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Syllable Structure in Sɛlɛɛ

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Abstract

The paper describes syllable structure that is characteristic of *Sɛlɛɛ*, a Kwa language spoken in some parts of the Volta Region of Ghana. Premised on the Moraic Phonology (Hayes, 1989), the paper accounts for the application of the syllable as phonological processes conditioned by morphological and phonological domains based on the primary data available. The paper suggests that the language has eighteen (18) consonant segments and sixteen (16) vowel segments and postulates that the alveolar stop [d] and the lateral [l] are contrastive segments. *Sɛlɛɛ* has a syllable weight of CV-light and CVː-heavy as the name of the language [sɛlɛː] suggests.

Keywords: Sɛlɛɛ, Syllable, Segment, Santrokofi, Kwa Language

Introduction

This paper describes the syllable structure as a phonological process that is characteristic of Sɛlɛɛ, a Kwa language spoken in the Santrokofi area of the Volta Region of Ghana. Sɛlɛɛ is a common language spoken by the people of Benua, Bume and Gbodome; these three villages are located between Hohoe and Jasikan. The speakers of Sɛlɛɛ are called Balɛɛ. Allen (1974) examines certain phonological processes occurring at the segmental level describing the alveolar stop [d] and the alveolar lateral [l] as allophones and that their distributions are complementary in Sɛlɛɛ, which I disagree in this paper. Agbetsoamedo (2014) describes some aspects of the grammar of *Sɛlɛɛ* and notes that subject clitics and noun class prefixes are subject to vowel harmony with the vowel of the first syllable of a stem. She also agrees with Allen (1974) that vowel harmony involves the feature [ATR] and introduces the feature [± high] to the Sɛlɛɛ harmonic system.

In this paper, the Moraic Phonology is employed to account for the application of the syllable structure based on the primary data available which show bijective (one-to-one) relations between the segments of the language. The paper argues that the segments [d] and [l] are contrastive in Sɛlɛɛ and concludes that the language has a syllable weight of CV-light and CVː-heavy. Again, it [Sɛlɛɛ] allows a system of complex onsets in which Codas are completely banned (e.g. CV, CCV *CVC). In this paper, I present the

orthography in "< >" and the phonemic transcription of the stems and number suffixes in "[ ]". However, for easy interpretation of the data, the IPA transcription is used.

Data

Both primary and secondary data were used in this paper where interview was employed as the main instrument for the data collection. Six (6) consultants, who were engaged, consents were sought personally before the interview exercise. The consultants from each area were three (3) males and three (3) females who were between the ages of 30 and 70 years. Two (2) field assistants who were a farmer and a Bible translator did not form part of the respondents; the field assistants were aged 42-65 years. The secondary data were collected from existing works on Sɛlɛɛ phonology (Allen ,1974; Agbetsoamedo 2014) while the primary data were collected through focus interviews in the Santrokofi areas.

The interview methods employed were rapid and anonymous surveys interviews and sociolinguistic interviews as by Milroy and Gordon (2003) and Inusah (2017). With the rapid and anonymous surveys, the researcher elicited a set of words or phrases in an entirely naturalistic condition where he examined the pronunciation of words among people who were seen catering for different socioeconomic strata. The procedure was to ask for directions to the location of some items already known in advance. The response was recorded with an audio recorder and later transcribed. This method is, however, applicable only if the investigator has in mind extremely clear goals that have been formulated in advance.

The sociolinguistic interviews were conducted on one-on-one with the consultants with structured questions asked in a predetermined order and a prescribed form with a more flexible interview protocol. The basic objective was to elicit the data in a relaxed 'natural' usage; each interview section lasted about one to two hours. The interviews were recorded with an audio tape and a video recorder and the data -were later transcribed with the help of two native speakers who were also the field assistance. The data were collected in Santrokofi area (Benua, Bume, & Gbodome) in the Volta Region where Sɛlɛɛ is mainly spoken.

