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Constraining Lexical Accent*

Jane S. Tsay

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0. INTRODUCTION

The goals of this paper are to argue against the theories of exceptional stress in Halle and Vergnaud (1987) (henceforth H&V) and Hammond (1989), 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, left-headed binary feet, and a right-headed word tree (H&V, 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. H&V consider lexical accents to be line 1 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 H&V 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 3. 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, H&V, Hammond 1989)

a. Antepenult -- most common (regular stress)

vodénica "mill"

pólkovnik "colonel"

rábota "work"

b. Penult -- less common (exceptional stress)

literatúra "literature"

konzumátor "consumer"

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c. Final -- less common (exceptional stress)

autobus' "bus"
 citát' "quotation"

H&V's analysis of regular stress assignment in Macedonian is as follows.¹

(2) Regular stress assignment in Macedonian -- (as paraphrased in Hammond 1989, following H&V's (16), p.58)

- 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. Conflation

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

(3) Regular stress assignment in Macedonian (H&V)

* * * * (2a) * * * [*] (2b) (*)(* *)[*] (2c)
 vodenicar ----> vodeni car ----> vo deni car ---->

* * (* *) (* *) (* *)
 (*)(* *)[*] (2d) (*)(* *)[*] (2e) (*)(* *)[*]
 vo deni car ----> vo deni car ----> vo deni car

*
 (. *)
 (2f) * (* *)[*]
 ----> vo deni car ----> vodénicar

As to the exceptional stress, H&V 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 H&V's model is given in (4), where 'citát' comes with a

¹ Although Hammond (1989) differs from H&V in some ways, for example, Hammond does not use conflation, 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.

line 1 asterisk on the final stress bearing unit in its underlying form.

(4)

```

1      *
0      * *
      citat

```

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

(5) 'literatúra'

```

1          *                *                *
0 * * * * * (2a)  * * * * [*] (2b) (*) (* *) (*) [*]
  literatura ----> literatu ra ----> li tera tu ra

          * * *                (* * *)
(2c) (*) (* *) (*) [*] (2d) (*) (* *) (*) [*] (2e)
----> li tera tu ra ----> li tera tu ra ---->

          *                *
(* * *)                (. . *)
(*) (* *) (*) [*] (2f) * * * * [*]
li tera tu ra ----> li tera tu ra --> literatúra

```

2. PROBLEMS WITH THE ACCENT-BASED THEORY

There are, however, several problems with the accent-based theory. First, the "accented elements", presumably the accented syllables, are not present underlyingly since syllables are predictable (Levin 1985, Itô 1986, Hayes 1989, among others). This raises a question as to where the lexical accent is marked underlyingly.²

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

² As pointed out to me by Nick Clements, however, there have been claims that there are syllables underlyingly in some languages.

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Third, the accent-based theory misses the generalization that stress in the words treated as "accented" in a particular language falls into patterns. By falling into patterns, I mean two things. First, words with exceptional stress have stress on predictable syllables, and not just anywhere in the word. Second, exceptional stress always falls within three syllables from the word edge, the same as regular stress.

Fourth, since exceptional stress falls into patterns, it is not different from regular stress except that it has fewer examples. In other words, the only evidence that it is "exceptional" is statistical. This presumes that the child learning the language is counting examples that he encounters. This presumption is not desirable because counting in learning is not easy to capture in models of learnability theory (e.g. Wexler & Culicover 1980).

3. THE ANALYSIS-BASED PROPOSAL

My proposal is that exceptional stress in languages like Macedonian is not lexical accent. Instead, it is assigned by the same set of parameters as regular stress but with different values.

The primary argument is that exceptional stress in these languages falls into patterns. That is, it is systematic. If we assume that all stress is assigned by metrical parameters, the difference between two stress patterns (i.e. "regular" vs. "exceptional") in one language is then just the difference of values of some parameter. For example, if a language has two stress patterns, one antepenult and one penult, it is possible that one pattern involves final syllable extrametricality and the other does not. In other words, one pattern has the value [+] for extrametricality, and the other has [-]. Under this proposal, the morphemes would be marked underlyingly as to which set of the parameters, including the values of the parameters, is chosen. Hence there is no distinction between "regular" and "exceptional" with respect to stress assignment, and these two terms should be abandoned. However, for convenience in referring to other studies, I will keep using these terms within quotes.

