

AN ALIGNMENT-BASED ACCOUNT OF AFFIXATION IN YORUBÁ

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Abstract

Most of the previous studies on affixation in Yorubá are largely based on morphological, morpho-syntactic and semantic classifications of the affixes. So far, not much attention has been given to the morpho-prosodic well-formedness of the phenomenon, especially within the ambit of a constraint-based theoretical framework. This paper, therefore, provided a principled account of the morpho-prosodic well-formedness, with respect to structural considerations, of Yorubá nouns that are derived by affixation. The study used Generalized Alignment (McCarthy & Prince, 1993), a model of Optimality Theory, as its analytical tool. The majority of the data were sourced from existing studies since the current work is a re-examination of affixation in Yorubá but from a different theoretical perspective. However, the researcher also employed the services of two competent native speakers to validate some of the data, particularly the accuracy of their semantic structure. The study established that affixation in Yorubá has a phonological goal of converting a root to a prosodic word (a disyllabic foot) especially in cases where the former is less than the latter in size with respect to syllable weight or segmental composition. More importantly, the paper claimed that Yorubá places an affix, whether a prefix or an interfix, at the left edge of the root morpheme so as to ensure that the right edge of the root and the right edge of the prosodic word are perfectly aligned. Therefore, in consonance with previous studies, it was argued that affixation in Yorubá is generally prefixal, and this position was entrenched by the theoretical evidence that ALIGN-RIGHT outranks ALIGN-LEFT in the morphological grammar of the language. By and large, the paper emphasized that Yorubá is a prefixing, rather than a suffixing language simply because positional alignment or coincidence is required strictly at the right edge.

Keywords: affixation, prefix, interfix, Yorubá, Generalized Alignment, ALIGN-RIGHT >> ALIGN-LEFT

Àṣamò

Opólòpò àwọn isẹ iwádíí tísáájú lórí ìgbésẹ̀ ifafòmókún-òrò nínú èdè Yorubá dá lórí ìpín-sí-isòrí àwọn àfòmó inú èdè yìí ní ilàṅà mofólójí, mofo-síntààsí àti sẹmántíki. Títí di àkókò yìí, kò tū sí akitiyan tí ó yẹ lórí itúpalè ibófimú ajemó-mofo-prósódíki tí ó nń́ se pẹ̀lú àwọn òrò-orúko tí a sẹ́dà nípa ìgbésẹ̀ ifafòmókún-òrò, pàápàá jùlò itúpalè tó dá lórí tíorí ajemótée. Nítorí nàà, oun tí isẹ iwádíí yìí dá lé lórí ní sise itúpalè jìnlẹ̀ bí irúfẹ̀ àwọn òrò bẹ́e se bá òfin ajemó-mofo-prósódíki mu. Tíorí ajemó-eti-ihun – Generalized Alignment (McCarthy & Prince, 1993), èyí tó jẹ̀ òkàn lára àwọn èdà tíorí optimálítí – ní itúpalè nàà gúnle. Níwón ìgbà tó tí jẹ̀ pé isẹ iwádíí yìí dá lórí sise atunyẹ̀wò ìgbésẹ̀ ifafòmókún-òrò nínú èdè Yorubá, púpọ̀ nínú àkójo-èdè-fáyẹ̀wò tí ó jẹyò nínú pépà yìí wá láti inú àwọn isẹ iwádíí tí a tí se sáájú. Sùgbón, onísẹ-ìwádíí túbò bẹ̀ àwọn aṣafò abíníbí èdè Yorubá méjì lówè láti rí i pé àkójo-èdè-fáyẹ̀wò nàà bẹgbẹ̀ mu, pàápàá jùlò ihun itumọ̀ wón. Isẹ iwádíí yìí fídí è múlẹ̀ pé ìgbésẹ̀ ifafòmókún-òrò nínú èdè Yorubá máa n sọ àwọn òrò tí a sẹ́dà nípa ìgbésẹ̀ yìí di òrò onísilẹ̀bù méjì pàápàá jùlò tí ó bá jẹ̀ pé ihun ipilẹ̀ àwọn òrò bẹ́e kò tó silẹ̀bù méjì. Ní pàtàkì jùlò, pépà yìí sàwári pé, nínú èdè Yorubá, ilàṅà ìgbésẹ̀ ifafòmókún-òrò nń́ se pẹ̀lú síso àfòmó-ibẹ̀rẹ̀ tàbí àfòmó-ààrín mò etí apá òsì mófímú ipilẹ̀ láti rí i pé etí apá otún mófímú ipilẹ̀ àti tí òrò onísilẹ̀bù méjì tí a sẹ́dà jọra wón tàbí bára wón mu. Nítorí nàà, ní ibámu pẹ̀lú àwọn isẹ iwádíí tísáájú, isẹ iwádíí yìí fihàn gbangba-gbàngbà wí pé gbogbo àwọn ilàṅà ìgbésẹ̀ ifafòmókún-òrò nínú èdè Yorubá ló jemọ̀ síso àfòmó mò ibẹ̀rẹ̀ òrò; èyí ló fà á tó fí jẹ̀ pé oté ALIGN-RIGHT ga ju oté ALIGN-LEFT lọ nínú mofólójí èdè Yorubá. Lákòótán, pépà yìí tẹnumọ̀ o wí pé idí tí Yorubá fí jẹ̀ èdè aláfòmó-ibẹ̀rẹ̀ ò sẹ̀yìn wí pé ìjọra tàbí ibáramu ajemó-àye gbódó nń́ se pẹ̀lú etí apá otún ihun nikan.

Àwọn òrò gbòógì: ifafòmókún-òrò, àfòmó-ibẹ̀rẹ̀, àfòmó-ààrín, Yorubá, Generalized Alignment, ALIGN-RIGHT >> ALIGN-LEFT

1. Introduction

Affixation is the use of bound morphemes either to inflect for certain grammatical features on a root morpheme or to derive an entirely new word from the root. The majority of the existing studies on affixation in Yorubá (e.g., Adewole, 1995; Arokoyo, 2017; Eleshin, 2017; Owolabi, 1995; Oyebade, 2010; Taiwo, 2011, etc.) are largely based on purely morphological, morpho-syntactic and semantic classifications of the affixes strictly within the confines of empirical considerations. So far, not much attention has been given to the morpho-prosodic well-formedness of the phenomenon, more so within the ambit of a constraint-based theoretical framework. As a necessary response to this lacuna, the present paper aims at providing a principled account of the morpho-prosodic well-formedness, with respect to structural considerations, of Yorubá nouns that are derived by affixation. Although there are three sub-types of affixation in the language, namely prefixation, interfixation and suprafixation, this paper focuses only on the first two since the third deals with the phenomenon of suprasegment (tone, in this case), and tone-centric issues are outside the scope of the paper. The study is couched upon Generalized Alignment (GA), a model of Optimality Theory, proposed by McCarthy and Prince (1993). The choice of GA as this study's tool of analysis is driven by the need to provide a principled account of why affixation in Yorubá is generally

prefixal rather than suffixal given the fact that the theory's main goal is to explain why languages treat their affixes as either prefixes or suffixes. Secondly, to show that the reason behind Yorùbá's preference for prefixes can best be explained in terms of positional alignment.