Segments in Sɛlɛɛ

This paper argues that [d] and [l] are contrastive with each other and other phonemes in the language, so they are different phonemes as illustrated in the minimal pair test in Table (1) and their distribution in Table (2).

Table 1: Minimal Pair Test for [d] and [l]

/l/	la ‘particle’		laka ‘bear’		ɔla ‘branch’
/d/		du ‘fetch’		di: ‘day’	ɔda ‘sister-in-law’
/p/	pa ‘beat’				
/t/	ta ‘give’	tu ‘taste’	taka ‘rise’		
/f/	fa ‘lay’	fu ‘receive’			
/k/	ka ‘read’	ku ‘and’	kaka ‘until’		ɔka ‘chief’
/s/	sa ‘sing’			si: ‘much’	
/w/	wa ‘come’	wu ‘hoot’		wi: ‘pour’	
/ɲ/		ɲu ‘look’			
/j/	ja ‘buy’	ju ‘steal’	jaka ‘hot		
/n/		nu ‘bite’		ni: ‘quench’	
/kp/	kpa ‘fall’				

Tale 2: Distribution of [d] and [l]

Segments	Word-Initial		Word-Medial			Word-Final
/l/	lipo:	‘forest’	kolo	*kodo	‘sky’	
	likpeŋkpe	‘hill’	bla	*bda	‘make’	
	lejo	‘room’	ɔla	*ɔda	‘branch’	
	lɛkɛ:	‘kidney’	bu:lɛ	*bu:dɛ	‘rotten’	
	laŋkɛ	‘crocodile’	kakele	*kakede	‘stream’	
			olisatu	*olisatu	‘dawn’	
/d/	dipi:	‘poverty’	kudu	*kulu	‘noise’	
	ditu:	‘clay’	odu	*olu	‘root’	
	dibi	‘drum’	ntudinbiyɔ	*ntulinbiyɔ	‘well’	
	dibintuwe	‘anus’	aditabi	*alitabi	‘maize’	
			ɔda	*ɔda	‘sister-in-law’	

From the data in Table (2), it appears that the two sounds [d] and [l] occur in similar environment in both word-initial and word-medial but do not occur in word-final, so it is most probable that they are contrastive, and hence separate phonemes. [d] is observed not to occur in words that rhyme with [la] in the first column while [l] is also observed no to occur in words that rhyme with [d] in the second column. So other minimal sets are set up until [d] and [l] units of the language have been tested as seen in column six which shows the occurring of the two sounds in a similar linguistic environment.

The segments [d] and [l] are not allophones in the language because they are not variants of the same phoneme since allophones are variants of a phoneme which differ but do not contrast (Inusah, 2020, 2021). Thus, [d] and [l] both occur in similar environment of word-initial before a vowel and word medial between vowels as in the distribution in Table (2). The only variation is that [d] occurs before a high vowel /i/ in word-initial and intervocalic position before high vowels /i, u/ while [l] occurs in the same environment

before both high and low vowels. This may trigger the reason why Allen (1974) describes them as allophones and explains that they are in complementary distribution. Unfortunately, they don't complement each other, for both sounds [d] and [l] appear before the vowel [i] (e.g. lipoː, dipiː), before [a] (e.g. ɔda, ɔla) in both word-initial and word medial and since they occur in similar environment, it is most probable that they are contrastive, and hence separate phonemes. Allen (1974) provided the following data to support her claim, {*} marked on the underlying form and the villages are not part of the original data, I put the mark there because those forms are ungrammatical in the major dialect of Sɛlɛɛ:

1. Alternation between [d] and [l] (cf. Allen, 1974, p.65)

S/N	Underlying form	After rule	Benua	Gbome / Bume	Gloss
a.	[*dí-saā]	[lɛ-saā]	[lɛ-saā]	[lɛ-saā]	'thing'
b.	[*dí-yō]	[le-yō]	[le-yō]	[le-yō]	'house'
c.	[di-bĩ]	[di-bĩ]	[di-bĩ]	[li-bĩ]	'drum'
d	[*dipóó]	[lipóó]	[lipóó]	[dipóó]	'forest'