I give the metrical parameters that I assume in (6), following different sources. Since what the parameters should be is not the focus of this paper, I will not attempt to motivate these parameters.

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- (6) Parameters (cf. H&V, Hammond 1986, 1990, Hayes 1981)
- Extrametricality -- [+ Em]/[-Em]
 - Quantity sensitivity -- QS/QI/ROB³
 - Unbounded / Bounded
 - Headedness -- [R-headed] / [L-headed]
 - Directionality -- [R->L] / [L->R]
 - Iterativity -- [+It] / [-It]

Recall that Macedonian has three stress patterns: antepenult, penult, and final. Since Macedonian is quantity-insensitive, and the stress assignment is from right to left, we can assume that words with antepenult stress have [+Em] and a left-headed binary foot, as shown in (7a). The penult stress is analyzed as having [-Em] and a left-headed binary foot, as shown in (7b). The final stress is analyzed as having [-Em] and a right-headed binary foot, as shown in (7c).

(7) Macedonian -- QI, R --> L

a. Stress I -- [+Em], binary, left-headed

*
* * * * * * * [*] *(* *)[*]
vodenica --> vodeni ca --> vodeni ca --> vodenica

b. Stress II -- [-Em], binary, left-headed

*
* * * * * * * * (* *) * * * (* *)
literatura --> litera tura --> litera tura
----> literatúra

c. Stress III -- [-Em], binary, right-headed

*
* * * * (* *)
citat -----> citat ---> ci tat --> citát

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 underlyingly, this lexical information is carried by the morpheme as a whole.

³ An ROB (revised obligatory-branching) foot is a kind of foot where the head must dominate an accent (Hammond 1986, 1989).

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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 underlyingly. Second, in this proposal, "exceptional" stress is assigned by the same metrical parameters as "regular" stress, only with different values. A diacritic is only needed to indicate which lexical item goes with which set of parameter values. Third, it 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 also handle cases other than "exceptional" stress where a language uses different sets of metrical 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

In English, nouns have final syllable extrametricality while underived verbs and adjectives do not (H&V p.230). 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 H&V)

ˈCána[da] ˈalúmi[num] aˈgén[da] aˈró[ma]

b. Main Stress in English Adjectives and Verbs
(after H&V)

ˈsólid aˈstónish aˈbsúrd divíne

Note that this is not a case where all the underived nouns have a lexical accent on some particular syllable. If you want to say that these words all systematically have a lexical accent on the antepenult syllable, this would defeat the purpose of the accent, which is supposed to mark unpredictable stress. The way H&V handle it is to have final syllable extrametricality for nouns in English, but not for the underived 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 [Em] for underived nouns and for verbs and adjectives. With other parameters being the same, the underived nouns in English would have [+Em], while the verbs and adjectives would have [-Em]. This is parallel to the different parameter settings that distinguish between "regular" and "exceptional" stress in Macedonian.

(9) English Nouns

Stress I -- [+Em], R->L, binary, left-headed

			*
			(*)
* * *	* * [*]	* (* *)[*]	* (* *)[*]
Canada ---->	Cana da --->	Cana da -->	Cana da

(10) English Verbs/Adjectives

Stress II -- [-Em], R->L, binary, left-headed

		*
		(*)
* * *	* (* *)	* (* *)
determine --->	determine --->	determine

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)

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The accent-based theory has to mark either the final or penult 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 penult stress always get penult stress. An example is given in (11).

- (11) butáN + an --> butaN-án (N=)
 "place" "place-ref.-fut."

* * SI * * aff. * * * SI * * *

butaN --> butaN ---> butaN-an --> butaN-an ->butaNán

In order to solve this problem, Hayes (1981) marks the relevant roots with a diacritic feature [+penult stress].

- (12) Aklan -- data (Chai 1971, Hayes 1981)

		[+penult stress]
pitú	"seven"	pítu "whistle"
sugúd	"room"	súgud "lice comb"
butáN	"place"	híkut "cook"
butaN-án	"place-ref.-fut."	hikút-an "cook-ref focus-fut."

The problem with Hayes's analysis is that a diacritic feature like [+penult stress] is unconstrained. Presumably, we can have the features [+ultimate], [+first], [+antepenult], etc. It is "brute force" 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.

