

# On the final vowel in Kikae

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## Abstract

In this paper, I argue that the final vowel of verbs in Kikae is not an independent morpheme in the sense of a suffix possessing an inflectional value. Concretely, I make the following two claims. 1. The verb stems are not concatenated from independent morphemes (root or base + final vowel), but deduced from leading forms. 2. The inflected verbs are formed in an inferential-realizational way and stem selection is guided by the elsewhere principle.

## 1 Introduction

Based on the regular alternations below, the final vowel in Kikae<sup>1</sup> can be analyzed as an independent morpheme if we follow the traditional view in Bantu linguistics (cf. Meeussen 1967: 110, Nurse 2008: 37-38, Hyman 2009: 178-179).

### (1) Regular alternations of FV

	D-stem (Default)	P-stem (Perfective)	S-stem (Subjunctive)
	...CV <sub>I</sub> (C)- <b>a</b>	...CV <sub>I</sub> (C)- <b>V<sub>I</sub></b>	...CV <sub>I</sub> (C)- <b>e</b>
a. - <i>lal</i> - ‘sleep’	- <i>lal-a</i>	- <i>lal-a</i>	- <i>lal-e</i>
b. - <i>tend</i> - ‘do’	- <i>tend-a</i>	- <i>tend-e</i>	- <i>tend-e</i>
c. - <i>vik</i> - ‘cook’	- <i>vik-a</i>	- <i>vik-i</i>	- <i>vik-e</i>
d. - <i>som</i> - ‘read’	- <i>som-a</i>	- <i>som-o</i>	- <i>som-e</i>
e. - <i>kut<sup>h</sup></i> - ‘see’	- <i>kut<sup>h</sup>-a</i>	- <i>kut<sup>h</sup>-u</i>	- <i>kut<sup>h</sup>-e</i>

<sup>1</sup> The Kikae dialect is a regional variety of Swahili spoken in the southern part of the Unguja Island in the Zanzibar Archipelago. The speakers mainly inhabit Makunduchi district with enclaves in other areas of the island (Whiteley 1959: 43, Nurse & Hinnebusch 1993: 11). All of the examples of Kikae in this paper are from speakers in the Kajengwa and Nganani area.

	D-stem (Default)	P-stem (Perfective)	S-stem (Subjunctive)
f. <i>-pig-i-</i> ‘hit + applicative’	<i>-pig-i-a</i>	<i>-pig-i-i<sup>2</sup></i>	<i>-pig-i-e</i>
g. <i>-kat<sup>h</sup>-ish-</i> ‘cut + causative’	<i>-kat<sup>h</sup>-ish-a</i>	<i>-kat<sup>h</sup>-ish-i</i>	<i>-kat<sup>h</sup>-ish-e</i>
h. <i>-bomo-k-</i> ‘break down + stative’	<i>-bomo-k-a</i>	<i>-bomo-k-o</i>	<i>-bomo-k-e</i>
i. <i>-fug<sup>3</sup>-u-</i> ‘close + reversive (open)’	<i>-fug-u-a</i>	<i>-fug-u-u</i>	<i>-fug-u-e</i>

The default stem (D-stem) and the subjunctive stem (S-stem) end with *-a* and *-e* respectively<sup>4</sup>. In the perfective stem (P-stem), the FV is copied from the last vowel of the root or base<sup>5</sup>. The D-stem occurs in more forms than the other two stems: the finite forms except for the perfective form, the conditional/consecutive form, the counterfactual form, the imperative form, the infinitive form and the relative clause verb forms. The P-stem and the S-stem occur only in the perfective form and the subjunctive form, respectively.

Note that the labels D-stem, P-stem, and S-stem are only used to distinguish the stem forms and do not mean that each stem has some inflectional value.

## 2 Problems

The analysis that the FV is an independent morpheme entails that a FV has some inflectional value, that there is some morphological process in which a FV is attached to a root or base, and that a verb acquires some inflectional value by this attachment. The following examples, however, cast doubt on these assumptions.

### 2.1 Problem1: Lack of FV

The FV does not occur in most loanword verbs as shown below.

