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Morphotactics in ekegusii borrowing: An optimality perspective

Mose Gesare Edinah[1*], Henry Simiyu Nandelenga[2], Gerry Ayieko[3]
[1-3] Department of Literature, Linguistics and Foreign Languages, Kenyatta University, P.O. BOX, Nairobi, Kenya

Abstract
Language morphotactics which encompass morphological constraints that determine what is permissible and impermissible in given language are very crucial in determining linguistic borrowing. This paper explores morphological adaptations, based on McCarthy and Prince's Generalized Alignment (GA), that is embedded in OT's constraints. It is demonstrated that to a large extent, loanwords undergo inflectional integration as opposed to derivational, both of which are highly constrained by Ekegusii's morphotactics.

Keywords: morphotactics, faithfulness, markedness, optimal, adaptation

1. Introduction

Language dynamism and attempts to cope with the arrival of new concepts has led to Ekegusii borrowing from English. Ekegusii is a Bantu language which is spoken in Kenya and it is classified as E42 by Guthrie (1971) [3]. Tsvetkor and Dyer (2016) [13] argue that when speakers borrow, they transfer linguistic constructions which can be syntactic, morphological, lexical and phonological, from a 'donor' language to a 'recipient' language. When this occurs, loanwords are integrated not just to the phonology but also the morphology of the recipient language. In particular, loanwords undergo modification of the morphological structure to achieve harmony with the established predominant patterns and morphological systems of the borrowing language. When a borrowed word enters a certain word class in a recipient language, it should, theoretically, acquire all features of that word class (Pakerys, 2016) [10].

Studies have been done on morphological adaptations which reveal the extent languages adjust foreign segments. Oh's (2012) investigates the degree to which morphological information affects initial perception of the incoming loanwords. He establishes that whole borrowing occurs whereby a morphologically complex word is not borrowed as a single unit, instead each component word is parsed and adapted separately and independently. Mira and Syejeong (2012) investigate the adaptation of the English plural suffix into Korean. They establish that /z, s/ in a mono-morphemic word final are always mapped to the perceptually closest sounds along with vowel epenthesis. However, when they are morphemic, that is denoting the plural they can be deleted. They argue the morphological structure of the suffixed words plays a role in loan adaptation. Saidat (2011) [11], in his study of English loanwords integration to Jordanian Arabic, notes that loans follow the Arabic gender and number inflection rather than English inflection. Mathkour (2012) [5] adds that the English loans are assigned either to the feminine or masculine gender through the suffixation. Fatimah and Abdulmohsen (2017) [2] investigate the morphological adaptation of English loanwords into Kuwait. They establish that there is no one on one mapping of the English allophones that mark plural. Instead Kuwait has [a:t] which is suffixed to the loanword to mark plural. They also note the morphological processes that loanwords undergo include conversion and clipping.

McCarthy and Prince (1993) [7] 's Generalized Alignment (GA), that is subsumed under OT's constraints of well-formedness is used to explain the morphological adaptations. GA explains that, the edges of grammatical constituents should align with corresponding prosodic constituents. The general alignment constraint for GA is presented in schema (2.1) below.

(2.1) Generalized Alignment
Align (Cat_1, $Edge_1$, Cat_2, $Edge_2$) = $_{def}$
V Cat_1, ∃ Cat_2 such that $Edge_1$ of Cat_1 and $Edge_2$ of Cat_2 coincide.
Where Cat_1, Cat_2 ϵ Pros Cat ∪ Gram Cat
$Edge_1$, $Edge_2$ {ϵ Right, Left}

From the schema, quantification of Cat_1 is universal whereas that of Cat_2 is existential, meaning for each Cat_1 there is some Cat_2. Both the morphological and the prosodic can be subsumed under a single family of well-formedness constraints as presented in (2.2a and b)

a. (2.2) a. ALIGN-WD-L: Align (PrWd, Left, Foot, Left)
b. ALL-FT-L: Align (Foot, Left, PrWd, Left)

Constraint (2.2a) states that for each left PrWd edge there is some left foot edge which coincides with it. It is violated by each PrWd which does not begin with a foot. Constraint (2.2b) states that for each left foot edge, there is some left PrWd edge which coincides with it. It is violated by each foot which does not lie at the beginning of a PrWd. Such differences become important in structures which contain multiple feet, or multiple PrWds. Other constrains include:

a. (2.3) a. ALIGN (Affix, L, Stem, L),
b. ALIGN (PrWd, L, Stem, L)

Constraint (2.3a) states that the left edge of the affix must coincide with the left edge of some stem; meaning, it expresses an instance where there is a prefix rather than a suffix. On the other hand, constraint (2.3b) states that each left edge of prosodic word aligns with the left edge of some stem.

