Hiatus Resolution in Urhobo: A Constraint-Based Account

التباعد بين الاصوات المتتاليه في الاورهوبو: القيود واستراتيجيات الاصلاح

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Abstract

The Urhobo language displays a hiatus environment created via morphological or syntactic concatenation. However, the grammar of the language requires that such an environment be repaired. This is because it violates a constraint forbidding hiatuses in the language. Languages that do not tolerate hiatus may apply one or more repair strategies to ensure deviant structures conform to constraint requirements. This study seeks to examine the hiatus resolution strategy in Urhobo and its interaction with general processes in the language. It employs data elicited from two adult L1 speakers of the language, while the analysis of the data is couched within the theory of constraint and repair strategies (TCRS). The study noted that only vowel elision is employed as a repair strategy, but it is bled by glide formation, which is a general process in the language. Elision targets V_1, but it is blocked by *$Ø_{LINCON}$, a constraint that requires the preservation of elements that encode greater linguistic content in a string. Hence, it seems, at least superficially, that vowel elision affects any of the vowels on either side of the word boundary in Urhobo. The interaction

between glide formation and vowel elision is couched in a serial implementation, such that the general process of glide formation applies first, thereby bleeding vowel elision. Thus, [+High] vowels do not necessarily survive vowel elision, as argued in previous studies, rather, glide formation as a general process bleeds an environment in which vowel elision, which is a repair strategy, can apply since it occurs first. There are two points of interest in this study; viz., it is argued that general processes can apply before repairs in the TCRS model and that such application accounts for bleeding relations between processes.

Keywords: Hiatus; Urhobo; Serialism; Repair Strategy; Bleeding.

ملخص

تقدم لغة الأورهوبو بيئة تسمح بوجود انقطاع بين أصوات العلة المتتالية في الكلام دون وجود صوت صحيح بينهما، وينتج ذلك عن العمليات الصرفية أو النحوية في اللغة. تتطلب قواعد اللغة إصلاح مثل هذه البيئة لسد تلك الفجوات الصوتية. عادةً، تطبق اللغات التي لا تتسامح مع هذه الفجوات إستراتيجيات إصلاح واحدة أو أكثر لضمان توافق الأنماط الصوتية المستحدثة مع القيود الصوتية المطبقة في تلك اللغات. تهدف هذه الدراسة إلى فحص استراتيجية إصلاح الفجوات الصوتية في الأورهوبو وتفاعلها مع العمليات العامة في اللغة. تستخدم الدراسة بيانات وأمثلة من متحدثين باللغة الأورهوبو كلغتهم الأم وهم في سن البلوغ، تم تحليل البيانات والأمثلة ضمن إطار نظرية القيود واستراتيجيات الإصلاح (TCRS) وقد بينت الدراسة وبما يتفق مع ما ورد في الدراسات السابقة ان حذف الحرف الصوتي يُستخدم كاستراتيجية لإصلاح الفجوة، والنتيجة هي تشكيل صوت مركب متحرك او منزلق (diphthong)، وهو عملية عامة في اللغة. عند حذف الصوت (V1)، يتم اعاقة العملية بواسطة القيد (Ø LIN*)، وهو القيد الذي يتطلب الحفاظ على العناصر في تسلسلها الأصلي دون إدخال فجوات، حيث يؤثر الحذف على الحروف الصوتية الموجودة على حدود الكلمة في الأورهوبو بحيث ينتج عنه تشكيل الانزلاق (diphthong) حتى في حالة الأصوات المرتفعة [High+]، وتفيد هذه الدراسة أن العمليات العامة يمكن أن تطبق قبل إجراء الإصلاحات حسب نظرية القيود واستراتيجيات الإصلاح و ان مثل هذا التطبيق يبرر التشابك بين العمليات الصرفية والقواعدية.

الكلمات المفتاحية: الأورهوبو، تتابعيه الاصوات، استراتيجية الإصلاح، إعاقة التطبيق.

