AFRIKA UND ÜBERSEE

Trilingual Journal of African Languages and Cultures
Revue trilingue des langues et cultures africaines
Dreisprachige Zeitschrift für afrikanische Sprachen und Kulturen

Volume 99

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Kolawole Adeniyi
Obafemi Awolowo University, Ile-Ife
kola.adeniyi@oauife.edu.ng

DOI: 10.15460/auue.2026.99.1.406

Peer-reviewed article
Submitted: 29.10.2024
Accepted: 19.09.2025
Published: 09.01.2026

Recommended citation:
Adeniyi, Kolawole. 2026. Synchronic variation in Igede syllable structure. *Afrika und Übersee* 99. 1–24.

Hosted by Hamburg University Press

Synchronic variation in Igede syllable structure

Kolawole Adeniyi

Obafemi Awolowo University, Ile-Ife
kola.adeniyi@oauife.edu.ng

Abstract
This study examines synchronic variation in the syllable structure of Igede, an Idomoid language spoken in Nigeria and concludes that the syllable structure of the language is currently undergoing change. Existing body of work on the language as far back as Bergman (1971) show that Igede has the V, CV, and N syllable types. Without necessarily focusing on the syllable, patterns in the Igede data in other works conform to these syllable structures (Abiodun 1989, 1991, 2005; Anyogo 2012). However, data from twelve competent speakers recorded between 2021 and 2023 show that the language is currently developing a CrV (CCV) structure. The CrV structure is evolving where V^1 gets elided in a $C^1V^1C^2V^2$ sequence. There are two main characteristics to this variation, namely (i) V^1 is one of the high vowels /i/, /ɪ/, /u/ and /ʊ/, and (ii) C^2 is strictly a /r/. The summary of this is that in a disyllabic word where a high vowel as the nucleus of a CV syllable is immediately followed by /r/ in the onset of a following CV syllable, the high vowel is elided. The result of this elision is the reduction of two contiguous CVCV syllables to only one having the CrV structure. The description of the CrV structure is complemented with acoustic analysis with the use of PRAAT. This CrV structure is systematic and consistent in the speech of all the twelve speakers that participated in this study. It is therefore concluded that this is a case of change in progress. The current stage of the change is modelled using Optimality Theory.

Keywords: change, high vowel, Igede, syllable, variation

1 Introduction

Variation is a common phenomenon in language and is a key trigger of change. The subject is well documented in the literature; studies often come under the umbrella of lexical attrition (Bavin 1989; Murray 2011; Dorian 2013; Tejedo-Herrero 2016; Sands, Miller & Brugman 2007: 59; Chebanne & Dlali 2017) or sound change (Labov

DOI 10.15460/auue.2026.99.1.406

1972, 2006; Ohala 1993; Honeybone 2019) among others. Regarding Benue-Congo languages, works on variation cover a wide array of areas. For instance, Adeniyi & Olaogun (2020) reported variations in the lexicon of Yoruba by which many lexical items were being replaced by synonyms, borrowings, neologism and descriptive phrases among others. It has also been reported that Igasi, a language spoken in southwestern Nigeria is currently developing nasalised vowels in word-initial position, a rare phonetic environment for such sounds (Adeniyi & Talabi 2020). A study that relates to syllables also reported that Yoruba had stopped the full nativization of borrowed words containing consonant clusters; this has introduced consonant clusters into the contemporary speech of many Yoruba speakers, contrary to the morpheme structure condition forbidding consonant clusters in the language (Adeniyi 2015b). A similar finding was also reported by Adebayo (2022), whose study drew from both diachronic and synchronic realities (see also Adebayo (2023) on variation in Yoruba). Also, Adeniyi (2018) reported that the current orthography of *òun* '3sg' in Yoruba is the outcome of a diachronic change in the word. Through this change, the phoneme /h/ got deleted from the earlier form *òhun* and this altered the syllable structure from V.CV to V.V. The V.V structure then became an exemption among Yoruba personal pronouns all of which have the V.CV structure. One key point from Adeniyi (2015, 2018) and Adebayo (2022, 2023) is that the study of variation goes beyond the phonetic realisations of phonemes; the syllable has been reported to be a subject of significant language change in Nigerian languages.

Igede, spoken in North Central Nigeria belongs to the Idomoid sub-group of West-Benue-Congo language family. The largest concentration of its speakers is in Oju, Otukpo, and Okpokwu Local Government Areas of Benue State (Simons and Fennig 2018), but speakers are scattered around Nigeria due to their flair for agriculture-motivated migration. They usually live in isolation within their migrant communities, a culture that affords them loyalty to their language. Although Igede is regarded as one of the most widely-studied Nigerian languages, there remains many aspects of the language that are yet to be sufficiently studied. One of this is the observed variation in its syllable structure. The documentation of the nature and extent of this variation is the primary objective of this paper.

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2 Literature review

Many studies have investigated the place of diachrony in synchronic syllable structures (Árnason 1981; Honeybone 2019; Nyoni 2021 among others). In his work on the evolution of the Icelandic syllable structure, especially with regards to the roles of consonants /v/, /j/, and /r/, Árnason (1981: 229) concludes that "syllables will have to be seen as partly a product of historical development".

