

Resolving Vowel Elision Complexities in Yoruba with Harmonic Constraints

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Abstract

Resolving vowel hiatus has generated different analyses using the available theoretical approaches. More to the challenge is the question of which vowel actually elides. The case of the elided vowel in a language like Yoruba continues to generate different form of analyses with none fully accounting for the process; among these include Casali (2007) MAXLEX approach and Orié and Pulleyblank (1998, 2000) Prosodic Minimality approach. However, more is involved to which vowel is elided than these. This paper aims to provide evidence on how vowel qualities such as vowel height and Advance Tongue Root contribute to the elided vowel. It also provides analysis to existing exemptions found in Optimality formalisms for Yoruba vowel elision. The paper is developed following the Constraints Based analysis. It draws from faithfulness and markedness (Prince and Smolensky, 1993; McCarthy, 1995) and harmonic constraints (Bakovic, 2000) to provide analysis of vowel elision process of hiatus environment resulting in disyllables. Findings show that ((C)VCV) Yoruba words resulting from vowel elision is subject to harmonic constraints in Yoruba, together with faithfulness and markedness constraints. The paper suggested that in a native speaker's mind, the constraints are ranked proportionately for the required output; it could higher rank or lower rank conflicting constraints and at the same time allow some of these conflicting constraints violated. As such covert rankings are allowed to take place before output candidate evaluations.

Keywords: *Vowel hiatus, Vowel elision, AGREE[F], *NO HIATUS, ANCHOR L*

Introduction

In many languages, vowels in hiatus context are not allowed. These languages use different processes to resolve the violation. Vowel elision is one of the phonological processes which Yoruba uses to resolve vowel hiatus. Several scholars have worked on vowel elision using different approaches to account for which vowel is elided. The elision of the vowel in final position across morpheme boundary (V_1) is commonly attested to be elided. Yoruba also exhibits cases where first vowel across morpheme boundary (V_2) is elided; and the default elision of high front vowels whether in V_1 or V_2 position adds complexity to the resolution of hiatus. This paper investigates what drives Yoruba vowel elision with a focus on harmonic constraints. This work is broadly divided into two sections:

- i) for accounting and formalizing for common elision
- ii) for accounting and formalizing for exceptions in Yoruba vowel elision

Background to the Study

Yoruba

Yorùbá belongs to the West Benue-Congo of the Niger-Congo phylum of African languages (Williamson and Blench 2000:31). The Standard Yoruba predominantly the Òyó dialect of Yorùbá has been in use for literary purposes since 1843, although the Òyó variety commands a wider social acceptability. Delano (1958), Adetugbo (1967, 1973), Oyelaran (1976) and Awobuluyi (1998) have classified Yorùbá dialects into North-West Yorùbá (NWY), South-East Yorùbá (SEY), Central Yorùbá (CY), North-East Yorùbá (NEY) and South-West Yorùbá (SWY).

Hiatus and Vowel Elision

The term vowel hiatus is commonly used to refer to a sequence of adjacent vowels belonging to separate syllables (Senturia1998:26). In some languages, vowel hiatus is permitted quite freely. Other languages place much stricter limits on the contexts in which heterosyllabic vowel sequences can occur, while some disallow them entirely. Languages that do not permit vowel hiatus may employ any of several processes that eliminate it in cases where it would otherwise arise such as vowel elision, coalescence, assimilation.

Vowel elision is a phonological process triggered by the need to resolve hiatus or for the need of ease of articulation. Vowel elision involves the deletion of a vowel within or across morpheme. The Yoruba language has the prevailing process in which when non identical vowels occur across morpheme boundary one elides. It has been attested that the V₁ easily elides, however, there are many instances in which the V₂ elides apart from the high front vowel. This paper examines harmony as a veritable influence on the vowel that goes in a vowel elision process in Yoruba.

Literature Review

According to Casali (2011:10), the analysis of hiatus resolution patterns within Optimality Theory (OT) dates from the early years of the paradigm and include, among other studies, Rosenthal (1994, 1997), Casali (1995, 1997, 1998), Orié and Pulleyblank (1998), Senturia (1998), Oyebade (1998), and Bakovic (2003, 2007). Seidl (2000)'s provision for elision process in Yorubais explained in terms of First Vowel Elision (FVE) and Second Vowel Absence (SVA). While Sedil's analysis clearly answers the question of first vowel elision, it has not been able to raise provisions to questions such as what triggers the elision of V₂ in sequences such as /bi ɔmɔ/ → [bimɔ] 'give birth to a child' giving a phonological analysis. Second vowel absence is a proposition to state that V₂ elision does not exist in Yoruba (Seidl, 2000). This is based on the assumption that certain nouns are incorporated into a verb or some other part of speech without their initial vowels. Consider the examples adapted from Sedil (2000).

