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Nankina Trochees

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Abstract. This paper presents an analysis of the stress system in Nankina (a language of Papua New Guinea) cast in the framework of Optimality Theory (OT), initially set forth in Prince and Smolensky (1993). This pattern reflects binary trochaic feet constructed from the right edge leftward. A word-initial stress clash is taken to indicate the presence of a degenerate foot at the left edge of the word. It is argued that standard OT can handle the stress facts without costs since it is more conservative in its theoretical assumptions than are grid-based analyses. Our analysis shows that exceptional stress can be modeled by a grammar with standard constraints and that catalexis is helpful in analyzing Nankina as a trochaic system. The respective patterns provide evidence against the claim that onset can contribute to syllable weight and against HEAD DEPENDENCE, a positional faithfulness constraint which bans epenthetic material in prosodic heads

1. Introduction

This paper presents an analysis of the stress system of Nankina (a language of Papua New Guinea; between the Coral Sea and the South Pacific Ocean, east of Indonesia) and discusses the theoretical implications of Nankina stress. The Nankina language has been discussed descriptively by Spaulding and Spaulding [1] but no work on the theoretical aspects of Nankina phonology has been done. The proposed analysis is meant to contribute to the understanding of the stress patterns of this so little studied language and is couched within the constraint-based approach of Optimality Theory (henceforth OT) (Prince and Smolensky [2], McCarthy and Prince [3-6], Cohn and McCarthy [7]. Nankina is a quantity-insensitive language. In disyllables, the regular foot pattern consists of a syllabic trochee at the right edge of the word. The presence of stress clash in odd-parity words implies that the first syllable in such words constitutes its own, degenerate foot. Two kinds of exceptional stress are attested: final stress on disyllabic words that have initial weightless syllables, and equal stress on both syllables in some two-syllable words.

In the process of developing this analysis, several things of a more general theoretical interest will also be discussed. Among the theoretical claims made herein is for the metrical irrelevance of syllable onsets. A case against HEAD DEPENDENCE (HD-DEP: Broselow [8]; Alderete [9]; Mellander [10] is also made. The present paper demonstrates that canonical stress is interrupted by epenthetic [1] as well as by non-epenthetic [1]. Such patterning cannot be accounted for by HD-DEP since the latter is not violated by non-epenthetic vowels. Finally, the paper provides evidence for catalexis where a right-peripheral catalectic syllable is footed together with a preceding syllable.

To briefly sketch the structure of the remaining discussion, section 2 below gives an overview of the phonological background of Nankina. Section 3 offers a more detailed OT analysis of word stress in Nankina. It considers and rejects two grid-based analyses in the final subsections, clearing the way to draw a number of theoretical conclusions from the Nankina facts that are sketched in the following three sections; section 4, 5 and 6. Section 7 concludes the paper.

2. Nankina

The Nankina language is spoken in the southeast corner of Madang Province. There are about 2200 speakers of this language living in ten villages on the northern slopes of the Finisterre Mountains. The data used in this paper comes exclusively from Spaulding and Spaulding [1] *Phonology and Grammar of Nankina* who present a purely descriptive account for these same phenomena.

2.1. Segment inventory

The phonemes and allophones of Nankina are given in (1) and (2) respectively.

(1) Nankina consonant phonemes

Stops	p [p ↑ f p│]	t [t 4 l]	ts [ts tsɘ s]	k [k ξ]
	b [^{m}b m∧b ^{m}b│]	d [^{n}d n∧d]	dz [^{n}dz n∧dz]	γ [^{N}g Ng]
Fricatives	B [B w]			
Nasals	m [m m∧ m│]	n [n nɘ n∧]		N [N]
Glides		j [j]		w [w H]

(2) Nankina vowel phonemes

i [i I □ iς]		u [u Y]
E [E ς Eς]	ς	O
A		

2.2. Syllable structure

The set of syllable shapes that are well-formed in Nankina are given in (3).

(3) Nankina syllables
(Onsetless syllables are restricted to word-initial position only).

I. Monosyllabic words

a.	CV	/kE/	[kE]	‘fat’
b.	CVC	/kit/	[kit]	‘hand’
c.	CCVC	/gwAn/	[gwAn]	‘mud’
d.	CVCC	/gAwn/	[^{N}gAwn]	‘a spider’
e.	V	/A/	[A]	‘here’
f.	VC	/At/	[At]	‘sugar cane’

II. Disyllabic words

a.	CV.CVC	/kumςn/	[ku.mςn]	‘rat’
b.	CV.CV	/jEmς/	[jE.mς]	‘door’
c.	CV.CCVC	/tAkwςn/	[tA.kwςn]	‘curse’
d.	CVC.CVC	/kςtnςm/	[kςt.nςm]	‘night’
e.	V.CV	/AwA/	[A.wA]	‘grandmother’
f.	V.CVC	/AjEt/	[A.jEt]	‘louse’
g.	V.CCV	/Ekwi/	[E.kwi]	‘bad’
h.	VC.CVC	/ςpmςk/	[ςp.mςk]	‘cough’
i.	CCV.CV	/kwς.bu/	[kwς.^{m}bu]	‘plank’
j.	CCV.CVC	/kwApOk/	[kwA.pOk]	‘ball’

III. Trisyllabic words

a.	CV.CV.CV	/bOtAmO/	[^{m}bO.4A.mO]	‘village’
b.	VC.CV.CVC	/Awkumin/	[Aw.ku.m1n]	‘go, then change direction’

2.3. The stress patterns of Nankina

The examples in (4) below illustrate the basic stress pattern of Nankina. The stress on a two-syllable word generally falls on the first syllable.

(4)	a. /tOwuN/	[tO(.wuN]	'egg'
	b. /wOtE/	[wO(.rE]	'a sore'
	c. /kςdEp/	[kς(.ⁿdEp]	'wood'
	d. /jEwi/	[jE(.Hi]	'cause'
	e. /wAsAk/	[wA(.sAk]	'power'
	f. /mujςk/	[mu(.jςk]	'a tree'
	g. /bEtςN/	[ᵐbE(.rςN]	'shoulder'
	h. /tAkwςn/	[tA(.kwςn]	'curse'

The regular stress pattern just described is disrupted in words containing [1], as we see by looking at the examples in (5) and by words whose second syllable begins with a sequence (including an affricate) as we see by looking at the examples in (6).

(5)	a. /bitsEp/	[ᵐb1.tsᵠE (p]	'time'
	b. /tipO/	[t1.pO(]	'rain'
	c. /jikgA/	[j1k.ᴺgA(]	'your bag'

(6)	a. /Ekwi/	[E. kwi (]	'bad'
	b. /AkwA/	[A.kwA (]	'mess up'
	c. /EtsEN/	[E.tsᵠE ((N]	'light weight'

There is usually equal stress on both syllables: (i) when they each have the same vowel; (ii) when the initial vowel is [I]; and (iii) if the first syllable is onsetless and not followed by a syllable that has a complex onset.

