The Syllable in Defaka: A Re-analysis

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Abstract
Defaka is a grossly endangered Ijoid language spoken in the Eastern fringe of the Niger Delta Region of Rivers State, Nigeria; precisely, the Opobo-Nkoroo Local Government Area. This paper discusses the syllable structure of Defaka within the Optimality Theoretic framework. The data for the work was elicited from fluent speakers of the language using the SIL comparative African word list. OT is a constraint-based theory where an optimal form is selected through a set of ranked constraints. Blevin, (1995) makes reference to two types of tone and stress languages; those in which mapping of stress and tone differ for heavy and light syllables and those in which such weight is irrelevant. Defaka fits into the first case where the mora or weight unit is viewed as the tone bearing unit. Essien, 2013 identified six basic syllable types for Defaka. The present analysis, on a closer look identified four basic syllable types for Defaka. This discrepancy forms the main thrust of the present analysis. Defaka has both open and closed syllables. The four syllable types re-analyzed are V, CV, VV and CVC. Onsetless syllables are permitted in all positions. Only the bilabial nasal can occur as coda in indigenous words. There are no phonological complex onsets in the language.

1. Introduction
The Defaka people are a small speech community sharing an island with a dominant population of the Nkoo̩roo̩o̩ (traditionally known as Kirika by its indigenes), whose linguistic relatives are the Kalabari, Okrika and Ibani. A fragmented portion of the Defaka speaking community live on an island called Iwoama and some fishing settlements around Nkoroo. The Defaka are bilingual. They speak Defaka and Kirika. The stigmatization of Defaka by the Nkoroo has resulted in heavy language shift which has reduced the functional domain of Defaka, over the years from being used in a healthy traditional society, to use within the Defaka ward in Nkoo̩roo̩o̩. The Defaka and Kirika people are predominantly fishermen. They engage in similar economic pursuits. They trade in such sea products as crayfish, periwinkles, crabs, oysters and several kinds of fishes. They also engage in basket weaving, net making, thatch making, petty trading and subsistent farming. Trading activities are carried out with their surrounding neighbours-the Andoni, Ogoni and Opobo people. Their involvement in trading with these neighbours, facilitate the speaking of a number of these languages, Nigerian pidgin and Igbo, (the Opobo variety) ranking top most on the list.

The population of Defaka speakers as cited by Ethnologue is put at 2000 (Lewis, 2009). Recent field research estimates the number of Defaka speakers within and outside Nkoo̩roo̩o̩ to be between 50 to 100, and fluent speakers to be less than 50. There are hardly any fluent speakers among the young adults in the community. Most fluent speakers are within the age of 50 and above. It is expected that the language might be extinct in the next forty years, since intergenerational transmission

has long ceased. To corroborate this claim on the language situation of Defaka, Essien (2013) carried out a sociolinguistic survey. Three separate surveys were adopted to investigate the use of languages in Nkoroo town, (where Defaka occupies one ward); the village profile (cf, Vossen 1987); a household survey; and a school-based survey. The aim was basically to investigate what languages are known and their communicative domains. The combined results of the three surveys give clear insight into the linguistic situation of Nkoroo town and its environs.

The first of three surveys produces a village profile which consists of a group interview with chiefs and village elders. The questions are designed to provide answers pertaining to the linguistic structure of the village; elicit information relating to village amenities such as, schools, religious institutions, medical facilities, water and electric services, and village history.

The second is the household survey, which entailed a door-to-door survey of selected households. A total of 301 homes were visited; 57 in Defaka ward, 231 in other parts of town and 16 in Iwoama. (Iwoama is an extension of the Dafaka ward in Nkoroo town, with a predominant population of Defaka speakers). All homes in the Defaka ward in Nkoroo town and Iwoama were visited, since these are the areas where Dafaka is spoken, to enable us have a clear picture of the state of the language. One adult member of the household was interviewed to provide information on the knowledge and use of language of both adults and children in the household. The survey was conducted by members of the project team and local assistants.

The third survey is the 'school-based survey'. This was conducted in primary and secondary schools in Nkoroo town and the only primary school in Iwoama by members of the research project, with the assistance of the headmasters of the different schools. Central to our investigation is the household survey. The household survey provides clear insight as to the knowledge and use of language in the community. The school-based survey only confirms the results of the household survey. We shall therefore provide a summary of the results for the household survey for Defaka and Kirika only, (Kirika is the traditional name by which the Nkoroo call their language (note that, Nkoroo town is a shared community by the Defaka and Kirika). The household survey asked four questions, and for each, answers were grouped according to age, adults, children aged 5-15, and children aged 1-5. Figures are provided for only three of the questions in this paper, since they are considered more salient for the purpose. The tables below provide percentages showing the knowledge and use of Defaka and Kirika.