- (1) a. /ó ta epo/ [ótapo]
 3sg spill oil 'He spilled oil'
- b. /ówíejó/ [ówíjɔ́]
 he says talk 'He says something'
- c. /ɔmɔdé obīrī/ [ɔmɔdébīrī]
 little-child girl 'little girl'
- d. /ɔmɔ aḍiye/ [ɔmɔḍiye]
 child chicken 'chick'
- e. /fɔ aʃɔ/ [fɔʃɔ]
 wash cloth 'wash cloth'

Controversies trail these examples. The analysis provided by Seidl assumes that the second vowel (which is the noun initial vowel) is not incorporated along with its other parts. This follows the posture of Bamgbose (1967) that Yoruba nouns have a noun class system which is marked by the initial vowel. Hence, inflectional morphemes are not incorporated into compounds (Harris, 1991; Sedil, 2000)). In other words, there are questions which comes to mind following the first vowel elision cum incorporation analysis. For examples, (1a, d and e) can have either V₁ or V₂ deleted in SY:

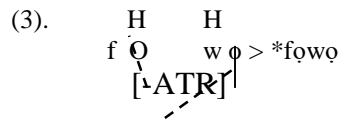
- (2) a. [ótepo] ‘he spilled oil’ b. [ɔmaɖiye] ‘chicken’ c. [faʃɔ] ‘wash cloth’

The meanings expressed by the examples in (2) do not differ from their counterparts in (1). Then the need arises to account for such alternatives which are possible in the language. Another interesting aspect is seen in example (1e.). Sedil’s claim is that it occurs only when there is an overt possessor. Our claim is that both are acceptable with or without overt possessors.

- (2) d. Mò ní faʃɔ/fɔʃɔ Wólé.
 Pro PROG wash/wash Wólé I am washing Wole’s clothes.
- e. Mò ní faʃɔ/fɔʃɔ lówó.
 Pro PROG wash/wash at hand I am washing at the moment.

Other Non Harmonic Proposal for V₁/V₂ alternations

Pulleyblank (1989) noted two points concerning the nature of the feature ATR in the vowel deletion across morpheme boundary in Yoruba. First, a H-tone on the vowel to be deleted always survives even after deletion, as in ‘fẹ̀owó --> fówó 'want money', and second, the [ATR] specification of the vowel to be deleted never survives, instead it is deleted along with the vowel elided. The deletion of the vowel of the verb ‘fẹ’ in such a case frees up both the verb's H-tone and the verb's [-ATR] specification. In the spirit of Pulleyblank, given automatic application of the Association Conventions (Goldsmith (1976)), it would be expected that both free autosegments would relink, creating a representation such as (3).



The tonal result of assuming such an analysis is correct, whereas the [ATR] effect of such a representation is incorrect. Stability effects are observed with tonal phenomena in Yoruba but not in the feature [ATR]. The point noted here is that the tonal effect is retained while eliminating the harmonic effect.

Furthermore, we could have assumed that tone contributes to trigger the vowel which gets elided such as high tone prominence over mid and low tones. Consider the examples in (4).

- | | |
|--|---|
| <p>(4)a. mú inulè wá múnulè wá
bring cleaner come 'bring the cleaner'</p> <p>b. gbá ilé gbálé
sweep house 'sweep the house'</p> <p>c. gbá ilè gbálè
sweep floor 'sweep the floor'</p> <p>d. se ifu sefu
cook yam 'cook yam'</p> | <p>e. pa ɔmo pɔmo
kill child 'kill child'</p> <p>f. gbé owó gbówó
carry money 'steal money'</p> <p>g. mú ata máta
take pepper 'take pepper'</p> |
|--|---|

The examples (4a-c) follow the assumption that the vowel with the high tone is retained, but in (4f-h), we have a reversal of the elided vowel. In examples (4d-e), it becomes more complicated. High front vowel in V₂ position is deleted in (d) while the low vowel is deleted in (e) despite that both V₁ and V₂ in (4d-e) bear mid tones.

It is suggested that tonal analysis for V₁/V₂ elision paradigm is not natural in the language. Therefore, we assume that since deletion blocks ATR spread, it is conversely acceptable that the segment bearing higher ranked disharmonic ATR factorial constraints becomes deleted. In other words, the ATR feature of vowels across morpheme boundaries in form of markedness constraint is included among other constraints to compute the optimum. The monophonemic assumption for ATR value in vowel elision follows disyllabic words. Hence, we assume that vowel elision which results in disyllabic words follows the harmonic pattern. This will be fully examined in the data analysis below.