(7)	a. /ςpmςk/	[ς(p.mς(k]	'cough'
	b. /tsAwAt/	[tsA(.wA(t]	'machete'
	c. /AwA/	[A(.wA(]	'grandmother'
	d. /dςgςm/	[ⁿdς(.ᴺgς(m]	'hair'

(8)	a. /tsiwEt/	[tsI (.HE(t/	' pit-pit'
	b. /ipmςN/	[I (p.mς(N]	'let go'
	c. /tsiwOt/	[tsI (.wO(t/	'garden'
	d. /jipmςN/	[jI (p.mς(N]	'put it'

(9)	a. /ςjuN/	[ς(.ju(N]	'meat'
	b. /AjEt/	[A(.jE(t]	'louse'
	c. /AkAk/	[A(.kA(k]	'baby'

Finally, in words with three syllables the first two syllables generally receive equal stress.

(10)	a. /bOtAmO/	[ᵐbO (.4A (.mO]	'village'

b. /mOtEni/ [mO ʃ.rE ʃ.ni] 'good'
c. /OkutsEkN/ [Oʃ.kuʃ.sэEkN] 'small'

3. OT-Analysis of Nankina Word Stress

Within OT, word stress has mainly been analyzed using concepts borrowed from metrical phonology. We will, therefore, briefly sketch the main principles of metrical theory (based on Hayes [11] and Kager [12]). In a parametric theory, the analysis of stress pattern is regarded as a particular choice from a limited set of options, or parameters. By setting all the relevant parameters, one derives a stress rule. The theory consists of a set of rule specifications, defined by values of parameters that are provided by Universal Grammar. The basic foot-shape parameters are:

(11)
1. Boundedness **(foot size)** – bounded feet contain no more than two syllables, while unbounded feet have no limit to the size of the feet.
2. Choice of foot type **labeling (foot form)** – this parameter determines the relative strength of the two syllables contained in them. It allows two basic varieties. In left-dominant feet, all left nodes are dominant and right nodes weak, while the reverse situation holds in right-dominant feet. Bounded left-dominant feet are called *trochees*, and bounded right-dominant feet are called *iambs*.
3. Quantity-sensitivity – whether stress rules refer to syllable weight or not.
4. a. Directionality **(direction of parsing)** left to right/right to left – is one parameter of foot construction. It determines the direction of foot-formation, starting at the right edge (right-to-left) or at the left edge (left-to-right).
 b. **Iterativity** – is another parameter of foot-formation, by which feet are constructed exhaustively or non-exhaustively. In non-iterative systems, only one foot has to be built.
5. **End rule (left/right**) – is a 'parameterized' labeling rule. Its common function is to select from strong syllables the one that will carry main stress.

For convenience we repeat in (12) the Nankina words, which exemplify the regular stress pattern of this language and give in (13) parametric analysis of two of them.

(12)	a. /bOtAmO/	[ᵐbO ʃ.4A ʃ.mO]	'village'
	b. /mOtEni/	[mO ʃ.rE ʃ.ni]	'good'
	c. /OkutsEkN/	[Oʃ.kuʃ.sэEkN]	'small'
	d. /jEwi/	[jEʃ.Hi]	'cause'
	e. /wAsAk/	[wAʃ.sAk]	'power'
	f. /mujçk/	[muʃ.jçk]	'a tree'

(13)
```
                (*)(*    .)                          (*   .)
   /bOtAmO/     [ᵐbO ʃ.4A ʃ.mO] 'village' /jEwi/    [jEʃ.Hi]  'cause'
```

Bounded: yes
Foot type: trochaic
Quantity-insensitive
Direction: right to left
Iterative: yes
Degenerate feet: yes
End rule: no main stress

(There is no difference between the strength of the stress in Nankina words. This language simply lacks an End Rule).

Thus, the description of stress in Nankina words yields the following parameter values, which will be shortly formulated in terms of OT-constraints: Nankina has bounded feet (the fundamental pattern is disyllabic), quantity-insensitive, the foot head is left-bounded (trochaic) and the foot-formation starts at the right edge of the word. The standard statement constraint on foot size is Prince and Smolensky's [2] FT-BIN that ensures that feet are binary (feet consist of two syllables or two moras).

(14) **FT-BIN**
Feet must be binary under syllabic or moraic analysis.

Directionality of foot parsing has been analyzed in terms of gradient alignment constraints. McCarthy and Prince [3, 4] propose that the constraints responsible for directionality in foot parsing are ALL-FT-LEFT, requiring feet to be as close as possible to the left edge of the word, and ALL-FT-RIGHT, requiring feet to be as close as possible to the right edge. The two constraints are defined as follows:

(15) **ALL-FT-L**
Align (Foot, Left, PrWd, Left)
'The left edge of every foot coincides with the left edge of some PrWd.'
ALL-FT-R
Align (Foot, Right, PrWd, Right)
'The right edge of every foot coincides with the right edge of some PrWd.'

A violation mark is assessed for each syllable that occurs between a foot and the relevant word edge.

Exhaustive metrification or incorporating every syllable in the string into the metrical structure is expressed by the constraint PARSE-σ defined as follows:

(16) **PARSE-σ**
All syllables must be parsed by feet.

ALIGN-HEAD are alignment constraints, which are the equivalent of End-Rule-Left, and End-Rule-Right which account for the assignment of main stress to a foot at the left or right edge of the prosodic word (McCarthy and Prince [3, 4]).

(17) a. **ALIGN-HEAD (PrWd, L, Hd(PrWd), L)**
Align the left edge of every prosodic word with the left edge of the head of the prosodic word.

b. **ALIGN-HEAD (PrWd, R, Hd(PrWd), R)**
Align the right edge of every prosodic word with the right edge of the head of the prosodic word.

The head-alignment constraints in (17) are assumed to be gradiently violable: a violation is assessed for each syllable that separates the designated edge of the head foot from the designated edge of the prosodic word.

In OT then, each parameter setting has a counterpart in the form of a ranked constraint:

(18)

Parametric Metrical Theory	*OT*
Foot Size	**FT-BIN**
Foot Form	**FOOT-FORM (TROCHAIC):** (i.e. $(\sigma_s\sigma_w)_{FT}$)
	FOOT-FORM (IAMBIC): (i.e. $(\sigma_w\sigma_s)_{FT}$)
Directionality	**ALL-FT-L**
	ALL-FT-R
Iterativity	**PARSE-σ**
End-Rule (Location of main stress)	
End-Rule-Left	**ALIGN-HEAD (PrWd, L, Hd(PrWd), L)**
End-Rule-Right	**ALIGN-HEAD (PrWd, R, Hd(PrWd), R)**

In order to set the stage for the parsing of the prosodic word into feet, two additional constraints must be introduced to account for the fact that rhythm is alternating. When two strong beats are adjacent, a rhythmic clash arises and when two strong beats are too far apart, there is a rhythmic lapse. The *CLASH constraint (Kager [13], Alber [14], Elenbaas [15], Elenbaas and Kager [16] bans sequences of stressed syllables. The *LAPSE constraint (Prince [17], Selkirk [18], Green and Kenstowicz [19], Elenbaas [15], Elenbaas and Kager [17], Alber [14] bans sequences of unstressed syllables. Following Alber [14], these constraints are formulated in (19) and (20).

