s theory. As for Monongahela, for example, he applies only Heaviness. Therefore, its stress representation is as follows:

\[
\begin{array}{c|c}
\text{b.} & + \\
\text{Mo non ga he la}
\end{array}
\]

A larger number of grids should basically indicate stronger stress. Then, to be malicious, the stress of the second syllable of Monongahela should look weaker than that of the second syllable of information. Yamada’s stress representation system is, in brief, based on an adding-up method. Thus, even weak positions can have more than one grid. He should also introduce destressing functions, for example, which can delete all the grids on unstressed syllables.

Furthermore, in order to guarantee tertiary stress on the second syllable of such words as ostentation, expectation, affectation, condemnation, incantation, importation, Yamada proposes rather specific functions and condi-
tions. Specifically, for ostentation, Yamada assumes that ACS gives two *’s because the first and third syllables both have a voiceless consonant: ostentation. I cannot agree with him, because hypothetical words like oz-
tentation, ostendation must have the same stress contour. For expectation, Yamada uses another function Velar-Alveolar Sequence. Then, along the same lines, should we not propose Bilabial-Alveolar Sequence for accepta-
tion and Retroflex-Alveolar Sequence for retardation? For affectation, in order to avoid the application of Bare Nucleus Avoidance which assigns “−” to a word-initial lax vowel, Yamada assumes that the first vowel of affectation is lexically tense. Then, why does the pronunciation of it not become /eiv/? For condemnation in which the first syllable ends with a stop conso-
nant /n/ and the second syllable begins with a stop consonant /d/, Yamada constructs Double-Stop (DS). Then, why do such words as competition, composition, compilation show a different stress pattern from that of con-
demnation? For incantation, to avoid the double application of ACS and DS, Yamada proposes a condition Non-Superimposition. It seems to me an ad hoc condition to obtain the desired result. For importation, Yamada assumes Category Selection Process. That is, importation selects its base from two possibilities: importN and importV, and through this process gets another “*.” This assumption seems absurd because the suffix -ation is subcategorized for verbs, that is, it attaches only to verbs to form nouns.

Consequently, Yamada’s assumption about these words ending with -ation is quite complicated and is not well-grounded. We can indeed obtain any stress pattern by using many functions and conditions. However, the more specific he makes the functions, the more his theory loses its elegance and appeal, and the less falsifiable it becomes. We should recall the lesson that a theory which can describe anything, in fact, does not explain anything. The simplest generalization to distinguish the stress patterns between such words as expectation, affectation, importation, relaxation and such words as composition, compilation, derivation, explanation seems to me to be that the former have two consonants before the primary stressed vowel, but the latter have only one consonant there (or in the former the second syllable has a coda consonant, but not in the latter). Then, why is the second syllable of information unstressed in contrast to importation? Consulting Random House Webster’s College Dictionary (Nichols (1999)), for example, we find the first definition of information as “knowledge communicated or received concerning a particular fact or circumstance.” And that of importation is “the act of importing.” Therefore, it is not unreasonable to suppose that information is not derived from a verb (i.e., it has no inner
cycle); on the contrary, importation is derived from a verb, so the second syllable preserves the stress of import. That is, I support the traditional view in SPE. As for another kind of key to account for the difference between information and importation, we should pay attention to the difference between the tenseness of the second vowel. In Kenyon and Knott (1953), inform and import are shown as /ɪnˈform/, /ɪmˈport/, respectively. Presumably the stop /p/, but not the fricative /ʃ/, can enhance the tenseness of the following vowel. This difference in verbs might be reflected in the corresponding nouns.

There is not sufficient space to discuss the problems or insufficiencies in SSE further. Still, I want to point out two more problems. Yamada insists that there is no order of application among Positional Functions (cf. note 23 in Chap. 10). However, in his system, some functions can feed or bleed others. Binarity, for example, can be invoked after the application of Trace. Hence, there is ordering in some cases. Lastly, it is a pity that Yamada discussed only subsidiary stress patterns before the primary-stressed syllable, and he did not show us concretely how such words as recognize, inventory which have a subsidiary stress after the primary-stressed syllable should be analyzed.

5. Closing Remarks

In this review, I have stated my naïve questions and pointed out insufficiencies and problems in SSE. My opinions are critical precisely because I expected a great deal of Yamada’s theory. I hope SSE will find an audience ranging from students to researchers, and that the theory will develop sufficiently to offer a new phonological paradigm.

REFERENCES

Burzio, Luigi (1994) Principles of English Stress, Cambridge University Press, Cambridge.

Chomsky, Noam and Morris Halle (1968) The Sound Pattern of English, Harper and Row, New York.

Flexner, Stuart Berg, ed. (1987) The Random House Dictionary of the English Language, 2nd ed., Random House, New York.

Halle, Morris and George N. Clements (1983) Problem Book in Phonology: A Workbook for Introductory Courses in Linguistics and in Modern Phonology, MIT Press, Cambridge, MA.
Halle, Morris and Michael Kenstowicz (1991) “The Free Element Condition and Cyclic versus Noncyclic Stress,” Linguistic Inquiry 22, 431–456.
Halle, Morris and Samuel J. Keyser (1971) English Stress: Its Form, Its Growth, and Its Role in Verse, Harper and Row, New York.
Halle, Morris and Jean-Roger Vergnaud (1987) An Essay on Stress, MIT Press, Cambridge, MA.
Hammond, Michael (1999) The Phonology of English: A Prosodic and Optimality-Theoretic Approach, Oxford University Press, Oxford.
Hayes, Bruce (1980) A Metrical Theory of Stress Rules, Doctoral dissertation, MIT.
[Published by Garland, New York, 1985]
Idsardi, William (1992) The Computation of Prosody, Doctoral dissertation, MIT.
Kenyon, John S. and Thomas A. Knott (1953) A Pronouncing Dictionary of American English, G. and C. Merriam, Springfield, MA.
Kiparsky, Paul (1979) “Metrical Structure Assignment Is Cyclic,” Linguistic Inquiry 10, 421–442.
Liberman, Mark and Alan Prince (1977) “On Stress and Linguistic Rhythm,” Linguistic Inquiry 8, 249–336.
Mish, Frederick C., ed. (1988) Webster’s Ninth New Collegiate Dictionary, Merriam-Webster, Springfield, MA.
Nichols, Wendalyn R., ed. (1999) Random House Webster’s College Dictionary, 2nd ed., Random House, New York.
Prince, Alan (1983) “Relating to the Grid,” Linguistic Inquiry 14, 19–100.
Selkirk, Elisabeth O. (1984) Phonology and Syntax: The Relation between Sound and Structure, MIT Press, Cambridge, MA.
Soukhanov, Anne H., ed. (1992) The American Heritage Dictionary of the English Language, 3rd ed., Houghton Mifflin, Boston.

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