#### (2) Stems of loanword verbs

	Others	Perfective form	Subjunctive form
a. <i>-rudi</i> ‘return’	<i>-rudi</i>	<i>-rudi</i>	<i>-rudi</i>
b. <i>-sahau</i> ‘forget’	<i>-sahau</i>	<i>-sahau</i>	<i>-sahau</i>

If the FV is the only overt marker of perfective and subjunctive, how are these inflectional

<sup>2</sup> Even in the applicative forms, vowel copy occurs although there are the case in which vowel copy does not occur in the applicative forms in the other dialect of Swahili (Nurse 2008: 275).

<sup>3</sup> The root *-fug-* is realized as *-fung-* in the non-augmented form.

<sup>4</sup> I show the D-stem as the citation form.

<sup>5</sup> The base is defined as the root accompanied by the extension suffix(es).

values acquired by loanword verbs which lack an FV?

The perfective form is not marked with the Aspect/Mood (AM) prefix, in contrast to other finite forms. The subjunctive form can co-occur the AM prefix *-ka-*, but this is not mandatory, and thus it is conceivable that subjunctive mood is not determined by this prefix.

(3) Templates of prefixed affirmative verbal forms

- a. Finite except for perfective:    Subject – AM – (Object) – D-stem
- b. Perfective:                            Subject –  $\emptyset$  – (Object) – P-stem
- c. Subjunctive:                            (Subject) – (*ka*) – (Object) – S-stem

**2.2 Problem 2: Mismatch of form and inflectional value**

The FV of passive verbs and *-ijua* ‘know’ is *-a* even in the perfective form. That is, the D-stem also occurs in the perfective form.

(4) Stems of passive verbs and *-ijua* ‘know’

	Others D-stem	Perfective form D-stem	Subjunctive form S-stem
a. <i>-pig-w-</i> ‘hit + passive’	<i>-pig-w-a</i>	<i>-pig-w-a</i>	<i>-pig-w-e</i>
b. <i>-let-e-w-</i> ‘bring + applicative + passive’	<i>-let-e-w-a</i>	<i>-let-e-w-a</i>	<i>-let-e-w-e</i>
c. <i>-iju-</i> ‘know’	<i>-iju-a</i>	<i>-iju-a/-ij-i</i> (negative) <sup>6</sup>	<i>-iju-e</i>

How is the inflectional value ‘perfective’ conveyed to these verbs? Does the FV *-a* also cover ‘perfective’?

**2.3 Problem 3: Irregular perfective stems**

There are some verbs whose P-stem formation cannot be described by the simple vowel-copy rule.

(5) Verbal stems of verbs containing a syllabic nasal and monosyllabic verbs

	D-stem	P-stem	S-stem	Other examples
a. <i>-laṃk-</i> ‘wake up’	<i>-laṃk-a</i>	<i>-laṃk-u</i>	<i>-laṃk-e</i>	<i>-cheṃka/-cheṃsha</i> ‘boil’, <i>-suṃka</i> ‘run’, <i>-zunguṃza</i> ‘chat’
b. <i>-j-</i> ‘come’	<i>-j-a</i>	<i>-j-a</i>	<i>-j-e</i>	<i>-k<sup>h</sup>a</i> ‘give’, <i>-wa</i> ‘Copula’
c. <i>-ly-</i> ‘eat’	<i>-ly-a</i>	<i>-l-i</i>	<i>-ly-e</i>	<i>-nya</i> ‘rain, defecate’
d. <i>-fw-</i> ‘die’	<i>-fw-a</i>	<i>-f-u</i>	<i>-fw-e</i>	<i>-gwa</i> ‘fall’, <i>-pwa</i> ‘ebb’

<sup>6</sup> The stem form of *-ijua* is *-iji* in the negative perfective form and the expected D-stem *\*-ija* is lacking.

These P-stem formations can be accounted for by modifying the rule or adding some assumptions. For example, the stem formation of verbs containing the syllabic nasal  $\eta$  could be explained well if we assume that the FV of the P-stem is determined by some feature of the last syllable nucleus of the root or base, not by the vowel itself, and the syllabic nasal  $\eta$  has the feature [+round] which yields  $u$  as the FV.

(6) Possible formation of the P-stem of *-la $\eta$ ka* ‘wake up’

$$-la\eta k- + -VC \rightarrow -la\eta k- + -u \rightarrow -la\eta k-u$$

$\begin{array}{ccc} | & & | \\ [+round] & & [+round] \end{array}$

As for monosyllabic verbs, it is not difficult to explain their formation if we assume that, because the last vowels of the stem causing vowel copy are not syllabic, they emerge as semivowels in the other stems and do not surface in the P-stems<sup>7</sup>.