Research Method

Data and Data Collection

The data (morpheme boundary paradigms) in this study were collected primarily from the native speakers of Yoruba. SY is picked because it is a wider dialect within the Yoruba community. It has enjoyed advanced research into its vowel elision but yet has unresolved issues in its V₂ elision. The data were collected with a digital recorder. Direct data elicitation were held at the homes of the informants and in a classroom at Command Secondary School, Ojo, Ibadan. The three informants used are native speakers of Yoruba who have been residing in Ibadan for 25-35. They are of the age 32, 40 and 62 respectively.

Research Design

The Optimality Theory approach was employed. Data were first compiled from the native speakers using a constructed 50-item morpheme boundary paradigm. The morpheme boundary paradigm was needed because vowel elision is more evident in connected speech. Secondary data was sourced from Casali (1997), Orie and Pulleyblank (2002) and Sedil (2000).

Data of interest included verb + noun combination and some other part of speech plus a verb with V+V sequence (which is not allowed in Yoruba). Noun + Noun concatenation violates the prosodic level of disyllabic XP¹ - where X equals to verb, preposition, some groups of adverbs

¹N+N constructions violate the minimality effects resulting elision in natural V+V hiatus environments. Thus rather than elision, hiatus is resolved through assimilation and coalescence. For more information on the choice of disyllabic XP, consider Orie, O. & Pulleyblank, D. 2002 and Bamgbose, 1967.

and the inter-fix 'kí'. It should be noted that Noun + Noun concatenation does not violate prosodic minimality in Yoruba thus allowing assimilation and blocking elision. The data gathered are provided below with environments of vowel elision:

Standard Yoruba: Syntactic Paradigm on Vowel Elision

5i. /se ɛwà/ → [sɛwà] 'cook beans'	xxiii. /ra ògɔ̀dɔ̀/ → [rògèdè] 'to buy plantain'
ii. /gbɛ̃ ilɛ̃/ → [gbɛ̃lɛ̃] 'dig house'	xxiv. /owó kí owó/ → [owókówó] 'any/bad money'
iii. /rã ɛwù/ → [rɛ̃wù] 'sow cloth'	xxv. /ní oko/ → [lóko] 'at the farm'
iv. /rã aso/ → [rãso] 'sow cloth'	xxvi. /wo aago/ → [wago] 'check the time'
vi. /mũ inulɛ̃ wá/ → [mũ nulɛ̃ wá] 'bring the rag'	xxvii. /se ɔ̀bɛ̃/ → [sɔ̀bɛ̃] 'cook stew'
vii. /se isu/ → [sesu] 'cook yam'	xxviii. /láti oko/ → [látoko] 'from farm'
viii. /gbá ilɛ̃/ → [gbáɛ̃] 'sweep the floor'	xxix. /láti àárò/ → [látàrò] 'since morning'
ix. /gbá ilé/ → [gbálé] 'sweep the house'	xxx. /láti èkó/ → [látèkó] 'from Lagos'
x. /gbé owó/ → [gbówó] 'steal money'	xxxii. /olú ti àárò lo/ → [olú tǎrò lo] 'Olu went since morning'
xi. /pa ɛ rã/ → [pɛ rã] 'kill goat'	xxxiii. /dá ɛ̀dá/ → [dɛ̀dǎ] 'to create a beign'
xii. /gba owó/ → [gbowó] 'collect money'	xxxiiii. /gbé odó/ → [gbódó] 'to lift a mortar'
xiii. /mũ ata/ → [máta] 'take/hold pepper'	xxxv. /dé oko/ → [dóko] 'to get to farm'
xiv. /be àgbà/ → [bàgbà] 'beg an adult'	xxxvi. /pe ɔ̀mɔ̀/ → [pɔ̀mɔ̀] 'to call a child'
xv. /gbĩ ɛ̀wà/ → [gbɛ̀wà] 'plant a beans seedling'	xxxvii. /pé ɔ̀mɔ̀/ → [pómɔ̀] 'that a child'
xvi. /bí ɔ̀mɔ̀/ → [bímɔ̀] 'to give birth to a child'	xxxviii. /ta epo/ → [tapo] 'to spill oil'
xvii. /bí òkúta/ → [bókúta] 'to give birth to a stone'	xxxix. /wí ɛ̃ jó/ → [wíjój] 'to plead a case'
xviii. /mũ aɛ̃/ → [máɛ̃] 'to hold a fowl'	xl. /ɔ̀mɔ̀dé okùrì/ → [ɔ̀mɔ̀dékùrì] 'a young male'
xix. /gbĩ àgbàdo/ → [gbĩgbàdo] 'plant a maize seedling'	xli. /pa ɛ̃ nu dé/ → [panudé] 'to close mouth/ to keep quiet'
xx. /bó àgbàdo/ → [bágbàdo] 'thresh the maize'	xlii. /fɔ̀ abó/ → [fabój] 'to wash plate'
xxi. /je ata/ → [jata] 'eat pepper'	xliii. /mũ ìwé/ → [múwě] 'to hold/bring a book'
xxii. /je àdǎ/ → [jàdǎ] 'to eat a bat'	

