6. INTRODUCTION

The goals of this paper are to argue against the theories of exceptional stress in Hale and Vergnaud (1987) (bancroft, EVY) and Harmon (1988), where exceptional stress is treated as lexical accent, and to argue for a model where exceptional stress may be assigned by the same parameters used for assigning regular stress, but with different values.

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Many languages have been claimed to have exceptional stress in addition to regular stress. For example, in Macedonian stress typically falls on the antepenult, a pattern that is usually analyzed as involving final syllable extrametricality, a stressed binary foot, and a right-headed word tree (Hrv, Hammond 1989). However, Macedonian also has words with exceptional stress which falls on the penult or final. Hammond (1989) proposes that these words with exceptional stress have underlying lexical accents on the penult and the ultima respectively, and these lexical accents surface as main stress. Hrv consider lexical accents to be like asterisks present in underlying representation.

However, there are many problems with their approach. I propose instead that exceptional stress should be assigned by the same mechanism as regular stress.

This paper is organized as follows. The treatment of exceptional stress in Macedonian and Polish by Hrv and Hammond (1989), which I call the accent-based theory, is given in section 1. The problems with the accent-based theory are discussed in section 2. A new proposal, which I call the analysis-based proposal, is presented in section 2. Finally, the advantages of the analysis-based theory are argued for in section 4.

1. THE ACCENT-BASED THEORY

Regular stress in Macedonian is on the antepenult, as illustrated in (1a). Exceptional stress is either on the penult (1b) or the final (1c).

(1) Macedonian -- data (Franks 1983, Hrv, Hammond 1989)

a. Antepenult -- most common (regular stress)
   \[\text{vodenica} \quad \text{"mill"}\]
   \[\text{polkovnik} \quad \text{"colonel"}\]
   \[\text{rabota} \quad \text{"work"}\]

b. Penult -- less common (exceptional stress)
   \[\text{literatura} \quad \text{"literature"}\]
   \[\text{konzusator} \quad \text{"consumer"}\]

c. Final -- less common (exceptional stress)
   \[\text{autobus} \quad \text{"bus"}\]
   \[\text{citat} \quad \text{"quotation"}\]

Hrv's analysis of regular stress assignment in Macedonian is as follows:  

(2) Regular stress assignment in Macedonian -- (as paraphrased in Hammond 1989, following Hrv's (1c), p.56)

a. The final syllable is extrametrical
b. Build left-headed bounded feet right to left
c. Supply heads to unheaded feet
d. Build a right-headed word tree
e. Supply a head to the word tree
f. Coordination

An example of regular stress assignment is given in (3).

(3) Regular stress assignment in Macedonian (Hrv)

\[\text{vodenica} \quad \text{"vodenica" } \quad \text{vodenica} \quad \text{"vodenica" } \quad \text{vo deni car} \quad \text{"vo deni car"}\\
\text{vo deni car} \quad \text{"vo deni car"} \quad \text{vo deni car} \quad \text{"vo deni car"}\\
\text{vo deni car} \quad \text{"vo deni car"} \quad \text{vo deni car} \quad \text{"vo deni car"}
\]

As to the exceptional stress, Hrv assigns line 1 asterisks to the "accented" elements and Hammond (1989) puts a special diacritic mark on the "accented" elements, in addition to regular stress assignment. An example of Hrv's model is given in (4), where "citat" comes with a

\[\text{citat} \quad \text{"quotation"} \quad \text{vodenica} \quad \text{"vodenica"} \quad \text{vo deni car} \quad \text{"vo deni car"} \quad \text{vo deni car} \quad \text{"vo deni car"}
\]

Although Hammond (1989) attempts to say in some ways, for example, Hammond does not use correlation, I consider them the same for my purposes with respect to the regular stress assignment. Hammond's analysis of stress assignment will not be repeated here.
The derivation of 'literatura', where the penult is an 'accented' element, is given in (4).

(4) ** iterate
cita

The derivation of 'literatura', where the penult is an 'accented' element, is given in (5).

(5) ** literatura

There are, however, several problems with the accent-based theory. First, the 'accented elements' are not present underlingly since syllables are not syllabifiable ([levin 1977, hayes 1980, among others]). This raises a question as to where the lexical accent is marked underlingly.