Allen (1974) argues that the lateral [l] is derived from the stop [d] after a realisation rule that states that /d/ → [l] /___v [-high]. This realization rule may not be applicable since both [d] and [l] occur before a high vowel [i] in the language as seen in the data in (1). Examples (1a), (1b) and (1d) are ungrammatical and cannot be the underlying form in the language; even if it is so, there is the need to provide evidence to show how they complement each other by occurring in different environments, how they do not contrast in such environment and what accounts for the high vowel [i] to change to mid vowels [ɛ, e] to trigger the sound change from [d] to [l] since they both have the same place feature [+alveolar]. One thing that is clear about allophones in the communication process is that allophones are entirely predictable according to the phonetic environment and thus carry no useful information. I, however, suggest that even if we follow Allen's (1974) argument, the two sounds [d] and [l] here will not be considered positional variants (allophones) but a kind of dialectal allophone which varies according to location, rather than position in the word as seen in Table (1). I, therefore, propose that the sounds [d] and [l] are separate phonemes in Sɛlɛɛ and both sounds are contrastive in the language. I support the argument with the following evidence based on the data in Table (1):

2. Evidence to show that [d] and [l] are separate phonemes in Sɛlɛɛ

   i. The two sounds occur in similar environments in word-initial and word-medial before a high vowel /i/. (e.g. /l/ in [lejo]'room', [kolo] 'sky' and /d/ in [dituː]'clay',[odu] 'root')

   ii. The two sounds pass the minimal pair test in which two words with different meanings differ only in one sound, such as /d/ in [ɔda] 'sister-in-law' and /l/ in [ɔla] 'branch'.

iii. The two sounds are not in complementary distribution because they don't occur in different environments (e.g. [dibi] *[libi] 'drum')

Agbetsoamedo (2014) disagrees with Allen (1974) that [l] is a surface variant of [d] but instead, she identifies [l] as a phoneme and [d] as its allophonic variant based on the distribution and the environmental conditions for the realization of both sounds. She argues on the motivation that "a sound may be classified as a phoneme if it has a wider distribution compared to its variant, which has a predictable and restricted environment; the sound [d] only occurs before high vowels in word-initial, whereas [l] occurs before all vowels except [u]" (Agbetsoamedo, 2014, p.11). In contrast, she identifies [di-] and [li-] with the distribution of [d] and [l] at the onset position of a CV syllable before a high vowel [i] as number prefixes that mark for singular forms. She observes that the choice of [di-] and [li-] depends on the geographical location of the speaker, so Bume speakers and Gbodome speakers prefer [li-] as a number suffix while Benua speakers prefer [di-]. In this case, I can present her claim as in (3).

3.

Benua	Bume/Gbodome	Plural	Gloss
[di-si]	[li-si]	[a-si]	'head'
[di-bula:]	[li-bula:]	[a-bula:]	'onion'
[di-ditabi]	[li-ditabi]	[a-ditabi]	'maize'
[di-bi]	[li-bi]	[a-bi]	'drum'
[di-kufi]	[li-kufi]	[a-kufi]	'bone'

Example (3) is a clear picture of dialectal variation where /d/ in Benua becomes [l] in Bume and Gbodome before a high vowel [i]; so the sound correspondence here is due to dialectal differences because, sometimes, in a casual speech, [li-] is used in Benua. This paper agrees with Agbetsoamedo (2014) that [l] is a contrastive sound but the paper, however, disagrees with her claim that [d] is a variant of [l] and that both sounds are variant of the same phoneme. With regards to their [d, l] distribution, both sounds occur in both word-initial (e.g. [likpeŋkpe] *[dikpeŋkpe], [ditu:] *[litu:]) and word-medial (e.g. [olisatu] *[odisatu], [aditabi] *[alitabi]) and contrast interms of meaning as seen in Table (1). so, they have similar distributions in words; they are both restricted to a certain class of vowels in words like other consonants which do not also occur before some vowels and this is normal in every language. [l] occurring before most of the vowels does not give it a wide range of distribution but shows its predictable restriction and frequency within a word while [d] is also restricted to only high vowels [i, u] which do not affect its distribution within a word. In this case, the realization here is not positional variants (allophones) but they are contrastive sounds that distinguish meaning in the language.