(7) Possible formation of the D-stem and P-stem of *-fwa* ‘die’

$$a. -fu- + \begin{array}{c} \sigma \\ | \\ -a \end{array} \rightarrow -fu- \begin{array}{c} \sigma \\ | \\ a \end{array} \rightarrow -fwa \quad b. -fu- + -VC \begin{array}{c} \sigma \\ | \\ u \end{array} \rightarrow -fu- \begin{array}{c} \sigma \\ | \\ u \end{array} \rightarrow -fwu (fu)$$

However, we need to discuss whether it would be legitimate to add these assumptions for this handful of verbs.

Note that it might be claimed that these irregular forms are the remnants of regular diachronic change. \*Mu has been reconstructed for the syllabic nasal  $\eta$  in Proto-Sabaki<sup>8</sup> (Nurse & Hinnebusch 1993: 181) and the semivowels in the monosyllabic stems are traced to the vowels in Proto-Bantu (Meeussen 1967, Guthrie 1971, Maho 2005). Thus, it can be assumed that the P-stems of these verbs was formed regularly by the simple vowel-copy rule. While I do not refute such a possibility, we have to keep in mind that historical explanations differ from synchronic word-formation explanations.

Additionally, there are a few verbs whose P-stem formations seem completely irregular.

(8) Irregular FV alternations of the P-stem

	D-stem	P-stem	S-stem
a. <i>-ch-</i> ‘dawn’	<i>-ch-a</i>	<i>-ch-e</i>	<i>-ch-e</i>
b. <i>-chw-</i> ‘set (of the sun)’	<i>-chw-a</i>	<i>-chw-e</i>	<i>-chw-e</i>

<sup>7</sup> The realization of the surface form *-fu*, not *-fwu*, can be explained by phonotactic constraint; the succession of  $w$  and  $u$  is not permitted phonotactically in Kikae.

<sup>8</sup> Nurse & Hinnebusch (1993) have reconstructed Proto-Sabaki for six closely related languages of East African littoral, Swahili, Mwani, Elwana, Pokomo, Mijikenda and Comorian.

	D-stem	P-stem	S-stem
c. <i>-t-</i> ‘lay eggs’	<i>-t-a</i>	<i>-t-i</i>	<i>-t-e</i>
d. <i>-langanz-</i> <sup>9</sup> ‘repair’	<i>-langanz-a</i>	<i>-langanz-i</i>	<i>-langanz-e</i>

We could assume that each of these roots have labels specifying the form of the FV in the P-stems or that these idiosyncratically inflected stems are lexical entries. There is no difference in economy between these two assumptions. In any case, we have to consider whether the regular patterns and the irregular patterns are really formed differently, in which case the former would operate in the grammar while the latter would operate in the lexicon.

#### 2.4 Problem 4: Inflectional value of *-a*

The function of the FV *-a* is opaque. Does this represent aspect, mood or nothing? Should we acknowledge it as an empty morph contrary to the basic definition of morpheme ‘the smallest meaningful unit’?

### 3 Word-based approach

In the previous section, I showed that there is a number of problems with analyzing the FV as an independent suffix. In this section, I describe the final vowel alternation according to the word-based model of morphology (Bochner 1993, Haspelmath & Sims 2010) in order to account for the problems, rejecting the idea that the final vowel is a morpheme.

#### 3.1 Morpheme-based model vs. Word-based model

##### 3.1.1 Morpheme-based model

In the morpheme-based model, it is assumed that the lexicon consists of morphemes and words are formed by combining morphemes. The two elements shown in (9a) and (9b) are the lexical entries constituting the word *bags*.

<sup>9</sup> There is an allomorph *-langanza* for *-langanz-a* ‘repair’ (BAKIZA 2012: 85). If the syllabic nasal is *ŋ*, the FV of the P-stem is *u* although if the syllabic nasal is *ɲ*, the FV of the P-stem is *i*. It is conceivable that the difference of the FVs in these P-stems is associated with the difference of the phonetic value of the syllabic nasals. The syllabic nasal *ɲ* is probably newer than *ŋ*, considering the diachronic changes in the other Bantu languages (Nurse & Hinnebusch 1993: 183-184, Hyman 2003: 52-53). Therefore, it is assumed that the loss of the feature [+round] in the syllabic nasal has caused the change of the FVs because the FV *i* can be interpreted as the high vowel which lost the feature [+round].