2. Previous Studies on Affixation in Yorùbá

One of the various existing studies on affixation as a nominalization operation in Yorùbá is Adewole's (1995) work, which specifically examines how the language employs prefixes in forming nouns. It is argued that various morphological types can be established for derived nouns in Yorùbá based on the semantic, syntactic and phonological properties of the prefixes, even though the classification rather fits into semantics rather than morphology. It is further established in the study that prefixes in Yorùbá can take only the mid or the low tone as there are no indigenous words in the language that bear a high tone at word-initial position. The study also presents evidence for a systematic categorization of Yorùbá derived nouns based on the features of prefixes with which they collocate. Thus, Adewole (1995:106-118) identifies the following categories of prefixes in Yorùbá based on either the syntactic or semantic properties of the root morphemes to which they are attached:

- (1) a. agentive, as in: *a-peja* 'fisherman', *adájó* 'judge', *òmùtí* 'drunkard'
- b. instrumental, as in: *ajò* 'sieve', *adé* 'crown', *asé* 'distiller'
- c. consequential, as in: *égàn* 'derision', *àlò* 'departure', *ètò* 'arrangement'
- d. action, as in: *ijà* 'fight', *ijó* 'dance', *irètí* 'hope'
- e. implement, as in: *ikólẹ̀* 'dust pan', *ìgbálẹ̀* 'broom', *ìlù* 'drum'
- f. thematic, as in: *ijòyẹ̀* 'chief', *ìgbìmọ̀* 'committee', *ìbejì* 'twins'
- g. result, as in: *ogbó* 'old age', *òwón* 'scarcity', *olà* 'wealth'

One significant feature of Adewole's account of prefixation in Yorùbá is the analysis of the negative nominalizer *àì-* and the agentive prefix *oní-* as consisting of two separate morphemes, which were otherwise analyzed as single-unit prefixes in the traditional accounts before it. Adewole opines that *àì-* consists of the negative prefix *à-* and the prefix *ì-* that could fall into any of four classes: action, consequential, implement or thematic. The two adapted sentences in (2) were contrasted in the study to justify this position.

- (2) a. *ì-mọ̀-ìwé-kà Olú* → *ìmọ̀wékà Olú* 'Olú's ability to read'
PRE¹-know-book-read Olú
'Olú's ability to read'
- b. *à-ì-mọ̀-ìwé-kà Olú* → *àìmọ̀wékà Olú* 'Olú's inability to read'
NEG-PRE-know-book-read Olú
'Olú's inability to read'

In (2a), the prefix *ì-* is added to *mọ̀* 'know' to derive the given nominal item, whereas in (2b), the prefix *à-* is introduced to negate the proposition in (2a). Thus, the study affirms that the prefix *àì-* is analyzable into two-unit prefixes². The examples presented in (2) are instances of clausal nominalization since a whole clause is turned to a noun. However, the derivation is straightforward as, apart from the deletion of vowel [i] in *ìwé* 'book', no further internal

¹ The prefix functions as a nominalizer: it is used to change a verb to a noun, e.g., *mọ̀* 'know' = *ìmọ̀* 'knowledge'. This is applicable to all the other prefixes in the language, only that *oní-* and *oni-* are used to change a noun to another noun.

² An argument between two schools of thought with respect to the morphemic status of the prefix *àì-* has been well documented in the literature. One school treats it as a single unit (e.g., Owolabi 1995; Ogunkeye 2005/2006; and Adeniyi & Taiwo 2018) while the other analyzes it as a divisible entity consisting of the negativizing prefix *à-* and the nominalizing prefix *ì-* (e.g., Adewole 1995; Awobuluyi 2008; and Eleshin 2017). The present study, however, does not delve into this argument. Therefore, rather than analyzing the internal structure of the prefix, this study takes a different route which entails explaining its relationship with the root using an alignment-based approach.

alteration takes place in the derived noun. In fact, this is the usual pattern of both lexical and clausal nominalizations in Yorùbá; tones play no role in the process and the verb root retains its status as a verb as well as its meaning in the final output. For *oní-*, the study contends that *o-* is a prefix while *ní* is a verb meaning ‘to have’ although it is claimed that *oní-* ‘owner/doer/seller of’ does not occur as an independent word in the language. Although the present study aligns with this position, its scope is beyond providing a rigorous argumentation to entrench it. Adewole (1995) proposes a uniform underlying form for derived nouns in Yorùbá using the rule schema in (A).

(A) $N \rightarrow \text{Prefix} + \text{VP}$

The word formation rule given in (A) illustrates that “every derived Yorùbá noun has an underlying binary node which has a prefix as head and a verb and all the internal arguments of that verb as complement. The verbal complex has properties of verb phrases but they are restricted in certain ways” (Adewole, 1995, p. 97). This implies that the prefix has full scope over the entire VP that undergoes nominalization.

The implication of Adewole’s (1995) position is that all the prefixes in Yorùbá are monosyllabic.³ Contra the general view held in the previous studies, such as Awoyale (1974, 1981) and Pulleyblank and Akinlabi (1988), Adewole (1995) concludes that there are no such things as infixes in Yorùbá based on the evidence that the so-called infixes in the language, namely *-má-* and *-kí-*, do not satisfy the requirement which stipulates that affixes are assignable to syntactic categories on the basis of their features. In this light, Adewole analyzes *-kí-* as a particle that participates in the process of reduplication, and characterizes *-má-* as a negator that subcategorizes for the VP stem.

Unlike some subsequent studies, such as Pulleyblank (2009) and Ehineni (2017), which also recognize infixes in Yorùbá, the present paper aligns with Adewole’s (1995) position that Yorùbá does not have infixes; what have been traditionally called infixes in the language are, in actual fact, interfixes. This is because the affixes in question are incorporated *between* two morphological constituents: the reduplicant and the root morpheme, and not *within* a single morphological material as an infix would conceptually suggest. Taking into consideration the proper characterization of the term ‘infixes’ as bound morphemes which are incorporated within a root (Arokoyo 2017:33), the so-called infixes in Yorùbá are interfixes. Echoing the same view, Oyebade (2010:225) avers that, “Although it is generally assumed that Yorùbá exploits a morphological process called infixation, a careful look at how the process operates clearly shows that what the language otherwise attests is interfixation and not infixation”. Apart from *-kí-* which is a very morphologically productive interfix in Yorùbá, other interfixes in the language not examined in Adewole (1995) but which are exemplified in this paper are *-dé-*, *-bí-*, *-ní-*, *-sí-*, and *-mọ-*. Also, Adewole (1995) did not provide a principled account of the positional alignment of the interfixes with respect to their appendage with the root. Hence, the need for the present study. For example, this study aims at providing a theoretical justification for why the interfix is more proximal to the root than the reduplicant.

Owolabi (1995) is another prominent work on the phenomenon of prefixation in Yorùbá. The work groups all the Yorùbá prefixes into two broad classes, as presented in (3). As stated earlier in footnote 1, all prefixes in the language are nominalizers.

(3) Class I
à-, è-, è-, ì-, ò-, ò-, ù-
a-, e-, e-, i-, o-, o-
àî-, òh-, oní-, àti-

³ This argument may only be tenable within a morpheme-internal structure analytical approach advanced in Awobuluyi (2008) and Eleshin (2017) in which the disyllabic Yorùbá prefixes are decomposed into isolated particles. Otherwise, a general view of the affixes is to phonologically classify them into monosyllabic (e.g., ì-, è-, o-, á-, ó-) and disyllabic (e.g., àì-, òh-, àti-, oní-, olú-). The latter position is the one supported in the present study.

Class II **oní-** and **oni-**

In the sense of Owolabi, there are significant differences between the two classes. For instance, the prefixes in the first group can only be attached to verbs, verb phrases and sometimes ideophonic adjectives to derive nouns or noun phrases whereas the prefixes in the second group can only be attached to nouns and noun phrases to derive other nouns or noun phrases. Secondly, Class I prefixes are capable of changing the syntactic category of the root word to which they are attached while Class II prefixes do not possess such syntactic license. Furthermore, the prefixes in the first class cannot co-occur with one another whereas those in the second group can do so successfully. Finally, all the nominals derived with the use of Class I prefixes are either abstract or concrete while only concrete nouns are derivable using the prefixes in Class II. As innovative as Owolabi's (1995) work is, it does not take into consideration the structural relationship between the edges of the root morpheme and the derived output after prefixation has taken place. This perhaps is due to the fact that the study is purely descriptive in its approach and focuses mainly on the morpho-syntactic features of the prefixes when they are attached to roots and/or stems. The present study's focus, therefore, is on the structural alignment that the right edges of the root and the derived output share with each other drawing insights from the Generalized Alignment theory. Additionally, the present study examines interfixation, which is outside the scope of Owolabi (1995), to further buttress why Yorùbá's affixational typology is generally prefixal.