xliii.	/mũ ara/ → [mũra] ‘to dress up’	xlvi.	/bu ata/ → [bata] ‘pour ground pepper’
xliv.	/mũ ε yi/ → [m̩yĩ] ‘to hold an egg’	xlvii.	/gé olú/ → [gólú] ‘cut mushrooms’
xlvi.	/ro ε jɔ/ → [rojɔ] ‘to talk/gossip’	xlvi.	/ta ðjε / → [tájε] ‘to sell food’
xlviii.	/kó èkó/ → [kékɔ̃] ‘to learn’	li.	
xlix.	/pa ε ja/ → [pε ja] ‘to kill fish’		

3.3 Adaptations

Constraints were chosen according to the vowel elision process and its agreement with [ATR] harmony. The visible constraints include:

AGREE[F]: Adjacent segments must have the same value of the feature [α F]. (Bakovic 2000:4)

FTBIN: a foot must be binary at either the moraic or syllabic level

MAX [α F]: this constraint dictates that underlying input segments should be maximally represented in the output. In other words, every input segment should correspond to some segment on the surface

ANCHOR L: Any element at the left edge of a morpheme in the input has a correspondent at the left edge of the morpheme in the output.

NO HIATUS: states that a sequence of vowel hiatus is not allowed

Data Presentation and Analysis

Vowel Elision in Yoruba

The vowel elision process respects harmonic constraint which is controlled by the final root vowel². Thus, a vowel may be elided when it is not in correspondence with the final root vowel [ATR] harmonic feature, when both vowels in V1+V2 satisfy harmony in Yoruba, positional faithfulness constraints determine which vowel is elided. We will present the data parallel to the vowel at the root; that is final vowel which may be low, mid or high.

Low Vowel

The low vowel [a] in is marked [+LO, -ATR]. It is bounded by a constraint and another condition. The constraint specifies that the low vowel [a] cannot be [+ATR] hence the markedness constraint *[+LO, +ATR]. The low [a] vowel triggers [-ATR] to the left in between a prefix and the final vowel. [a] to the left edge of a final vowel is harmonic if the final vowel is [-ATR]; but disharmonic yet tolerated if the final root vowel is [+ATR]. That is, a medial low vowel, ‘[a]’ must agree in [ATR] harmony with the initial vowel such as in (6b,c,e). These conditions are considered in the evaluation of constraints which determines the vowel which elides. The data below shows examples of low vowel in the root final position.

² Adetugbo (1967), Bacovic (2000) provide information that the final vowel in a verb/noun is the root vowel from which various assimilatory process could stem such as ATR harmony

- (6).a. /se ɛwà/ → [sɛwa] ‘cook beans’
cook beans
- b. /múata/ → [máta] ‘take/bring pepper’
take pepper
- c. /bɛ àgbà/ → [bàgbà] ‘to beg an adult’
beg adult
- d. /gbĩɛ wà/ → [gbɛwà] ‘plant beans’
plant bean
- e. /jɛ ata/ → [jata] ‘eat pepper’
eat pepper
- f. /dáɛdà/ → [dɛ!dà] ‘create a being’
create being
- g. /mũara/ → [mũra] ‘to dress up’
dress up

In the examples (6a-f), the verb phrases largely give a unified result of V₁ elision except from (6g) exhibiting V₂ deletion. The vowels in the disyllabic nouns tolerating the harmony have either the forms [ɛCa] (in 1a,d and f) or [aCa] in (b, c and e). We assume that the occurrence of the first form is determined by the trigger of [-ATR] to its left (Bakovic, 2000). In the second form, the prefix [a] is opaque to [ATR] hence, ATR spread becomes neutralized. Example (6g) presents an interesting fact, first we might assume it is more convenient to have the output *[mára] because of the physiological ease in a rapid speech. Noting that our focus is on the [ATR] harmony, [aCa] is more faithful than [uCa] which is disharmonic yet tolerated. A pair-wise analysis of the two will be shown below.

Satisfies AGREE[F]	Violates AGREE[F]
7a. [aCa]	b. [uCa]
[-F] C [-F]	[+F] C [-F]

That (7b) is the optimal candidate is based on a higher ranking constraint which dominates AGREE[F] and ANCHOR L, this dominating constraint can either be ANCHOR R alignment constraint or IO-IDENT[HI] faithfulness constraint. We will give representations of the data as we have described above. Tableau (1) represents structure resulting from ɛCa and Tableau (2) represents aCa.