- (9) a. *bag* [bæg/ N ‘bag’]    b. *-s* [/z/ N\_ ‘plural’] (Haspelmath & Sims 2010: 43)

This view of morphology corresponds to the idea that the FV is a morpheme.

### 3.1.2 Word-based model

In the word-based model, it is assumed that the lexicon consists of words, including morphologically complex words. Both (10a) and (10b) are lexical entries.

- (10) a. *bag* [bæg/ N ‘bag’]    b. *bags* [bægz/ N ‘bags’] (Haspelmath & Sims 2010: 46, 47)

In this paper, I assume that the abstract morphological patterns are generalized from the lexical entries and are themselves lexical entries as proposed by Haspelmath & Sims (2010: 70). The following word-schema represents the morphological pattern of the English plural nouns ending with /z/.

- (11) [X/ N ‘x’] ↔ [Xz/ N ‘plurality of xs’] (Haspelmath & Sims 2010: 47)

The morphological rules represent the association between morphologically related sets of words or morphological patterns as shown by the bidirectional arrow in (11).

In this section, I outline how formation of Kikae verbal stems can be explained in this model..

### 3.2 Inflection classes

We can divide the verbs of Kikae into seven inflection classes, based on the form of the P-stem except for the completely irregular forms. The morphological patterns of each class are shown below.

- (12) Seven inflection classes and their morphological patterns of Kikae’s verbal stem
- |   |                |
|---|----------------|
| a. [XV <sub>1</sub> (C)a/ default] ↔ [XV <sub>1</sub> (C)V <sub>1</sub> / PFV] ↔ [XV <sub>1</sub> (C)e/ SUBJ] | Normal         |
| b. [XmCa/ default] ↔ [XmCu/ PFV] ↔ [XmCe/ SUBJ]   | Syllabic nasal |
| c. [Ca/ default] ↔ [Ca/ PFV] ↔ [Ce/ SUBJ]   | Mono syllable  |
| d. [Cya/ default] ↔ [Ci/ PFV] ↔ [Cye/ SUBJ]   | Mono syllable  |
| e. [Cwa/ default] ↔ [Cu/ PFV] ↔ [Cwe/ SUBJ]   | Mono syllable  |
| f. [Xwa/ default] ↔ [Xwe/ SUBJ]   | Passive        |
| g. [X/ default]   | Loanwords      |

Note that there is no way to distinguish the P-stems ending with *-a* in (12a, c) from the

D-stem, and the P-stem ending with *-e* in (12a) from the S-stem although I show them as separate morphological patterns for ease of exposition. The loss of opposition of the FV between the P-stem and the D-stem or the P-stem and the S-stem can be interpreted as the reduction of the functional load of the FV.

### 3.3 Stem formation based on the morphological patterns

All stem forms of a particular verb can be predicted from any given stem form, given the abstract morphological patterns in (12). For example, if a stem contains the syllabic nasal *m*, the forms of the other stems are predicted based on the morphological pattern (12b). If a stem is monosyllabic, the forms of the other stems are predicted from the phonetic value of the semivowel in the D-stem or the S-stem, or the phonetic value of the FV in the P-stem. If a stem is that of a passive verb, that verb lacks a P-stem.

Therefore, I propose that a stem is not formed by combining morphemes but deduced from any given stem, just referring to the morphological pattern in (12).

While a form of a particular stem can be predicted from any other stem, it can be argued that the D-stem is listed in the lexicon and that the other stems are deduced from it because the D-stem is distributed more widely than the other two stems and the connection of the form with an inflectional value is not clearer than that of the other stems. It is conceivable that the P-stems and the S-stems in the following examples are deduced from the D-stem, referring to the morphological patterns in (12).