A similar work to Owolabi (1995) is Ogunkeye (2005/2006), which also does a comprehensive classification of all the Yorùbá prefixes employing both the syntactic and semantic criteria. The study echoes some of the findings in Owolabi (1995) and also carries out an indepth analysis of the internal structure of prefixes such as **oní-** and **oni-**. The morpheme-internal structure analytical approach is not the one adopted in this paper; rather, emphasis is placed on the diverse relationships between the edges of roots and affixes on the one hand, and the edges of roots and prosodic words on the other hand. Thus, a review of Ogunkeye's (2005/2006) analysis of the internal structure of **oní-** and **oni-**, as an example of such approach, is overlooked here. Other related studies that focus on the classification of Yorùbá affixes especially on the basis of their semantic features and syntactic behavior include Awobuluyi (2008), Ilori (2010), Taiwo (2011), and Akinola (2014). These studies are not reviewed here due to their obvious similarities to one another and their similarities to Adewole (1995) and Owolabi (1995), which were reviewed above.

A more recent study on affixation in Yorùbá is Eleshin (2017), which carries out a morpho-syntactic study of nominalization in Yorùbá within the framework of the Minimalist Theory. The author examines the distinctive features of Yorùbá prefixes along the dimensions of tongue height, tones and vowel harmony, as well as the kinds of nouns they derive. The author also discusses the productivity of the prefixes and the internal structure of nominals derived by them. Eleshin premises the three phonetic features (tongue height, tone and harmonic interaction) on three hypotheses and he claims that the hypotheses are based on the vowels that are used as prefixes in the process of nominal derivation. These hypotheses are summarized as follows. Given the Hierarchy of Prefix Productivity (HPP), Eleshin hypothesizes that high vowels derive a set of nominals different from non-high vowels. The second hypothesis holds that low-tone prefixes are more productive than their mid-tone counterparts. Finally, it is hypothesized that prefix vowels with [+ATR] feature derive a distinctive set of nominals different from their [-ATR] counterparts. Apart from doing a comprehensive classification of Yorùbá nouns that can be derived by the prefixes: abstract, inanimate, concrete, count, animate, event, referential, mass, agent, and instrument, one major strength of Eleshin's (2017) work is its uniform approach to the study of affixation, compounding and reduplication in Yorùbá in which it is argued that all the elements derived by these three-word formation processes are left-headed. However, Eleshin does not also say anything about the structural alignment shared by the edges of the root morphemes and their respective affixes (prefixes and interfixes). Providing a theoretical justification for such structural or positional alignment is the main goal of this paper.

From the foregoing empirical reviews, it could be deduced that the majority of the existing studies on affixation in Yorùbá are largely based on the classification of the prefixes

in the language with respect to their morphological, syntactic and semantic features. However, there are other issues which have not attracted much attention but are worthy of scrutiny. For instance, what is the phonological goal of affixation in Yorùbá? Is there any structural resemblance between the root morpheme and the derived noun after affixation has applied? Why does Yorùbá exclude suffixes from its morphology, after all, there are languages, such as English, that attest both prefixes and suffixes? The quest to provide viable answers to these questions is what motivates the present study. The morphological productivity of interfixation in Yorùbá, which is not always given due attention as prefixation in the literature, is equally worthy of examination. Most importantly, with the theoretical approach adopted in this paper, it would be easy to provide a uniform account of prefixation and interfixation in the language. A brief exposition of the framework is taken up in the next section.

3. Generalized Alignment

The Generalized Alignment (hereafter GA), championed by McCarthy and Prince (1993), is posited to formally capture, in the form of pairing, the structural relationships between the edges of morphological and prosodic constituents such as those between a morpheme and a syllable, and those between a word and a foot. It is important to point out that alignment constraints (the majority of which are instantiated as markedness constraints while some, as faithfulness constraints) were originally introduced by Prince and Smolensky (1993) as part of a theory of morphological infixation. The general idea, in the words of McCarthy (2008:181), is that “every affix is associated with a violable constraint aligning it to initial or final position of the word, depending on whether it is a prefix or a suffix.” However, GA has been so designed to “include all the various ways that constituents may be enjoined to share an edge in prosody and morphology” (McCarthy & Prince 1993:79). According to McCarthy and Prince (1993:87-88), “Two categories are aligned when they ‘share an edge’, and the Alignment [sic] constraint specifies the categories and which side of each is involved in ‘sharing an edge’”. Essentially, GA was proposed to unify all of the diverse ways in which edges of constituents (e.g., stem, root, prosodic word, foot, etc.) figure in morphological and phonological processes. This model, reproduced from McCarthy and Prince (1993:80), is notationally schematized in (B).

- (B) Generalized Alignment
 $\text{Align}(\text{Cat1}, \text{Edge1}, \text{Cat2}, \text{Edge2}) = \text{def}$
 $\forall \text{Cat1} \exists \text{Cat2}$ such that Edge1 of Cat1 and Edge2 of Cat2 coincide.
 Where
 $\text{Cat1}, \text{Cat2} \in \text{PCat} \cup \text{GCat}$
 $\text{Edge1}, \text{Edge2} \in \{\text{Right}, \text{Left}\}$

McCarthy and Prince (1993:80) say that, “PCat and GCat consist, respectively, of the sets of prosodic and grammatical (morphological or syntactic) categories provided by linguistic theory.” They maintain further that, “a GA requirement demands that a designated edge of each prosodic or morphological constituent of type Cat1 coincide with a designated edge of some other prosodic or morphological constituent Cat2.” The specific interpretation of GA can be characterized as “Align(GCat, PCat),” where the designated edge of a grammatical constituent (e.g., morpheme) is required to coincide with the designated edge of a prosodic constituent (e.g., foot). The paired edges of the grammatical and prosodic constituents could be congruent in terms of being both left or both right, such as Align(PrWd, L; Foot, L) demanding that the left edge of a Prosodic Word coincide with the left edge of a Foot, or incongruent in terms of being left versus right or vice versa, such as Align(Afx, L; Stem, R) demanding that the left edge of an Affix lie at the right edge of a Stem. Although alignment in GA is generally associated with edges of distinct categories (i.e., morphology and prosody), the theory also gives room for alignment of edges of similar categories (i.e., prosody and prosody, morphology and morphology).

Following McCarthy and Prince, there are two crucial assumptions upon which the foundation of GA is laid, and which are also consistent with the central tenets of Prince and Smolensky’s (1993) classical version of Optimality Theory (OT). First, “GA is embedded in a theory of constraints on the well-formedness of phonological and morphological representations, rather than a theory of rules or procedures for constructing representations.”

In other words, GA is characterized strictly in terms of constraints, rather than in terms of operations. What it does is to formally give account of diverse operations, for example, appending an affix to a root, parsing words into feet, and so on, in the grammar of a language. Second, in GA, “constraints on representation can be violated minimally, under specific conditions that compel violation.” For instance, in Tagalog, the alignment constraint $\text{Align}([\text{um}]_{\text{Af}}, \text{L}; \text{Stem}, \text{L})$ is violated minimally by the actual form *sumulat* ‘write’ due to a condition requiring that the *m* of the affix *–um–* must not be syllabified as a coda. One could observe that although perfect alignment is not witnessed in the actual form, the affix lies as near as possible to the designated edge (cf. sub-optimal forms such as **sulumat* and **sulatum*, both of which incur fatal violations of the alignment constraint). In a nutshell, GA assumes that “representational constraints need not be categorically true facts of a language.” Otherwise, the success of the GA enterprise would be out of reach.

GA handles the phenomenon of affixation, at least in Yorùbá, more efficiently and uniformly than other theories, including Autosegmental Phonology that is mainly concerned with spreading of features from a base to an affix or vice versa without giving due consideration to the structural relationships between their edges. Similarly, GA is more efficient in handling affixational phenomena than Lexical Phonology, a phonology-morphology interface theory whose major goal is organization of affixes into different strata, lexical and postlexical, with little or no recourse to the same consideration earlier stated. GA gives a more straightforward account of the diverse interfaces between phonology and morphology at various levels, emphasizing the need to see the grammar as a systemic function rather than a mechanism housing some isolated linguistic compartments. Although GA is largely a theory of infixation, the analysis presented in this paper demonstrates that the theory is also applicable to prefixation and interfixation in Yorùbá due to the observation that GA generally expresses facts about characterization of affixes as either prefixes or suffixes.