The consonant inventory of Sɛlɛɛ is presented in Table (3) and it includes both [d]

and [l] as contrastive phonemes and suggests that [d] contrasts with the voiceless counter parts [t] in both word-initial and word-medial. All the sounds in Table (3) are phonemic and they can all be realized in the same form in the orthography except the double articulated labio-velar sounds [ʧ], [ɲ], [ŋ] and [j] which are written as <ky>, <ny >, <nw> and <y>.

Table 3: Consonant Inventory in Sɛlɛɛ

	Labial	Labio-dental	Alveolar	Palatal	Palato-alveolar	Velar	Labial-velar
Stop	p b		t d			k	kp
Nasal	m		n	ɲ		ŋ	
Fricative		f	s		ʃ		h
Affricate					ʧ		
Lateral			l				
Glide	w			j			

The Vowel inventory in Sɛlɛɛ is sixteen vowel (16) segments including seven (7) short vowels [i, e, u, a, ɔ, ɛ]; seven (7) long vowels [iː, eː, uː, aː, ɔː, ɛː] that are represented as double sounds <ii, ee, uu, oo, aa, ɔɔ, ɛɛ> and two (2) nasal vowels [ĩ, ʊ̃] as in Table (4). The vowels can be classified as class one vowels and class two vowels according to the feature [±ATR]. It is observed that Class I vowels are [+ATR] while Class II vowels are [-ATR] as illustrated in Table (4) below:

Table 4: Vowel Inventory in Sɛlɛɛ

Class I				Class II			
i	iː	u	uː	ĩ		ʊ̃	
e	eː	o	oː	ɛ	ɛː	ɔ	ɔː
				a	aː		

In Sɛlɛɛ, short vowels contrast with long vowels to bring about meaning difference as illustrated in (4):

4. Contrast between long and short vowels

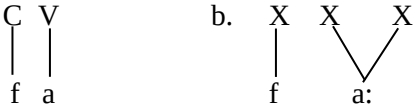
[a]	fa	'lay'	faː	'shout'
[o]	lo	'kill'	loː	'finish'
[ɛ]	mɛ	'swallow'	mɛː	'disappear'
[u]	mu	'bend'	muː	'all'
[i]	ni	'it'	niː	'tie'
[ɔ]	ɲɔ	'lies'	ɲɔː	'see'
[e]	je	'know'	jeː	'forget'

The long vowels are usually represented by two vowels as <aa, oo, εε, uu, ii, ɔɔ, ee> in the orthography while the short vowels are <a, o, ɛ, u, i, ɔ, e >. Interestingly, all the underlying short vowels in each case has a corresponding long vowel, which contrasts in meaning as noticed in (4).