(19) ***CLASH**
Rhythm is alternating; no two adjacent stressed syllables.

(20) ***LAPSE**
Rhythm is alternating; no two adjacent unstressed syllables.

We are now in a position to give an account of Nankina stress facts in terms of OT. Consider first a standard analysis of this pattern.

3.1. The standard account

In the standard OT account, the construction of feet and the manner of foot-parsing is designated by constraints. The following constraints form a relevant subset of the constraints required for trochaic analysis of Nankina:

(21) **FT-BIN**
Feet must be binary under syllabic analysis.

(22) **PARSE-σ**
Every syllable must be parsed by a foot.

(23) **ALIGN-FT-L**
Align (Foot, Left, PrWd, Left)
'The left edge of every foot coincides with the left edge of some PrWd.'

(24) ***CLASH**
Rhythm is alternating; no two adjacent stressed syllables.

When PARSE-σ is dominant, its demand to parse all syllables into feet overrides any desire on the part of the alignment constraints to have all feet aligned with the left edge of the PrWd. When ALIGN-FT-L dominates PARSE-σ, the situation is reversed: only the leftmost pair of syllables is footed, at the expense of exhaustive footing. On the other hand, if FT-BIN ranks above PARSE-σ, stray syllables are not included in foot structure, but if PARSE-σ ranks above FT-BIN, stray syllables are parsed as degenerate feet. As shown in the tableau in (26), the constraint ranking in (25) derives the correct result.

(25) Constraint ranking for Nankina:

PARSE-σ
⇓
FTBIN, ALIGN-FT-L
⇓
*CLASH

(26)

/mOtEni/ [mOrEni] 'good'	PARSE-σ	FTBIN	ALIGN-FT-L	*CLASH

a. mO(rE⎛.ni)	*!		*	
b. (mO⎛.rE)ni	*!			
c. (mO⎛.rE)(ni⎛)		*	**!	
d. (mO⎛)(rE.ni⎛)		*	**!	
e. ☞ (mO⎛)(rE⎛.ni)		*	*	*

A dominant ALIGN-FT-L constraint forces the creation of a single degenerate foot at the left edge of the word. In trochaic systems like Nankina, this leads to the creation of a stress clash at the left edge and hence to violation of the lower ranked constraint against clashes. The clash-avoiding candidates (26c) and (26d) have to lose, since they rate worse on ALIGN-FT-L, their second foot being two syllables away from the left edge.

As Everett [20, 21], Hewitt [22], Crowhurst and Hewitt [23], Downing [24] and Green and Kenstowicz [19] have pointed out, the standard statement constraint on foot size, FTBIN (21) must be reformulated. The reason (21) must be reformulated is that in competition between a candidate with a degenerate foot and a candidate with a ternary foot, both of which deviate from FTBIN to the same degree, ternary feet will always be favored by alignment constraints over degenerate feet. This is exemplified in tableau (27). (A candidate, which is erroneously chosen as optimal, is indicated by 💣).

(27)

/mOtEni/ [mOrEni] 'good'	PARSE-σ	FT-BIN	ALIGN-FT-L	*CLASH
a. mO(rE⎛.ni)	*!		*	
b. 💣 (mO⎛.rE.ni)		*		
c. (mO⎛.rE)ni	*!			
d. (mO⎛.rE)(ni⎛)		*	**!	
e. ☞ (mO⎛)(rE⎛.ni)		*	*	*

In tableau (27), candidates (27a) and (27c) are out because they violate PARSE-σ. The undesired emergence of candidate (27b) as a winner over (27e) is an effect of ALIGN-FT-L, since both candidates tie on FT-BIN. Unfortunately, the desired candidate loses because it violates ALIGN-FT-L, which is satisfied by the candidate with ternary foot.

To avoid ending up with a ternary foot as the optimal candidate, two basic strands of attempts to split FT-BIN into two independent constraints can be isolated in the literature. One is the proposal of Everett [21] that Prince and Smolensky's [2] FOOT BINARITY, repeated here as (28) be broken into the two constraints in (29) and (30):

(28) FTBIN: Feet are binary under syllabic or moraic analysis

(29) FTMAX (Foot Maximality): Feet are maximally binary
(feet can contain no more than two syllables or two moras)

(30) FTMIN (Foot Minimality): Feet are minimally binary
(feet can contain no fewer than two syllables or two moras)

Let us see how an analysis along these lines can be applied to the Nankina data. By virtue of the fact that a degenerate foot is preferred for odd-parity forms, we know that both PARSE-σ and FTMAX must outrank FTMIN, as indicated in the ranking below.

(31) Constraint ranking for Nankina:
PARSE-σ, FTMAX
⇓
FTMIN, ALIGN-FT-L
⇓
FTFORM (T)

To demonstrate how this ranking achieves the stress pattern in (12), consider the tableau below in (32).

/mOtEni/ [mOrEni] 'good'	PARSE-σ	FTMAX	FTMIN	ALIGN-FT-L	FTFORM (T)
a. mO(rE´.ni)	*!			*	
b. (mO´.rE.ni)		*!			
c. (mO´.rE)ni	*!				
d. (mO´.rE)(ni´)			*	**!	
e. (mO´)(rE.ni´)			*	*	*!
f. ☞ (mO´)(rE´.ni)			*	*	

The candidates in which all feet are strictly binary, (32a) and (32c), must leave one syllable unparsed, and are thus eliminated by the high-ranking PARSE-σ constraint. Candidate (32b) is ruled out by FTMAX because it has a foot containing more than two syllables. FTMIN does no work for us, as the remaining candidates are tied with a single FTMIN violation each, and so the decision is passed to ALIGN-FT-L. Candidate (32d) is ruled out because its feet are further misaligned than the other two candidates (32e) and (32f) with respect to the left edge of the word. The tie between (32e) and (32f) is broken by FTFORM (T).

The alternative approach is that of Green and Kenstowicz [19], who propose to split FT-BIN into the two constraints in (33) and (34).

(33) FTMIN (Foot Minimality): A metrical foot contains at least two moras or two syllables.

(34) LAPSE: Adjacent unstressed moras or syllables must be separated by a foot

boundary.

This turns out to be functionally equivalent to the FTMAX and FTMIN constraints proposed by Everett [21]. To see why, consider the tableau in (35).