GA expresses the full range of reference to edges in grammar, thus is considered appropriate for morphological

adaptations in Ekegusii borrowing. In GA theory, there are no derivations by ordered rules, but only well-formedness constraints which evaluate possible output representations.

2. Ekegusii Noun Morphology

Literature on Ekegusii noun morphology indicates that nouns are entered in a system of pairs of prefixes that mark semantic-syntactic categories of singular and plural (Cammenga, 2002) [1]. Whitely's early research of 1956 indicated that Ekegusii had 16 classes while Cammenga (2002) [1] revised the classes to 21. Of these pairs of classes, one prefix marks the singular of the noun to which it is prefixed while the other marks the corresponding plural. This paper analyses data that shows how the borrowed segments are integrated to the various Ekegusii noun classes, what determines the mapping, the inflectional and derivational morphology as well as morphological processes. We begin with the Ekegusii noun classes as presented below:

Table 1

Class	Example (Singular/Plural)	English Gloss
1. Omo-	omo-nto	'a person'
1b. Ø		
2. aβa-	aβa-nto	'people'
3. omo-	omo-te	'a tree'
4. eme-	eme-te	'tress'
5. eri-	eri-so	'an eye'
6. ama-	ama-iso	'eyes'
7. eke	eke-rebi	'head scarf'
8. eβi-	eβi-rebi	'head scarfs'
9. e-	e-kabira	'tribe'
9a. e-n	e-nyigo	'kidney'
10. ci-	chi-kabira	'tribes'
10a. ci- n	chi-nyigo	'kidneys'
11. oro-	oro-ko	'firewood'
12. aka-	aka-mura	'small boy'
13. oβo-	oβo-βa	'mushroom'
15. oko-	oko-boko	'hand'
16b. a-	a-mate	'saliva'
21. ńa-		
		(Cammenga, 2002) [1]

The Ekegusii noun classes reveal that in terms of structure, the noun has two elements; a prefix and a root. The prefix in most of the classes consists of an initial vowel called an augment or pre-prefix. Nouns are assigned to different classes, often on a minimally semantic basis, depending on whether they refer to a human/animate individual or on the basis of salient properties of the entity denoted by a noun such as its shape and size (Katamba, 2003) [6].

An analysis on Ekegusii noun classification reveals that class 1 and 2 prefixes select nouns which denote human referents in singular and plural respectively. Class 9 and 10 denote animal referents. Other class memberships happen to be very heterogeneous in that they do not seem to constitute a semantically coherent group. Further, some human categories occur outside the expected human classes 1 and 2. This is class 12 which denotes the diminutive form '*aka-*'. So from the noun classification, a number of inferences can be made. First, the noun prefix carries information about number and shape. Secondly, the prefix plays no role in determining the noun class, instead the nature of the noun whether it is animate or inanimate determines class assignment. On the other hand, researchers on Bantu languages agree that the noun class features are determined by grammatical number, semantics, (whether they are human/animal/non-living things) and in other cases it is arbitrarily assigned (Katamba, 2003) [6].

3. Morphological Class Adaptations

As already presented, Ekegusii has 21 noun classes. Here is a presentation of how the loanwords are integrated to the various classes.

Class 3 and 4

Table 2

Class 3 and 4		
Ekegusii Loan (3)	Plural (4)	English Gross
omo-ito	eme-ito	'mattress'
Class 7 and 8		
Ekegusii Loan (7)	Plural (8)	English Gross
eke.rasi	eβi-rasi	'glass'
eki-riniki	eβi-riniki	'clinic
eke-si	eβi-kesi	'case'
eke-ragita	eβi-ragita	'tractor'
Class 9 and 10		
Ekegusii Loan (9)	Plural (10)	English Gross
e-seneta	chi-seneta	'senator'
e-roya	chi-roya	'lawyer'
e-sekeretari	chi-sekeretari	'secretary'
e-gaβana	chi-gaβana	'governor'
e-sati	chi-sati	'shirt'
e-tiβi	chi-tiβi	'T.V'
e-roni	chi-roni	'loan'
e-soβa	chi-soβa	'sofa'
e-rura	chi-rura	'ruler'
Class 13		
Ekegusii Loan	Plural	English Gross
oβo-rangeti	ama-rangeti	'blanket'

This data from the loanwords in Ekegusii indicates that class 3 and 4, 7 and 8 as well as class 13 comprise of inanimate referents. However, class 9 and 10 is a mixture of both human referents like lawyer, senator, governor and inanimate referents like loan. None of the loanwords especially human referents was mapped to class 1 and 2. Hence, in this loanword adaptation, the overriding factor seems to be the prefix marker whereby if the beginning of the loanword adaptation matches the Ekegusii prefix, the loan is assigned to that class.