Moraic Phonology

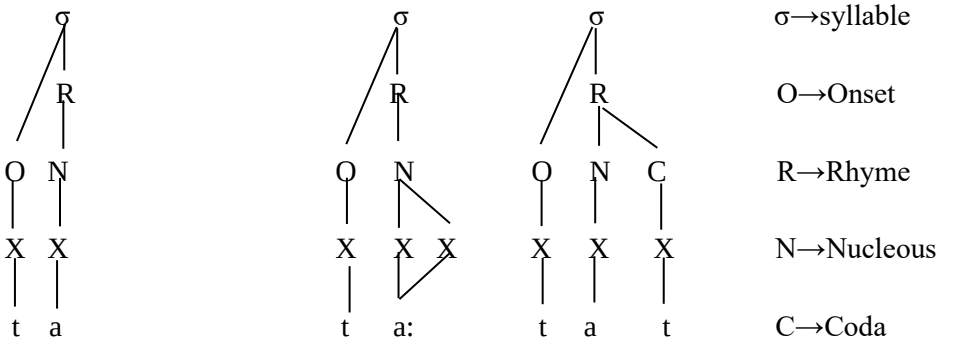
Davis (2011, p.103) notes, "quantity refers to either segmental duration or syllable weight and with respect to segmental duration, quantity differences among segments are said to be phonemic in languages that contrast a long and a short form of a vowel of the same quality." The data in (4) illustrate this type of contrast in Sɛlɛɛ. In autosegmental, long vowels are linked to two slots on a prosodic tier while short vowel or consonant is linked to one slot. Davis (2011) explain that a common view of this tier was that it either consisted of CV-slots as illustrated in (5) in which (5a) presents the CV-tier of [fa] and (5b) presents the X-tier of [fa:] as seen in data in (4).

5. a b.



Hayes (1989, p.253) notes that Levin (1985) and Lowenstamm and Kaye (1986) proposed to replace the symbols C and V with a uniform sequence of elements, represented as Xs". He further explains that "the elements of the X tier vary according to their organization in a syllable structure, which includes nucleus nodes" as in (5c):

5c. X Theory



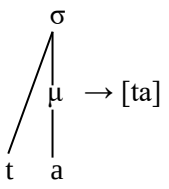
(cf. Hayes 1989, p.253)

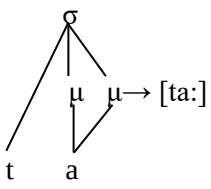
Hayes (1989, p.254) notes, "the prosodic tier favoured by Hyman (1984, 1985) has just one kind of unit, as in X theory, but instead of representing a segment, this unit represents the traditional notion of mora which has a dual role in this theory." This is illustrated below:

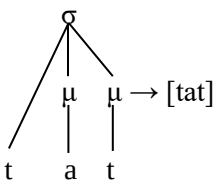
a. " It represents the well-known contrast between light and heavy syllables: a light syl able has one mora, a heavy syllable two."

b. " The mora counts as a phonological position: just as in earlier theories, a long segment is normally represented as being doubly linked."

Hayes (1989) in adopts the schematic syllables under (5) and represents it as in (6), where μ = mora:

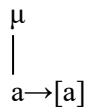
6. a. 

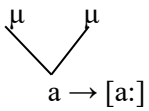
b. 

c. 

It is observed that Latin and other spoken languages count CV: and CVC syllables as heavy while CV is light. In Lardil, CV: is heavy while CVC and CV are both counted as light. According to the moraic phonology, languages such as Latin and Lardil differ in their rules for assigning moraic structure; in Latin, CVC is assigned two moras while one mora in Lardil.

I argue in this paper that Sɛlɛɛ is one of the languages in which only CV: is heavy and CV is light and the language exhibits a syllable weight distinction and a vowel length distinction as well. Hayes (1989, p.225) states that "in languages with contrastive vowel length, long vowels have two moras and short vowels have one and this is assumed to reflect directly in underlying forms," this is presented in (7) below. Davis (2011, p.105) confirms that "a short vowel is underlyingly monomoraic while a long vowel is bimoraic and with respect to geminate consonants, a geminate consonant differs from a short consonant in that the geminate is underlyingly moraic while a short consonant is non-moraic." This is illustrated in example (7) in which (7a) illustrates a V syllable while (7b) illustrates a V syllable with a long vowel.

7. a. 

b. 

As illustrated in (7), short vowels (V) have one mora while long vowels (V:) have two moras.