(35)

/mOtEni/ [mOrEni] 'good'	PARSE-σ	*LAPSE	FTMIN	ALIGN-FT-L	FTFORM (T)
a. mO(rE´.ni)	*!			*	
b. (mO´.rE.ni)		*!			
c. (mO´.rE)ni	*!				
d. (mO´.rE)(ni´)			*	**!	
e. (mO´)(rE.ni´)			*	*	*!
f. ☞ (mO´)(rE´.ni)			*	*	

Notice that the *LAPSE constraint in (35) replaces FTMAX in (32). Thus, these two constraints are ranked in the same position relative to PARSE-σ and FTMIN. They are functionally identical.

To summarize the discussion so far, we have seen that the challenge posed for standard OT by ternary feet can be successfully met in an analysis decomposing FOOT BINARITY into two separate constraints. This analysis has been able to distinguish degenerate feet from ternary feet.

3.2. Grid-based accounts

In contrast to the standard OT account, which appeals to the metrical foot, a theory of stress is developed that has grid-based representations of stress. Under grid-based representational assumptions, the level of stress associated with a syllable is a function of the number of levels of grid marks above a given syllable. Thus, an unstressed syllable is dominated by a single grid mark, a secondary stressed syllable is dominated by two, and a syllable with primary stress is dominated by three. Note that there is no difference between the strength of the stresses in Nankina words. Adopting these representations, a trisyllabic word with equal stresses on the first two syllables would display the following associations between grid marks and syllables (36).

(36)	/bOtAmO/	[^{m}bO´4A´mO]	'village'
	Level 1	x x	
	Level 0	x x x	
		σ σ σ	

In such theory the alignment constraints are formalized in terms of alignment of grid marks to the metrical grid. To conserve space, full representations of metrical grids will be omitted; instead following convention, Nankina stresses will be marked with an acute accent. In this subsection of the paper, two recent grid-based analyses of left-aligning trochaic systems with degenerate feet, that of Gordon [25] and that of Hyde [26] will be extended to the Nankina data.

3.2.1. Gordon [25]

Gordon [25] provides an account of quantity-insensitive stress, using the alignment constraint ALIGN EDGES, which is in some sense an amalgamation of the constraints ALIGN-LEFT and ALIGN-RIGHT, which require that words begin and end respectively with a foot except that it has a grid-based format. This constraint ensures that syllables at both edges of the word are stressed. Violations are calculated in a simple fashion: one violation is incurred if either the initial or the final syllable does not carry stress, and two violations are incurred if both the initial and the final syllable do not have a stress. Repulsion of stress from the right edge is captured by NONFINALITY. The third and fourth constraints are restrictions against stress lapses and stress clashes; *LAPSE bans sequences of two unstressed syllables while *CLASH bans sequences of two stressed syllables. The constraints and their definitions, as proposed by Gordon [25], are given in (37).

(37) a. **NONFINALITY**
Stress does not fall on the final syllable. (A final syllable does not have a level 1 grid mark.)

b. ***LAPSE**
A string of more than one consecutive stressless syllable may not occur. (A sequence of more than one consecutive syllable lacking a level 1 grid mark is banned.)

c. **ALIGN EDGES**
ALIGN (EDGES, Level 0, PrWd, $x_{level\ 1}$): The edges of level 0 of grid marks in a prosodic word are aligned with level 1 grid marks.

d. ***CLASH**
A stress domain does not contain adjacent stressed syllables. (Adjacent syllables carrying a level 1 grid mark are banned.)

On Gordon's account, the pattern of stress in Nankina falls out of the ranking in (38). This ranking is demonstrated by the tableau in (39).

(38) Constraint ranking for Nankina:

NONFINALITY, *LAPSE
⇓
ALIGN EDGES
⇓
*CLASH

(39)

/mOtEni/ [mO(rE(ni] 'good'	NONFINALITY	*LAPSE	ALIGN EDGES	*CLASH
a. mOrE (ni			**!	
b. mO (rEni		*!	*	
c. mOrEni (	*!	*	*	
d. mO (rEni (	*!			
e. mOrE (ni (	*!		*	*
f. ☞ mO (rE (ni			*	*

Candidate (39a) has no violations of undominated constraints, but is naturally ruled out by ALIGN EDGES. Of the remaining candidates, three (39c), (39d) and (39e) violate the top ranked constraint NONFINALITY. Each of the remaining candidates (39b) and (39f) incurs one violation of ALIGN EDGES. Among these, the one is selected that does not violate the next constraint up the hierarchy, *LAPSE.

3.2.2. Hyde [26]

Hyde [26] presents an analysis of stress pattern of languages like Nankina, which is intended to account for weight-insensitive stress systems. He adopts an alignment constraint that differs from the standard alignment relationships between the edges of prosodic words and the edges of feet. Instead the alignment constraint HDS-L is an alignment relationship between the edge of prosodic words and the edge of foot-heads. It is responsible for determining both foot type and footing directionality. The MAPGRIDMARK constraint discourages stressless feet and the anti-clash constraint *CLASH discourages adjacent stressed syllables. The INITIAL GRIDMARK constraint requires stress on a prosodic word's initial syllable. These constraints are stated in (40) and ranked in (41).

(40) a. **HDS-L**
The left edge of every foot-head is aligned with the left edge of some prosodic word.

b. **MAPGRIDMARK**
A foot-level gridmark occurs within the domain of every foot.

c. **INITIAL GRIDMARK**
A foot-level gridmark occurs over the leftmost syllable of a prosodic word.

d. ***CLASH**
For any two gridmark entries on level n ($\neq$ the base level) there is an intervening entry on level $n-1$.

(41) Constraint ranking for Nankina:

HDS-L

⇓
INITIAL GRIDMARK, MAPGRIDMARK
⇓
*CLASH

Under Hyde's approach, foot-structure is distinct from grid-structure. The grid structure is represented in the top layer with x's, the foot structure is given in the bottom layer, where vertical association lines '|' indicate foot-heads. His account would assign the type of structure in (42) to Nankina's odd-parity forms.

(42) /bOtAmO/ [^{m}bO(4A(mO] ' village'

Grid structure x x x
σ σ σ
Foot structure | |/

This allows his theory to refer to heads and grid marks independently. Hyde also assumes improper bracketing; feet that share a syllable. The tableau in (43) illustrates how these constraints interact to yield the correct output.

(43)

/mOtEni/ [mO(rE(ni] 'good'	HDS-L	INITGR	MAPGM	*CLASH
a. x x σ σ σ gf g	**!			
b. x σ σ σ g gf	*		*!	
c. x σ σ σ gfgf	*	*!		
d. ☞ x x σ σ σ g gf	*			*

Highly ranked HDS-L eliminates candidate (43a). MAPGRIDMARK excludes candidate (43b), because leaving its second foot-head stressless means that its second foot is also stressless. INITIAL GRIDMARK excludes candidate (43c), because its gridmark configuration does not position a gridmark over the initial syllable. The Nankina pattern in candidate (43d), which violates the low-ranked *CLASH, emerges as the winner.

