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Aklan Stress: Disjunctive Ordering or Metrical Feet?

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Stress rules often display the property of assigning stress at a variable distance from the end of the word or another stress, depending on the nature of the syllables that are skipped over. In Latin, for instance, stress is placed on the antepenultimate syllable of a word if the penultimate syllable ends in a short vowel; otherwise the penult is stressed. Phenomena such as this are ordinarily handled in generative phonology by invoking the principle of disjunctive ordering, which states that when rules are abbreviable by means of parentheses, the longer subrules apply first, with later expansions omitted once a given subrule has been applied successfully. Under the principle, the facts of Latin follow from a simple rule of roughly the following form:

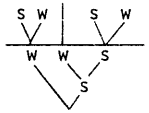
(1) $V \longrightarrow [+\text{stress}] \;/\; \_\_\_ C_0(\breve{V}C)VC_0\#\#$

The disjunctive ordering principle insures that words that fit the longer expansion of (1) will receive antepenultimate stress, and that the shorter expansion will not later assign a penultimate stress to them as well.

The metrical theory of stress, as developed in works such as Liberman and Prince (1977), Halle and Vergnaud (1978), and Selkirk (forthcoming), offers an alternative to the disjunctive ordering principle. Before presenting this alternative, I must make clear the crucial aspects of the metrical theory that this paper presupposes. Under the metrical theory, stress is regarded not as a

local property of segments, but rather as a relation of relative prominence between syllables. The theory expresses this prominence relation using tree structures, in which sister nodes are labelled as relatively strong (s) or weak (w). For example, the stressing of the English word Halicarnassus is represented as follows:

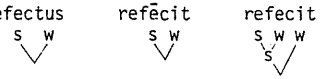
(2) Halicarnassus



The subtrees lying above the horizontal line in (2) are called metrical feet. Each foot is interpreted as having a single stress, which falls on its strongest (or else its only) syllable. The relative prominence of the stressed syllables is determined in turn by the remaining structure, which is called the word tree. The word tree assigns the greatest prominence to the final foot by virtue of its being relatively strong with respect to the other feet. The main stress of the word thus falls on the strong syllable of the final foot; that is, the penult. The relative prominence of the other two stressed syllables is determined by the principle that the prominence of weak feet is inversely proportional to their depth of embedding in the tree: the first syllable of Halicarnassus is more strongly stressed than the third because its foot is less deeply embedded.

Under this framework the main stress rules of a language will be those that construct the metrical feet. In Latin, for instance, we wish to construct feet at the end of the word that contain two syllables when the penult is heavy and three syllables when the penult is light, as in (3):

(3) refectus refēcit refecit



We can do this with a rule of the form (4):

(4) Construct a left branching foot at the end of a word, such that

(a) The foot contains at most three syllables.
(b) The middle syllable, if there is one, is light.

Label each pair of sister nodes S W.

In order to function correctly, rule (4) must have a condition placed on it to the effect that it must construct the largest possible foot, so that stress will always be placed as far to the left as possible. Since this condition appears to be applicable

to all stress rules, I will formulate it here as a universal principle governing the construction of metrical feet:

(5) Maximal Foot Construction Principle

Foot construction rules construct the largest foot compatible with their conditions.

What advantages does the metrical framework have over the old segmental approach? First, it appears that the only rules that required the use of the disjunctive ordering convention under the segmentally based theory were rules of stress and accent. This had to be regarded as a coincidence under the old theory, but is entirely expected under the metrical account, since it is precisely the rules of stress and accent assignment that involve the construction of metrical feet. Second, the metrical theory enables us to make serious claims about the nature of stress rules in general: it turns out that the inventory of foot types and labelling conventions that is needed for the description of the stress rules found in natural languages is quite limited. Because of this, the metrical theory gives us a clear idea of what is a possible or unmarked stress rule, and can reveal the basic similarities among the stress rules of various languages. (A discussion of this claim will appear in Hayes (forthcoming).)[1]

Aside from these theoretical arguments, it is possible to find more direct confirmation for the metrical theory, in that there are stress systems that may be described simply and elegantly using the metrical system, but require a complex and arbitrary description using the segmental framework. One such system is that of Aklan, a Philippine language. The Aklan data that follow are taken from Chai (1971).