Second, while current metrical theory tries to use metrical parameters to assign stress, lexical accent stipulation would be a step back towards arbitrary accent stipulation. In other words, since underlying marking of 'accented elements' cannot be parameterized, it is not organic to metrical theory, hence not desirable.

3 As pointed out to me by nick clements, however, there have been claims that there are syllables underlingly in some languages.

a. Extrametricality \( \equiv \{ E_9 \}/\{ E_8 \} \)

b. Quantity sensitivity \( \equiv \{ Q \}/\{ R \}/\{ Q \}, \{ R \} \)

c. Unbounded \( \equiv \{ B \} \)

d. Boundedness \( \equiv \{ B \} \)

e. Directionality \( \equiv \{ B \} \)

f. Iterativity \( \equiv \{ I \} \)

Recall that Macedonian has three stress patterns: antepenult, penult, and final. Since Macedonian is quantity-insensitive, and one strand assignment is from right to left, we can assume that words with antepenult stress have \( \{ E_8 \} \) and a left-headed binary foot, as shown in (7a). The penult stress is analyzed as having \( \{ E_9 \} \) and a left-headed binary foot, as shown in (7b). The final stress is analyzed as having \( \{ E_9 \} \) and a right-headed binary foot, as shown in (7c).

7 Macedonian \( \equiv \{ Q \}, \{ B \} \equiv \{ L \}

7. a. Stress I \( \equiv \{ E_9 \} \), binary, left-headed

\[ \text{vendemia} \rightarrow \text{vendem} \rightarrow \text{vendem} \rightarrow \text{vendem} \]

7. b. Stress II \( \equiv \{ E_9 \} \), binary, left-headed

\[ \text{literatura} \rightarrow \text{litera} \rightarrow \text{litera} \rightarrow \text{litera} \]

7. c. Stress III \( \equiv \{ E_9 \} \), binary, right-headed

\[ \text{citat} \rightarrow \text{citat} \rightarrow \text{citat} \rightarrow \text{citat} \]

Note that the differences among these three groups of words still have to be marked lexically. But instead of being marked on some particular syllable underrunningly, this lexical information is carried by the morpheme as a whole.

3 As ROB [revised obligatory-branching] foot is a kind of foot where the head must dominate an accent (Hammond 1986, 1990).

4.4.4.1 English noun vs. English verbs and adjectives

In English, nouns have final syllable extrametricality while underived verbs and adjectives do not (NAV p.232). Except for extrametricality, English nouns and English verbs/adjectives have the same stress assignment. That is, stress falls either on the first heavy syllable counting from the right edge (not counting the extrametrical syllable) or, if there is no heavy syllable, on the second light syllable from the right edge (not counting the extrametrical syllable). Some examples are given in (8), where [] mark an extrametrical syllable and heavy syllables are underlined.

8 a. Main Stress in English nouns (after NAV)

\[ \text{Canada} \rightarrow \text{aluminum} \rightarrow \text{zinc} \rightarrow \text{zinc} \]

b. Main Stress in English Adjectives and Verbs (after NAV)

\[ \text{solid} \rightarrow \text{astonish} \rightarrow \text{abound} \rightarrow \text{divide} \]

Constraining lexical accent

Hence this proposal solves the problems raised by the accent-based theory. First, "exceptional" stress is assigned after syllabification, just like regular stress. This solves the problem as to how to mark the accent unproductively. Second, in this proposal, "exceptional" stress is assigned by the same material parameters as "repair" stress, only with different values; a distinguishing only need to indicate which lexical item goes with which set of parameter values. Third, it avoid accounts for the fact that "exceptional" stress falls into patterns. Fourth, there is no distinction between "regular" stress and "exceptional" stress in the grammar with respect to how they are assigned; therefore it does not raise the counting problem with respect to learnability.

In addition to solving the above problems, this proposal has another significant advantage. Namely, it can handle cases other than "exceptional" stress where a language obey a given set of material parameter values to assign stress to different lexical items. Such cases cannot be handled at all in an accent-based theory. I turn to some examples in the next section.

4. CASES THAT THE ACCENT-BASED THEORY CANNOT HANDLE

4.1. English nouns vs. English verbs and adjectives
Note that this is not a case where all the underlined nouns have a lexical accent on some antepenultimate syllable. If you want to say that these words all systematically have a lexical accent on the antepenultimate syllable, this would defeat the purpose of the accent, which is supposed to mark unpredictable stress. The way we handle it is to have final syllable extrametricality for nouns in English, but not for the underlined verbs and adjectives. In other words, the accent-based theory has to have some special mechanism for this case.