Table 1: Language knowledge

	Defaka	Kirika
Adult	31%	100%
Children 5-15	23%	93%
Children 1-5	10%	88%

The report in table 1 reveals that the use of Defaka is on the decline and intergenerational transmission has greatly waned. The majority of Defaka, speak Kirika.

Table 2: Language spoken at home

	Defaka	Kirika
Adults	28%	99%
Children 5-15	23%	89%
Children 1-5	20%	87%

The declining status of Defaka is further confirmed by the figures in table 2. The figure given for children 1-5, reveal a degree of sentiments expressed by adults with regards to the declining state of their language (note that adults are the ones reporting on language use by their children). The figures for adults in table 2 when compared to table 1 show that, not all adults who claim to have knowledge of Defaka use it at home.

Table 3. Languages spoken outside the home.

	Defaka	Kirika
Adults	20%	100%
Children 5-15	10%	88%
Children 1-5	1%	75%

The results presented in the tables above clearly reveal the declining status of Defaka. Defaka is spoken only in the home and that also sparingly. Adults may communicate in Defaka outside their homes, but only marginally. Intergenerational transmission is broken to a large extent. The figures generally, reveal a shift to Kirika.

The first linguistic description of Defaka was carried out by Jenewari (1983; 1989), who was primarily concerned with its linguistic affiliation. With evidence based on sound correspondences and grammatical relatedness, he classified Defaka as an Ijoid language The other two linguistic descriptions of the sound system of Defaka were done by Bob-Manuel (1990), a long essay for the B.A degree and 'The Phonetic Structure of Defaka by Ladefoged et al (1996/97). Essien (2013) appears to be the most detailed analysis of the phonology of Defaka. In that analysis, she identified six basic syllable types while the present analysis posits four basic syllable types. This discrepancy is one of the main thrust of the present paper.

2. Methodology

The data for this work was got through elicitations based on the 1700 SIL Comparative African Word List. Our primary consultants were fluent native speakers of the language between ages 45 and 78. This paper is part a larger work done on the language. The field work lasted for a period of three years which involved documentation of aspects of the culture of the people. Audio and video recorders were used to both elicit and document data. Data extracted for the analysis of the syllable structure were organized into different categories based on the syllable makeup of the lexical items. Analysis for this paper is carried out within the OT framework.

3. Theoretical Framework

This paper adopts Optimality Theory of Prince and Smolensky as theoretical framework. OT is a theory of constraints that proposes that Universal Grammar (UG) is made up of a set of violable constraints (Sunday & Oyatokun, 2016). The fundamental idea in OT is that, Universal Grammar consists of a set of constraints on representational well-formedness and from these, individual grammars are constructed. (Prince and Smolensky, 1993). These constraints are ranked in different ways in each language and there are two sets of constraints: faithfulness and markedness constraints. Constraints are ranked hierarchically and the most important part of any OT analysis is a collection of constraints rankings. Generally, an input receives a set of output candidates. These candidates are evaluated against the constraint hierarchy. The optimal output form is the one which least violates the hierarchy of constraints. The elements of a ranking argument are illustrated with a tableau.

A summary of the constraints for the syllable structure of Defaka is given below:

i. ONS: Every syllable must have an onset.
ii. *COMPLEX: Complex onsets are not allowed.
iii. *VV: A VV sequence is prohibited
iv. *CODA: Codas are prohibited

These four constraints participate in the syllable structure analysis according to their relevance. A ranking of these constraints is given below:

ONS>>*VV>> *COMPLEX

Tableau 1: Constraint tableau for CV syllable in /wá/ 'we':

/wá /	ONS	*VV	*COMPLEX
a. [wáá]		*!	*
b.[á]	*!		
☞c.[wá]			

The choice of OT as a formal framework of analysis for the Defaka data is based on its simplicity, clarity and analytic tenets.

Syllable Structure

The syllable, according to Blevins, (1995:207), is described as the phonological unit which organizes segmental melodies in terms of sonority. Syllabic segments are equivalent to sonority peaks within these organizational units. Closely following this definition, Blevins, (1995) also makes reference to two types of tone and stress languages; those in which mapping of stress and tone differ for heavy and light syllables and those in which such weight is irrelevant. Length is distinctive in Defaka, so, Defaka fits into the first case where the mora or weight unit is viewed as the tone

bearing unit. The mora or weight unit is formed as follows: a syllable onset does not represent any mora, a syllable nucleus with a single short vowel (V- nucleus) represents one mora, one with a long vowel (VV-branching nucleus) represents two moras. Consonants serving as syllable nuclei also represent one mora. Monomoraic syllables are said to be light syllables; bimoraic syllables are heavy syllables.