The stress facts of Aklan are as follows: main stress always falls on either the penultimate or the final syllable of a word. The position of the main stress is an arbitrary property associated with the root of each word: roots that have final stress in isolation have final stressed derivatives, and roots that carry penultimate stress when alone have penultimate stressed derivatives, as in (6):

(6)a.	híkut	"cook"
	hikút-an	"cook-referent focus-future"
	sípa?	"kick"
	sipá?-a	"kick-goal focus-imperative"
b.	butáŋ	"place"
	butaŋ-án	"place-ref.-fut."
	bisá	"kiss"
	bisa-hí	"kiss-ref.-imp."

Apparently, then, some diacritic marker attached to the root is responsible for determining the position of main stress in the word as a whole. However, this simple pattern is always overridden by the more general principle that all words which have closed penultimate syllables have penultimate stress. Thus while closed penult roots may vary in whether their derivatives have final or penultimate stress, the roots themselves are always stressed on the penult, as is shown in (7):

(7)a.	bítbit	"carry"
	bitbít-a	"carry-goal-imp."
	hámbaǥ	"speak"
	h-aǥ-ambáǥ-un	"that which should be said"
b.	gásta	"spend"
	gasta-hún	"spend-goal-fut."
	?asírtar	"lucky"
	?asirta-hí	"lucky-ref.-imp."

The crucial examples in (7) are those under b., in which the roots gasta and ?asirtar display penultimate stress, even though their derivatives gasta-hun and ?asirta-hi reveal that they belong to the lexical class that triggers final stress assignment. To handle these cases, the correct analysis must therefore provide some means of neutralizing the root-governed underlying stress contrast in words that have closed penults.

Secondary stress in Aklan falls on the final syllable of words that have penultimate main stress:

(8)	pínìŋ	proper name
	balíbàd	"refuse"
	nàg-hi-ŋ-úhà?	"go trying to take-actor focus-pres."

It also appears on certain syllables to the left of the main stress. The distribution of these stresses can be predicted if we draw a distinction in Aklan between heavy and light syllables: heavy syllables include all closed syllables, plus a number of prefixes, the most common of which are ka-, a widespread nominalizing prefix, and ga-, a verbal prefix with progressive meaning. The secondary stresses fall on (a) all heavy syllables; (b) alternating light syllables to the left of another stress, counting from right to left.[2] These facts are summarized under (9):

(9) Closed Syllables

màg-m-aǥ-áŋhùd	"more than two siblings"
ma-sìg-hímus	"will each tidy up"
h-aǥ-àmbaǥ-án-ùn	"maxim"

ka- and ga-

na-gà-hádlùk	"frighten-actor focus-progressive"
kà-hilúŋ-ùn	"state of drunkenness"
g-in-à-saǥápù	"have a stomach ache-goal-pres."

Alternating Light Syllables

mà-pa-ŋ-ísdà?	"go fishing-actor-fut."
s-ùǥ-ùgu?-ún	"servant"
mà-t-in-àmar-ún	"being lazy"
mà-?-uǥ-ùgtás-ùn	"fussy"
na-gà-pà-n-abún	"go soaping-actor-pres."

The secondary stresses are not equal in force: generally if a word has more than one secondary stress, the leftmost one will be the strongest, insofar as this is reflected in the consistency with which the stresses are recorded in Chai's transcriptions.

These, then, are the crucial facts to be accounted for: that main stress falls on the penultimate or final syllable, as determined by the root; that closed penults receive final stress no matter what the marking on the root is; that secondary stress falls on heavy syllables and alternating light ones; and that the strongest secondary stress is the leftmost one. How might the facts fall out from a metrical analysis? Confining our attention for the moment to words with final main stress, we formulate the rule for foot construction as follows:

(10) Foot Construction

> Going from right to left, assign feet of at most two syllables, labelled W S, such that any syllable dominated by W is light; that is, neither closed nor the prefix ka- or ga-.