Tableau (1) showing the analysis of /gbĩɛ wà/

Input: /gbĩɛwà/

CANDIDATES	AGREE[ATR]	NOHIATUS	ANCHOR L	IO-IDENT[MID]	FITBIN
a. [gbɛwa] 		*!			*

b. [gbĩɛ wà] +ATR -ATR -ATR	*!	*!			*
c. [gbwà] -ATR -ATR					
d. [gbĩwà] +ATR -ATR	*!		*	*	

Tableau (1) represents the examples (6 a, d and f). Candidates (b) and (d) is canceled out by the highest ranking constraint, violation of NOHIATUS by the candidate (a) allows EVAL to consider candidate (c) as the optimal candidate because other candidates have more violation of constraints relative to candidate (c). The next tableau shows the relative ranking of constraints for the examples (6b and c).

Tableau (2) showing the analysis of /múata/³

Input: / múata/
-ATR

CANDIDATES	AGREE[ATR]	NOHIATUS	IO-IDENT[LO]	ANCHOR L	FITBIN
a. [múata] +ATR -ATR -ATR	*!	*!			*
b. [máata] -ATR -ATR -ATR		*!			*
c. [máta] -ATR -ATR					
d. [múta] +ATR -ATR	*!		*	*	
e. [méta] -ATR -ATR			*!	*	

³ The OT philosophy attributes constraint universals to all languages and processes (McCarthy, 2008). Ranking of these global constraints are of the result of workings in the mind of the native speaker. As such, tableaux present the most ranked constraints not a different constraint. Giving unlimited spreadsheets we would have some other accorded constraints which are lower ranked. See below on 'accounting for exceptions', details constraints interaction in Yoruba vowel elision.

Tableau (2) is important in two ways; first, it will serve as a template for which the relative ranking of constraints will determine the output for (6g). Second, the introduction of IO-ID[LO] ensures that [a] is preserved in cases such as ‘*pa esè pò*’ → [kpasɛkpɔ] ‘join legs together’. Hence, IO-ID[LO] outranks ANCHOR L. mid vowels in example (6). However, examples like *gbà èbè* → *gbèbè* “accept apology” suggests an exception. Proposition such as relative rankings constraints and their interactions with faithfulness constraints of vowel qualities help to resolve the exceptions.

Mid Vowels

The focus of harmony in Yoruba is centered mainly on mid vowels. The [+ATR] mid vowels [e o] and the [-ATR] mid vowels [ɛ ɔ] do not occur together in disyllabic verbs. Hence, the forms *[eCɛ] *[ɛCe], *[ɛCo] *[eCɔ] are marked. Our concern however, is the ATR feature of the root mid vowel and how it affects the vowel that is retained and the ones deleted. While, we know that Yoruba does not tolerate hiatus, and it could be resolved through elision, the vowel which is retained in a V # V sequence depends on agreement with ATR feature of the root’s final vowel of the noun. The data in example (7) has the mid vowels in the root final position.

- 7a. /rã asɔ/ → [rãɔ] ‘sow cloth’
- b. /kpe ɔmɔ/ → [kpɔmɔ] ‘call child’
- c. /kpé ɔmɔ/ → [kpómɔ] ‘that child’
- d. /múadiɛ / → [mádiɛ] ‘to hold a fowl’
- e. /fɔ abɔ́/ → [fabɔ́] ‘to wash plates’
- f. /gbéowó/ → [gbówó] ‘to steal money’
- g. /gbaowó/ → [gbowó] ‘to hold/take money’
- h. /ta ekpo/ → [takpo] ‘to spill oil’
- i. /déoko/ → [dóko] ‘to get to the farm’

The examples provided in (7) can be broadly divided into two groups. The first set (7a-e) are a group disyllabic compounds with [-ATR] final root vowel control. The other group, (7f-i) belongs to [+ATR] final root vowel control. We will start by describing the relation of harmony to vowel elision in the first group. Then proceed to the second group.

[-ATR] Mid vowels

The vowel sequence, [ã # a] in (7a) violates hiatus since it is a concatenation of vowels across morpheme boundary, however, the vowel which elides in this case is the first vowel (Casali, 1997). However, nasality which is stable spreads to the V₂ (that is, morpheme initial vowel). The vowel [a] is [-ATR] hence, the [-ATR] feature of the final root vowel agrees with retained vowel. The higher ranking NOHIATUS and ANCHOR L do the job. This is shown in the tableau (3) below.