Regarding the presence of complex syllables in Nigerian languages, especially those genetically close to Igede, Gwari, also a West Benue-Congo language, has consonant-nasal (CN), consonant-glide (CG), consonant-nasal-glide (CNG) clusters in the onsets of syllables to yield CNV, CGV and CNGV syllable structures respectively (Hyman & Magaji 1970; Adeniyi 2015a). In Igala and Nupe, the glides /j/ and /w/ can combine with consonants in the onset position of a syllable to yield the consonant-glide-vowel (CGV) syllable structure (Akinkugbe 1976; Hyman 1970: 59–60). Adeniyi (2015a) shows that in both Igala and Nupe, many instances of the glides /j/ and /w/ in the CGV structures are synchronically traceable to vowels /i/ and /u/ respectively which converted to glides to resolve hiatus. In both languages, the gliding of the vowels effectively altered the structure of the syllables.

High vowels generally have been noted to participate in highly restricted processes. Their behaviour in hiatus situations in Nigerian languages is such that whether they are elided or glided depends on different factors such as whether they occur as V^1 or V^2, or on the quality of the interacting vowel with them. The vowel /i/ is among the weakest class of segments and thus extremely vulnerable to change. Among vowels, its acoustic print is the faintest and it is the most difficult to characterise. The vowel /i/ is known crosslinguitically to be affected by reduction, often resulting in outright elision. Lunda, a Zambian Bantu language is an example of languages with this process (Easterday 2019: 300). Also in Tshivenḓa, a Bantu language spoken in South African and Zimbabwe, the vowel /i/ is shown to be among the most prone to elision, which occurs when the suffix /-iwa/ is added to some verbs, in demonstratives and in some other environments (Nyoni, 2021: 311). In vowel elision in Ikhin, the high vowels /i/ and /u/ behave differently from the other vowels in the

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sense that they either become corresponding glides [j] and [w] or get elided in the same phonetic environment (Opoola & Oladimeji 2021).

It is possible for sounds to be lost in restricted phonological environments. Parker (1981: 29f.) reports that West Germanic languages "lost labial and velar voiced stops in final position after nasals". Using data from German and English, Parker showed how this process has significant interaction with syllabification and stress shift. Typologically, vowel reduction has been shown to occur more in unstressed syllables (Sen 2012: 466). However, Igede lacks stress, which eliminates the place of stress in the case reported in this study. However, the consonant /r/, which appears to be the main trigger of the change reported for Igede in this study, is among the weakest consonants, being an approximant (Murray & Vennemann 1983: 523–524).

Many factors have been advanced for diachronic sound change, one being instances of extreme differences between contiguous segments (Murray & Vennemann 1983: 520). Perception has also been argued to account for instances of diachronic and synchronic vowel reduction. This has been convincingly argued by Ohala (1974). Parker (1981: 34) is emphatic that acoustic/auditory theory helps to relate diachronic change to synchronic alternation by placing perception at the centre of the change. Sen (2012) also notes that the strength of perceptual cues in particular environments is capable of triggering change. "Syllable shape is also occasionally found in the literature as a factor: vowel reduction is reported to be more common in open syllables than in closed ones" (Sen 2012: 466). For instance, word-internal open syllables show more extreme reduction than closed syllables in Latin (Sen 2012: 467). It has been shown that this is because the vowel has reduced duration in this environment.

3 Methodology

Data for this study was collected from Igede migrant settlements in owode-Ede, Abere-Osogbo and Awo communities in Osun state during a series of field trips between 2021 and 2023. The focus group discussion method was used for data collection in each of the speech communities. Each focus group contained an average of four participants, and at least twelve participants were involved in each of the speech communities. Despite the involvement of a large number of Igede speakers during data collection, only twelve who were spokes-

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persons for the focus groups were recorded across the communities. All the recorded participants were adults who were competent in Igede who migrated from different villages in Benue State. This implies that the data were not of any particular variety, but rather of the general usage of the language among all the speakers regardless of varieties.

Most, but not all the speakers were acquiring Yoruba informally within the Yoruba speech community. At least three of the recorded participants could be regarded as being monolingual Igede speakers because they migrated shortly before the period of data collection and so did not speak any language other than Igede. Apart from the few whose migration was recent at the time of data collection; the other participants had lived in different parts of Yoruba community for more than 20 years but maintained close ties with their respective villages by regular visitation.

Data were recorded on the field. Because there was no privilege of sound-proofed laboratories, recordings were done in quiet environments. The Zoom H1N and Zoom H4N digital audio recorders were used for recording. Data were recorded in .WAV format at 44 kHz sampling rate at 16 bits resolution. The wordlist used was the Ibadan wordlist of 400 basic items. The wordlist has been used widely in the study of Nigerian languages (Lewis 2013; Adeniyi 2015; Legbeti 2022; Ajani 2023 among others).

In this study, perception cues were doble-checked acoustically, using PRAAT (Boersma & Weenink 2011). By this, formants were examined on PRAAT to ascertain whether there were vowels in the investigated environments or not. PRAAT also made it possible to present annotated spectrograms of selected words as part of the analyses.