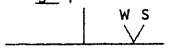
The application of the rule can be illustrated with the derivation of the word na-ga-pa-n-abun: the first iteration of the rule produces a bisyllabic foot on the last two syllables:

(11) na-ga-pa-n-abun

W S (\/)

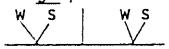
The second iteration can only produce a monosyllabic foot, since if the foot had two syllables its weak node would dominate the heavy prefix ga-:

(12) na-ga-pa-n-abun



The final iteration of the rule draws one more foot, so that all the syllables of the word are now incorporated into foot structures:

(13) na-ga-pa-n-abun



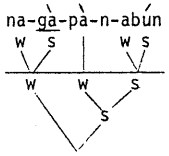
The word tree is then constructed, using a rule that happens to be identical to the word tree rule for English:

(14) Word Tree Construction

Construct a word tree that is right branching, labelling right nodes as strong iff they branch.

Rule (14) constructs the following tree for na-ga-pa-n-abun:

(15) na-gà-pà-n-abún

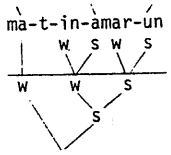


Since the final foot is branching, it is labelled S, as is the node that dominates it. Thus the strong syllable of the final foot, bun, receives main stress. The syllables ga and pa, being either the strongest or the only syllables of their feet, receive secondary stress. The fact that the secondary stress on ga is stronger than the one on pa is accounted for, since the foot that contains ga as its strong element is less deeply embedded in the word tree than the foot that contains pa. The ranking of the stresses is thus the same as that found in Halicarnassus, which has an identical word tree. The left branching trees assigned by rule (14) will always give greater prominence to the leftmost secondary stress, since this stress is always the least deeply embedded in a left branching tree.

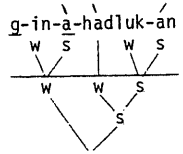
The stressing of various other final stressed words is carried out in a similar manner:

(16) a. butáŋ

b. mà-t-in-àmar-ún



c. g-in-à-hadluk-án "frighten-ref.-prog."



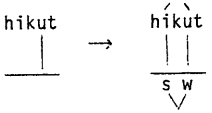
Notice that the foot construction procedure (10) is adequate to produce the desired pattern of secondary stresses once the position of the main stress is established. Heavy syllables will always be either the strong syllable of a bisyllabic foot or constitute a monosyllabic foot on their own, so that they will always receive secondary stress. Light syllables, however, will only constitute the strong element of a foot when they occur an even number of syllables to the left of another stress, owing to the strong-weak alternation imposed by the bisyllabic foot structure.

The stressing of words whose roots are diacritically marked for penultimate stress can be carried out if we assume that such roots trigger the construction of a monosyllabic foot at the end of the word, by means of a rule such as (17):

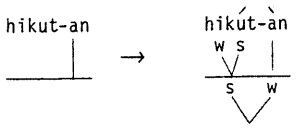
(17) $CVC_0 \longrightarrow \underset{F}{CVC_0} \; / \; \left[\begin{array}{l}\_\_\_\_ \\ +\text{Penult} \\ \text{Stress}\end{array}\right] \#\#$

The normal stress rules will then always assign main stress to the penultimate syllable, as in (18):

(18) hikut → híkut



hikut-an → hikút-àn



The segmental rules just proposed clearly amount to little more than a brute force description of the facts. The rules are numerous, and each aspect of the Aklan stress pattern must be described with a separate rule. Under the metrical analysis, by contrast, all of the relevant facts fall out as a natural consequence of a small set of fairly simple rules. The underlying unity of what appear to be totally disparate phenomena is revealed by the metrical notation. The crucial role in the metrical theory is played by conventions that appear to be universal; that is, the procedure for the interpretation of metrical trees and the Maximal Foot Construction Principle. We see, then, that although analyses involving the construction of metrical feet often mimic segmental analyses that use disjunctive ordering, there is at least one case in which the good effects of maximal foot construction cannot be duplicated in a segmental account. The facts of Aklan thus constitute evidence to support the metrical theory.

FOOTNOTES

[1]A number of other general arguments in favor of the metrical theory can be found in Liberman and Prince (1977).

[2]Aklan has no distinctions of vowel length. It thus constitutes a counterexample (by no means rare) to tne putative universal often mentioned in the literature to the effect that "languages with a heavy vs. light dichotomy (in their stress rules) always have a vowel length contrast" (Hyman (1977)).

[3]Rule (22) would have to be ordered before the main stress rule, or else revised slightly, in order to keep it from reducing final main stresses to [2 stress].

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