#### (13) Newly formed stems

	D-stem	P-stem	S-stem
a. <i>-na</i> ‘have (verbid)’	<i>-n-a</i>	<i>-n-a</i>	<i>-n-e</i>
b. <i>-tafuta</i> ‘search (loanword)’	<i>-tafut-a</i>	<i>-tafut-u</i>	<i>-tafut-e</i>
c. <i>-hara</i> ‘have diarrhea (loanword)’	<i>-har-a</i>	<i>-har-a</i>	<i>-har-e</i>
d. <i>-sepa</i> ‘go’	<i>-sep-a</i>	<i>-sep-e</i>	<i>-sep-e</i>

The S-stem *-ne* in (13a) must have been formed later because *-na* is derived from \**na* ‘conjunction/associative’ in Proto-Bantu, not from a verb (Nurse 2008: 251, cf. Meeussen 1967: 115) and the final vowel alternation was not applied to this constituent in Proto-Bantu. *-Tafuta* and *-hara* in (13b, c) have entered the language from Arabic as D-stem, not P-stem or S-stem, forms, and thus the P-stem and the S-stem must have been deduced from the D-stem. *-Sepa* in (13d) is a slang term in Kiunguja, the prestigious dialect of Swahili. In Kiunguja, there is no vowel copy stem formation as it occurs in the P-stems

in Kikae. Thus, the P-stem *-sepe* must be deduced from the D-stem.

### 3.4 Lexicon

#### 3.4.1 Regularly inflected stems

Following Bochner (1993: 59-60), I assume the regularly inflected stems are listed in the lexicon though it seems more economical to assume that they are not lexical entries because they can be predicted from the morphological patterns presented in (12). However, the morphological patterns would not be abstracted if the regularly inflected forms were not lexical entries because the morphological patterns arise from generalizations based on the already existing words (see also Haspelmath & Sims 2010: 70-71). While this assumption seems to be incompatible with the idea that the lexicon should be maximally economical, it does not matter because, in the word-based model, it is assumed that the lexicon includes redundant information (Bochner 1993: 65, Haspelmath & Sims 2010: 70-71).

Note that this is not to say that all of the words are listed in the lexicon. While it is not clear how many words are listed, it is reasonable to assume that there are enough words in the lexicon to generalize the regularity (cf. Bochner 1993: 49).

#### 3.4.2 Irregularly inflected stems

In the word-based model, it is assumed that complex words are also listed in the lexicon. Therefore, no additional, ad-hoc rules are necessary in order to explain away the irregular forms.

The forms of the P-stems in (14) deviate slightly from the regular morphological patterns, differing from the examples in (8).

#### (14) Semi-irregular forms of the P-stem

	D-stem	P-stem	S-stem
a. <i>-nyw-</i> 'drink'	<i>-nyw-a</i>	<i>-nyw-i</i>	<i>-nyw-e</i>
b. <i>-ivw-</i> 'get ripe'	<i>-ivw-a</i>	<i>-iv-u</i>	<i>-ivw-e</i>

The FV of the P-stem in (14a) is *i* as in the verbs generalized in (12d), reflecting the semivowel *y* of the root, although the semivowel *w* occurs in the end of the root unlike those verbs. The FV of the P-stem in (14b) is *u* as in the verbs generalized in (12e), reflecting the semivowel *w* of the root, although the stem is not monosyllabic in contrast to the verbs in (12e).

Note that it is meaningless to assume that abstract morphological patterns for completely irregular forms are listed in the lexicon. Morphological patterns are generalized based on the already existing words, and assumed in order to explain the analogical stem formations as in (13) or secure a way of retrieving lost information on the words. That is, the morphological patterns for completely irregular forms are lost from the lexicon at the same time the corresponding words are lost and unavailable when necessary.

## **4 Stem realization**

In the previous section, I have argued that the inflected stems are themselves lexical entries and that the stems which are not listed in the lexicon are deduced from the D-stem. There remain, however, two problems: first, how can we resolve the lack of the FV and the form-function gap shown in section 2, and second, how can we explain the prefixation to the verbal stems in a compatible way with the formation of verbal stems? The correspondence of the prefixes with the inflectional values is more clear than that of the stems (or the FVs) and the prefixation rule apparently differs from the stem formation rule. In order to solve these problems, I introduce an inferential-realizational morphological theory, Paradigm Function Morphology (PFM) (Stump 2001).

### **4.1 Paradigm Function Morphology**

The characteristics of PFM are summarized as below.