Class assignment and mapping of the loanwords in Ekegusii can be accounted for using McCarthy and Prince (1993) [7]'s alignment theory constrains to show how morphological and prosodic edges interact with each other. First, there is the ALIGN (Affix, L, Stem, L) constraint which proposes that the left edge of the affix must coincide with the left edge of some stem; in other words, it expresses an instance where there is a prefix rather than a suffix. Since most of the loanwords add prefixes in adaptation rather than suffixes, for Ekegusii we propose the constraint ALIGN ($[e]_{AF}$, L, Stem, L) which states that the left edge of the prefix [e] must align with the left edge of the stem. This markedness constraint is simplified as ALIGN-[e]. The violation of this constraint is realized in terms of distance from the designated edge. Secondly, is the constraint ALIGN (PrWd, L, Stem, L) which requires that each left edge of prosodic word aligns with the left edge of some stem.

McCarthy and Prince (1993) [7] further argue that some prosodic constraint, like NO-CODA, must dominate some

morphological constraint, like Align (Affix, Stem) for morphology to be prosodic at all within OT. In other words, phonological constraint must dominate some constraint of the morphology. Hence, in Ekegusii, the constraint hierarchy will be NO-CODA >> ALIGN($[e]_{AF}$, L, Stem, L) >> ALIGN (PrWd, L, Stem, L). ONSET is also another prosodic constraint although it will be dominated since loanwords in Ekegusii take an initial morpheme class marker. In addition, the inputs from the English language are observed to undergo suffixation but when adapted they are prefixed. Therefore, the constraint: ALIGN (PrWd, R, Stem, R) which requires that each right edge of prosodic word aligns with the right edge of some stem is relevant although it will be dominated whenever invoked. So far, the constraints proposed are all markedness constraints which require to be counterbalanced by faithfulness constraints. They include; DEP-IO(V) which militate against vowel insertion, MAX-IO_{SEG} which disallows segment deletion as well as IDENT-IO(F) which prohibits feature change.

As already noted, OT's markedness and faithfulness constraints can account for class assignment and mapping of the loanwords in Ekegusii. First, we illustrate in tableau (3.1) using an example from class 9/10 where most of the borrowed words were mapped to. So, the constraints are ranked as follows:

*CODA >> ALIGN-[e] >> ALIGN (PrWd, L, Stem, L) >> ONSET >> DEP-IO(V)

(3.1) senator ⟶ {e-seneta}

/senata/	*CODA	ALIGN-[e]	ALIGN (PrWd, L, Stem, L)	ONSET	DEP-IO(V)
a.☞[e-se.ne.ta]			*	*	**
b.[se.ne.ta]		*!			
c. [se-e-net]	*!	*		*	
d. [se.na.ta]		*!			

Fig 1

Tableau (3.1) indicates that candidate (c) is the most disharmonic. It not only violates the high ranked markedness constraints: *CODA but also the ALIGN-[e] constraint that allows for the attaching of a prefix. Besides, it violates the low ranked ONSET. On the other hand, candidates (b) and (d) are isoharmonic. They each violate the high ranked markedness constraints ALIGN-[e]. Candidate (a) is the optimal although it violates the low ranked constraints ALIGN (PrWd, L, Stem, L), ONSET and the faithfulness constraint DEP-IO(V).

Similarly, class 3 /4 allows for the insertion of the morpheme marker although in this case it is 'o'. Thus, the same constraints can be used to account for the loanword mapping in the class and they are ranked as follows in tableau (3.2):

*CODA >> ALIGN-[e] >> ALIGN (PrWd, L, Stem, L) >> ONSET >> DEP-IO(V)

(3.2) mattress ⟶ {omoito}

/matras/	*CODA	ALIGN-[o]	ALIGN (PrWd, L, Stem, L)	ONSET	DEP-IO(V)
a.☞ [o-mo.i.to]			*	*	**
b.[mo.i.to]		*!		*	*
c. [mo.i.to.o]		*!		**	**
d. [mat.tras]	*!	*			

Fig 2

Tableau (3.2) shows that candidate (d) is the most disharmonic. It not only ends with a consonant violating *CODA in the Ekegusii language, but also drops the morpheme marker 'o' requirement for borrowed words in this class. Candidates (b) and (c) equally violate the high ranked markedness constraints ALIGN-[e] in addition to violating the low ranked ONSET and DEP-IO(V). Candidate (a) is the optimal although it violates the low ranked ALIGN (PrWd, L, Stem, L), ONSET and DEP-IO(V).