Introduction

This study examines hiatus resolution in Urhobo. Hiatus refers to two adjacent vowels belonging to different syllables (Crystal, 2008: 228). Sequences of vowels in a phonological word may be tautosyllabic, in which case they occupy a single nucleus slot in a syllable, or heterosyllabic, in which case they occupy distinct but adjacent nucleus slots. Thus, a heterosyllabic vowel sequence is a hiatus. Hiatus environments may be underlying or created via morphological or syntactic concatenation and are subject to different responses cross-linguistically. These responses include resyllabification, vowel elision, consonant insertion, glide formation, coalescence/ merger, or allomorphy (Hildebrandt, 2006). In some cases, a combination of two or more of these processes is employed. Hiatus resolution is a universally common phonological phenomenon. It has been reported in many languages, including most Niger-Congo languages (Casali, 1996; Adeniyi, 202; Ekiugbo, 2022). Aziza (2010) presents a descriptive overview of the case in Urhobo. Although the main focus of her study is to account for the implication of vowel elision and glide formation on the behaviour of tones, she notes that,

Since all syllables [in Urhobo] end with a V and most words begin with a V, vowel sequences are commonly found in the underlying representation but are prohibited from occurring at the phonetic level. When vowel sequences occur in the underlying representation, one of them obligatorily undergoes some systematic phonological process to arrive at acceptable phonetic forms and the two common processes are vowel elision and glide formation. (Aziza, 2010:456).

The above clearly shows that there are instances in which some derived formatives produce hiatus environments in Urhobo, but such environments are disallowed. A standard principle in the phonological literature, especially in generative frameworks, is that when certain segments or structures are disallowed in a language, the grammar of the language often applies one or more strategies to repair the deviant segment or structure. In the hiatus environment noted above, Aziza (2010) argues that the structure is repaired through vowel elision or glide formation. She

also pointed out that vowel elision affects [-High] vowels in V_1 or V_2 position depending on morphosyntactic consideration, while [+High] vowels in V_1 position 'survive' elision as the [+High] vowel is realised as a glide. However, no particular reason is offered for why [+High] vowels (/i, u/) survive vowel elision while [-High] vowels do not. A similar case is reported for Olukumi in Okolo-Obi (2014:85–86), in which he asserts that,

When there is a co-occurrence of two vowels in the language (usually in associative constructions), the first vowel in the sequence (V_1) obligatorily deletes. However, when the first vowel across the boundary is a high vowel /i/ or /u/, deletion becomes impossible. Rather the front high vowel is converted to the voiced palatal approximant [j], while the back high vowel is converted to the voiced labio-velar approximant.

This view will require ad hoc rules to account for the interaction of the two processes, which will introduce complexity into the phonological grammar of the language. The interaction between vowel elision and glide formation in Urhobo hiatus resolution has also not been accounted for. In this study, the theory of constraint and repair strategies (henceforth TCRS) is employed to give an account of the hiatus resolution strategy in Urhobo, their interaction with other processes in the language, and their motivation. The work is divided into five sections, viz., introduction, literature review, methodology, data analysis, and conclusion.

Literature Review

This section presents a review of some of the extant literature on hiatus resolution. The syllable is a very useful concept in discussing the general rules underlying the distribution of sounds in languages (Ugorji, 2013). The ways in which segments (consonants and vowels) are allowed to combine in a language are regulated by the syllable requirements of the language. Thus, the distributional and combinatorial patterns of phonemes are not haphazard but follow certain universal and language-specific rules or constraints. Following Ọla (1995) and Orie & Pulleyblank (2002), languages that do not tolerate hiatus have a constraint that prohibits sequences of vowels. This constraint can be represented as (1).

(1) NoHiatus: Sequences of vowels are prohibited (Orie & Pulleyblank, 2002:110).