4. Methodology

This paper adopted both the primary and secondary methods of data collection. The majority of the data were sourced from existing studies since the present one is a re-examination of affixation in Yorùbá but from a different theoretical perspective. However, the services of two competent native speakers of the language were employed to verify the authenticity of some of the data and the accuracy of their semantic structure. Being a competent native speaker of the standard Yorùbá, the researcher equally exploited his native intuition to supply a few of the data analyzed in the paper. With respect to the analytical methodology of the data, the study made recourse to the descriptive approach anchored on the tenets of GA, a version of OT.

5. An Alignment-Based Account of Affixation in Yorùbá

As a morphological process, affixation in Yorùbá has a major phonological goal: turning a root to a prosodic word if the former is less than the latter. A prosodic word is a word that has at least one foot, and a foot typically contains two moras or syllables. However, if a root is equal to a prosodic word, then affixation would apply to turn it to a larger prosodic word since there is no limit on the length of a prosodic word due to its recursive nature (McCarthy & Prince 1993). By implication, every lexical item derived via affixation in Yorùbá cannot be less than a prosodic word in size. Thus, affixation in Yorùbá is geared towards an absolute satisfaction of the markedness constraint, $\text{PROSODIC-WORD}_{\text{MINIMALITY}}$ (PRWD_{MIN}), which is defined in (I).

(I) $\text{PROSODIC-WORD}_{\text{MINIMALITY}}$ (PRWD_{MIN}): A prosodic word minimally consists of one foot.

Generally, Yorùbá affixes exhibit some morphological and phonological properties which are very crucial to a proper understanding and explicit description of how the edges of a root and a prosodic word are properly aligned. These characteristic features are presented in (4).

(4) a. Prefixes occur before a root while interfixes occur in-between a root and its leftward reduplicant, both of which are made up of exactly the same prosodic, morphological, and semantic properties.

b. Except vowel [u] and all the five nasal vowels, all other Yorùbá vowels can be used as prefixes.

c. The majority of the prefixes have monomoraic V shape (e.g., *à-*, *ì-*, *e-*, *ò-*, *o-*, etc.) whereas others have bimoraic shape: VV (e.g., *àì-*), VN (e.g., *òń-*), and VCV (e.g., *oní-*, *oni-*, *olú-*, and *àtí-*). Whether monomoraic or bimoraic, all Yorùbá prefixes begin with a vowel.⁴

d. None of the prefixes can begin with a high tone due to a general tonotactic constraint in Yorùbá that forbids a word-initial vowel from bearing a high tone.

e. All the interfixes have monomoraic CV shape (e.g., *-kí-*, *-dé-*, *-kò-*, *-mò-*, etc.).

The thesis of this paper is hinged on the argument that affixation (prefixation and interfixation) in Yorùbá is generally prefixal: an affix is positioned at the left edge of a root in both cases so as to ensure that the right edge of the root coincide or match with the right edge of the prosodic word that is derived after the process. The alignment at the right edge of the two constituents can otherwise be explained in terms of edge-based faithfulness: the right edge of the prosodic word is required to be faithful to the right edge of the root. It is as a result of this that Yorùbá subscribes to prefixation and interfixation, and excludes suffixation from its morphology. The alignment constraint controlling right-edge coincidence of a root and a prosodic word is defined in (II) while its edge-reversed image is defined in (III).

(II) ALIGN-RIGHT

ALIGN(ROOT, RIGHT; PRWD, RIGHT): The right edge of every root must coincide with the right edge of a prosodic word. That is, the last segment in the root must be the last segment in the prosodic word.

(III) ALIGN-LEFT

ALIGN(ROOT, LEFT; PRWD, LEFT): The left edge of every root must coincide with the left edge of a prosodic word. That is, the first segment in the root must be the first segment in the prosodic word.

The alignment constraints in (II) and (III) are morpho-prosodic in nature by accommodating a morphological constituent (the root) and a prosodic constituent (the prosodic word). Note also that the root is a sub-component of the prosodic word. Therefore, wherever the root appears within the prosodic word, some alignment is required either at their right edge (as controlled by ALIGN-RIGHT) or left edge (as controlled by ALIGN-LEFT). Given the fact that Yorùbá is a prefixing, rather than a suffixing language, ALIGN-RIGHT must dominate ALIGN-LEFT. The ranking ALIGN-RIGHT >> ALIGN-LEFT means that alignment at the right edge takes precedence over alignment at the left edge. This empirically implies that the right edge of a root should not be tampered with when it is converted to a prosodic word via affixation. The analysis of the two types of affixation is presented in the subsequent sections.

5.1. Prefixation in Yorùbá

Prefixation is a very productive process in Yorùbá; the majority of nouns in the language are derived from verbs and verb phrases via prefixation while prefixes like *oní-*, *oni-*, and *olú-* are attached to nouns to derive larger nouns. Some data are presented in (5) as additional examples to those ones in the empirical review section.

⁴ I assume canonical prefixes here, as a host of scholars (e.g., Awobuluyi 2008; Pulleyblank 2009; and Eleshin 2017) have analyzed the [Cí] reduplicative pattern in Yorùbá as a prefixal phenomenon where the 'C' is a copy of some root's initial consonant and the high vowel prespecified with a high tone is added, both of which then form a prefix to the given root. Given such proposal, the CV template of the reduplicant obviously negates the generalization that all Yorùbá prefixes begin with a vowel. However, unlike the canonical prefixes, [Cí-] uniquely requires reduplication for its derivation. Consequently, its fixed prosodic template differs from the canonical prefixes'. For this reason, I have excluded [Cí-] from the group of Yorùbá affixes in this paper.

(5) i. Monosyllabic Prefixes

- a. **i – kú** **ikú** ‘death’
PRE die
- b. **a – dá – ejó** **adájó** ‘judge’
PRE create case
- c. **ò – se – eré** **òsèré** ‘actor’
PRE do play
- d. **o – gbó** **ogbó** ‘old age’
PRE ripe
- e. **à – rò – sọ** **àròsọ** ‘fiction’
PRE think say
- f. **ọ – da – ilẹ** **òdàlẹ** ‘traitor’
PRE throw ground
- g. **ọ – mu – ọtí** **òmùtí** ‘drunkard’
PRE drink alcohol
- h. **è – rò** **èrò** ‘thought’
PRE think
- i. **à – jẹ - kù** **àjẹkù** ‘crumbs’
PRE eat remain
- j. **ì – gbá – ilẹ** **ìgbálẹ** ‘broom’
PRE sweep ground

ii. Disyllabic Prefixes

- a. **àì – jẹ** **àìjẹ** ‘not eating’
PRE eat
- b. **àì – lọ** **àìlọ** ‘not going’
PRE go
- c. **òh – ta – ọjà** **òh̄tajà** ‘trader’
PRE sell market
- d. **òh – tè** **òh̄tẹ** ‘rubber stamp’
PRE press
- e. **àtì – jẹ** **àtìjẹ** ‘the act of eating’
PRE eat
- f. **àtì – sùn** **àtìsùn** ‘the act of sleeping’
PRE sleep
- g. **àtì – lọ** **àtìlọ** ‘the act of going’
PRE go
- h. **oní – iṣu** **oníṣu** ‘owner/seller of yam’
PRE yam
- i. **oní – bàtà** **oníbàtà** ‘owner/seller of shoe’
PRE shoe
- j. **olú – èkọ** **olùkọ** ‘teacher’
PRE lesson

In addition to ensuring well-formedness of a prosodic word, the precedence of right edge alignment over its left edge counterpart in Yorùbá with respect to prefixation is shown in Tableaux 1 and 2.