Class 7 /8 also show the insertion of the morpheme marker 'e'. Likewise, the same constraints can be used to account for the mapping of loanwords to this class and they will be ranked as:

*CODA >> ALIGN-[e] >> ALIGN (PrWd, L, Stem, L) >> IDENT-$IO_{LAT/VOI}$, DEP-IO(V)

(3.3) glass ⟶ {e-kerasi}

/glas/	*CODA	ALIGN-(e-)	ALIGN(PrWd, L, Stem, L)	IDENT-$IO_{LAT/VOI}$	DEP-IO(V)
a.☞ [e-ke.ra.si]			*	**	***
b.[ke.las]	*!	*		*	*
c. [e.ke.ra.si-e]			*!	**	****
d. [gla.s]	*!	*			

Fig 3

Tableau (3.3) indicates that candidate (b) and (d) are isoharmonic. They each violate the high ranked undominated markedness constraint *CODA and ALIGN-[e]. In addition, candidate (b) violates the low ranked faithfulness constraints IDENT-$IO_{LAT/VOI}$ and DEP-IO(V). As for candidate (c), it violates the markedness constraint ALIGN (PrWd, L Stem, L). In this case, candidate (a) is the optimal although it violates ALIGN (PrWd, L, Stem, L); a markedness constraint which is not ranked high in Ekegusii and all the faithfulness constraints.

Data from class 13 presented indicates that this class too allows for the insertion of the morpheme marker 'o'. So, as already proposed the same constraints used in other classes can be used to explain the mapping as follows:

*CODA >> ALIGN-[e] >> ALIGN (PrWd, L, Stem, L) >> ONSET >> IDENT-$IO_{NAS/CONT/LAT}$, DEP-IO(V)

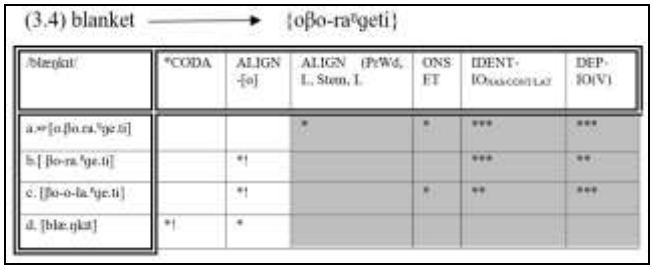

Fig 4

Tableau (3.4) indicates that candidate (d) is the most disharmonic. It violates the undominated *CODA, and ALIGN[o]. Candidate (b) and (c) are isoharmonic. Each of them violates the high ranked markedness constraint ALIGN-[o] in addition to violating the low ranked faithfulness constraints. Candidate (a) is the optimal although it violates the markedness constraints ALIGN (PrWd, L, Stem, L), ONSET, IDENT-IO$_{NAS/CONT/LAT}$ and DEP-IO(V).

3.1 Inflectional and Derivational Morphology of Loanwords

Inflectional morphology deals with syntactically determined affixation while derivational morphology is used to create new lexical items (Katamba, 2003) [6]. However, Katamba is quick to note that there is no unanimity in the classification of processes as inflectional or derivational. What differentiates the two is like the criterion of obligatoriness which characterises inflection and productivity which characterises derivation. Generally then, morphology deals with information about word structure that is relevant to syntax. Therefore, affixes that express number, tense and person fall under inflectional morphology. However, as for nouns, the inherent categories are number, gender and class. Number is an obligatory category in English nouns in that they must inflect to show whether they are singular of plural. The loanwords from the English language inflect for number and typically it is suffixed. On the other hand, when they are borrowed to Ekegusii, the loanwords mark number but it is prefixed as shown in the data presented.

Table 3

English Input	English Output	Ekegusii Output	Ekegusii Output
Singular	Plural	Singular	Plural
brake	/breɪk-s/	ebureki	chi-βurekɪ
bathroom	/'ba:Ðrum-z/	ebaturumu	chi-βaturumu
brush	/brʌʃ-ɪz/	eburasi	chi-βurasɪ
class	/klɑ:s-ɪz /	ekerasi	eβi-rasɪ
clinic	/'klɪnɪk-s/	ekiriniki	eβi-rɪnɪkɪ
governor	/'gʌvənə-z/	egabana	chi-ɣaβana
blanket	/'blæŋkɪt-s/	oborangeti	ama-raⁿgetɪ
machine	/mə'ʃi:n-z/	amasini	ama-sɪnɪ
mattress	/mætrəs- ɪz /	omoito	eme-ito

Data presented reveals that loans inflect for number. However, the prefix selected is determined by the class the loanword is mapped to in Ekegusii. This can be justified since the prefix that forms the noun structure in Ekegusii carries number. Some of the prefixes that express number include: {chi-, eβi-, ama-, eme-}. This plural formation in Ekegusii can be accounted for using OT's morphological constraints. First, we note that most of the loanwords were mapped to Ekegusii class 9 /10 which forms the plural by dropping the morphological class marker 'e' and introducing a prefix (chi-). All the other classes represented in the loanwords: class 3 /4, 7 /8 and 13 retain the initial morphological vowel whether it is 'e-' or 'a-'.