It should be emphasized here that it is difficult to compare Gordon's analysis to Hyde's, or to the standard account discussed above because each one of them makes very different assumptions that run counter to the standard account. For example, while the standard account tolerates weak layering between prosodic categories, Hyde's proposed account requires strict succession. In the standard account stress and feet maintain a one-to-one correspondence, in Hyde's approach feet share a stress and sometimes feet remain stressless. In the standard account prosodic categories maintain proper bracketing, Hyde's account allows intersections: improperly bracketed feet that share a syllable. *CLASH and *LAPSE constraints play a major role in his theory, but on his account anti-lapse is an unvioable condition requiring alternation of foot-heads, while anti-clash is a vioable constraint requiring alternation of grid marks. Gordon's approach, on the other hand, differs from contemporary work in its grid-based rather than foot-based representations of stress. His theory does not appeal to the metrical foot. Moreover, it advocates novel constraints in their method of evaluation or their formulation, including five *LAPSE constraints: two non-position specific *LAPSE constraints and three sensitive to lapses at word edges, and a constraint ALIGN EDGES which requires that both the initial and the final syllable be aligned with a level 1 grid mark. *CLASH and *LAPSE constraints play a central role in his theory as well. Under his approach these high-ranking rhythm constraints do the work that is traditionally assumed by such constraints as PARSE-σ and FTBIN in generating left-aligning trochaic systems with degenerate feet. Thus, PARSE-σ and FTBIN do not figure in his theory.

So, it seems that we have to conclude that while the standard approach and the grid-based approaches have the same empirical coverage, the grid-based accounts make use of a set of constraints and structural assumptions that run counter to prevailing theories' fundamental principles and therefore the standard account is at an advantage. The result is that it is the one that is adopted in this paper and the grid-based analyses are included for the sake of completeness. Note now that although for the purposes of the present analysis FTMAX could replace *LAPSE since they are functionally equal the latter will be disfavored on the grounds that *LAPSE is not ternarity-specific constraint. This point is made explicitly in Elenbaas and Kager [16], in connection with Finnish.

Let us summarize the analysis arrived at so far. We have invoked five constraints altogether. The constraints, and their respective ranking, are given below:

(44)	PARSE-σ	Syllables must be parsed into feet.
	FTMAX	A metrical foot contains at most two syllables.
	FTMIN	A metrical foot contains at least two syllables.
	ALIGN-FT-L	Align (Ft, L, PrWD, L).
	FTFORM (Trochaic)	Feet are trochaic.

(45) Constraint ranking for Nankina stress:

PARSE-σ, FTMAX
⇓
FTMIN, ALIGN-FT-L
⇓
FTFORM (T)

3.3. Noncanonical stress

So far, we have not yet considered as candidates the forms that exhibit unstressable segments. Consider the following set of data in (46) and (47), repeated from (5) and (6).

(46) a. /bitsEp/ [^{m}b1.ts^{φ}E ⎛p] 'time'
b. /tipO/ [t1.pO⎛] 'rain'
c. /jikgA/ [j1k.^{N}gA⎛] ' your bag'

(47) a. /Ekwi/ [E. kwi ⎛] 'bad'
b. /AkwA/ [A.kwA ⎛] 'mess up'
c. /EtsEN/ [E.ts^{φ}E ⎛⎛N] 'light weight'

Looking at the examples above, we can see that initial syllables are not stressed. In (46), [1] causes the stress to surface on the word-final syllable where it would normally have surfaced on the penultimate vowel. The words in (47) are stressed on the syllable immediately following the one that would be the stress bearer if a regular trochee were projected in word-final position.

Following Piggott [27] and Mellander [28] we take the position that the systematic avoidance of stress by particular vowels is due to the fact that they are phonologically weightless (cf. Hyman [29]). In Nankina, canonical stress is interrupted when the vowel in the initial syllable is [1] or when onsetless syllables are adjacent to syllables of complex onsets. When this occurs, stress is shifted to the final syllable in disyllables. The avoidance of stress on weightless syllables can be accounted for by the constraint in (48) which demands quantitative unevenness between head and dependent syllables. In Nankina words with a weightless syllable HD-PROM forces stress shift placing the weightless syllable in the dependent position of the foot, consider the tableau in (49).

(48) HEAD PROMINENCE (HD-PROM: Piggott [27]; Mellander [28])
The head syllable of a foot is quantitatively greater than the dependent syllable.

(49)

/tipO/ [t1.pO⎛]	PARSE	FTMAX	HD-	FTMIN	ALIGN-FT-L	FTFORM (T)

‘rain’	-σ		PROM			
a. (t1(́.pO)			*!			
b. ☞ (t1.pO(́)					*	*

In the above tableau, the losing candidate parses [1] internal to the head syllable of the word, and hence violates HD-PROM because the weight of this vowel is not greater than that of the dependent syllable. The result, then, is that stress falls on the final syllable, in violation of the set of constraints restricting stress to the initial syllable, as a means of satisfying HEAD PROMINENCE.

To sum up this section, we have argued that the stress pattern in Nankina is a reflection of syllabic trochees aligned with the left edge, where a degenerate foot is allowed in odd-parity forms. (50) summarizes the constraints invoked in the analysis thus far.

(50) Ranking for Nankina stress:

PARSE-σ, FTMAX, HD-PROM
⇓
FTMIN, ALIGN-FT-L
⇓
FTFORM (T)

The remaining discussion proceeds as follows. Section 4 argues that onset consonants do not add to the weight of the syllable, and thus, never influence the location of word stress. Section 5 points out the inadequacy of HEAD-DEPENDENCE, a positional faithfulness constraint militating against the insertion of material into prosodic heads and presents an analysis exploiting a constraint on relative prominence within the foot. In section 6 a catalectic analysis for Nankina is considered.

4. Onset Sensitivity

Theories of stress assignment assume that syllable onsets do not determine a syllable’s ability to attract stress. In the frameworks of McCarthy [30], Hayes [11, 31] and Halle and Vergnaud [32] for example, the weight of a syllable is simply a matter of counting the number of segments in the nucleus and or the coda, the segments in the onsets are completely irrelevant. In Moraic Theory (Hyman [29]), onsets are not assigned mora based on the fact that onset deletion doesn’t trigger compensatory lengthening.