Tableau (3) showing the analysis of /rãasɔ/

Input: /rã asɔ/

CANDIDATES	AGREE[ATR]	NOHIATUS	ANCHOR L	IO-IDENT[MID]	FT-BIN
a. [rãasɔ]		*!			*
b. [☞] [rãasɔ]					

The examples (7b & c) form an output which rejects disharmonic forms in standard Yoruba. Realizations such as *[eCɔ] and *[eCɛ] are not allowed in SY (with exceptions such as [seb[□]] ‘cook stew’). Considerably, the constraint AGREE [ATR] is undominated and NOHIATUS and ANCHOR L relatively ranked determine which candidate is optimal.. Consider the representations in the tableau (5).

Tableau (4) showing the analysis of /pe ɔmɔ/

Input: /pe ɔmɔ/

CANDIDATES	AGREE[ATR]	NOHIATUS	ANCHOR L	IO-IDENT[MID]	FT-BIN
a. [peɔmɔ]	!*	*!			*
b. [pemɔ]	!*		*	*	
c. [☞] [pɔmɔ]					

For the exception, [seb[□]], ANCHOR L outranks AGREE[ATR] in Yoruba.

Tableau (5) showing the analysis of / se ɔb[□]/


Input: /se ɔb[□]/

CANDIDATES	ANCHOR L	AGREE[ATR]	NOHIATUS	IO-IDENT [MID]	FT-BIN
a. [seɔb [□]]		*!	*!		*
b. [☞] [seb [□]]		*!		*	
c. [sɔb [□]]	!*				

The last example given under the [-ATR] mid vowel is (7d); the two forms [aCɛ] and [uCɛ] are accepted forms in SY harmony inventory. We have discussed the opacity of the [a] in the previous chapter (see Archangel and Pulleyblank, 1994, Pulleyblank, 1986, Bakovic, 2000). However, its markedness constraint *[+LO, +ATR] always retain it as low. Hence, it is opaque to [+ATR] and triggers the [-ATR] feature. The form [uCɛ] is tolerable in Yoruba because of the markedness constraint preventing high vowels from being [-ATR], this is *[+HI, -ATR]. The significant details for the tolerability of both forms however do not guarantee the [uCɛ] form in (7d). We can assume that the high ranking constraint IO-ID[LO] over IO-ID [HI] determines the optimal candidate as illustrated in Tableau (6).

Tableau (6) showing the analysis of /mũadiɛ/

Input: /mũadiɛ/

Candidates	AGREE[ATR]	NOHIATUS	IO-ID[LO]	ANCHOR L	IO-ID[HI]
a. [mũadiɛ]	*!	*!			
b. [mũdiɛ]			*!	*	
c.  [mádiɛ]					*

4.3.2 [+ATR] Mid Vowels:the examples provided under this aspect are contained in (7f-j). The data shares sameness of harmonic sequencing apart from (7h). ANCHOR L ensures that the initial prefix (V₂) is preserved, however, this is in congruence with the fact that V₂ agrees with the final root vowel in the [+ATR] feature. Example (7h) does not agree in the [+ATR] feature because of the markedness constraint [+LO, +ATR]. However, it is the higher ranking of IO-ID[LO] over ANCHOR L which ensures the optimal candidate (c) in Tableau 1.8. The representations of both are given below in tableau (7&8) respectively.

Tableau (7) showing the analysis of /gbéowó/

Input: / gbé# owó/
 + ATR



Candidates	AGREE[ATR]	NOHIATUS	ANCHOR L	IO-IDENT[MIDF]
a. [gbɛ # owó] / -ATR +ATR +ATR	*!	*!		*
b. [gbɛ wo] -ATR +ATR	*!		*	*
c. [gbéwó] +ATR +ATR			*	
c.  [gbowo] +ATR +ATR				

Tableau (8) showing the analysis of /ta epo/

Input: /ta epo/

CANDIDATES	IO-ID[LO]	AGREE[ATR]	NOHIATUS	ANCHOR L
a. [taepo]		*!	*!	
b. [tepo]	*!			
c.  [tapo]				*

We will excuse ourselves from the alternative [tepo] which is also acceptable in SY. Our intention is to show how the constraint ranks to derive the output. We also know that a large proportion of native speakers of the Yoruba language use [tapo].

High vowels


The high vowels: [i] and [u] in the Yoruba language are [+ATR] vowels. Several scholars have discussed the behaviours of the high vowels in vowel elision process. Casali (1997) describes them to be susceptible to elision. We will add to this point also that when they are root final vowel, they can occur with vowels of [\pm ATR] value. The examples we will provide below shows that it is not in every V+V sequence that a high vowel deletes, especially the front vowel in contrast to Casali (1997) and Amanda (2000). Higher ranking MAXNONHI prevents the deletion of high vowels, markedness constraint *HIFRONT preserves [u] over [i], in a sequence [u#i]. Examples which borders on our discussions are given in (8).