Tableau 1: The precedence of right edge alignment over left edge alignment: /jẹ + àì/⁵

/jẹ + àì/	PRWD _{MIN}	ALIGN-RIGHT	ALIGN-LEFT
a. [àì(jẹ)]			**
b. [(jẹ)àì]		*!*	

⁵ Note that, ‘[]’ and ‘()’ are used in this paper to capture a prosodic word and a root, respectively. Also, the left edge of each constituent is defined by the first segment while the right edge is defined by the last segment.

The input in Tableau 1 consists of the root *je* and the affix *àì*. Based on the fact that candidates (a) and (b) satisfy the higher-ranking constraint governing the well-formedness of a prosodic word, $PRWD_{MIN}$, by having three syllables each, the competition has to be settled elsewhere. Placing the affix after the root violates ALIGN-RIGHT whereas placing it before the root violates ALIGN-LEFT. Given the ranking $ALIGN-RIGHT \gg ALIGN-LEFT$, the first candidate wins because both the root and the prosodic word share the same edge at the right which is defined by vowel [e]. Regardless of the linear ordering of the root and the affix in the input, the actual output must have the root being preceded by the affix, empirically illustrating the fact that Yorùbá affixes are prefixal and not suffixal. In consonance with GA, alignment constraints are evaluated in a gradient fashion such that a violation is incurred by every segment (and sometimes, syllable) intervening between the edges of the two constituents participating in a given constraint. Candidate (a) has two violation marks on ALIGN-LEFT because there are two segments, [àì], intervening between the left edge of the root and the left edge of the prosodic word. A similar performance is witnessed in candidate (b) with respect to ALIGN-RIGHT.

Tableau 2: Prosodic well-formedness and right edge alignment: /kú + i/

/kú + i/	$PRWD_{MIN}$	ALIGN-RIGHT	ALIGN-LEFT
a. [(kú)i]		*!	
☞ b. [i(kú)]			*
c. [(kú)]	*!		

In Tableau 2, candidate (a) loses to candidate (b) for fatally violating ALIGN-RIGHT by placing the affix at the right edge of the root. On the other hand, candidate (c) does not realize the affix; hence, a vacuous satisfaction of the two alignment constraints. This implies that it dislodges candidate (a) from its winning position as far as the ranking $ALIGN-RIGHT \gg ALIGN-LEFT$ is concerned. However, given the entire hierarchy, (c) loses to (a) on $PRWD_{MIN}$ because it is not equal to a foot, having failed to phonetically parse the affix which would have turned it to a well-formed prosodic word. This empirically supports the earlier assumption of this paper that affixation in Yorùbá phonologically aims at turning a root to a prosodic word most especially when the root is less than a prosodic word.

Independent of affixation, two pieces of internal evidence can be put forward to justify why Yorùbá favours right edge over left edge alignment. The first is reduplication. In Yorùbá, the root is reduplicated (either partially or totally) to the left, a fact that has also been corroborated in the literature, such as Pulleyblank (2009), Ehineni (2017), Eleshin (2017), and Oyinloye (2020). Consider the following examples for illustration:

- (6)
- a. **peja** → **pejapeja** ‘fisherman’
 - b. **wolé** → **woléwolé** ‘sanitary inspector’
 - c. **òwúrò** → **òwòòwúrò** ‘every morning’
 - d. **osù** → **osoosù** ‘every month’
 - e. **ìran** → **ìrandíran** ‘from generation to generation’
 - f. **àrà** → **àràbarà** ‘remarkable’
 - g. **sùn** → **sísùn** ‘sleeping’
 - h. **lọ** → **lílọ** ‘going’

What could be inferred from data (6) is that the reduplicant (the underlined constituent) is placed before the root as a prefixal material so as to ensure that the right edge of the root coincide with the right edge of the prosodic word, that is, the reduplicated output.

Another piece of evidence is associated with the pattern of vowel deletion observable in nominal compounds. When two vowel-initial nouns are combined to derive a compound noun, the hiatus that occurs at the morphological boundary is repaired by deleting the initial vowel of the second noun while the final vowel of the first noun is retained. This pattern of deletion serves to preserve the right edge of each of the constituent nouns making up the compound. The examples given in (7) are used as an illustration.

- (7)
- | | | | | |
|----------------|-----------------|---|------------------|---------------------|
| a. ará | obìnrin | → | arábìnrin | ‘a female relative’ |
| | relative female | | | |
| b. ará | òkùnrin | → | arákùnrin | ‘a male relative’ |
| | brethren male | | | |
| c. aya | oba | → | ayaba | ‘queen’ |
| | wife king | | | |
| d. ewé | òbẹ̀ | → | ewébẹ̀ | ‘vegetable’ |
| | leaf soup | | | |
| e. etí | odò | → | etídò | ‘waterside’ |
| | edge river | | | |
| f. ògá | ogun | → | ògágun | ‘war-lord’ |
| | boss war | | | |
| g. ìkó | ilẹ̀ | → | ìkólẹ̀ | ‘refuse parker’ |
| | packing ground | | | |
| h. ìsẹ̀ | ogun | → | ìsẹ̀gun | ‘victory’ |
| | winning battle | | | |

A generalization about data (7) suffices: the right edge, defined by the final vowel, of each noun in the compound is preserved in the output. This further entrenches the earlier claim that right edge alignment is given priority over left edge alignment in Yorùbá. If reduplication and compounding provide a way of justifying why affixation in Yorùbá is governed by coincidence of edges at the right, then it is apposite to argue that this paper’s proposal is valid.

Back to the primary analysis, it is crucial to ask the following question: If a losing candidate satisfies all the three constraints employed so far, as demonstrated in Tableau 3, how then do we justify the choice of the winner?

Tableau 3: A losing candidate obeying the hierarchy at the expense of the purported winner!

/gbó + o/	PRWD _{MIN}	ALIGN-RIGHT	ALIGN-LEFT
?? a. [(gboó)]			
☞ b. [o(gbo)]			*

One could observe that the first candidate places the input affix *o* as an infix in the output, thereby leading to a vacuous compliance with the entire hierarchy: it is prosodically well-formed, and it preserves both the left and right edges of the root morpheme *gbó* ‘be old’. For such an excellent performance on the hierarchy, one would have expected it to win while the second candidate, which flouts the last constraint in the hierarchy, to lose. Since what the grammar of Yorùbá prefers is *ogbo*, and not *gboó*, it is plausible to assume that the basis for choosing the winner between (a) and (b) in Tableau 3 lies outside the scope of the proposed hierarchy. Two reasons can be adduced for why candidate (b) is the preferred output form in Yorùbá. First, the language does not entertain infixes in its morphological grammar. Second, the supposed loser, candidate (a), entertains syllabic ill-formedness as a result of the hiatal configuration which pairs two successive vowels [oó] without an intervening consonant. Interestingly, vowel hiatus is relatively banned in Yorùbá. Building on this empirical justification, a theoretical perspective into the competition between the two candidates in Tableau 3 reveals that some other constraints not yet included in the hierarchy employed hitherto are needed to theoretically justify why (b) is preferred to (a). Without making the analysis unnecessarily elaborate, a single markedness constraint, which is highly ranked in Yorùbá, would be enough to knock out (a) in favour of (b). This constraint is defined in (IV) and the analysis is presented in Tableau 4.

(IV) NO-HIATUS

Two adjacent vowels linked to different sets of features are banned.