We begin with the plural marking for class 9 /10. OT's constraints, ALIGN-[e] and ALIGN (PrWd, L, Stem, L) are invoked. In this category, it is stated as ALIGN-[chi]. Also relevant is the universal markedness constraint *CODA and the faithfulness constraints MAX-IO$_{SEG}$, IDENT-IO$_{CONT/DIPH}$ and DEP-IO(V). We illustrate using an input like 'brakes' adapted as {chi-βurekɪ}. The constraints will be ranked as follows:

*CODA >> ALIGN-[chi] >>MAX-IO$_{SEG}$ >> ALIGN (PrWd, L, Stem, L) >> IDENT-IO$_{CONT/DIPH}$, DEP-IO(V).

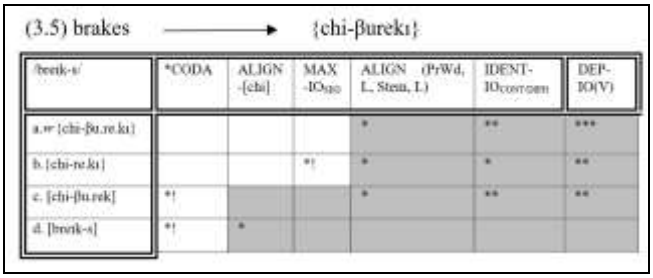

Fig 5

Tableau (3.5) indicates that candidate (d) is the most disharmonic. It not only violates *CODA but also ALIGN –[chi]. On the other hand, candidates (b) violates the high ranked MAX-IO$_{SEG,}$ though a faithfulness constraint, Ekegusii ranks it higher than the markedness constraint ALIGN (PrWd, L, Stem, L) and other faithfulness constraints. Candidate (c) does not fare well either. It violates the high ranked undominated *CODA constraint. Candidate (a) is the optimal form although it violates the markedness constraint ALIGN (PrWd, L, Stem, L) and all the faithfulness constraints.

For class 3 /4, the plural is formed by allowing the occurrence of the morpheme for class marking in this case 'e' so that the plural prefix is {eme-}. To explain this plural formation, we invoke OT's markedness constraints *CODA, ALIGN-[eme] and ALIGN (PrWd, L, Stem, L). Another relevant markedness constraint is ONSET. The faithfulness constraints relevant are DEP-IO(V) and IDENT-IO$_{VOI}$. In an input like 'mattresses' adapted as {e-meito}, the constraints will be ranked as:

*CODA >> ALIGN-[eme] >>ALIGN (PrWd, L, Stem, L) >> ONSET >> DEP-IO(V), IDENT-IO$_{VOI.}$

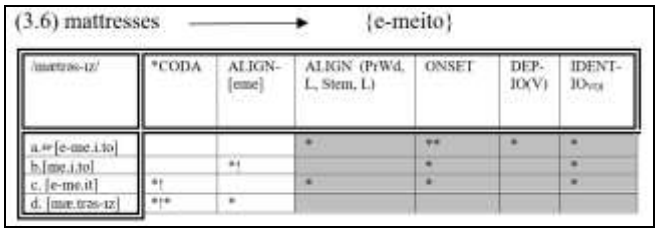

Fig 6

Candidate (d) is the most disharmonic. It violates all the high ranked markedness constraints: *CODA and ALIGN-[eme]. Conversely, candidate (a) is the most harmonic though it violates the markedness constraint ALIGN (PrWd,

L, Stem, L), ONSET and DEP-IO(V) as well as IDENT-IO_{VOI}. For candidate (b), it violates the high ranked markedness constraint ALIGN-[e]. Lastly, candidate (c) violates the undominated *CODA.