Following the definition and analysis above, Essien (2013) identified six basic syllable types in Defaka,

1)	V-	í-kpá	'skin'
	VC	ʔɔ́m	'body'
	CV	jè	'it'
	(C)VV	ìì	'heavy'
		ɓáá	'moon'
	CVC	nɔ́m	'human being'
	N- homorganic syllabic nasal		
		ḿ-bé	'be strong'

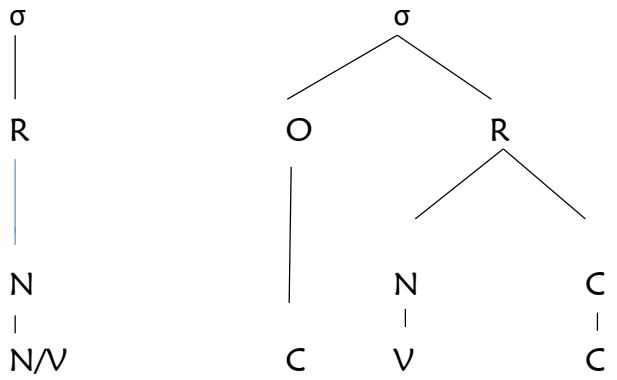
In the present description and analysis, we posit four basic syllable types for Defaka. A close examination of our data reveals that, the VC syllable type can be subsumed under the CVC syllable type because from the available data, we find the VC syllable type occurring only in words which begin with back vowels. These words are not necessarily restricted to a particular word class and their occurrence in the language, specifically from the available data is rather tenuous. The occurrence of the glottal stop as shown in examples (2) below is phonetic since it occurs only before back vowels.

2)	ʔɔ́m	'body'
	ʔṳ̀ṳ̀	'earth/ ground'
	ʔúóì	'ten'
	ʔṳ̀mbà	'sit down'

In the same vein, the N- syllable type can be captured under the V- syllable type since they both constitute the nucleus of a syllable as shown in examples (3) below.

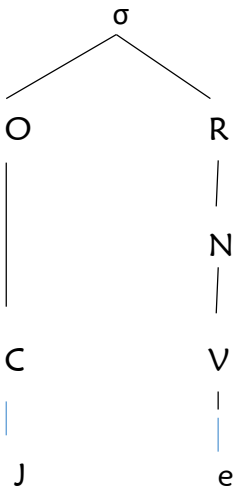
3)	m.bé	'be strong'
	ǹ.sú.á	'to enter into'
	ŋ́.gí	'axe'
	ŋḿ.kpè	'brain'
	ŋ̀.já̋à̋	'to walk'

The examples in 2 and 3 are illustrated in the tree diagrams below



Data Presentation and Analysis
CV Syllable Type

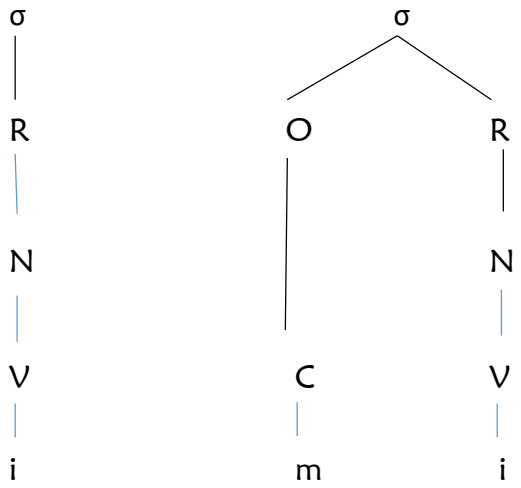
4) jè 'it' á.má 'town'
wá 'we' ɔ́.jɔ̀ 'eye'
ní 'they' ò.bò 'back'
ò.pè.pè 'sun set' kɔ́.kɔ̀ 'all'
ɔ̀.bɔ̀.bɔ̀.nɔ̀ 'banana' sɔ́.nɔ́ 'ant'



The **CV** syllable type is the basic syllable type in Defaka. It occurs in all positions: initial, medial and final positions as the examples in 4 show.