Tableau 4: Candidate (b) wins on PRWD_{MIN}, NO-HIATUS, ALIGN-RIGHT >> ALIGN-LEFT

/gbó + o/	PRWD _{MIN}	NO-HIATUS	ALIGN-RIGHT	ALIGN-LEFT
a. [(gboó)]		*!		
☞ b. [o(gbo)]				*

What could be deduced from the above argumentation is that, the overall well-formedness of an output form that is derived by affixation is principally governed by some markedness constraints, in addition to the alignment constraints which govern the coincidence of its left and right edges with those of some morphological or prosodic constituents. Thus, in situations where alignment constraints are not enough to decide a competition between two or more candidates, markedness constraints are appealed to. In fact, one of the reasons why GA gives room for the interaction of alignment and markedness constraints is to address a scenario where a winning candidate violates a given alignment constraint that is obeyed by its fellow competitors or all the competitors perform in exactly the same way on the given alignment constraint, either in terms of satisfaction or violation. In either of the two tricky cases, what the grammar of the language does is to supply some markedness constraint(s) that would pick the candidate as the winner over its fellow competitors. In consonance with the position of McCarthy and Prince (1993), proper morpho-prosodic alignment is characterized by a domination of well-formedness (markedness) constraints over alignment constraints.

5.2. Interfixation in Yorùbá

Yorùbá is morphologically rich in interfixation, just as in prefixation. In Yorùbá, an affix can be placed between two morphological constituents – reduplicant and root – having exactly the same phonological properties to derive a new nominal. This process is called interfixation.⁶ Put in another way, cases of interfixation in Yorùbá typically interact with full reduplication in which the former takes place after the latter has taken place. The systematic derivation of this type of affixation is presented in (8). Note that the root (which is typically a noun) is fully reduplicated to the left; thus, the reduplicant is the underlined constituent.

	Root	→	Reduplication	Interfixation	Output
(8) a.	ọmọ child 'any/bad child'	→	* ọmọ ọmọ	ọmọ – kí – ọmọ	ọmọkọmọ
b.	iye amount 'priceless'	→	* iye iye	iye – bí – iye	iyebíye
c.	àrà wonder 'remarkable'	→	* àrà àrà	àrà – bí – àrà	àràbarà
d.	ọdún year 'many years'	→	* ọdún ọdún	ọdún – mó – ọdún	ọdúnmọdún
e.	ọsù month 'many months'	→	* ọsù ọsù	ọsù – mó – ọsù	ọsùmoşù
f.	ọpọ plenty 'abundance'	→	* ọpọ ọpọ	ọpọ – ní – ọpọ	ọpọlọpọ
g.	àgbà elder 'elderly person'	→	* àgbà àgbà	àgbà – ní – àgbà	àgbàlagbà
h.	ilé house 'from house to house'	→	* ilé ilé	ilé – sí – ilé	ilésilé

⁶ Arokoyo (2017:35) has affirmed that the two morphological constituents participating in interfixation “may be identical or non-identical”. In the case of Yorùbá, the two constituents are identical.

- i. **ìran** → ***ìranìran** **ìran – dé – ìran** **ìrandíran**
generation
'from generation to generation'
- j. **ìgbà** → ***ìgbàìgbà** **ìgbà – dé – ìgbà** **ìgbàdégbà**
time
'from time to time'

For authors like Pulleyblank (2009) and Ehineni (2017), the affix is ‘infix’ within the form that has been derived by reduplication; hence, the use of the term ‘infixing reduplication’ to characterize such data as (8). But owing to the fact that the form derived by full reduplication in such examples cannot be well-formed until the affix is incorporated into it, then, it is safe to conclude that the pattern of nominal derivation under consideration is not an instance of infixing reduplication on the ground that an infix can only be incorporated into an already well-formed morphological constituent, namely the root or stem, and not within an ill-formed reduplicated output (cf. the second column in example (8)). For the reduplicated form to be well-formed, an affix must be inserted between the reduplicant (the underlined constituent which is on the left) and the base morpheme (which is on the right); and such affix can best be characterized as an interfix. Again, by virtue of the prefix *inter* in the term *interfix* itself, it implies that the affix is fixed *between* two morphological constituents – the reduplicant and the base – and not *within* a single, already well-formed morphological constituent as it is naturally the case with an infix as evident in true infixing languages such as Bontoc (Emenanjo, 1982), Tagalog (McCarthy & Prince, 1993), and Oaxaca (Arokoyo, 2017). In a nutshell, the fully reduplicated form in Yorùbá is not yet a well-formed stem before the affixal incorporation, and the form itself is made up of two separate morphological entities; hence, the affix incorporated between them cannot be conceptualized as an infix. As Arokoyo (2017) rightly notes, the two morphological constituents between which the interfix is sandwiched may be similar or dissimilar. In Yorùbá, they are similar. On this premise, this paper treats example (8) as instances of interfixal reduplication. In a nutshell, the present study rejects the conceptualization of the affixes *-kí-*, *-bí-*, *-mó-*, *-ní-*, *-sí-*, and *-dè-* as infixes but rather aligns with Adewole’s (1995), Awobuluyi’s (2008) and Oyebade’s (2010) position that they are interfixes.

Whereas all other interfixes in Yorùbá exhibit the same phonological behaviour by having the vowel of the interfix consistently deleted⁷, interfixation involving [-kí-] uniquely interacts with deletion and coalescence. Given this unique phonological behaviour, the analysis done in this section focuses mainly on the [-kí-] category. Whether the root is a derived lexical item or a basic word, once it begins with any of these five vowels: a, e, ɛ, o, ɔ, the vowel of the interfix is subjected to deletion. Consider the following examples:

- (9)
- | | | |
|------------------------------|-------------|-------------------|
| a. <u>ètò</u> – kí – ètò | ètòkétò | ‘any arrangement’ |
| arrangement | | |
| b. <u>eni</u> – kí – eni | enikèni | ‘anybody’ |
| person | | |
| c. <u>aşo</u> – kí – aşo | aşokášo | ‘bad dress/cloth’ |
| cloth | | |
| d. <u>òbí</u> – kí – òbí | òbíkóbìí | ‘any parent’ |
| parent | | |
| e. <u>opolo</u> – kí – opolo | opolokópolo | ‘bad brain’ |
| brain | | |

Furthermore, if the root is underived and begins with vowel [i], deletion of the interficx's vowel would still be the choice. The examples in (10) illustrate this generalization.

- (10) a. ilé – kí – ilé ilékílé ‘any house’
house

⁷ The only two exceptions known to me in which the interfix's vowel is retained while the vowel of the base is lost are *ìgbàdédégbà* (*ìgbà-dé-ìgbà*) "from time to time" and *ilédélélé* (*ilé-dé-ilé*) "house to house".

that the vowel of *-kí-* would still be deleted if the root to which it attaches is underived and begins with vowel [i]. Another reason why the generalization about data (11) is not contradicted by data (12) is the fact that the initial vowel [i] of the derived root in (11) is consistently specified with a low tone whereas that of (12) is a mid-tone. Thus, it is safe to argue that data (12) are not exceptional cases to the generalization about data (11); rather, they are forms that bear some resemblance with data (10).

Whether or not the examples in (12) are actually exceptional cases, what is indisputable on the whole is the fact that coalescence would only take place if the interfix *-kí-* is attached to a derived disyllabic root which begins with a low-toned vowel [i]; otherwise, the generalization would again be challenged by trisyllabic roots which are also derived and begin with a low-toned vowel [i] and where deletion, rather than coalescence, applies. For example, /*ìgbésè* – *kí* – *ìgbésè*/ → [ìgbésèkígbésè] ‘any step’; /*ìjòbà* – *kí* – *ìjòbà*/ → [ìjòbakíjòbà] ‘any government’; /*ìlànà* – *kí* – *ìlànà*/ → [ìlànàkílànà] ‘any pattern/plan’; /*ìsèlè* – *kí* – *ìsèlè*/ → [ìsèlèkíìsèlè] ‘any happening’, and so on.

The question ensuing from the asymmetrical behaviour of the vowel of *-kí-* and that of the root is: Why is the vowel of *-kí-* deleted before an underived vowel *i*-initial root but fused with the initial vowel [i] of a derived root? The logical explanation is given as follows. If deletion is obligatorily required when the vowel of *-kí-* abuts with another vowel [i] of an underived root, the best choice is to delete the vowel of the interfix and preserve that of the root. Two reasons serve to justify this choice. One, a root takes precedence over an affix (interfix, in this case); hence, its phonological materials are expected to be preserved at the expense of an affix’s phonological materials. Two, the vowel of the root is canonically part of its morphology since the root is not derived. For this reason, all its phonological materials are, again, not to be tampered with in the output.