- | | |
|--|---|
| 8. a. /gbéilè/ → [gbéìlè] ‘dig a house’ | b. /gbáilè/ → [gbálè] ‘sweep the floor’ |
| c. /nioko/ → [loko] ‘at the farm’ | d. /latieko/ → [lateko] ‘from Lagos’ |
| e. /latiaarɔ/ → [latarɔ] ‘since morning’ | f. /gbĩ àgbàdo/ → [gbĩgbàdo] ‘plant maize seedling’ |
| g. /bi ɔmɔ/ → [bimɔ] ‘gave birth’ | h. /wiejɔ/ → [wijɔ] ‘make a case’ |
| i. /mũinulè/ → [múnulè] ‘take the rag’ | j. /mũ iwe/ → [múwě] ‘take a book’ |

The examples in (8) can also be grouped into three forms. The first group is those in which [i] deletes in either V₁+V₂ position when it is in sequence with a non-high vowel (8a,b,c,d&e); the second group is those in which [i] does not delete in V₁ position when it is in sequence with non-high vowels (8f,g&h) and the third group is those which [i] deletes in the sequence [u#i] (8i&j). The higher ranking of the faithfulness constraint MAX[αF] determines the optimal output for the first group. We will illustrate this using /gbáil□/ ‘sweep the floor’ in tableau (9).

Tableau(9) showing the analysis of /gbáil□/

Input: /gbáil□/


CANDIDATES	AGREE[ATR]	NOHIATUS	MAXNONHI	ANCHOR L	FT-BIN
a. [gbáil□]	*!	*!			*
b. [gbil□]			*!		
c.  [gbál□]				*	

The higher ranking constraint MAXNONHI over ANCHOR L compels V₂ deletion. The markedness constraint *[+HI, -ATR] neutralizes the spread of [-ATR] in [gbil□] but becomes canceled out by MAXNONHI.

The second group retains [i] in V₂ position. The higher constraint MAXHI ensures [i] in V₁ position is preserved. The optimal candidate [bimɔ] satisfies harmony in Yoruba as highlighted in candidate (b) in tableau (9) because of the markedness constraint [+HI, -ATR]. The point here is AGREE[ATR] conditions in Yoruba must be satisfied for any optimal candidate, whether they are harmonic or disharmonic. The computation is shown in the tableau (10) below:

Tableau (10) showing the analysis for /bí ɔmɔ/

Input: /bí ɔmɔ/


CANDIDATES	AGREE[ATR]	NOHIATUS	MAXHI	ANCHOR L	FT-BIN
a. [bíɔmɔ]	*!	*!			*
b. [bómɔ]			*!		
c.  [bímɔ]				*	

We state here that *[+HI, -ATR] is undominated and also it neutralizes disharmony between [i] and [ɔ].

The last group entails the sequence [i # u]. The higher ranking markedness constraint, *[HIFRONT] over ANCHOR L preserves [u] over [i]. We will illustrate with the example /mũ ìwé/ in the next tableau.

Tableau (11) showing the analysis for /mũiwé/

Input: /mũiwé/

CANDIDATES	AGREE[ATR]	NOHIATUS	*HIFRONT	ANCHOR L	FT-BIN
a. [mũiwé]		*!			*
b. [míwě]			*!		
c.  [mũwě]				*	

Accounting for Exemptions


The design of the optimality framework is engendered towards the description of language as used by native speakers. In other words, it explains what is being said in a mathematical way. OT says all CONSTRAINTS are universal to all languages. Ranking of constraints will determine the grammar of individual languages (McCarthy, 2008). Thus it forbids rules about how a language is to be used. This implies that in tableau, all possible forms of constraints are available for all languages based complexities; CONSTRAINTS STRESS are available in tonal languages and vice versa in stress based languages. The important thing then is the selection of constraints based on their harmonicity to inputs and possible candidates. This is because a native speaker will decide to obey constraints harmonic to his speech and allows the violation of constraints that may not be harmonic to his speech. This is the phonotactic principle, a language has possible ways sounds are combined for instance *CC is a markedness constraint in Yoruba. But *CC becomes violable when syllabic nasals follow another consonant such that *ŃC outranks *CC.