Paradigm Function Morphology (PFM) is an inferential-realizational theory of inflectional morphology which takes as its central premise the assumption that paradigms are essential to the very definition of a language's inflectional system. It is **REALIZATIONAL** because it presumes that a word's inflectional markings are determined by the morphosyntactic properties which it carries; that is, it rejects the assumption, characteristic of **INCREMENTAL** theories, that words acquire their morphosyntactic properties only as an effect of acquiring the exponents of those properties. In addition, PFM is **INFERENCEAL** because it presumes that word forms are deduced from more basic forms (roots and stems) by means of rules associating particular morphological operations with particular morphosyntactic properties; that is, it rejects the assumption, characteristic of **LEXICAL** theories, that morphosyntactic properties are associated with inflectional markings just as lexicosemantic properties are associated with lexemes – in lexical entries or as “vocabulary items”. (Stewart & Stump 2007: 386-387)

In PFM, two different types of inflectional rules are assumed (Stump 2001: 44, 60, 184).

- Morphomic rules: the rules of stem formation and stem indexing – no reference to the morphosyntactic properties.
- Realization rules: the rules of exponents, including stem selection – the individual rules of morphology realizing the language’s morphosyntactic properties.

These two rules can be assumed to operate in the formation of the inflected verbal forms of Kikae. The former rule corresponds to the stem formation rule as stated in section 3. In PFM, it is also assumed that the form of a stem is deduced from that of some other stem (Stump 2001: 183, 199). The latter rule can be assumed to operate in prefixation and stem selection depending on the morphosyntactic properties. That is, given some morphosyntactic properties, the choice of prefixes and stem is determined by the stipulation of this rule.

#### 4.2 Verbal stem selection in Kikae

The process of stem realization is represented as below.

(15) Stem realization process

- a. Stem formation → b. Stem indexing → c. Stem selection

First, the P-stem and the S-stem are deduced from the D-stem of the same lexeme if they are not listed in the lexicon (Stem formation). Second, each stem is indexed as ‘Default’, ‘Perfective’ and ‘Subjunctive’ respectively, corresponding to its form (Stem indexing). Third, each stem is selected according to some morphosyntactic property (Stem selection).

In verbal word-formation, the D-stem or the loanwords’ verbal stem is chosen by the default stem-selection rule. This rule can be overridden by the following more specific rules.

(16) More specific stem-selection rules

- a. Given perfective aspect, the P-stem is chosen iff the verb has a P-stem.  
b. Given subjunctive mood, the S-stem is chosen iff the verb has an S-stem.

These assumption can explain lack of FV and the form-function mismatch straightforwardly.

For example, *-soma* ‘read’ has three types of stems: [/soma/ default], [/somo/

perfective] and [/some/ subjunctive]. Given perfective aspect, the P-stem competes with the D-stem, but the P-stem is selected by the elsewhere condition – more specific conditions apply before more general ones. By contrast, *-pigwa* ‘hit + passive’ has only two types of stems: [/pigwa/ default] and [/pigwe/ subjunctive]. Given perfective aspect, there are no other choices than the D-stem, and thus the D-stem is selected even in the perfective form. In other words, the D-stem is always an option in stem-selection even in the perfective form and the subjunctive form, but not chosen in most cases by the elsewhere condition. As for loanwords’ stems, there are no alternatives, and thus the stem form is the same in every environment.

### **4.3 Modification of PFM**

PFM is incompatible with the word-based model if there is an intuition that the lexicon should be largely ‘redundancy free’ behind PFM as stated in Blevins (2006: 537). In addition, it would be unclear in the word-based model whether the fully inflected forms are lexical entries or not since the number of the possible combinations of the prefixes is very large. Is it necessary to modify PFM to count the inflected words as lexical entries as proposed in Sims (2006: 56-57)?

At present, I basically assume that prefixation is mainly based on rules, not on direct access to prefixed word forms stored in the lexicon, while most of the stems are listed in the lexicon. However, the fully inflected forms should also be stored in the lexicon to some extent in order for the speakers to know why the prefixes are realized in the way they are. This issue remains to be investigated as stated by Haspelmath & Sims (2010: 68).

## **5 Conclusion**

In this paper, I have discussed the final vowel alternation of verbal stems in the Kikae dialect of Swahili within the word-based morphology and Paradigm Function Morphology. The conclusions are summarized below.

- The verbal stems are themselves lexical entries, not segmented into the root or base and final vowel, and the P-stem and S-stem are deduced from the D-stem without any reference to morphosyntactic properties.
- The verbal inflection of Kikae should be explained in an inferential-realizational way as proposed by Stump (2001).

- Stem formation and stem selection are governed by the different types of rules, and the elsewhere condition plays an important role in stem selection.

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