Sɛlɛɛ Syllable Structure

Sɛlɛɛ exhibits only the open syllable types but not the closed type. The closed syllable ends in a consonant sound while the open syllable ends with a vowel or a syllabic nasal. Sɛlɛɛ is one of the language types whose syllables have onsets but no codas, as listed in (8). The onset is obligatory in (8a) and it has a system that allow complex onsets in (8c)

8. Systems without codas

a. Onsets are required: CV
b. Onsets are optional: CV, V
c. Codas are banned: CV, CCV, CV:

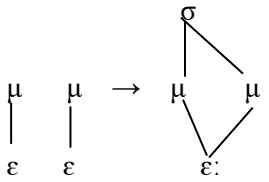
The V syllable in (8b) usually occurs in a VCV word and supports Zec (2007) claim that "the onset/coda asymmetry is evidenced in a VCV sequence which is cross-linguistically syllabified as V.CV rather than VC.V". Sɛlɛɛ has systems that allow complex onsets in which codas are banned and those that the onset may include more than one consonant, yielding the additional types in (8c). This is illustrated in (9) below:

11. Syllable Types in Sɛlɛɛ

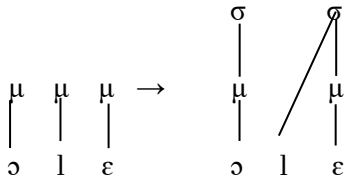
	V		**CV**		**CV**:		**CCV**		***CVC**
a.	ɛ.ɛ	'yes'	ka	'read'	sɛ:	'witch'	mba	'salt'	*ɔ.lan.le
b.	a.lɛ	'that'	sa	'sing'	nɛ:	'hand'	mpa	'bed'	* ɔl.an.le
c.	a.ku	'rubbish'	du	'reach'	pa:	'labour'	kle	'wear'	ɔ.la.nle 'slave'
d.	ɔ.ka	'chief'	fu	'receive'	fa:	'shout'	ŋkpa	'life'	*kpan.te
e.	e.ku	'rope'	lo	'kill'	bu:	'rot'	nta	'drink'	*kpant.e
f.	o.si	'yam'	wo	'due'	fu:	'boil'	ntɔ	'blood'	kpa.nte 'hunter'

As observed from the data, the language does not permit a coda consonant as it occurs in some Ghanaian languages like Dagbanli (Inusah 2020, 2021; Inusah & Mahama 2021). However, it has no CVC syllable structure, as shown in the possible sounds' sequences under CVC in (9). Following Hayes (1989), this moraic representation is used to account for the syllable types given in (8) and illustrated in (9) where the V type is formed from V.V words or V.CV words as in (9).

10. a.

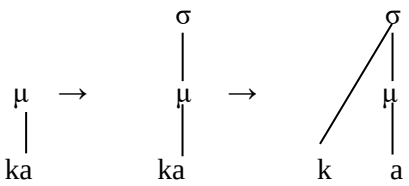


b.



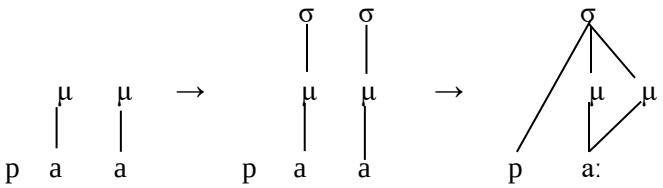
Examples (10a-b) show the V syllable form from V.V words or V.CV words. The structure of the CV syllable type which comprises a CV word with an obligatory onset consonant and a short vowel is represented below:

11.



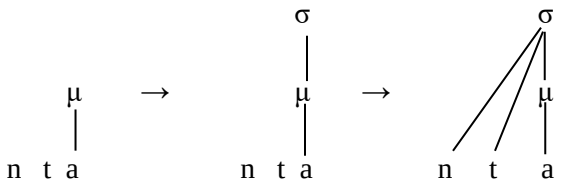
The structure of the syllable type which comprises a CV.V word with an obligatory onset consonant and a long vowel is represented below:

12.