Harmonicity has helped in providing the most needed constraints tied on orthographic space in accounting for complexity of vowel elision in Yoruba. A unified set of constraints is already available in the native speakers' mind; it can be said to be infinitum. When a constraint fails to account for the realisation of the retained vowel in Yoruba, it means that the unified constraints are ranked in different ways for the two different optimal outputs. This is what OT defines as grammar, 'the manifestation of sound combinatorial possibilities'. Thus, in examples

(6) where the introduction of IO-ID[LO] ensures that [a] is preserved in cases such as ‘pa esè pò’ → [kpasɛkpɔ] ‘cross legs’ but would not account for [gbèbè] ‘accept apology’, the point is IO-ID[LO] is lower ranked and ANCHOR L is higher ranked such that we have a tableau of:

Tableau 12 showing analysis of /gba ɛbɛ/

/gba ɛbɛ/

CANDIDATES	AGREE[ATR]	NOHIATUS	ANCHOR L	IO-IDENT[LO]	FITBIN	
gba ɛbɛ		*!				
gbabɛ			*			
gbɛbɛ 						

The ability of OT to allow for universally constraints which could be ranked and violability of the constraints help to account for what a native speaker utters. Hence, the grammar of OT is the grammar that allows higher ranked constraints to be lower ranked when not harmonious with input. This is similar to Chomsky and Lasnik (1977) Filter Theory Model. Inputs are allowed to undergo rewrite rules optionally which may lead to them undergoing, any, all or none. Filters account for what will then be grammatical or not grammatical. But unlike this model, OT allows filters, that is, constraints to violable. This provide for possibility of ranking. If it were to be that they were not violable. They would be set of rules determining what is grammatical. But conspiracies in languages such as examples ATR spread from the root vowel proposed in this work are resolved when filters are made violable and rankable relative to the harmony of the input-output. For instance, in gbéowó/ → [gbówó] ‘to steal money’ ANCHOR L higher ranks ANCHOR R where AGREE[ATR] and NO HIATUS are undominated. However, a word such as sé-òdò → sédò ‘block the river’ could not have been accounted for with this set of the unified constraints ranked in this way. It will portend that AGREE[ATR] is lower ranked whereas ANCHOR R higher ranks ANCHOR L⁴. It is possible to argue that retaining the vowel of the verb help to protect the semantic property of the phrase especially of the action that was carried out. This is not arguable because the native speaker picks parametric variability to express what he has in mind. This is shown in the tableau below:

Tableau 13 showing analysis of /sé òdò/

/sé òdò/

CANDIDATES	ANCHOR R	NOHIATUS	AGREE[ATR]	IO-IDENT[MID]	FITBIN	
sé òdò		*!	*		*	
Sódò	*!					
sédò			*!			

⁴Though part of the universal constraints, it is not relevant to be provided in the tableau since it less harmonious in the set of constraints to be evaluated by EVAL

Thus, complexities surrounding the retained vowel in Yoruba become easier explainable when viewed in terms of possibility of the violation and ranking of constraints.

Findings and Conclusion


In summary, we have been able to discuss vowel elision workings in the mind of a Yoruba native speaker. We undertook this aspect with the focus of harmony controlled by the root final vowel in low and mid vowels; and to demonstrate how vowel harmonic qualities forming constraints can be used to analyse the complicating issues of high vowels. In the process of our data gathering, we discovered that some other disyllabic compounds also compel V₂ deletion. Such awareness makes us know that the vowels which elide are not only those in V₁ position. Examples of V₂ deletion apart from the complicated high vowels are given in (9).

9. a. /roε jɔ/ → [rojɔ] ‘to gossip’
 b. /lɔ ata/ → [lɔta] ‘to grind pepper’

The constraint IO-ID[+ATR] ranks over AGREE[ATR] and ANCHOR L ensures the output [rojɔ]. Consider tableau (14) below:


Tableau (14) showing the analysis for /roε jɔ/

Input: /roε jɔ/

CANDIDATES	IO-ID[+ATR]	NOHIATUS	AGREE[ATR]	ANCHOR L	FT-BIN
a. [roε jɔ]		*!			*
b. [rɛ jɔ]	*!				
c.  [rojɔ]			*	*	

The example (9b) births the output [lɔta] because of the high ranked *[LO] over ANCHOR L. Consider it the tableau (13) below:

Tableau (15) showing the analysis of /lɔ ata/ Input: /lɔ ata/

CANDIDATES	AGREE[ATR]	NOHIATUS	*[LO]	ANCHOR L	FT-BIN
a. [lɔata]		*!			*
b. [lata]			*!		
c.  [lɔta]				*	

In conclusion, vowel elision in Yoruba needs to be looked at from [ATR] agreement, prosodic minimality and other vowel qualities. Hence, positional constraints (Casali 1997) and syllabic constraints (ONSET) are not sufficient to capture the vowel elision process in Yoruba. We opined that other vowel quality constraints and prosodic minimality contributes to Yoruba vowel elision. Most importantly is that in a native speaker’s mind, the constraints are ranked proportionately for the required output; it could higher rank or lower rank conflicting constraints and at the same time allow some of these conflicting constraints violated. As such covert rankings are allowed to take place before output candidate evaluations.

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