Given this constraint, when hiatus environments are created through concatenation, some processes are employed as resolution strategies to correct the illicit structure. A cross-linguistic survey of patterns of hiatus resolution has shown that different languages and language groups employ different strategies (Bergman, 1968; Casali, 1997; Hildebrandt, 2006; Adeniyi, 2021). Casali (1997) presents the result of a cross-linguistics survey of factors that affect which of two adjacent vowels is elided when using vowel elision as a strategy for hiatus resolution. He argues that although both V_1 and V_2 elision are attested, the choice of which vowel is elided is not random but is subject to interesting restrictions. According to him, this choice is determined by positional-sensitive faithfulness. Thus, he noted the following patterns:

a. At the boundary between two lexical words, elision always affects V_1. Exceptions occur only under very special circumstances, such as those involving the idiosyncratic behaviour of particular vowels in some languages.

b. At the boundary between a lexical word and a following function word, V_1 elision also appears to be more common.

c. Only V_1 elision generally occurs at the boundary between a (minimally) CV prefix and a root.

d. At the boundary between a root and a suffix, either V_1 or V_2 elision is possible.

However, the data in Adeniyi (2021) suggests that the pattern of hiatus resolution is a little more complex than that reported in Casali (1997), and in some cases, haphazard. His study is a survey of vowel sequences and how they are resolved in eight West Benue-Congo languages, all of which are three-toned system languages. The languages are Ebira, Ghotuo, Gwari, Igala, Itsekiri, Nupe, Yala (Ikom), and Yoruba. Although the study made some generalisations similar to those made by Casali (1997), some of the data show deviations and were considered exceptional cases in the

study. Particularly, he claims that the surveyed languages exhibit a number of peculiarities, but the two most common processes of resolving hiatus in these languages are V_1 elision and glide formation. However, even in their implementation, the languages exhibit different exemptions. These exemptions include specifics regarding which of two vowels in a sequence is elided or glided and under what phonological circumstances, as well as how sacrosanct the process of vowel elision and glide formation is when the phonological criteria are met. Of particular interest is his assertion in the Yoruba case. According to him, there is no agreement among scholars on the preferred pattern of vowel sequence reduction in this language. This is due to the fact that every order has a crystal-clear exemption, but the linguistic details of these exclusions are still unclear, particularly in the case of verb tenses. This notwithstanding, the repair options include vowel elision, vowel coalescence, vowel assimilation, and vowel sequence preservation.

Orie and Pulleyblank's (2002) study of hiatus resolution in Yoruba however suggests that the choice of vowel to be deleted can be determined by some other factors other than position. They reported that in Yoruba hiatus resolution, vowels of minimally sized words are shielded from elision by foot binarity and prosodic word minimality. The minimal size of a prosodic word in the language is two syllables (bisyllabic). Monosyllabic words are sub-minimal, while polysyllabic words are supra-minimal. Accordingly, when two minimally sized words are concatenated, both vowels are retained, as they are shielded from elision. It is only the vowels of a sub-minimal word that are deleted. Thus, in a V_1+V_2 sequence, V_1 gets deleted when it occurs in a monosyllabic word. In a V_1+V_2 sequence, V_1 is retained when contained in a word of two or more syllables. However, when both vowels are retained, one will typically assimilate to the other. They also noted in a footnote that although "in deletion contexts, it is generally the case that V_1 deletes and V_2 is retained... [t]here are a significant number of cases, however, where the opposite pattern holds: V_1 is retained and V_2 deletes" (Orie & Pulleyblank, 2002:105).

Methodology and Theory

This study employs data collected from primary sources. The data consist of associative constructions elicited from two adult L1 speaker of Agbarho dialect of Urhobo, the dialect from which literacy in Urhobo is targeted. The data were analysed using TCRS, a framework first proposed in Paradis (1988). The assumption underlying TCRS is that the phonology of any language consists of both universal and non-universal constraints, which, when violated, trigger the application of repair strategies. Thus, phonological well-formedness in any language is a function of an aggregate of inviolable constraints. Following Archangeli and Pulleyblank (1994:14), well-formedness encodes the requirement that no representation may be allowed, even temporarily, to violate any constraint. Murphy (2019:1) also notes that when grammatical constraints impose conflicting requirements on a linguistic expression, this conflict is often resolved by employing a repair operation. Therefore, repair is any of the processes used to ensure that content or structure conforms to a violated constraint. Thus, given the constraint in (1), examples such as those in (2) will be considered to have violated this phonotactic constraint and thus require repair.