4 Igede sound system and syllable structure

Igede has 36 consonant (Bergman 1971) and nine vowel phonemes (Abiodun 1989). The consonant phonemes of Igede are divided into 20 neutral and 16 palatalized and labialized consonant phonemes. Bergman (1971: 15) noted that “p, c, k, b, j, g, m, ŋ, r, and h occur with labialisation as unit phonemes”, and p, b, g, m, r, and h occur

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with palatalisation as unit phonemes. Graphemes[1] generally share the same symbols with their corresponding phonemes. The neutral consonant phonemes are presented in (1a), with graphemes indicated only where the symbols differ from those of the phonemes. Similarly, the graphemes of vowels are only indicated where the symbols differ from those of the vowel phonemes in (1b–c). Igede vowels are divided into two harmonic groups based on their tongue root values (1b–c) (Abiodun 1991). As is usual of languages with ATR vowel harmony, sounds from these two groups do not co-occur within the same word, especially in the basic lexical items. There are four contrastive tones in Igede, the High <á>, high-mid <ā>, low-mid <ä>, and low <à>tones (Hartell 1993: 230). The low-mid tone is left unmarked in this article.

(1) a. /b/, /c/ <ch>, /d/, /f/, /g/, /g͡b/, /h/, /ɟ/ <j>, /k/, /k͡p/, /l/, /m/, /ŋ/ <ng>, /ŋ͡m/ <nm>, /ɲ/ <ny>, /p/, /r/, /s/, /t/, /v/, /w/, /j/ <y>, /z/

b. Set 1 (+ATR): /i/, /e/, /o/, /u/

c. Set 2 (-ATR): /ɪ/ <ị>, /ɛ/ <ẹ>, /a/, /ɔ/ <ọ>, /ʊ/ <ụ>

Igede has the CV, V, and N syllable types (Bergman 1971). The data in examples (2a–f) are presented in a syllabified manner. As seen in (2a–c), it is common for nouns to begin with a vowel, followed by a consonant and then a vowel in a V.CV structure. Example (2e) shows that two adjacent vowels are syllabified into two different syllables, while the final syllable in (2e) and another medial one in (2f) contain syllabic nasals that stand alone as independent syllables. In a tone language, the syllabic nasal typically bears its own tone, and it is usual to subsume it within the V syllable type. This then leaves us with only the V and the CV syllable types in Igede.

(2) a. *ū.dō* ‘basket’

b. *ẹ́.rụ̀* ‘farm’

c. *ò.gbì* ‘guinea corn’

d. *ọ̀.tụ́.kà* ‘big’

e. *ọ.tá.à.kọ̄.m̄* ‘cassava’

f. *ò.jé.ń.wé* ‘new’

1 The graphemes are from Hartell 1993.

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5 Variation in Igede syllable structure

Perceptual impression of some Igede words suggests that they have the CCV structure involving a cluster of C^1, which can be any of the consonants of the language, followed by C^2, which is strictly /r/ and V, which can be any of the vowels of the language. Portions written in boldface in examples (3a–g) have the sequences <dra>, <tré>, <bri>, <grú>, <krí>, <krò> and <krẹ> respectively. As shown in the items on the left in example (3a–g), this CCV structure alternates with $C^1V^1C^2V^2$, where V^1 is a high vowel and is always followed by <r> in the C^2 slot. If <i> represents high vowels, the CVCV ~ CCV alternation can be summarised as CirV~ CrV.

(3) a. *adiraho* ~ *a**dra**ho* ‘king’
b. *ṫìrɛ́ɛkpɛ́* ~ ***tré**ɛkpɛ́* ‘return’
c. *ɔ̀ŋɔ́bíri* ~ *ɔ̀ŋɔ́**bri*** ‘black’
d. *igúrú* ~ *i**grú*** ‘to die’
e. *ɔ̀kíríhje* ~ *ɔ̀**krí**hje* ‘frog’
f. *ōhūkúrɔ̀hɔ́kpɔ́* ~ *ōhū**krɔ̀**hɔ́kpɔ́* ‘twenty-one’
g. *iwokṵ́rẹrụ* ~ *iwo**krẹ**rụ* ‘fifteen’

A further detail about this alternation is that in the forms on the left in example (3) with the full CVCV specified, V^1 tends to be a short period of sonority between the two consonants. This is because the high vowels /i/, /ɪ/, /u/ or /ʊ/ in this context tend to be perceptually shorter than the regular vowels of the language. This short sonority has been referred to as “transitional sonority” in Yoruba (Adeniyi 2015b) and as “vocalic transition” in Wobé, a Kru language spoken in Cote d’Ivoire (Obikudo et al. 2024).

The elision or reduction of high vowels before <r> is evident in the spectrogram in Figure 1. Notice, first, that *ɔ̀kíríhje* ‘frog’, shown in Figure 1 has the vowel /i/ both before /r/ and before /h/ (which represents other environments); notice also that when followed by /r/, /i/ has a duration of 0.6 second, while its duration in the other environment is significantly longer at 0.10 seconds.