V-Syllable Type

5) /i/ í.mì 'present' ḿ.bé 'be strong
/e/ è.bè 'pig' ŋ́.gí 'axe'
/ɛ/ ɛ̀.sɛ́ 'to see' ŋḿ.kpé 'brain'



Defaka manifests an onsetless syllable as seen in example 5. This syllable type may occur in all positions but more productively in word initial position. It incorporates the N syllable type posited by Essien (2013). For the avoidance of redundancy, the present analysis posits the V-syllable type to account for whatever constitutes the nucleus of a syllable in the language.

Sequences of vowels are a very productive phenomenon in the language. These could be identical or non-identical vowels. Evidence from the available data shows that vowels freely co-occur in the language. The V- syllable type may occur word finally or medially (V-syllables occur sparingly in medial position) in a sequence with another vowel. Some examples are given in (6) below.

6) í.á 'water' dɛ̀.ù.mà 'to soak' bṵ̃.ɔ̃́ 'to call '

ɓá.í 'male' tɔ̀.ì 'brother' ɓù.ò 'fishing'

bí.é 'slave' ká.à 'hand' ʔú.ó.ì 'sickness'

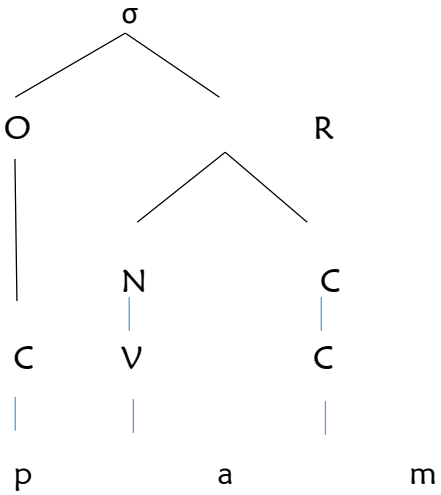
CVC Syllable Type

7) ɓɛ́m 'bee' fɔ̀m 'to bail water'

pám 'scar' fúm 'to faint'

gbɔ̀m 'peck' lɔ̀m 'palmnut'

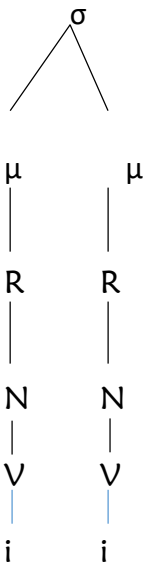
bɔ̀m 'child' bì à̀m 'trap'



As mentioned in our earlier discussion, Defaka admits codas. The only phoneme allowed as coda in indigenous words in the language is the voiced bilabial nasal /m/ as shown in the examples in (7). Other segments which are allowed as codas occur only in loan words, as observed from the available data. These are, /l/- /gol/ 'gold', /f/- /m̀bùlôf/ 'envelope' /n/- /pân/ 'pan'.

(C) VV Syllable Type

8) ìì 'heavy' ɓáá 'moon'
èè 'eat' dɛ́ɛ́ 'chief'
ɔ̀ɔ 'daybreak' ʔṵ̀ṵ̀ 'ground'

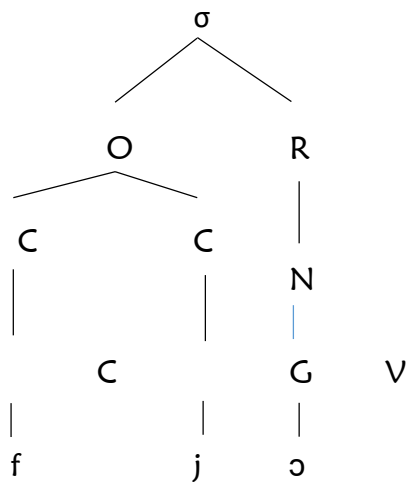


The mora or weight unit is the tone bearing unit in Defaka. A syllable onset does not represent any mora, a syllable nucleus with a single short vowel (V- nucleus) represents one mora, one with a long vowel (VV-branching nucleus) represents two

moras. The (C) VV syllable type may have an onset or may be onsetless as shown in the examples in 8.

Derived syllable types

9) CGV fìɔ̀ → fjɔ̀ 'suck'
kùɔ̀ → kwɔ̀ 'chest'
ɔ̀.bìɔ̀ → ɔ̀.bjɔ̀ 'inside'
kía̋ → kja̋ 'market'
ŋ́.gíè → ŋ́.gjè 'run'



There are no phonological complex onsets in the language. Complex onsets are phonetically realized through a process of glide formation and the deletion of a high vowel between a plosive and a liquid as shown in the examples in 9 and 10. Words consist of one or more of these syllable structures. No particular syllable structures are restricted to particular word classes.