- (13) Aklan -- under the new proposal

a. Stress I -- [-Em], binary, right-headed

* * (* *)

sugud --> sugud --> sugúd "room"

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b. Stress II -- [-Em], binary, left-headed

	*	
* *	(* *)	
sugud -->	sugud -->	súgud "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 1983, Kaisse 1985, Hammond 1986) are provided in (14) and (15).

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

tani'	"know"
tanidik'	"acquaintance"
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'	"(Paul) Samuelson"
Vasinkton'	"Washington"

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

Ankara'	"city in Turkey"
penjere'	"window"

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

Kenedi'	"Kennedy"
Pitolemi'	"Ptolemy"

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Under this new proposal, ordinary words in Turkish have QI, [-Em], and a right-headed binary foot, as shown in (16a), while place names and borrowed words have [+Em] and a right-headed ROB foot, as shown in (16b), with everything else being the same, i.e. R->L directionality and right-headed word tree.

(16) Turkish -- R->L, right-headed word tree (after Hammond 1986)

a. Ordinary words -- QI, [-Em], binary, right-headed

*
* * (* *) (* *) --> tani'
tani --> tani --> tani --> tani'

b. Place names and borrowed words -- [+Em], right-headed ROB foot (the head must be heavy) (* is a heavy syllable)

(i)

*
* * * * * [*] (* *) [*] ,
Samuelson --> Samuelson --> Samuelson --> Samuelson

(ii)

*
* * * * * [*] (*) * [*] ,
Ankara --> Anka ra --> Anka ra --> Ankara

(iii)

*
* * * * * [*] * * [*] * * [*] ,
Kenedi -> Kene di -> Kene di -> Kene di -> Kenedi

Since the two stress patterns in Turkish differ in their sensitivity to syllable weight, there is no way that the accent-based theory can handle it.

4.4. Apparent problem

Macedonian, however, appears to pose a problem for the analysis-based theory proposed in this paper, since, unlike Aklan, words in Macedonian change stress patterns after affixation.

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(17) Macedonian with affixation (H&V, Comrie 1976)

- a.
- | | |
|----------------|-----------------|
| konzumátor | "consumer" |
| konzumátor-i | "consumers" |
| konzumátor-ite | "the consumers" |
- b.
- | | |
|-----------|------------------|
| citát | "quotation" |
| citát-ot | "the quotation" |
| citát-ite | "the quotations" |

In (17a), the underived form has penult stress, but after affixation, it has antepenult stress. Similarly, in (17b), the unaffixed form has final stress, but the affixed forms have either penult or antepenult. 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 Aklan, not preserved after affixation, and that after affixation there is only one stress pattern, antepenult.

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

(18) Stress in Macedonian

- Stress I : QI, R->L, [+Em], binary, left-headed
 Stress II : QI, R->L, [-Em], binary, left-headed
 Stress III: QI, R->L, [-Em], 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 forms, with the stress from the first cycle being respected. Thus, if we assume Stress Copy, following H&V, the stress from the first cycle (i.e. the stress that the underived form 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 H&V in (19).

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(19) Stress Copy (SC) (H&V)

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

The derivation of "citátot " is given in (20). First, the morpheme comes with Stress III (SIII) pattern underlyingly, and gets final stress in the first cycle. Then the suffix "-ot" is added, and stress is erased, while copied as a line 1 asterisk. When assigning the stress pattern Stress I (SI) in the second cycle, this line 1 asterisk is respected. Hence we get penult stress.

(20) citát + ot --> citátot

	*				*	
* * SIII (* *)	aff.	* * *	SC	* * *		
citát	---->	citát	---->	citát-ot	---->	citát-ot
		*				
S I		*(*)[*]				
----->		citát-ot	----->	citátot		

4.5. Unsolved problem

There is, however, at least one case that remains unsolved. That is, in some languages, there seem to be morphemes that always attract stress. For example, in Aklan, the morphemes 'ga' and 'ka' always attract stress (secondary stress), as shown in (21).

(21) Aklan (Hayes 1981, p.22)

na-gá-hádluk	"frighten-actor-pres."
ka-hilúN-un	"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 this 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 or

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final stress in Macedonian), and cases like English, Aklan, and Turkish, where two or more stress patterns in a language can not be handled by marking lexical accent. This is schematized in (22). By "other cases", I mean English, Aklan, and Turkish.

(22)

	"regular" stress	"exceptional" stress	other cases
Accent-based Theory	assigned by metrical parameters	lexical accent & metrical parameters	???
Analysis-based Proposal	assigned by metrical parameters		

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