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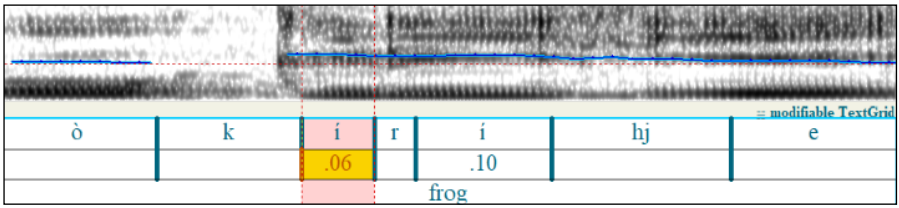

Figure 1. *òkírîhje* ‘frog’ showing comparative duration of /i/ before /r/ and elsewhere

Figures 2 and 3 present two repetitions for each of *adiraho* ‘king’ and *ōhūkúròhókpó* ‘twenty-one’. The first part of the spectrogram of *adiraho* ‘king’ in Figure 2 shows that the vowel /i/ is not realised before /r/, while in the second part it is realised as a short vowel spanning only 0.03 seconds before /r/. It can be seen in Figure 2 (i) that the penultimate and final vowels (/a/ and /o/ respectively) tend to be shorter than in Figure 2 (ii). This is an indication that the utterance in Figure 2 (ii) actually contains more “careful speech” which makes it slower. Even in this careful speech, the high vowel /i/ is still fleeting before /r/, which is the environment being investigated. A similar impression is obtained in Figure 3, where the vowel /u/ is not realised before /r/ in the first part of *ōhūkúròhókpó* ‘twenty-one’; whereas in the second part where it is realised, its duration is only 0.04 seconds. The spectrograms of these two words are representative of words containing high vowels in this environment in Igede; the high vowels are either not realised or they appear very short.

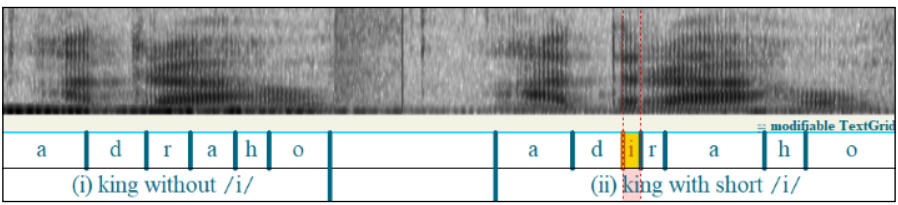

Figure 2. *adraho* ‘king’ showing zero vs. short duration of /i/.

This sort of alternation is not found in the other vowels in the same context. For instance, the vowels <ẹ>, <e> and <o> are not perceived as shorter than usual before /r/ in examples (4a–d). As shown in Figures 4 and 5, the vowels <ẹ> and <o> that are between consonants and <r> are neither elided nor shortened. This is assumed to be because these vowels are not high vowels.

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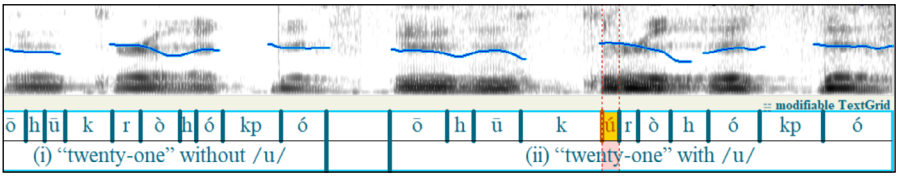

Figure 3. *ōhūkúròhókpó* 'twenty-one' showing zero vs. short duration of /u/ before /r/.

(4) a. *ọ́bẹrẹ* 'spoilt' (**ọ́brẹ*)
b. *ọ́mẹrẹ* 'swollen' (**ọ́mrẹ*)
c. *fóregji* 'descend' (**fregji*)
d. *òperèrè* 'right side' (**oprèrè*)

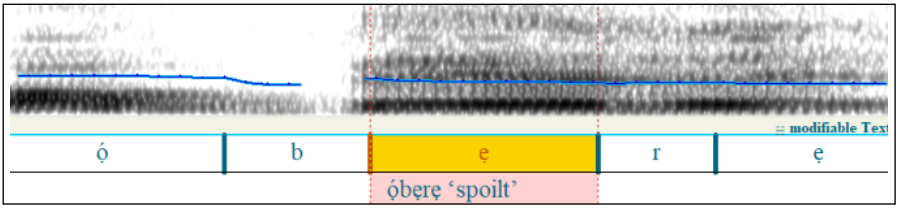

Figure 4. Spectrogram of *ọ́bẹrẹ* 'spoilt'

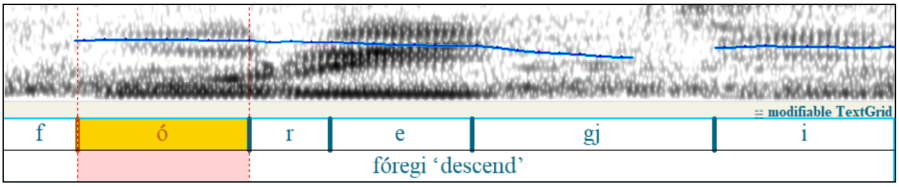

Figure 5. Spectrogram of *fóregji* 'descend'

This suggests that the high vowel is prone to elision (or reduction) in a CirV sequence. It is necessary to point out at this point that there is a strong tendency for utterances with elided high vowels to be shorter than those with the same vowels present. This suggests that there is a correlation between the alternation seen and rate of speech. However, even when the high vowels are present, they are shorter than the other vowels in the same phonetic environment. This suggests that while outright elision of the high vowels is connected to speech rate, reduction is not. Thus, the rate of speech does not provide a holistic explanation of the alternation; especially, it does not explain why reduction affects only the high vowels to the exclusion of the other vowels. What motivated the phonetic investigation reported

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in the next section is curiosity on what exactly is the nature of this alternation.