Yet, there are, however, a few exceptional cases of onset sensitivity. The most famous case is probably that of Mura-Pirahã (Everett and Everett [33, 34], Everett [35], which has a stress rule that is sensitive to the nature of the syllable onset. Stress is assigned to one of the last three syllables; whichever one has a long vowel. If more than one in a three-syllable window has a long vowel then the one with voiceless onset receives stress. If none of the last three syllables has a long vowel then the rightmost syllable with a voiceless onset bears main stress. Other cases of onset sensitivity include Alyawarra (Yallop [36]), Banawá (Buller and Everett [37]) (Ladefoged *et al.* [38]), Júma (Abrahamson and Abrahamson [39]), and Western Aranda (Davis [40]), in which main stress falls on the initial syllable if it begins with a consonant; otherwise main stress is placed on the second syllable. Bislama (Camden [41] and Nankina (Spaulding and Spaulding [1] are also claimed to treat syllables with complex onsets as heavier than those with simple onsets.

There have been several attempts to reanalyze these stress systems as completely as not being onset-sensitive. For example, Halle and Vergnaud [32] have reanalyzed Western Aranda, Levin [42] has reanalyzed Pirahã and Goedemans [43] has reanalyzed Western Aranda and Alywarra with no reference to onset weight. In this section, we propose to reanalyze this pattern and show that Nankina stress is not in fact sensitive to syllable onsets.

Nankina is characterized by canonical penultimate stress, as shown in (51), but if the second syllable begins with a complex onset (including an affricate), it receives the stress. The words in (52) illustrate this unusual stress pattern.

(51) a. /tOwuN/ [tO(.wuN] 'egg'
b. /wOtE/ [wO(.rE] 'a sore'
c. /jEwi/ [jE(.Hi] 'cause'

(52) a. /Ekwi/ [E. kwi (] 'bad'
b. /AkwA/ [A.kwA (] 'mess up'
c. /EtsEN/ [E.ts$^{\varphi}$E ((N] 'light weight'

At first glance, the Nankina stress rule seems to make a case for onset-sensitivity: syllables with complex onsets are heavier than those with simple onsets. It is difficult to maintain that reference to onset weight is needed. It seems rewarding to look at the data once again from an OT point of view. It will appear that in OT we can handle the kind of onset sensitivity that we find in Nankina without onset weight. We just assume that rhythmic reversal is triggered by [1] and by head vowels of onsetless syllables that are followed by complex onsets since the latter are phonologically weightless. Consider the data in (53) and (54), repeated from (46) and (47).

(53) a. /bitsEp/ [^{m}b1.ts$^{\varphi}$E (p] 'time'

b. /tipO/ [t1.pO⁄] 'rain'
c. /jikgA/ [j1k.^{N}gA⁄] 'your bag'

(54) a. /Ekwi/ [E. kwi ⁄] 'bad'
b. /AkwA/ [A.kwA ⁄] 'mess up'
c. /EtsEN/ [E.ts^{φ}E ⁄⁄N] 'light weight'

The same constraint ranking will therefore yield irregular stress whenever weightless syllables come into positions of canonical stress. The relevance of the above contrast is that onsetless syllables that are adjacent to syllables of complex onsets correlate with noncanonical stress, showing that the stress system does not count these vowels in the rendering of stress. This class of weightless vowels is empirically distinct from the class represented by the [1] examples, yet they both involve the same notion of HEAD PROMINENCE given here, allowing a certain amount of freedom in specification of the meaning of HEAD PROMINENCE. Thus, HEAD PROMINENCE, is playing a decisive role in the system. HEAD PROMINENCE dominates alignment, yielding a repositioning of the main stress foot within the prosodic word. It forces rhythmic reversal in disyllables placing the weightless syllable in the dependent position of the foot as the tableau in (55) below demonstrates.

(55)

/Ekwi/[E.kwi⁄]'bad'	PARSE-σ	FTMAX	HD-PROM	FTMIN	ALIGN-FT-L	FTFORM (T)
a. (E⁄.kwi)			*!			
b. ☞ (E.kwi ⁄)					*	*

Thus, Nankina stress is not sensitive to the nature of syllable onsets, and does not constitute a counterexample to the claimed linguistic universal that stress is never onset-sensitive. Nankina stress system is readily amenable to a reanalysis in which onsets play no role at all.

5. Against HEAD DEPENDENCE

In Nankina, canonical penultimate stress is interrupted when the penultimate vowel is epenthetic [1]. When this occurs, stress is shifted to the final syllable in disyllables (56).

(56) a. [p1.rA⁄] 'stand' (> Nankina /ptA/)

b. [g1.rA⁄s] 'grass, hair' (> Pidgin /grAs/)
c. [s1.ri ⁄p] 'sleep' (> Pidgin /slip/)
d. [s1.mO⁄k] 'smoke' (> Pidgin /smok/)
e. [s1.nE ⁄k] 'snake' (> Pidgin /snek/)

Recent optimality-theoretic analyses of this pattern of stress-epenthesis interaction have exploited the notion of HEAD DEPENDENCE (Broselow [8]; Alderete [9]; Mellander [10]), a wellformedness constraint that militates against the insertion of material into prosodic heads.

(57) HEAD DPENDENCE (HD-DEP: Broselow [8]; Alderete [9]; Mellander [10])
Every segment in the head *foot* must have an input correspondent.
(No epenthetic vowels in prosodic heads.)

On this account, the Nankina pattern can be analyzed in terms of the ranking below:

(58) PARSE-σ, FTMAX, HD-DEP
⇓
FTMIN, ALIGN-FT-L
⇓
FTFORM (T)

Let us consider a tableau for an input /ptA/ 'stand': the constraints proposed already select the attested output if HEAD DEPENDENCE is ranked higher than ALIGN-FT-L and FTFORM (T).

(59)

/ptA/[p1.rÁ] 'stand'	PARSE-σ	FTMAX	HD-DEP	FTMIN	ALIGN-FT-L	FTFORM (T)
a. (p1́.rA)			*!			
b. ☞ (p1.rÁ)					*	*

In the candidates above, epenthetic [1] has no input correspondent; this is because epenthetic vowels by definition do not stand in correspondence with underlying vowels. Therefore, parsing [1] internal to the syllable head of a trochaic foot, as in the first candidate, fatally violates HD-DEP. The optimal candidate is thus the form that satisfies the input dependence constraint by reversing the rhythm type of the stress foot.

The next set of data, in (60), shows however that not only the epenthetic [1] but also the non-epenthetic [1] triggers rhythmical reversal. In each form, stress is displaced to the final syllable.

(60) a. /bitsEp/ [^{m}b1.ts$^{\varphi}$Ép] 'time'
b. /tipO/ [t1.pÓ] 'rain'
c. /jikgA/ [j1k.^{N}gÁ] 'your bag'

Such patterning cannot be accounted for by HEAD DEPENDENCE since this positional faithfulness constraint is not violated by non-epenthetic vowels, and thus stress shift is incorrectly predicted in the context of epenthetic vowels only (56). In contrast, HEAD PROMINENCE does not distinguish between epenthetic and non-epenthetic vowels, and the correct pattern is predicted for both cases. On the other hand, positing two separate constraints to account for the behavior of epenthetic [1] and non-epenthetic [1] in Nankina misses the generalization that the patterning is identical.