(2) a. abɔ#eɻa[(1)] 'three times'

b. ɔ-jɔ̃re#iɣo 'treasurer'

c. oma#eɾovo 'rest'

d. abɔ#emuo 'wresting'

e. akpɔ#ɛɾjɔ 'enjoyment'

Repair processes are however distinguished from general processes. It has been argued in the literature that phonological processes are of two types: general processes and repair strategies (Calabrese, 2022). General processes are 'contextual and arbitrary', while Repair strategies are context-free; their application is justified by the constraints. Thus, while

(1) Urhobo is a tone language. However, tone is not marked in this study, as they do not play much significant role in the discussion in this study.

repair processes are processes employed to repair segments and/or structures that violate any constraint (Paradis, 1988; Lacharité, 1993; Paradis and Prunet, 1991; Ekiugbo and Eme, 2023).

Analysis

Cross-linguistically, languages exhibit regularities in the forms that are permitted. This is because the way sounds can be combined is constrained. The phonological grammar of a language is constrained at different levels, including its phonotactics. In Urhobo, one of the phonotactic constraints disallows hiatus. This constraint is represented in (1) above. Given that the constraints in the TCRS model are inviolable, when any associative construction, such as compounding, gives rise to a hiatus in Urhobo, repair process is triggered. Vowel elision is the strategy for resolving hiatus in Urhobo, contrary to previous assumptions in which vowel elision and glide formation are identified as the processes for resolving hiatus. The position that will be assumed in this study is that glide formation is a general process in Urhobo, while vowel elision is a repair strategy. Thus, the first argument in this study is that only vowel elision is employed in repairing hiatus. Elision targets V_1, as shown in examples (3) below.

(3)	a. oma#ɛxɔxɔ	>	[omɛxɔxɔ]	'resemblance'
	b. ɔ-mré#àro	>	[ɔmraro]	'seer'
	c. ɔmɔtɛ#ojojovì	>	[ɔmɔtojojovi]	'beautiful girl'
	d. aŋma#ɔfũãfõ	>	[aŋmãfũãfõ]	'white cloth'
	e. ò-xʷe#íjèrí	>	[òxʷíjèrí]	'fisherman'
	f. ɔg͡ba#ofoβ̩i	>	[ɔg͡bofoβ̩i]	'soldier'
	g. ɔ-ta#ota	>	[ɔtota]	'spokesman'
	h. iruo#ɛɣʷa	>	[irwɛɣʷa]	'farming'
	i. cere#ɔnɛ̃	>	[cerɔnɛ̃]	'cook yam'
	j. oɸiɛ̃#erãβ̩e	>	[oɸjɛ̃ɾ̃ãβ̩e]	'fur'

As shown in example (3), hiatus environments are created via the morphological process of compounding. This is common in Urhobo because of the structure of words in the language. All words in the language end in vowels (open syllables), while nouns begin with an onsetless syllable. Thus, when two words are concatenated, it opens up the possibility for a vowel-initial word to follow another word, thereby creating a hiatus environment, since the first word in the new construction ends with a vowel. Given that the constraint in (1) operates in Urhobo phonology, it is expected that such an environment is repaired. This explains why one of the vowels on either side of the boundary is elided, in this case, the first vowel. Elision of V_1 is however blocked by *$Ø_{LINCON}$. As a result of the effect and demand of this constraint, V_1 is not deleted in some instances. Instead, V_2 is as shown in example (5).