6 Acoustic investigation

As reported in the preceding section, perceptual impression suggests that high vowels /i/, /ɪ/, /u/ and /ʊ/ are shorter between C and <r> in a Ci.rV sequence than non-high vowels in Igede. Also, the high vowels are shorter in the Ci.rV environment than in other environments in the language. In order to verify this, 41 words containing different vowels immediately followed by /r/ were extracted from the Ibadan wordlist of 400 basic items. The durations of the vowels in pre-/r/ environment were measured. There were a total of 90 tokens. Of the nine vowels of Igede, it was only seven that were found to occur between a consonant and <r> in the wordlist. This explains why the result presented in Table 1 below contains only seven vowels.

Table 1. Average durations of vowels /i/, /ɪ/, /u/, /ʊ/, /ɛ/, /e/, and /o/ preceding /r/.

S/N	Vowel Type	Average duration
1	i	0.032308
2	ɪ	0.0294
3	u	0.041563
4	ʊ	0.05
5	ɛ	0.132857
6	e	0.075
7	o	0.105

The average duration of each vowel is given in Table 1. The comparative chart in Figure 6 shows a clear pattern of high vowels having apparently shorter duration in the environment tested. Among the high vowels, front vowels /i/ and /ɪ/ are generally shorter than back vowels /u/ and /ʊ/. It can be seen also that the vowel /ɛ/ which is the lowest of the sampled vowels also has the longest duration, followed by /e/ and /o/. The duration difference between /e/ and /o/ is in consonance with the observation that front vowels tend to be shorter than their corresponding back vowels. This gradience shows the tendency for vowels to get progressively shorter in proportion

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to vowel height before /r/. This therefore confirms the tendency for high vowels to either get reduced in length or get elided between C and <r> such that a Cr consonant cluster is emerging in its place. Figure 7, which compares high vowels and non-high vowels confirms this.

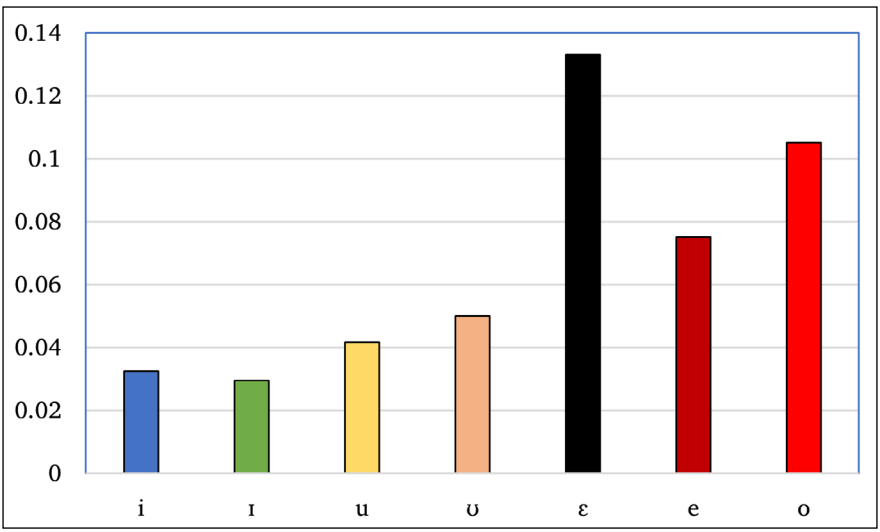

Figure 6. Comparative vocalic duration of vowels preceding /r/.

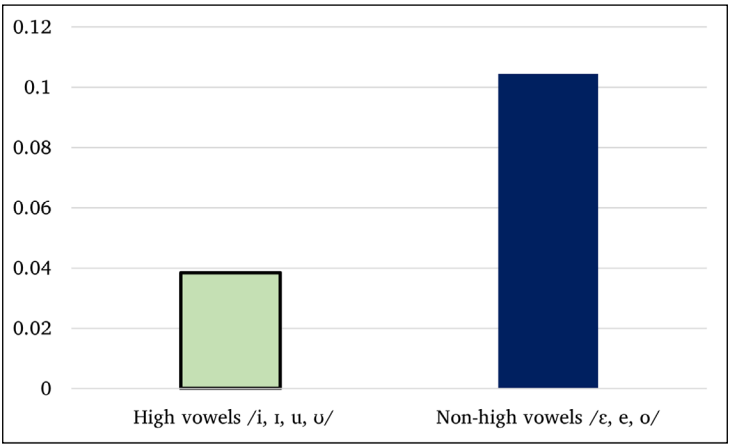

Figure 7. Vocalic duration of high versus non-high vowels.