On the other hand, the initial vowel [i] of a derived root is permitted to coalesce with the adjacent vowel [i] of the interfix *-kí-* since the vowel is not originally part of the root’s morphology. Nevertheless, fusion does not imply deletion of any of the two underlying vowels; rather, it is a situation whereby the features of the two vowels are merged at the phonetic level of representation. Although coalescence violates UNIFORMITY⁸, it does not run afoul of MAXIMALITY⁹, implying that the underlying features of the derived root’s initial vowel and the vowel of the interfix are ‘hidden’ in the output vowel. In optimality-theoretic parlance, the point of convergence between cases of deletion and those of coalescence in Yorùbá *-kí-* interfixation is reflected in the motivation to satisfy the markedness constraint NO-HIATUS. That is, both processes are invoked to get rid of hiatal configuration instantiated by the presence of two contiguous vowels.

From the foregoing, cases of *-kí-* interfixation involving deletion would violate MAX whereas those involving coalescence would violate UNIFORM, and each category would obey the constraint violated by the other. Also, the preservation of the root’s initial vowel at the expense of the interfix’s vowel implies that MAX_{RT} must outrank MAX_{AFX}¹⁰: MAX_{RT} >> MAX_{AFX}. Given the systematic derivation of interfixal reduplication shown in (8), the input would comprise only the root and the interfix; the reduplicant would receive its phonetic content in the output. This proposal is founded on the assumptions of the correspondence theory of reduplication (McCarthy & Prince 1995) where the reduplicant is treated as an abstract morphological constituent which lacks featural specification in the input but whose phonetic interpretation is possible in the output. Since interfixation in Yorùbá uniquely interacts with reduplication, a reduplication-esque markedness constraint is of necessity because it ultimately determines the well-formedness of the derived forms in conjunction with their positional alignment. This constraint is defined in (V).

(V) RED-ROOT

REDUPLICATE-ROOT(LEFT): Every segmental material in the root must be reduplicated to the left.

⁸ This is a faithfulness constraint kicking against fusion of segments.

⁹ This is a faithfulness constraint kicking against deletion of segments.

¹⁰ Note that while MAX_{RT} requires that the segmental materials of a root be preserved in the output, MAX_{AFX} requires the preservation of the segmental materials of an affix. Thus, satisfaction of one is violation of the other.

It is important to specify the direction of reduplication in the constraint defined in (V) for an obvious reason: Yorùbá is a prefixing language; hence, the reduplicant must be left-aligned with the base.

The ranking which produces forms with *-kí-* interfixation involving deletion is proposed in (D), and the analyses are presented in Tableaux 5 and 6. Note that the ranking incorporates the hierarchy that was used earlier in the analysis of prefixation.

- (D) $\text{PRWD}_{\text{MIN}}, \text{NO-HIATUS}, \text{RED-ROOT}, \text{ALIGN-RIGHT} \gg \text{MAX}_{\text{RT}} \gg \text{MAX}_{\text{AFX}} \gg \text{ALIGN-LEFT}$

Tableau 5: Alignment in interfixation involving deletion: /òmò + kí/

/òmò + kí/	PRWD_{MIN}	NO-HIATUS	RED-ROOT	ALIGN-RIGHT	MAX_{RT}	MAX_{AFX}	ALIGN-LEFT
a. [òmòk(òmò)]						*	*****
b. [òmò(òmò)kí]		*!		**			***
c. [kíòmò(òmò)]		*!*					*****
d. [k(òmò)òmò]		*!	*	***		*	*
e. [òmòkí(òmò)]		*!					*****
f. [òmòkí(òmò)]					*!		*****

All the candidates in Tableau 5 are prosodically well-formed by having at least a foot; hence, they all obey the first highly ranked constraint – PRWD_{MIN} . The competition among the candidates is largely settled on the next highly ranked constraint: NO-HIATUS. Candidates (b – e) violate this constraint for entertaining a sequence of vowels without an intervening consonant along various dimensions. The competition between candidates (a) and (f) is fierce in that no winner could emerge by evaluating them on the four undominated constraints in the hierarchy. In the long run, the winner is picked by the sub-ranking $\text{MAX}_{\text{RT}} \gg \text{MAX}_{\text{AFX}}$. The implication of the ranking is that, although deletion of one of the vowels at the boundary between the interfix and the root morpheme is required due to the hiatus formed by the vowel sequence, the vowel that should be deleted is that of the interfix. Any contrary move would lead to a fatal violation of MAX_{RT} , a faithfulness constraint which requires all the segmental materials of the root to be preserved in the output. This is why candidate (f) loses to candidate (a).

Tableau 6: Alignment in interfixation involving deletion: /ètò + kí/

/ètò + kí/	PRWD_{MIN}	NO-HIATUS	RED-ROOT	ALIGN-RIGHT	MAX_{RT}	MAX_{AFX}	ALIGN-LEFT
a. [kètòk(ètò)]						*	*****
b. [(ètò)kètò]			*!	*****		*	
c. [ètòkí(ètò)]		*!					*****
d. [ètòk(ètò)]						*	****
e. [(ètò)ètòkí]		*!	*	*****			

In Tableau 6, the second candidate reduplicates the root to the right instead of to the left as stipulated in the definition of RED-ROOT in (V). The candidate is, therefore, knocked out of the competition because the constraint is highly ranked in Yorùbá. The third candidate

preserves all the segments of the affix, leading to a hiatal configuration at the boundary between the affix and the root. For this reason, it is also ruled out as a potential winner due to the high-ranking status of NO-HIATUS in Yorùbá. The same fate applies to the last candidate with respect to its performance on NO-HIATUS. Candidates (a) and (d) demonstrate an interesting performance on the hierarchy as a whole: they both satisfy all the first five constraints and incur the same number of violations on the last but one constraint. This implies that the competition between them has to be settled on the last constraint. Although they both disobey the last constraint, ALIGN-LEFT, their degrees of violation differ: whereas (a) violates the constraint at five points, (d) does so at four points. This situation perfectly illustrates the GA tenet which says that alignment constraints should be evaluated in a gradient fashion such that a candidate with an additional violation mark would lose. On this premise, (d) wins.

The ranking which produces forms with *-kí-* interfixation involving coalescence is similar to that involving deletion; the only additional constraint is UNIFORM, which will be ranked below the two anti-deletion constraints because fusion does not imply deletion, as mentioned earlier. However, UNIFORM will be ranked above ALIGN-LEFT simply because the latter is generally a lowly ranked constraint in Yorùbá. The ranking is proposed in (E), and the analysis is presented in Tableau 7.

- (E) PRWD_{MIN}, NO-HIATUS, RED-ROOT, ALIGN-RIGHT >> MAX_{RT} >> MAX_{AFX} >> UNIFORM >> ALIGN-LEFT

Tableau 7: Alignment in interfixation involving coalescence: /ije + kí/

/ije + kí/	PRWD _{MIN}	NO-HIATUS	RED-ROOT	ALIGN-RIGHT	MAX _{RT}	MAX _{AFX}	UNIFORM	ALIGN-LEFT
a. [ìjek(ìje)]						*!		*****
b. [ìjekí(je)]					*!			*****
c. [ìjek(úje)]							*	*****
d. [ìjekí(ìje)]		*!						*****
e. [(ìje)kí]			*!	**				
f. [kí(ìje)]		*!	*					**

What Tableau 7 demonstrates is that deleting any segment of either the root or the affix is fatal; the priority rather lies in merging the underlying features of the two adjacent vowels at the boundary between the affix and the root. This is shown by the sub-ranking: MAX_{RT} >> MAX_{AFX} >> UNIFORM. Candidates (a) and (b) opt for deletion in order to guard against violating NO-HIATUS and UNIFORM. They are, however, knocked out as a result of their fatal violations of MAX_{AFX} and MAX_{RT}, respectively. On the other hand, candidates (d) and (f) opt against deletion and fusion of the two adjacent vowels, thereby leading to a satisfaction of MAX_{RT}, MAX_{AFX}, and UNIFORM. This choice, however, naturally leads to a severe violation of NO-HIATUS since a sequence of vowels without an intervening consonant is a universally marked configuration, as instantiated in Yorùbá in the foregoing analysis. Note that (f) would equally be ruled out for violating RED-ROOT, an undominated markedness constraint in the hierarchy, having refused to reduplicate the root. In a similar vein, candidate (e) loses out for failing to reduplicate the root, in addition to its misalignment at the right edge. By and large, candidate (c) is picked as the winner for being the most harmonic candidate as far as the entire hierarchy is concerned. Crucially, it is properly aligned at the right edge, and, additionally, it makes recourse to fusion in order to forestall hiatal configuration.