The nouns in class 7/8 inflect for number by adding the prefix {eβi-} to the stem to mark plural. Similarly, *CODA, *$CL_{ONS,}$ ALIGN-[eβi] and ALIGN (PrWd, L, Stem, L) can be invoked. As for the faithfulness constraints DEP-IO (V), MAX-IO_{SEG} and IDENT-IO_{LAT} are relevant. In an input like 'clinics' adapted as {eβi-riniki}, the constraints will be ranked as follows in tableau 3.7:

*CODA, *CL_{ONS} >> ALIGN-[eβi], >> ALIGN (PrWd, L, Stem, L) >> MAX-IO_{SEG}, IDENT-IO_{LAT}, DEP-IO(V)

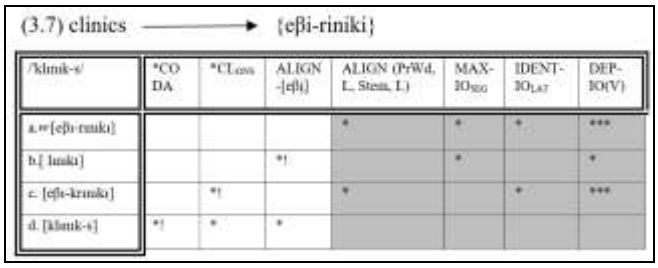

Fig 7

Tableau (3.7) indicates that candidate (a) is the optimal form although it violates the markedness constraint ALIGN (PrWd, L, Stem, L) and all the faithfulness constraints. On the other hand, candidate (d) is the most disharmonic. It violates all the high ranked markedness constraints which include the undominated *CODA, *CL_{ONS} and ALIGN-[eβi]. Candidate (b) also violates one of the high ranked markedness constraints: ALIGN-[eβi]. As for candidate (c) it violates the undominated *CL_{ONS}. The markedness constraints crucially dominate the faithfulness constraints.

Lastly on number is class 13. Borrowed segments which fall in this class mark the plural by prefixing {ama} to the stem. A case in point is the adaptation of 'blankets' as {ama-ra^{n}geti}. The markedness constraints proposed here include the undominated *CODA, *$CL_{ONS,}$ ALIGN-[ama] and ALIGN (PrWd, L, Stem, L). Relevant faithfulness constraints, include MAX-$IO_{SEG,}$ IDENT-$IO_{NAS/LAT/VOI}$ and DEP-IO(V). They will be ranked as follows in tableau 3.8.

*CODA, *CL_{ONS} >> ALIGN-[ama] >> ALIGN (PrWd, L, Stem, L) >> MAX-IO_{SEG} >> IDENT-$IO_{NAS/LAT/VOI}$, DEP-IO(V)

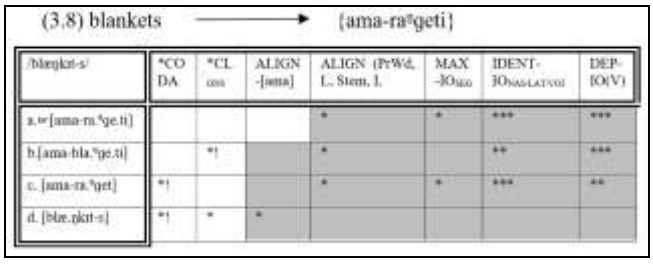

Fig 8

Tableau (3.8) shows that candidate (d) is the most disharmonic. It violates all the high ranked markedness constraints; *CODA, *CL_{ONS} and ALIGN-[ama]. On the other hand, candidate (a) is the most harmonic, it satisfies the high ranked markedness constraints and emerges as the winner. As for candidates (b) it violates one of the high ranked markedness constraint; *$CL_{ONS.}$ Candidate (c) is almost optimal, however, it violates the undominated *CODA constraint.

Another category that nouns inflect for is gender. Katamba (2003) [6], notes that in many European languages, nouns referring to animate individuals are usually either masculine or feminine depending on whether the individual in question is a male or a female. He also notes that in many sub-Saharan African languages, Australian languages and native American languages, this classification does not have even the most tenuous gender basis. Thus, even the English language does not inflect for gender like French. Instead, individual nouns which denote male or female inflect for agreement in syntactic configurations. Similarly, in Ekegusii, nouns do not inflect for gender. Instead, they will inflect for number and it will be determined by the class they belong to. The data below illustrates this:

Table 4

English Input	Ekegusii Output	Class
Watchman	ewochimani	9/10
Headmaster	etumasita	9/10
Headmistress	etimisituresi	9/10
Chairman	echeamani	9/10

OT can account for this mapping by invoking the markedness and faithfulness constraints. In this case we can illustrate using 'chairman' adapted as {echeamani}. The relevant markedness constraints include: *CODA, *[REDUCED-V], *DIPH, ALIGN-[e] and ALIGN (PrWd, L, Stem, L). For the faithfulness constraints DEP-IO (V), MAX-IO_{SEG} as well as IDENT-IO_{DIPH} can be considered and they will be ranked as follows in tableau 5.9:

*CODA, *[REDUCED-V], *DIPH >> ALIGN-[e] >> ALIGN (PrWd, L, Stem, L) >> DEP-IO(V), IDENT-IO_{DIPH}

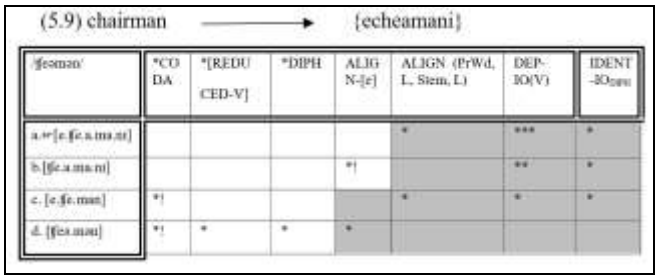

Fig 9

Candidate (a) is the optimal form although it violates the low ranked markedness constraint ALIGN (PrWd, L, Stem, L) and all the low ranked faithfulness constraints. On the other hand, candidate (d) is the most disharmonic. It violates all the markedness constraints which include the undominated *CODA, *[REDUCED-V] and *DIPH as well as the markedness constraints ALIGN-[e]. As for candidates (b), it violates the high ranked markedness constraint ALIGN-[e]. Lastly, candidate (c) violates the high ranked markedness constraint*CODA as well as ALIGN (PrWd, L, Stem, L). In this adaptation, markedness constraints dominate the faithfulness constraints.

Evidently, gender does not influence class assignment in Ekegusii nor do we have an overt prefix or suffix to mark gender. But borrowers because of perceptual similarity, will infer that the borrowed segment denotes either male or female.

Derivational morphology as already noted creates new words and it is uniquely productive. Ordinarily then, it is expected to generate new words from the borrowed segments. However, the data collected coupled with native speaker competence reveals, that there is very minimal derivation. This is not a unique phenomenon. Hafez (1996) observes that newly introduced loan verbs and nouns have a very limited derivational paradigm. This however does not mean derivation does not occur in Ekegusii nouns. Native Ekegusii nouns are derived to form new classes which include verbs. Data collected reveals only one instance of derivation.

This derivation in Ekegusii is illustrated using the noun /'bæptızm/ which is adapted as a [eβatıso] 'baptism'. A verb can be derived from baptism which is /bæp'taız/ adapted [βatısa] 'baptize'. The input here is /'bæptızm/ (noun) while the output will be [βatısa] (verb). OT's markedness constraints *CODA, *CN, *[p], *[b], *OBSVOI and *ALIGN-[e] as well as ALIGN (PrWd, L, Stem, L) are relevant. These markedness constraints will be counterbalanced by the faithfulness constraints: DEP-IO(V), MAX-IO$_{SEG}$ and IDENT-IO$_{VOI/CONT.}$ The constraints will be ranked as follows in tableau (5.10)

*CODA, *CN, *[p], *[b] >> *OBSVOI >> *ALIGN-[e] >> ALIGN (PrWd, L, Stem, L) >> MAX-IO$_{SEG}$

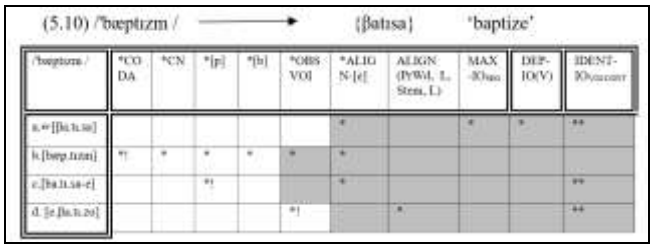

Fig 10

Tableau (5.10) indicates that candidate (b) is the most disharmonic. It violates all the high ranked markedness constraints: *CODA, *CN, *[p], *[b] and *OBSVOI as well *ALIGN-[e]. On the other hand, candidate (a) is the optimal although it violates *ALIGN-[e] since this is a case of derivation and other faithfulness constraint MAX-IO$_{SEG,}$ DEP-IO(V) and IDENT-IO$_{VOI/CONT.}$ Candidate (d) is eliminated because it violates the high ranked markednesss constraint; *OBSVOI. As for candidate (c), it allows the occurrence of a bilabial plosive which is not attested in the Ekegusii language.

3.2 Morphological Processes

Generative morphology accounts for the different processes of forming words. Some of these processes responsible for word formation include: prefixation, suffixation, compounding, conversion, backformation, clipping, blending, acronyms and reduplication. Out of these word processes, only clipping is attested in Ekegusii borrowing. Clipping is the cutting short of a word, either at the beginning or at the end of a word without changing the meaning. It was observed in the following loanwords:

Table 5

English Input	Ekegusii input	Ekegusii output
a. bathroom	ebaturumu	[eβaβu]
b. certificate	esatibigeti	[esatı]

Clipping can be observed from the words listed (a)-(b). From the segments in (a) and (b) it can be inferred that, it is the loss of many segments. When clipping occurs, whether many segments are lost, meaning is not lost. Therefore, it means there is morphological constraint that ensures that meaning is maintained. This can be MAX-IO$_{SEMANTIC.}$ This constraint ensures that the output remains faithful to the input in terms of meaning. So this constraint in addition to other markdeness constraints and faithfulness constraints will be ranked as follows to account for clipping in Ekegusii.