The results of the acoustic investigation were corroborated in a separate interview with one of the key participants in this study. The participant was the leader of the Igede community in Awo village;

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he assisted in selecting competent participants, ensured the cooperation of the speakers and was the spokesperson of one of the focus groups. He was presented with each alternant of the words in examples (3a–g) and was asked to judge appropriateness. For each of the words, he accepted both alternants as correct, with a note that the alternants in which high vowels are elided before /r/ were common in the spoken form, while the ones without such elision constituted the written forms of the words.

6.1 Optimality Theory

McCarthy (2007: 1) defines Optimality Theory (OT) as "a general model of how grammars are structured". As a theory, Optimality Theory is a departure from the rule-based Generative Phonology. Rather, it assumes the operation of well-formedness constraints as accounting for the phonological properties of language. According to Prince and Smolensky (2002), constraints are universal, and each language only selects those that are sufficient for its phonological grammar. "Universal Grammar consists largely of a set of constraints on representational well-formedness, out of which individual grammars are constructed" (Prince & Smolensky 2002: 2). The phonological grammar of each language is a function of the ranking of the relevant constraints; this is also the basis of variations attested across and within languages.

Phonological constraints are violable and are of two types, namely faithfulness and markedness constraints. Whereas the faithfulness constraints require that the input (underlying form) to each analysis be preserved in the output (phonetic form), the markedness constraints demand changes. In place of rules, the Generator (GEN) component of the OT architecture generates "candidates", which are possible outputs from any given input. It is these candidates that the evaluator (EVAL) component ranks in such a way that it chooses only correct outputs in the language. McCarthy (2002: 10) summarizes the core universal elements of OT as in (5) below. While McCarthy says that these are core to OT, he notes that they are still subject to "refinement" where necessary.

(5) Input → GEN → candidate → EVAL → Output (McCarthy 2002: 10)

OT has several benefits in phonology. First, by limiting levels of representation to only the input and output, OT reduces abstract-

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ness in phonology such that the motivation to have several levels between the input and the output becomes unnecessary. Also, by using "testable, cross-linguistically valid hypotheses about output well-formedness", OT minimises arbitrariness associated with phonological processes in theories that precede it (Downing 2009: 2, 14). According to Downing, OT is also of benefit in factorial typology in comparative linguistics because constraints are universal and it only takes re-ranking of shared constraints to identify variations between grammars, dialects and languages (Downing 2009: 2). Iosad (2017) argues that this allows more explicit typology because of OT's computational properties. More specifically, OT has been shown to be especially successful in handling syllable-related analyses (Fery & Vijver 2003: 3). This explains why the description undertaken in the preceding sections are formalised using OT in this section.

6.2 Synchronic grammar of Igede syllable structure within Optimality Theory

The summary of the preceding sections is that Igede has the CV and V syllable structures but the language is now developing the CCV structure. This CCV structure is specifically CrV which is in alternation with CirV. For ease of referencing, the summary is stated as the two generalizations in (6) below.

(6) a. Igede has CV and V basic structures (The N type, which is a syllabic nasal is subsumed under the V type).
b. There are alternations between CirV~ CrV sequences; this has resulted in synchronic CCV structure.

I consider four constraints as primarily relevant to the analysis in this section. *COMPLEX, which forbids clustering of consonant in the onset and codas of syllables (McCarthy 2008). This constraint exempts the complex Igede phonemes namely labialised and palatalised consonants such as /hj/ in example (3e), which are really not complex syllable components but complex sounds. Another constraint relevant to this analysis is NOCODA which ensures that codas do not appear in violation of the Igede syllable structure (Tesar 2004). The constraint NOCODA has been said to be central to OT-based analyses of syllabification (Goldsmith 2011: 181). The constraint MAX prevents deletion of input segments in the output (McCarthy & Prince 1999), while the constraint DEP prevents phonological insertion in

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the output (McCarthy & Prince 1999). These four constraints are summarised in (7a–d) below.

(7) a. *COMPLEX: Complex onset and complex codas are forbidden (McCarthy 2008)
b. NOCODA: Syllables must not have codas (Tesar 2004)
c. MAX: Every segment of the input has a correspondent in the output: no phonological deletion (McCarthy & Prince 1999)
d. DEP: Every segment of the output has a correspondent in the input: no phonological epenthesis (McCarthy & Prince 1999)

Although the sequence CrV, which alternates with CV.CV (3a–g), involves a violation of the Faithfulness Constraint MAX, the specific sound to be deleted, which is the high vowel, requires an additional (markedness) constraint. This markedness constraint ensures that only high vowels are deleted and this is done specifically to prevent a sequence of CirV. This is a matter of structure-dependent change, which is not strange in phonology (Anttila & Cho 1998: 32). It has also been referred to as "narrowly restricted context" by Kroch (1989: 35) and as "phonologically very specific" constraint (Honeybone 2019: 17). Belth (2023: 1) also asserts that it is usual to address local dependency by the inclusion of "strictly local constraints in Optimality Theory".

More specifically, the constraint requires that a syllable beginning with onset <r> cannot be directly preceded by a syllable ending in a high vowel within a word. In that case, the high vowel is deleted. So this is a case of HighVowel ~ ø alternation in syllable final position before ONSET/rV. Since it is required that the high vowel be also preceded by C, this constraint is expressed in (8).