CV-CV→CCV

10) m̀.bì.ré → m̀.brě 'name of a family'
ɔ̀.tù.ɓù.rù → ɔ̀.tù.ɓrù 'name of a family'
pí.rí.!ká → prí.!ká 'half'
tì.rì.ɓà → trì.ɓà 'outside'
ì.tì.kì.là → ì.tì-klà 'head pad'
kì.lá̋à.rì → klá̋à.rì 'bead'

OT Analysis

The OT analysis in this paper reveals how constraint ranking account for the syllable distribution of Defaka. The markedness and faithfulness constraints are determined by the description of the attested syllable in section. An examination of the syllable

structure of the language yields the faithfulness constraint MAX-IO and the markedness constraints ONS, *VV, *COMPLEX and *CODA.

A summary of the constraints for the syllable structure of Defaka is given below:

i. MAX-IO: All elements in the input are present in the output.
ii. ONS: Every syllable must have an onset.
iii. *COMPLEXONS: Complex onsets are not allowed.
iv. *VV: A VV sequence is prohibited
v. *CODA: Codas are prohibited

These five constraints participate in the syllable structure analysis of Defaka according to their relevance. A ranking of these constraints is given below:

MAX-IO>> ONS>> *VV>>*COMPLEX>>*CODA

The constraint ranking ONS>>*VV>>*COMPLEX is drawn from the expanded constraint ranking above.

Tableau 2: Constraint tableau for CV syllable in /wá/ 'we':

/wá/	ONS	*VV	*COMPLEX
a. [wáá]		*!	*
b. [á]	*!		
☞c.[wá]			

The analysis in Tableau 2 produces candidate c.[wá] as the optimal and attested output form. In this analysis, two candidates (a) and (c) satisfy the top most ranking constraint ONS. Candidate (a) however loses out as it fatally violates the second top ranking. Candidate (c) satisfies the top ranking constraints ONS and *VV and is thus the optimal form.

Tableau 3: Constraint tableau for V syllable in / í-mì / 'present':
In this analysis, attention is on the initial syllable

/í-mì/	MAX-IO	ONS	*VV	*COMPLEX
a. [mí.mì]	*!			
☞b.[í.mì]		*		
c. [mrí.mì]	*!			*
d. [íí.mì	*!	*		

Candidate (b) is the optimal candidate. It satisfies the topmost ranking constraint MAX-1O. candidates (a), (c) and (d) are disqualified as they violate the highly ranked MAX-1O and are thus the losers. Although candidates (a) satisfies every other constraint apart from the faithfulness constraint MAX-1O, it is not chosen as the optimal form because it does not satisfy this topmost ranking constraint. Therefore, the acceptable form in the language is [í-mì] with a syllable at word initial position in the given example.

Tableau 4: Constraint tableau for CVC syllable in /gbɔ̀m/ 'peck':

/gbɔ̀m/	MAX-IO	ONS	*VV	*COMPLEX	*CODA
a. [ɔ̀m]	*!	*			
b. [gbɔ̀]	*!			*	*
☞c.[gbɔ̀m]				*	*
d. [gbrɔ̀m]	*!			*	*

Candidate (c) gbɔ̀m is the optimal candidate. The other output forms generated by GEN fatality violates the highest ranking constraints MAX-1O

Tableau 5: Constraint tableau for VV syllable in /i̗i̗/ 'heavy':

/i̗i̗/	MAX-IO	ONS	*VV	*COMPLEX	*CODA
☞a.[i̗i̗]		*	*		
b.[bri̗i̗]	*!		*		
c.[i̗]	*!	*			
d.[i̗m]	*!	*			*

Candidate (a) emerges as the optimal output as it satisfies the highest ranking constraint MAX-1O, though it violates the constraints ONS and *VV
The OT analysis of Defaka syllable reveals the importance of the faithfulness constraint in the language. This constraint defines the syllable structure of this language.

Conclusion

From our analysis, we conclude that Defaka has four basic syllable types- CV, V-, CVC and VV. There are no phonological *CCV structures. What appears to be clusters of consonants in (9) and (10) above are the result of glide formation and the deletion of an intervening high vowel between a plosive and a liquid. The OT analysis of the syllable structure of Defaka reveals the faithfulness constraint as the most important

constraint in the syllable patterning of Defaka. Any violation of the faithfulness constraint renders the syllable type unacceptable in the language.

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