It could be observed that only vowel-initial roots (nouns) have been participating in interfixation so far. It is, however, necessary to examine consonant-initial roots in order to ascertain whether or not the same hierarchy can be used. It is important to establish that there are very few consonant-initial nominal roots in Yorùbá, and that they employ only the *-kí-* interfix. Data (13) show examples of such category of interfixation.

	Root	Reduplication	Interfixation	Output
(13) a.	bàbá father	* bàbábàbá	bàbá – kí – bàbá	bàbákíbàbá ‘any father’
b.	dòdò plantain plantain’	* dòdòdòdò	dòdò – kí – dòdò	dòdòkídòdò ‘any
c.	filà cap	* filàfilà	filà – kí – filà	filàkífilà ‘any cap’
d.	bàtà shoe	* bàtàbàtà	bàtà – kí – bàtà	bàtàkíbàtà ‘any shoe’
e.	gèlè headdress headdress’	* gèlègèlè	gèlè – kí – gèlè	gèlèkígèlè ‘any
f.	kòkòrò insect ‘any insect’	* kòkòròkòkòrò	kòkòrò – kí – kòkòrò	kòkòròkíkòkòrò
g.	garawa bucket ‘any bucket’	* garawagarawa	garawa – kí – garawa	garawakígarawa

In (13), the nominal root is first of all reduplicated to the left, then the resulting reduplicant and the root are sandwiched by the interfix *-kí-*. The output form which is a prosodic word exhibits neither deletion nor coalescence owing to the fact that no hiatal structure is formed at the boundary between the interfix and the root morpheme since the latter begins with a consonant. Recall that it was claimed earlier that deletion and coalescence would only be necessary when there is a sequence of adjacent vowels. Using the first item in (13) as an illustration, Tableau 8 shows that the same ranking used heretofore is capable of accounting for the well-formedness of prosodic words that are derived by interfixation involving consonant-initial roots.

Tableau 8: Interfixation involving consonant-initial roots: /bàbá + kí/

/bàbá + kí/	PRWD _{MIN}	NO-HIATUS	RED-ROOT	ALIGN-RIGHT	MAX _{RT}	MAX _{AFX}	UNIFORM	ALIGN-LEFT
☞ a. [bàbákí(bàbá)]								*****
b. [bàbá(bàbá)kí]				*!*				****
c. [(bàbá)bàbákí]			*!	*****				
d. [(bàbá)kíbàbá]			*!	*****				
e. [bàbákí(àbá)]		*!			*			*****
f. [bàbá(bàbá)]						*!*		****
g. [kí(bàbá)]			*!					**
h. [(bàbá)kí]			*!	**				

In Tableau 8, the winning candidate – (a) – satisfies all the constraints except ALIGN-LEFT. All the remaining candidates are disqualified for their disharmony with the entire hierarchy, albeit in one specific way or another. For instance, rightward reduplication is a fatal choice (cf. candidates (c) & (d)); non-reduplication is equally fatal (cf. candidates (g) & (h)); non-realization of the affix in the prosodic word (output) is a serious offence (cf. candidate (f)); deleting the initial consonant of the root creates a hiatal structure and such structure is entirely disallowed (cf. candidate (e)); and placing the affix after the root is a severe violation of rightward alignment (cf. candidate (b)).

A number of deductions can be made from the foregoing analysis of prefixation and interfixation in Yorùbá. First and foremost, in both cases, an affix is usually placed at the left edge of the root morpheme so as to ensure that the right edge of the root and that of the prosodic word are perfectly aligned. Put in another way, an affix must be positioned at the left edge of a root because the latter's right edge must not be tampered with, given the fact that Yorùbá relatively places premium on the right edge of its words. This would necessarily imply a violation of ALIGN-LEFT. With the evidence of reduplication and nominal compounding, the domination of ALIGN-RIGHT over ALIGN-LEFT in Yorùbá is justified. In the case of interfixation, reduplication is obligatory, and the direction of the process is leftward. This again justifies the priority of rightward alignment over leftward alignment in Yorùbá with respect to edge-based faithfulness between some root and the resulting prosodic word. Furthermore, the basic ranking ALIGN-RIGHT >> ALIGN-LEFT which is consistent in both prefixation and interfixation analysis shows why affixation in Yorùbá is generally prefixal, and not suffixal. In fact, the strong bond between an affix and its host in Yorùbá is demonstrated by the cliticization of an interfix with the left edge of the root via deletion or coalescence. Therefore, it can be argued that while an affix must be left aligned with some root, the root must be right aligned with some prosodic word. Finally, the foregoing analysis has revealed that a single constraint hierarchy is capable of accounting for the two sub-processes of affixation, notwithstanding the interaction of interfixation with deletion and coalescence. This is the advantage that a constraint-based approach has over a rule-based one in which multiple rules would have to be formulated to account for an array of processes.

6. Conclusion

Within the framework of Generalized Alignment, an offshoot of Optimality Theory, this paper has demonstrated that affixation in Yorùbá is generally prefixal in consonance with existing accounts such as Awobuluyi (2008), Eleshin (2017), Ogunkeye (2005/2006), Owolabi (1995), etc. based on the theoretical evidence that ALIGN-RIGHT outranks ALIGN-LEFT in the morphological grammar of the language. Both prefixation and interfixation were analyzed, and it was established that Yorùbá places an affix at the left edge of the root morpheme so as to ensure that the right edge of the root and that of the prosodic word are perfectly aligned. Reduplication and nominal compounding were used as independent evidence to justify why Yorùbá relatively attaches importance to the right edge of a word. The uniform alignment-based approach to the study of affixation adopted in this paper provides an insight into the internal workings of the grammars of human languages, Yorùbá in particular. For instance, it helps to explain why some languages prefer prefixation to suffixation, or suffixation to prefixation, in their morphology.

In addition to the various morphological implications of affixation in Yorùbá which previous studies have established, this study has also established that the process is driven to achieve a phonological goal of converting a root to a prosodic word (a disyllabic foot), as seen especially in cases where the former is less than the latter in size. Affixation in the language is principally used to derive nouns. Since all Yorùbá nouns, whether basic or derived, contain at least two syllables, the nominal output of affixation in the language cannot be less than a prosodic word, regardless of the phonological size of the root or base. It is on this basis that all outputs of affixation in the language satisfy the markedness constraint PRWD_{MIN}. This shows that proper alignment also requires some prosodic well-formedness, in addition to morphological well-formedness. By and large, Yorùbá is a prefixing, rather than a suffixing language simply because positional alignment or coincidence is required strictly at the right edge.

Abbreviations

AFX/Af	Affix
ATR	Advanced Tongue Root
Cat	Category
CV	Consonant-Vowel
GA	Generalized Alignment
GCat	Grammatical Category
HPP	Hierarchy of Prefix Productivity
L	Left

MAX	Maximality
MIN	Minimality
N	Noun
NEG	Negator
OT	Optimality Theory
PCat	Prosodic Category
PRE	Prefix
PRWD	Prosodic Word
R	Right
RED	Reduplicate
RT	Root
UNIFORM	Uniformity
V	Vowel
VCV	Vowel-Consonant-Vowel
VP	Verb Phrase
VV	Vowel-Vowel

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