(8) *Ci.rV: assign a violation for each Ci.rV sequence (where 'i' represents high vowels).

This brings the relevant constraints to five (9).

(9) relevant constraints

NOCODA	*Ci.rV	MAX	DEP	*COMPLEX

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7 Partial order co-phonology

The alternation discussed so far is a case of synchronic variation, and both CirV and CrV alternants are grammatical in the language. I therefore adopt the partial order co-phonology approach to model this variation within OT (Anttila & Cho 1998; Anttila 2002). Co-phonology has been shown to be advantageous in handling instances of diachronic change in languages (Inkelas 1998, 2008). Thus, Igede has two variation grammars, one core (10a), and the other a sub-grammar (10b). The core grammar prohibits complex sequences, while the sub-grammar allows COMPLEX only if it is created by the elision of a high vowel before <r>. Igede is therefore assumed to have two partially-ordered rankings of the relevant constraints.

(10) a. CVCV (Core Grammar):
NoCoda > > MAX > > *Ci.rV > > *COMPLEX > > DEP

b. CrV (Sub-Grammar):
NoCoda > > *Ci.rV > > MAX > > *COMPLEX > > DEP

8 Sample analysis

How the two grammars expressed in (10a & b) determine their respective optimal candidates is illustrated in Tableaux 1–3. The two competing synchronic grammars of Igede are paired in each of Tableaux 1–3; in each instance the core grammar is numbered (a) and corresponds to grammar (10a) while the sub-grammar is numbered (b) and corresponds to grammar (10b). While the core grammar ranks MAX higher than *Ci.rV, which correctly realizes the general syllable pattern of Igede by forbidding deletion, the sub-grammar ranks *Ci.rV higher than MAX to allow the deletion of only high vowels in the specified phonetic environment. This is in synergy with Casali's (1997) proposition that position-sensitive MAX constraints are ranked higher in order for the optimal candidates not to be eliminated before non-optimal ones.

To be specific, in Tableau 1 (a) with the ranking NoCoda > > MAX > > *Ci.rV > > *Complex > DEP, it is NoCoda that eliminates candidate (a.i) because of the sound /d/ that ends the first syllable, while MAX eliminates candidate (a.iii) because it involved the deletion of input /i/. Candidate (a.iii) further violates *Complex. Whereas,

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candidates (a.iv) and (a.ii) both violate *Ci.rV due to the presence of the banned "i.r" sequence, (a.iv) further violates DEP because of the insertion of a glottal stop word-initially. This leaves (a.ii) as the optimal candidate because it is the candidate with the least grievous violation. This is in line with the prediction of grammar (10a). The prediction of grammar (10b) is illustrated in Tableau 1(b) which shows the effect of constraint reranking such that *Ci.rV now ranks higher than MAX. Notice first that candidate (b.i) is eliminated by the constraint NoCoda as a result of the structure of its first syllable, while (b.ii & iv) are eliminated by *Ci.rV. This leaves candidate (b.iii) as the optimal candidate because at this point, it is the only candidate yet to incur any violation. This same pattern is illustrated in Tableaux 2 and 3. This confirms the argument that the difference between the two co-grammars relates only to the local ranking between the two constraints MAX and *Ci.rV.

Tableau 1(a)

/adiraho/→[adiraho] 'king'	**NoCoda**	**MAX**	***Ci.rV**	***COM-PLEX**	**DEP**
(i) ad.ra.ho	*	*			
(ii) ☞ a.di.ra.ho			*		
(iii) a.dra.ho		*		*	
(iv) ?a.di.ra.ho			*		*

Tableau 1(b)

/adiraho/→[adraho] 'king'	**NoCoda**	***Ci.rV**	**MAX**	***COM-PLEX**	**DEP**
(i) ad.ra.ho	*		*		
(ii) a.di.ra.ho		*			
(iii) ☞ a.dra.ho			*	*	
(iv) ?a.di.ra.ho		*			*

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Tableau 2(a)

tìrɛ́ɛkpɛ́ ~ tré́ɛkpɛ́ ‘return’	**NoCoda**	**MAX**	***Ci.rV**	***COM-PLEX**	**DEP**
(i) tré.ɛ.kpɛ́		*		*	
(ii) ☞ tì.ré.ɛ.kpɛ́			*		
(iii) tì.réɛ.kpɛ́			*	*	
(iv) tì.ré.ɛkp.ɛ́	*		*		
(v) tìr.ɛ́.ʔɛ.kpɛ́	*	*	*		*

Tableau 2(b)

tìrɛ́ɛkpɛ́ ~ tré́ɛkpɛ́ ‘return’	**NoCoda**	***Ci.rV**	**MAX**	***COM-PLEX**	**DEP**
(i) ☞ tré.ɛ.kpɛ́			*	*	
(ii) tì.ré.ɛ.kpɛ́		*			
(iii) tì.réɛ.kpɛ́		*		*	
(iv) tì.ré.ɛkp.ɛ́	*	*			
(v) tìr.ɛ́.ʔɛ.kpɛ́	*	*			*