In summary, the notion of HEAD PROMINENCE permits an adequate analysis of Nankina stress-epenthesis interaction in OT. The result illustrated here is that the initial syllable is skipped, in violation of ALIGN-FT-L, and FTFORM (T) because parsing it, as a weak member of the trochee would violate HEAD PROMINENCE.

6. Catalexis

There is now one fact left which is problematic for the account presented here, namely two-syllable words that have equal stress on both syllables. These either consist of words whose syllables each have the same vowel, or words whose initial syllable is [I], or words whose first syllable is a single vowel and their second syllable is CV or CVC as the examples in (61) (repeated from (7), (8), and (9)) show.

(61) a. /ςpmςk/ [ς⁄p.mς⁄k] 'cough'
/tsAwAt/ [tsA⁄.wA⁄t] 'machete'
/AwA/ [A⁄.wA⁄] 'grandmother'
/dςgςm/ [ⁿdς⁄.ᴺgς⁄m] 'hair'

b. /tsiwEt/ [tsI⁄.HE⁄t/ 'pit-pit'
/ipmςN/ [I⁄p.mς⁄N] 'let go'
/tsiwOt/ [tsI⁄.wO⁄t] 'garden'
/jipmςN/ [jI⁄p.mς⁄N] 'put it'

c. /ςjuN/ [ς⁄.ju⁄N] 'meat'
/AjEt/ [A⁄.jE⁄t] 'louse'
/AkAk/ [A⁄.kA⁄k] 'baby'

The problem we now have to solve is: how can we account for the fact that exceptional stress patterns such as these are possible? This can be accomplished in one of two ways. A first approach is to follow-up on a proposal for Dutch made by Van Oostendorp [44] that the lexical marking we need to posit is underlying prosodic structure. In accordance with the spirit of OT, it is proposed that feet can occur underlyingly anywhere in the word. Thus, the faithfulness constraint on underlying feet in (62) will do the appropriate work.

(62) MAX-FOOT: An underlying foot needs to have a correspondent in the output.

Now we must rank MAX-FOOT above FTMIN, so that protecting input [foot] specification is better than obeying the binary footing constraint. Consider the candidates for /ςpmςk/ [ς⁄p.mς⁄k] 'cough' in (63).

(63)

/ςp(mς⁄k)/ [ς⁄p.mς⁄k]'cough'	PARSE-σ	FTMAX	MAX-FOOT	FTMIN	ALIGN-FT-L	FTFORM (T)
a. ☞ (ς⁄p)(mς⁄k)				**	*	
b. ςp(mς⁄k)	*!			*	*	
c. (ς⁄p.mςk)			*!			

The constraint ranking in (63) does the correct work: (63a) is chosen over (63c) by virtue of MAX-FOOT, which prohibits the deletion of input material.

Yet, there is a theory-internal technical problem with this. There are arguments to assume that we need to specify underlying metrical structure for other words that surface with a pattern of final stress as well. Take for instance */tipO/* 'rain'. This word bears exceptional stress. It would be stressed on the penultimate syllable [t1⁄pO] if it followed the canonical stress of Nankina, but in actual fact stress always falls on the final syllable. It can be argued that the best way to describe this is to assume that it gets assigned a lexical stress, i.e. an underlying foot.

The problem now is that the initial leftover syllable must be parsed into a degenerate foot since this language displays exhaustive parsing. As far as we can see, differentiating these two types of exceptional stress requires some arguably ad hoc manipulation. Hence, an analysis built on MAX-FOOT is rejected. We, therefore, need a different type of lexical marking. The alternative analysis considered – and adopted here – is catalexis.

Catalexis, after Kiparsky [45], "is the addition of a metrical constituent at the edge of a prosodic domain, where it is adjoined to the superordinate metrical structure if permitted by the language's well-formedness constraints". It is the exact logical opposite of extrametricality. A phonetically null syllable (or grid beat) is added at the edge of the domain, where it becomes accessible to prosodic rules. Crucially, catalexis and extrametricality are subject to the Peripherality Condition. Thus, in a language like, Nankina with trochaic feet, a right-peripheral catalectic syllable is footed together with a preceding syllable. A word with final catalexis (indicated by square brackets) is illustrated below:

```
(64)                         (x) (x    . )
          /ςpmςk/            ςp.mςk[σ]
                             [ς⁄p.mς⁄k]        'cough'
```

This permits a syllabic trochee to be headed by the word-final syllable. In order to achieve catalexis, we invoke the quite standard constraint FILL (for Prince and Smolensky [2] parametrized following Inkelas [46] by the kind of structural entity it pertains to), and rank it low.

(65) FILL: Syllables dominate segmental material.

The constraint interaction resulting in outputs like those in (64) is depicted in tableau (66).

(66)

/ςpmςk/[σ]/ [ς́p.mς́k] 'cough'	PARSE-σ	FTMAX	HD-PROM	FTMIN	ALIGN-FT-L	FTFORM (T)	FILL
a. (ς́p.mςk.[σ])		*!					*
b. (ς́p.mςk)[σ]	*!						
c. (ς́p.mςk)([σ])			*!	*	**		*
d. ☞ (ς́p)(mς́k[σ])				*	*		*

As illustrated in the tableau in (65), our analysis correctly generates the correct output. Candidate (66a) crucially violates FTMAX, and candidate (66b) is eliminated by PARSE-σ. Both (66c) and (66d) violate FILL, because both contain null syllables in the output. Moreover, (66c) is worse than (66d) in two additional ways. First, in having a foot whose syllable head is weightless, violates HD-PROM. Second, it incurs two violations of ALIGN-FT-L by having its second foot two syllables away from the left edge of the prosodic word.

The catalexis-based proposal thus captures the pattern of stress within these words in a relatively simple fashion, using only trochaic feet. Unlike the proposal considered above, it handles exceptional stress without complication. For now, let us consider the consequences of catalexis.

A pleasing consequence of catalexis is that we can now explain the puzzling behavior of the disyllabic words in (61). The forms in (61) pattern as trisyllabic words in that they have stress on both the initial and the final syllable. The second advantage of a catalexis-based analysis is that it provides a unitary representation for all of these types of exceptions, providing a further generalization. Thus, there is no need to distinguish them as in (7), (8) and (9). These data are formally identical. The generalization becomes simpler; these are words with final lexically governed catalexis. In providing a neater generalization over the data, the catalexis-based account is at an advantage.

Projecting from the Nankina situation, we can say that the use of catalexis does not eliminate degenerate feet completely. One of the fundamental claims of the theory using catalexis is that there are no degenerate feet, period, and that where there appear to be degenerate feet, there is in reality a "segmentally empty metrical position at the right edge of the word" (Kager [47]. Because these words are disyllabic the feet built on them are both catalectic and degenerate.