(4) *$Ø_{LINCON}$: Do not delete an element that encodes greater linguistic content

(5) a. ox^{w}o#ɔjena > [ox^{w}ojena] ‘that person’

b. ewũ#ɔwɛ̃ > [ewɛ̃̀ũ̀w̃ɛ́] ‘your clothes’

c. ekpu#ɔmɛ̃ > [ekpumɛ̃] ‘my bag’

d. ikpu#emɛ̃ > [ikpumɛ̃] ‘my bags’

e. ix^{w}o#ejena > [ix^{w}ojena] ‘those people’

Cross-linguistically, certain elements or positions in a lexical or sentential formative encode greater linguistic importance. These positions, which are sometimes considered as ‘strong positions’ in the literature, are often unaffected by certain processes, among other things (Steriade, 1997; Dresher and van der Hulst, 1995; Lombardi, 1991; Webb, 1982). Positional neutralisation, a form of phonological process in which material held in a ‘strong’ position is resistant to neutralisation processes that impact material in the corresponding ‘weak’ position, is a classic example. According to Smith (2000), the inclusion of a particular position in the class of strong positions is justified when that position has intrinsic psycholinguistic or phonetic salience. Following Aziza (2010), a grammatically functional vowel would normally be retained in Urhobo,

while a grammatically vacuous vowel would be elided. Thus, in example (3), V_2 is retained because it indicates number distinction, which makes this position a salient one in the language; whereas in example (5), V_2 is deleted because the words bearing the vowels occur immediately preceded by the head of the compound, which is also a salient position. Thus, even though the second vowel in the VV sequences in example (5) marks concordial relation, their function in the (semantic) word is redundant.

Although it seems that it is also possible for glide formation to apply in some hiatus environments, at least superficially, or as previously argued, the position assumed in this study is that glide formation is not a repair strategy for hiatus but a general phonological process that applies in the phonological grammar of Urhobo prior to the application of vowel elision, thus causing a bleeding relation between the two processes. Firstly, data showing the application of glide formation in Urhobo is shown in Example (6) below.

(6)	a. utiɛ̃	>	[utjɛ̃]	'orange'
	b. ofiã	>	[ofj̃ã]	'lie'
	c. kiɛ̃	>	[kj̃ɛ̃]	'sour'
	d. kidia	>	[kidja]	'sit'
	e. ɛ-ro-ɔ	>	[ɛrwɔ]	'entry'
	f. ek͡peti#uɣe	>	[ek͡petjuɣe]	'television'
	g. eɻi#ɔfũãfo	>	[eɻ̊jɔfũãfo]	'Holy spirit'
	h. o-si#ɔbe	>	[osjɔbe]	'secretary'
	i. ikũ#e-gbe	>	[ikw̃ẽgbe]	'chat'
	j. eki#ɛ-cuɔ	>	[ekjɛcwɔ]	'trading'

The data in example (6) shows how [+high] vowels as V_1 in a vowel sequence undergo glide formation(1). But unlike vowel elision, the glide formation can occur within and across morpheme/word boundaries, whereas vowel elision occurs only across word boundaries. Implicitly, vowel elision and glide formation apply to distinct entities. Also, the process of glide formation applies under certain conditions, a phenomenon characteristic of general processes. One of the major distinctions between repair strategies and general processes is that the former apply when there is a need to repair a structure that violates a given constraint, while the latter apply when certain conditions or environments are met. Thus, while repair processes are context-free, general processes are context-sensitive. In the case of glide formation in Urhobo, the following contexts trigger the application of this process:

(7) a. In all cases, the first vowel must be a high vowel (i.e. [+high] vowel only).

b. Within morpheme/word boundary, the second vowel must not be identical with V_1.

c. Across morpheme/word boundary, the second vowel can be identical with V_1.

d. In all cases, the sequence must be preceded by a consonant.