*CODA >> ALIGN [e] >> MAX-IO$_{SEMANTIC}$ >> ALIGN (PrWd, L, Stem, L), >> IDENT-IO$_{CONT}$, DEP-IO(V)

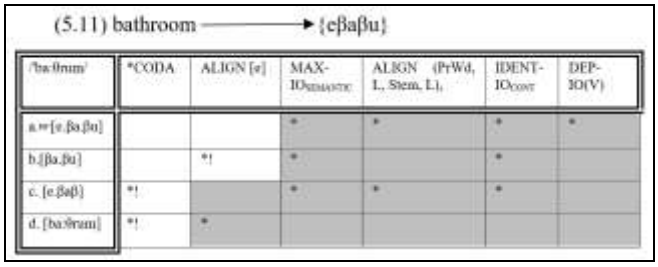

Fig 11

Candidate (a) is the most harmonic since it does not violate the high ranked markedness constraints but violates the low ranked faithfulness constraints. On the other hand, candidate (d) is the most disharmonic. It violates all the high ranked markedness constraints. Candidates (b) and (c) are isoharmonic. They each violate one of the high ranked markedness constraints; ALIGN-[e] and *CODA respectively.

On morphological adaptations, Ekegusii maps the loans to its various classes and the assignment of loans to various classes is constrained by OT's morphological constraints. Similarly, the same morphological constraints determined the inflection of the loans as well as the morphological processes. Conclusively, to a large extent, OT is able to account for the morphological borrowing in Ekegusii.

4. Summary and Conclusions

OT's morphological constraints have been used to explain how Ekegusii maps individual loanwords to its various classes. These constraints include: *CODA, ALIGN [e], ALIGN (PrWd, L, Stem, L) which are markedness constraints. Faithfulness constraints include: DEP-IO(V), MAX-IO$_{SEG}$ IDENT-IO$_{NAS/LAT/CONT}$. In most of the adaptations, the markedness constraints dominated the faithfulness constraints as: *CODA >> ALIGN-[e] >> MAX-IO$_{SEG}$ >> ALIGN (PrWd, L, Stem, L) >> IDENT-IO$_{NAS/LAT/CONT}$, DEP-IO(V).

On inflectional and derivational morphology, we note that to a large extent, loanwords undergo inflectional integration. Whereas English loans inflect for number which is typically suffixed, in Ekegusii the borrowed words are prefixed to express number. Further, the prefix selected is determined by the class the loan is mapped to in Ekegusii. Some of the prefixes expressing number in Ekegusii include: {chi-, eβi-, ama-, eme-}. Also, we observe that class 9 /10 forms the plural by dropping the class morpheme marker 'e' and introducing a prefix {chi-} while 3 /4, take {eme-}, 7 /8 selects {eβi}and 13 {ama-}. OT's constraints, *CODA, ALIGN-[Affix] and ALIGN (PrWd, L, Stem, L) are invoked

as well as the faithfulness constraints MAX-IO_{SEG} and DEP-IO(V) and IDENT-$IO_{LAT/NAS/VOI}$ to account for pluralisation in various classes.

Further on inflection morphology, in Ekegusii borrowing, the loans do not inflect for gender since the language does not have an overt prefix or suffix to mark gender. However, loanwords borrowed into Ekegusii denoting gender are adapted and native speakers infer if they are referring to either male or female. This mapping is accounted for by invoking *CODA, ALIGN-[e] and ALIGN (PrWd, L, Stem, L) as markedness constraints and DEP-IO(V) as the faithfulness constraint.

On derivational morphology, only one instance is realized whereby the noun /'bæptɪzm/ is adapted as a [eβatɪso] 'baptism' is derived to form a /bæp'taɪz/ a verb adapted as [βatɪsa]. Generally, derivation was very minimal compared to inflection. Similarly, OT's markedness and faithfulness constraints were invoked to account for the adaptation and they included *CODA >> *ALIGN-[e] >> MAX-IO_{SEG} >> ALIGN (PrWd, L, Stem, L).

Lastly, morphological processes are explored and only one is reported in the loanwords; clipping. This too is accounted for using OT's markedness and faithfulness constraints. MAX-$IO_{SEMANTIC}$ constraint ensures that the output remains faithful to the input in terms of meaning.

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