In my proposal, this case can be handled by having different values of the parameter [\( \phi \)] for underived nouns and for verbs and adjectives. With other parameters being the same, the underived nouns in English would have \([-\phi\phi\phi]\), while the verbs and adjectives would have \([-\phi\phi\phi\phi]\). This is parallel to the different parameter settings that distinguish between "regular" and "exceptional" stress in Macedonian.

(9) English Nouns

Stress I --- \([-\phi\phi]\), \(R=\phi\), binary, left-headed

\[
\begin{array}{c}
\text{Canada} \rightarrow \text{Cana} \rightarrow \text{Cana da} \rightarrow \text{Cana da} \rightarrow \text{Cana da}
\end{array}
\]

Stress II --- \([-\phi\phi\phi]\), \(R=\phi\), binary, left-headed

\[
\begin{array}{c}
\text{determine} \rightarrow \text{determine} \rightarrow \text{determine}
\end{array}
\]

(10) English Verbs/Adjectives

Stress I --- \([-\phi\phi]\), \(R=\phi\), binary, left-headed

\[
\begin{array}{c}
\text{pitu} \rightarrow \text{pitu} \rightarrow \text{pitu}
\end{array}
\]

\[
\begin{array}{c}
\text{supud} \rightarrow \text{supud} \rightarrow \text{supud}
\end{array}
\]

\[
\begin{array}{c}
\text{butak} \rightarrow \text{butak} \rightarrow \text{butak}
\end{array}
\]

\[
\begin{array}{c}
\text{place-ref-fut} \rightarrow \text{place-ref-fut} \rightarrow \text{place-ref-fut}
\end{array}
\]

4.2. Aklan

The second case is from Aklan. Aklan has been claimed to have two stress patterns.

"Main stress always falls on one of the last two syllables of the word, determined in large part by arbitrary lexical categorization of the root." (Hayes 1981, p. 20)

(11) butak --- \(R=\phi\), binary, right-headed

\[
\begin{array}{c}
\text{butak} \rightarrow \text{butak} \rightarrow \text{butak} \rightarrow \text{butak}
\end{array}
\]

\[
\begin{array}{c}
\text{supud} \rightarrow \text{supud} \rightarrow \text{supud}
\end{array}
\]

\[
\begin{array}{c}
\text{room} \rightarrow \text{room} \rightarrow \text{room}
\end{array}
\]

The accent-based theory has to mark either the final or penultimate syllable as having lexical accent. However, this cannot account for the fact that the stress pattern is carried over after affixation. That is, after affixation, words with final stress always get final stress, and words with penultimate stress always get penultimate stress. An example is given in (11).

In my proposal, this case can be handled by having different values of the parameter \( \phi \) for underived nouns and for verbs and adjectives. With other parameters being the same, the underived nouns in English would have \([-\phi\phi\phi]\), while the verbs and adjectives would have \([-\phi\phi\phi\phi]\). This is parallel to the different parameter settings that distinguish between "regular" and "exceptional" stress in Macedonian.

In order to solve this problem, Hayes (1981) marks the relevant roots with a diacritic feature \([-\text{penultimate}\text{stress}]\). The problem with Hayes's analysis is that a diacritic feature like \([-\text{penultimate}\text{stress}]\) is unconstrained. Prosumably, we can have the features \([-\text{ultimate}\text{stress}]\), \([-\text{first}\text{stress}]\), \([-\text{antepenultimate}]\), etc. It is "forceful" and not explanatory. If we allow features like these, metrical theory becomes superfluous.

Under my proposal, by contrast, stress in Aklan is analyzed as being assigned by the standard metrical parameters: one stress pattern has a right-headed foot and the other a left-headed foot.

(12) Aklan --- under the new proposal

\[
\begin{array}{c}
\text{pitu} \rightarrow \text{pitu} \rightarrow \text{pitu}
\end{array}
\]

\[
\begin{array}{c}
\text{supud} \rightarrow \text{supud} \rightarrow \text{supud}
\end{array}
\]

\[
\begin{array}{c}
\text{room} \rightarrow \text{room} \rightarrow \text{room}
\end{array}
\]
b. Stress II \( \rightarrow \) [+\( \mathrm{En} \)]. Binary, left-headed

\[
\text{agud} \rightarrow \text{agud} \rightarrow \text{agud} \quad \text{"lice comb"}
\]

4.3. Turkish

The third case is from Turkish. In Turkish, stress is insensitive to syllable weight for ordinary words, but sensitive to syllable weight for place names and borrowed words. The switch of quantity sensitivity cannot be handled by the accent-based theory since as with English, this is not a case where some particular syllable has lexical accent. Data from Turkish (Sezer 1985, Kaiser 1989, Hammond 1986) are provided in (14) and (15).