Tableau 3(a)

/òkíríhje/→[òkríhje] ‘frog’	**NoCoda**	**MAX**	***Ci.rV**	***COM-PLEX**	**DEP**
(i) ò.krí.hje		*		*	
(ii) ☞ ò.kí.rí.hje			*		
(iii) ʔò.kí.rí.hje			*		*
(iv) ò.kí.ríh.je	*		*		

Tableau 3(b)

/òkíríhje/→[òkríhje] ‘frog’	**NoCoda**	***Ci.rV**	**MAX**	***COM-PLEX**	**DEP**
(i) ☞ ò.krí.hje			*	*	
(ii) ò.kí.rí.hje		*			
(iii) ʔò.kí.rí.hje		*			*
(iv) ò.kí.ríh.je	*	*			

The co-existence of two different variation grammars as seen in Tableaux (1–3) indicates that in the overarching grammar of contemporary Igede, the two constraints MAX and *Ci.rV are not ranked (11). Assuming that except for these two constraints, the ranking of

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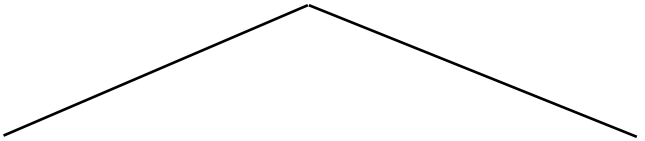
all the other relevant constraints is the same in both the core and sub-grammar, how this GRAMMAR in (11) produces the two variations is summarised in Figure 6.

(11) GRAMMAR: NoCoda > > **MAX, *Ci.rV** > > *COMPLEX > > DEP
MAX > > *Ci.rV
*Ci.rV > > MAX



Core grammar **Sub-grammar**
MAX > > *Ci.rV *Ci.rV > > MAX

Figure 6. Lattice of the two grammars

The Igede lattice in Figure 6 contains only the two partial orders which correspond to the two grammars summarized in (10a–b). The node to the left on the lattice, with the ranking {MAX > > *Ci.rV} defines the core grammar that produces *tìrɛ́ɛkpɛ́* 'return', *òkírîhje* 'frog', etc., while the node to the right with the ranking {*Ci.rV > > MAX} defines the sub-grammar that produces *trɛ́ɛkpɛ́* 'return', *òkrîhje* 'frog', etc. The other constraints that are ranked in (10a, b) have no impact on the lattice since they are constant in both variation grammars.

9 Conclusion

This study examines synchronic variation in the syllable structure of Igede and concludes that the syllable structure of the language is currently undergoing change. CVCV nouns alternate with CrV (CCV) where V^1 gets elided in a $C^1V^1C^2V^2$ sequence. There are two main characteristics to this variation, namely (i) V^1 is one of the high vowels /i/, /ɪ/, /u/ and /ʊ/, and (ii) C^2 is strictly a /r/. This CCV structure is systematic and consistent in the speech of all the 12 speakers that participated in this study. This is a case of synchronic variation in which both alternants are grammatical in the language. It was shown in section 5 that while speech rate sheds light on outright elision of the high vowels before /r/, it does not explain why the high vowels' duration is generally shorter relative to non-high vowels in instances where they are phonetically realised. Insight about this is drawn from the phonetic nature of the high vowels generally and

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that of /r/ which constitutes the environment for the variation. The partial order co-phonology approach is adopted to model this variation within OT.

Beyond the diachronic development of this cluster in Igede, it is not necessarily a very complex structure crosslinguistically. Easterday (2019: 8) notes that "an onset cluster in which the second member is a liquid or a glide is considered less complex than one in which the second member is a nasal, fricative, or stop". In fact, Easterday (2019: 32) classifies the type of complexity in Igede as "moderately complex".

An inference that can be drawn from the linguistic situation of Igede speakers as portrayed by the extensive multilingualism around the speech community is that language contact may be the motivation for this change. Many of the other West Benue-Congo languages spoken within or around Benue State have the CCV syllable structure. For instance, Hyman (1970) reports that Nupe allows the CCV structure involving a consonant plus glide, while Adeniyi (2015a) reports the presence of the CCV structure in Yala (Ikom). Among other Idomoid languages, Etulo has also been reported to have the CCV structure, although restricted to ideophones (Ezenwafor-Afuecheta & Inyani 2021). More specifically, the CCV structure in Etulo occurs in "/pl/, /tr/, /gl/, and /fl/" positions (Ezenwafor-Afuecheta & Inyani 2021: 135). Igede speakers also have contact with Nigerian English, which has different types of consonant clusters in the onset position of syllables. This same pattern is attested in Naija (Nigerian Pidgin), another widely-spoken Nigerian language. Since all of the speakers who participated in this study have had regular interactions with speakers of some of these languages, it can be said that consonant clustering is not entirely new to them. This makes language contact the most probable motivation of the change.

However, beyond the general motivation, the phonological restriction to pre-<r> position as it is in Igede has not been reported for any of the related languages; this suggests that how the change proceeds may be internal to Igede. Since this is still a case of change in progress, there are certainly more to be discovered. This means that the change described in this study is worth keeping an eye on to see how it evolves through Igede grammar.

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