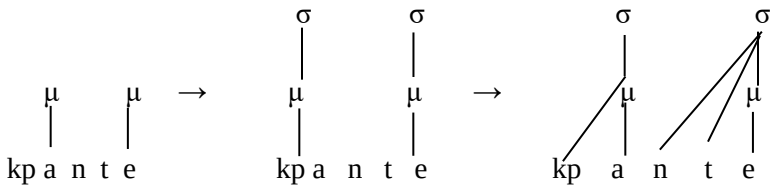
The structure of the CCV syllable type which comprises complex syllable structure of CCV with two obligatory onset consonants at the onset and a short vowel is represented below:

13.



In some languages, a coda consonant is not permitted. Sɛlɛɛ is one of these languages which avoids codas and does not require it in any environment; this is represented below by using the moraic theory.

14.



In (14), it is clear that the bimoraic syllable presented has the sequence of CV.CCV structure and since Sɛlɛɛ does not permit a syllable coda, the word cannot be syllabified as CVC.CV to cater for a coda consonant (e.g [kpa.nte] *[kpan.te]).

Davis (2011, p.107) states, “a formal distinction between a light syllable and a heavy syllable is that a light syllable is one that is monomoraic whereas a heavy syllable is bimoraic (or greater)”. Thus, the structure in (10ab), (11) and (13) are light or monomoraic whereas the one in (12) and (14) are heavy or bimoraic. Zec (2007) explains, “syllable weight and the phenomena directly relate to it, such as segment length, are directly represented in structural terms by positing a second peak within the syllable”. A light syllable consists of one mora illustrated in (15a) while a heavy syllable comprises two moras illustrated in (15b).

15. a. Light b. Heavy

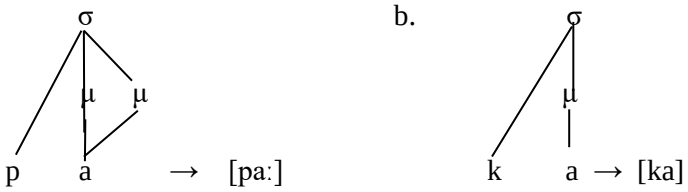
Davis (2011, p.106) explains, "there are at least two types of systems with respect to syllable weight in languages in which syllable weight plays a role." The illustrations in example (16) present this idea in a moraic structure.

16. Syllable weight systems:

a. Heavy	Light	b. Heavy	Light
CVV	CV	CVV	CV
CVC			CVC

Davis (2011) explains that the system in (16) is an illustration of languages with syllable "Weight-by-Position" which permits coda consonants in which CVV and CVC syllables are treated as heavy while (16b) has only CVV as heavy. Sɛlɛɛ belongs to the category of languages in (16b), as illustrated in moraic structure in *Sɛlɛɛ* in (17):

17. a. b.



The syllable structure in (17a) shows a CV: heavy syllable while (17b) is a CV light syllable. The two peaks in (1a) are represented as moras. The structures in (17) prove the fact that *Sɛlɛɛ* has CV: heavy syllable and CV light syllable.

Conclusion

The paper examined the syllable structure as a phonological process that is characteristic of *Sɛlɛɛ*. It gave the phonological processes which accounted for the differences in the distribution of consonants and vowels in the language and also provided data for *Sɛlɛɛ* phonological analyses. The paper described the contrastive segments in *Sɛlɛɛ* and revealed that the language has eighteen (18) consonants and sixteen (16) vowels. It argued that both [d] and [l] are contrastive phonemes suggesting that [d] contrast with the voiceless counter parts [t] in both word-initial and word-medial environment.

As part of the phonological processes, the paper discussed *Sɛlɛɛ* syllable types and proposed that Sɛlɛɛ is dominated by V.VC, CV, CCV and CV: types and claimed that the

onset/coda asymmetry is evidenced in a VCV sequence which is cross-linguistically syllabified as V.CV rather than VC.V. The paper showed that *Sɛlɛɛ* has systems that allow complex onsets in which Codas are banned: CV, CCV and following Hayes' (1989) formal theory of moraic phonology in which the prosodic tier is characterized as moraic, the paper concluded that Sɛlɛɛ has a heavy syllable weight of CV: and a light syllable of CV.

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