(14) Turkish ordinary words (Insensitive to syllable weight):

- \( \text{tani} \) "know"
- \( \text{tanidik} \) "acquaintance"
- \( \text{tanidiklar} \) "acquaintances"

(15) Turkish place names and borrowed words (Sensitive to syllable weight):

a. Words with a heavy penult are stressed on the penult:

- Samuelson \( \rightarrow \) "(Paul) Samuelson"
- Washington

b. Words with a heavy antepenult and a light penult are stressed on the antepenult:

- Ankara "city in Turkey"
- peñéjere "window"

c. Words with a light penult and a light antepenult are stressed on the penult:

- Kenedi "Kaneyu"
- Pitolesi "Ptoleys"
(17) Macedonian with affixation (HAV, Comrie 1976)


In (17a), the underlined form has penultimate stress, but after affixation, it has antepenultimate stress. Similarly, in (17b), the unaffixed form has final stress, but the affixed forms have either penultimate or antepenultimate. At first glance, this seems to be a problem for my proposal. However, this problem can be solved if we assume that the lexical marking triggering different stress patterns in Macedonian is, unlike the case in Akan, *not* preserved after affixation, and that after affixation there is only one stress pattern, antepenultimate.

Recall that there are three stress patterns in Macedonian, which I summarize in (18).

(18) Stress in Macedonian

| Stress I | QI, R→L, [+H] | binary, left-headed |
| Stress II | QI, R→L, [-H] | binary, left-headed |
| Stress III | QI, R→L, [-H] | binary, right-headed |

Morphemes may come with any one of these three stress patterns. However, after affixation, only Stress I is assigned to the derived form, with the stress from the first cycle being unaffected. Thus, if we assign Stress Copy following HAV, the stress from the first cycle (i.e., the stress pattern the morpheme is assigned) would mark the morpheme with a line 1 asterisk, and hence affect the stress assignment in the following cycle, where affixation takes place.

Before giving the derivation, I repeat the Stress Copy Rule from HAV in (19).

[19] Stress Copy (SC) [HAV]

Copy the line 1 asterisks from the metrical planes of earlier cycles.

The derivation of “citotot” is given in (20).

The stress pattern Stress III ([SIII] pattern) is assumed to be preserved after affixation. When assigning the stress pattern Stress I (SI) in the second cycle, this line 1 asterisk is respected. Hence we get penultimate stress.

(20) citat + ot → citatot

S I *+ot* *SIII* *SC* *+ot* → citat → citat-ot → citatot

4.5. Unsolved problem

Of the examples discussed, at least one case that remains unsolved, that is, in some languages, there seems to be a morpheme that always attract stress. For example, in Akan, the morphemes ‘ga’ and ‘ke’ always attract stress (secondary stress), as shown in (21).


na-ghê-dwñk “tremble-noun”

na-hîldûm “state of drunkenness”

At this point, I do not have an answer for this, except that the vowels in these morphemes might have some special properties.

5. Conclusions

In my paper, I have argued that by changing the values of the parameters, we can account for languages having more than one stress pattern. In other words, this proposal expands metrical theory by covering cases that used to be treated as exceptions (e.g., the penult...
JANE S. TSAY

Final stress in Macedonian, and cases like English, Akan, and Turkish, where two or more stress patterns in a language cannot be handled by purely lexical accent. This is schematized in (22). By "other cases", I mean English, Akan, and Turkish.

(22)

<table>
<thead>
<tr>
<th>Accent-based Theory</th>
<th>&quot;regular&quot; stress</th>
<th>&quot;exceptional&quot; stress</th>
<th>other cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>assigned by metrical parameters</td>
<td>assigned by metrical parameters</td>
<td>lexical accent</td>
<td>???</td>
</tr>
</tbody>
</table>

Analysis-based Proposal | assigned by metrical parameters

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