Thus, the position assumed in this study about the place of glide formation and vowel elision in the phonological grammar of Urhobo is premised on the assumption that both processes have different motivations underlying them and apply at different phonological domains. With respect to motivation, while vowel elision is triggered by the need to repair a structure that violates a phonological constraint in the language, glide formation is triggered when the contexts stated in (7) are present, whether within or across a word or morpheme boundary. Implicitly, while glide

(1) /e, o/ behaves sometimes as [+high] vowels and sometimes as [-high] vowels; that is, they undergo glide formation in some environments like high vowels. Such instances have been reported to be reflexes of */ɪ, ʊ/ which was once attested in the language, but has merged with /e, o/ respectively (Casali, 1995; Aziza, 2008; Ekiugbo and Ugorji, 2019).

formation may apply at the lexical level, vowel elision, on the other hand, applies only at the post-lexical level. The interaction between glide formation and vowel elision in Urhobo is shown in example (8) below.

(8) UF> General process> Repair process> SF

a. o-gũ#ɛdʒɔ	o-gw̃#ɛdʒɔ	o-gw̃#ɛdʒɔ	[ogw̃ɛ̃dʒɔ] 'judge'
b. onĩ#aje	onj#aje	onj#aje	[onj̃ãje] 'mother-in-law'
c. iꭍibo#ɛkpro	iꭍibo#ɛkpro	iꭍibØ#ɛkpro	[iꭍibɛkpro] 'fresh pepper'
d. ɔ-ta#ota	ɔ-ta#ota	ɔ-tØ#ota	[ɔtota] 'spokesperson'
e. iɾuo#ɛɣʷa	iɾwo#ɛɣʷa	iɾwØ#ɛɣʷa	[iɾwɛɣʷa] 'farm'
f. kidia#etinɛ̃	kidja#etinɛ̃	kidiØ#etinɛ̃	[kidjetinɛ̃] 'sit here'
g. ʊiɛ#eja	ʊjɛ#eja	ʊjØ#eja	[ʊjeja] 'birth women'

The examples in (8) show the process of deriving concatenated forms involving glide formation and vowel elision from their underlying forms. The concatenation process results in the juxtaposition of two or three vowels in the underlying form. In (8a-b), where the first vowels of the VV sequences are [+High], the general process applies to render them as glide; thus, no repair is exerted since the structures at this point no longer violate the NoHiatus constraint; whereas in (8c-d), in which no context exists for the application of glide formation and the structures violate the NoHiatus constraint, repair is triggered to ensure the resulting structures conform with the constraint. Accordingly, the examples in (8e-g) in which there are sequences of three vowels, with V_1 as [+High vowel][(1)], the high vowel I realized as a glide, leaving a sequence of two vowels which violates NoHiatus; thus, repair is applied in these examples.

Conclusions

Hiatus environment has been reported in a number of languages. It has also been shown that different languages or language groups employ

(1) In any concatenation resulting in a sequence of three vowels in Urhobo, V_1 is always a [+High] vowel.

different strategies in resolving hiatus. The current study provided an account of the strategy employed in resolving hiatus in Urhobo and its interaction with glide formation, which is considered a general process in the language. The views presented were couched within TCRS. The study noted that only vowel elision is the strategy for repairing hiatus in Urhobo. This process itself is triggered by a NoHiatus constraint. As expected and within the TCRS model, such an environment must be repaired given that constraints are inviolable. Glide formation, which has been argued in the extant literature as a hiatus resolution strategy, is accounted for in this study as a general process that is triggered when its conditioning environment is met, and its application precedes the application of any repair process. Given that glide formation applies prior to the repair of the environments that violate the NoHiatus constraint, it bleeds some of the environment in which vowel elision can apply.

Accordingly, only vowel elision is employed in hiatus repair in Urhobo. This process targets the first vowel in the sequence, but it is blocked by *$Ø_{LINCON}$, a constraint that requires the preservation of elements that encode greater linguistic content in a string. Implicitly, we believe, the choice of vowel to be deleted is constrained by the need to preserve positions or materials that encode greater semantic content. Thus, in the data in example (3), all of which are compound words containing two lexical items, with the headwords of the compounds occurring to the right, it is the vowels of the words to the left that are deleted. In example (5), the concatenated words consist of lexical words that are followed by functional words. Given that the head of such a formative is the functional word, it is the vowels of the right words that are therefore deleted.

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