The Nankina data also argue against a number of theoretical claims. First, it was claimed that FT-BIN is never violated because where degenerate feet are required for the analysis of final secondary stresses in odd-numbered words in certain languages syllable catalexis permits parsing into syllabic trochees, ensuring that all feet are binary. The data shows clearly that FT-BIN is violable despite the adoption of catalexis. Secondly, an attempt to argue that the apparent final stresses are really phonetic effects due to lengthening or intonational factors may be plausible for some cases but will not work for the Nankina case, where the putative foot is constructed over the *initial* as well as over the *final* syllable. Thirdly, in the cases of a final closed syllable (/ςpmςk/ [ς́p.mς́k] 'cough') one might suppose that the feet built on these syllables are not degenerate, but well-formed syllabic trochees after Hayes' modified definition, stating that a degenerate foot for syllabic trochees systems is a *light-syllable* foot (Hayes [11]). But then there are many words ending with an open syllable, where the same structure arises (such as /AwA/ [Á.wÁ] 'grandmother') so that the assumption of a wellformed trochee does not hold. Furthermore, as already shown in the previous sections, the language allows degenerate feet with the structure CV (/bOtAmO/ [^{m}bÓ.4Á.mO] 'village'), thus, degenerate feet in strong metrical position must be allowed in Nankina.

7. Conclusion

This paper has shown that the following parameters govern stress in Nankina:

- Nankina is a quantity-insensitive language.
- It forms syllabic trochees at the right edge of words.
- Foot is exhaustive. An optional degenerate foot is in the first syllable.
- Exceptional stress is restricted to final stress on some disyllabic words that begin with a weightless syllable and equal amount of stress on both syllables of some underlyingly trisyllabic words.

Optimality Theory, in the form of the constraint hierarchy in (67) has been used in the analysis of stress in Nankina. The constraints PARSE-σ, FTMAX, FTMIN, ALIGN-FT-L and FTFORM (T) have been shown to account for the regular trochaic pattern. The constraint HD-PROM ensures that one kind of exceptional stress pattern in disyllables is enforced through rhythmic reversal. By the use of final catalexis and by invoking the constraint FILL, another kind of exceptional final stress is generated as a direct consequence of the trochaic foot structure.

(67) Final ranking for Nankina stress:

PARSE-σ, FTMAX, HD-PROM
⇓
FTMIN, ALIGN-FT-L
⇓
FTFORM (T)
⇓
FILL

Thus, the conclusion is that a standard OT account of the complex Nankina stress phenomena is feasible. We believe that this analysis is more conservative in its theoretical assumptions than are grid-based analyses. The ability to characterize such complex patterns of stress without compromising the basic tenets of OT as a theory is critical to its success; it is therefore important that extensions to the model be minimal.

Our analysis of Nankina exceptional stress has appealed to a constraint on prosodic wellformedness, which requires the head syllable of a foot to be more prominent than a dependent syllable, and to prespecification. We have shown that OT provides the means to mark diacritic features in the lexicon in form of prosodic structure. It is precisely 'richness of the input' aspect of OT that makes the prespecification account so successful. In her analysis of Turkish exceptional stress, Inkelas [46] has proposed two contrasting OT-analyses of the data. One analysis made use of morpheme-structure constraints. The other analysis made use of prespecification in the lexicon. Inkelas has shown that both analyses were descriptively adequate. Thus, the lexical account was preferred on explanatory grounds. On her lexical account FINAL-STR, an alignment constraint, which requires the word-final syllable to be stressed, dominates FILL, the constraint against null syllables. This alleviates the need to have a catalectic constituent present in the input. A similar analysis cannot be extended to the Nankina data because it would lead to a theory-internal technical problem similar to the MAX-FOOT analysis, which uses an input foot. Had foot assignment in Nankina been non-iterative, the MAX-FOOT analysis would have been disfavored on explanatory grounds and this would have made an argument for the superiority of an analysis of exceptionality in which catalectic candidates win. This study shows, then, that there is no obvious way in which to avoid utilizing underlying metrical structure to characterize these examples of irregularly stressed bisyllabic words. These classes of exceptional stress with final catalexis pattern with trisyllabic words on the grounds that the syllabic trochee is the only foot, which can capture the entire stress system of Nankina; it is the presence of this underlying structure, which distinguishes these exceptional stress patterns from default ones. Such would constitute strong evidence for catalexis.

In testing the phonological predictions the theory using catalexis makes, we can confirm a few predictions. First, languages with final stress, which lack vowel length, must lack word minima, i.e. monosyllabic words are allowed. A second prediction is that the ban on weak degenerate feet corresponds to a lack of catalexis. Discussions above, as well as the data presented in section 2 imply that these predictions are indeed valid for Nankina.

Finally, we believe that the analysis of Nankina data presented here can contribute a part in the controversy over the issue of onset sensitivity in stress systems, in demonstrating that onsets may not contribute to a syllable's weight.

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الإيقاعات ا ابطة اللغة النانكينية

عواد أ د دان الأ دي ا ر
أستاذ علم اللغة المشارك بقسم اللغة الإنجليزية بجامعة أم القرى

(قدم للنشر في ١٤٢٥/٣/٣٠هـ ؛ وقبل للنشر في ١٤٢٥/٨/١٩هـ)

ملخص البحث. يقدم هذا البحث تحليلاً لنظام النبر في اللغة النانكينية وهي إحدى لغات بابوا- غينيا الجديدة، ويطبق الكاتب في تحليل هذه اللغة نظرية الإستمثال التي بدأت في كتابات برنس وسمولنسكي ١٩٩٣م. وتعكس هذه اللغة نمطاً يسمى الإيقاع الهابط تتكون وحدته الإيقاعية من مقطع منبور فمقطع غير منبور، وتنشأ هذه التفعيلة من الحافة اليمنى للكلمة مما يتسبب في وجود تفعيلة متردية في الحافة اليسرى وتصادم في النبر. وقد قدمنا الدليل على أن حقائق النبر في هذه اللغة يمكن معالجتها بدون تعريض أصول نظرية الإستمثال وقوانينها لأي خسارة في الفرضيات الأساسية، لذا فإن هذا التحليل أكثر إجتهاداً من التحاليل القائمة على الشبكة في مراعاة القوانين العتيقة لهذه النظرية، ويظهر التحليل الذي قدمناه كيف يمكن صياغة النبر الاستثنائي بقيود نموذجية، كما يظهر أن الحذذ (حذف مقطع من آخر الكلمة) يسهم بشكل فعال في تحليل هذه اللغة كلغة قائمة على الإيقاع الهابط. وتقدم أنماط هذه اللغة دليلاً بخلاف الرأي القائل إن مستهل المقطع يسهم في معادلة ثقل المقطع ودليلاً بخلاف قيد الوفاء الموضعي المسمى الإعتماد الرأسي الذي يحظر إقحام مواد في الصدر الفوقطعي.