Phonosemantic Conditioning in Kirundi Loanword Noun Class Allocation

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Abstract

This paper examines the phonological and semantic factors in the noun class allocation of loanwords in Kirundi, a Bantu language (JD62) spoken primarily in Burundi. I provide a formal account of the criteria used in determining the noun class of loanwords during the lexicalization process. The data indicates a clear two-way interaction between phonological and semantic factors. Within an Optimality Theory framework, I formalize the relevant factors as constraints and describe a ranking capable of predicting the noun class allocation of novel loanwords in Kirundi. The analysis taken here calls for greater unity between the disciplines of semantics and phonology, traditionally taken to be distinct save for certain phenomena, such as prosody.

1 Introduction

This paper examines the noun class allocation of loanwords in Kirundi, a Bantu language spoken primarily in Burundi, providing an account of the semantic and phonological criteria used in determining the noun class of loanwords within the same system. Kirundi employs a noun class system similar to gender, expressed through noun class prefixes. Noun class pairings are pairs of noun classes in which nouns typically alternate between to express number. Generally, Kirundi loanwords appear with class 9/10 prefixes (Niyondagara, 1993; Niyonkuru, 1987; Zorc & Nibagwire, 2007).[1] However, there are several other semantic and phonologically motivated factors in determining noun class. I present several examples indicating that semantic factors

[1]The data used for this paper was taken from a variety of sources. Cox and Cox's 1969 dictionary, Zorc and Nibagwire's 2007 grammar, Niyondagara's 1993 dissertation, and Rwamo and Constantin (2019) all supplied a large portion of the data on loanwords. In addition, I consulted native speakers for their judgement of loanwords

may override phonological criteria in select instances. Restrictions on the semantic content of a noun class block a noun whose phonological form would otherwise condition it to appear with a particular class prefix. I also demonstrate instances where phonological factors place nouns in noun classes that do not represent their semantic qualities. Neither phonological, perceptive, nor semantic factors can solely account for the allocation of noun class in Kirundi loanwords. The data presented indicate a clear interaction between phonological and semantic constraints relating to faithfulness and markedness. A formal ranking is provided, capable of predicting the noun class allocation of novel loanwords in Kirundi.

Section 1 provides a brief background of Kirundi and the Kirundi noun class system. Section 2 overviews data on loanwords in Kirundi and identifies core morphological and phonological factors involved in determining the noun class of Kirundi loanwords. In section 3, I formalize these morphophonological factors in an Optimality Theory (OT) framework by supplying constraints and justifying their ranking. Section 4 presents apparent irregularities in allocating Kirundi loanwords to the noun class system, where semantic aspects of noun classes are seen to affect phonological principles. Section 5 accounts for the semantic effects by providing formal semantic constraints that are ranked crucially with the morphophonological constraints discussed in section 3. I show a clear interaction between semantic, morphological, and phonological constraints and advocate for an analysis where a single merged interface accounts for noun class allocation, the implications of which are discussed in section 6. In section 7, I summarize the findings and provide a conclusion.

1.1 Kirundi

Kirundi is a Narrow Bantu language spoken primarily in Burundi (Eberhard et al., 2022). As a Bantu language, it is a member of the Niger-Congo language family. Kirundi is classified as an East Western Lakes Bantu language and a member of the West Highlands Kivu group (Hammarström et al., 2022). According to the Guthrie code classification, Kirundi is geographically considered a zone J language and is assigned the Guthrie classification code JD62 (Maho, 2009). Kirundi is mutually intelligible with Kinyarwanda (JD61), spoken primarily in neighbouring

discussed in those sources and was suggested additional data points. Extra data points were found for Kirundi loanwords by referring to Kayigema (2018) for Kinyarwanda loanwords and confirming with a native speaker of Kirundi that those loans exist in Kirundi as well and their noun class allocation. I would like to extend a sincere thank you to native speakers of Kirundi who have helped me on this project. This would not have been possible without their generosity.

Rwanda (Zorc & Nibagwire, 2007), and they together form the JD60 dialect continuum (Maho, 2009).

Hammarström et al. (2022) note there are over 10,000,000 Kirundi speakers in Burundi and more than 11,000,000 speakers of Kirundi in all countries. Kirundi is recognized as Burundi's official national statutory language as of 2005 and is taught in primary and secondary schools mandatorily up until grade 4 (Hammarström et al., 2022). Various ethnic groups indigenous to Burundi are associated with the language, the most prominent being the Hutu ethnic group, which comprises an estimated 80-85% of the speaker population, followed by the Tutsi ethnic group, which comprises approximately 15% of the total population, and the Twa ethnic group which comprises 1% of the speaker population.

1.2 Phonological Outline

In this section, I give a very brief outline of the phonemic inventory in Kirundi and some relevant phonological processes that have been described. I outline the basic syllable structure in Kirundi, describe the consonant and vowel inventory and overview tone and length.

	Bilabial	Labiodental	Alveolar	Postalveolar	Palatal	Velar	Glottal
Oral stop	p b		t d			k g	
Nasal	m		n		ɲ	ŋ	
Trill			r				
Fricative		f c	s z	ʃ ʒ			h
Affricate	pf		ʦ	ʧ			
Approximant					j		

Figure 1: Kirundi Consonant Inventory

Kirundi has the basic consonant inventory shown in Figure 1 above (Niyondagara, 1993; Zorc & Nibagwire, 2007). Note that intervocalic /b/ is realized as the voiced bilabial fricative [β]. Kirundi generally disallows codas and consonant clusters, and as such /b/ is most often seen intervocalically and realized as [β] unless word-initial.

I additionaly note a process in many Bantu languages referred to as Dahl's Law. Dahl's Law is a process of voicing dissimilation where voiceless stops become voiced when preceding a voiceless sound following a vowel, stated simply as a rule in (1). Zorc and Nibagwire (2007) note that Dahl's Law is not necessarily pervasive in every Kirundi word, as there are instances where voiceless stop onsets can appear adjacent to each other in a word's stem, but every noun class prefix is sensitive to the sound change. This follows from the fact that most Kirundi noun classes take the minimal form of /CV-/. Thus, every noun class prefix consonant becomes voiced if the first consonant of the noun root is voiceless.

(1) **Dahl's Law**

$[-Voiced, C] \rightarrow [+Voiced] \,/\, \_V\, [-Voiced, C]$

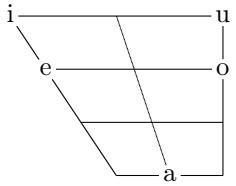


Figure 2: Kirundi Vowel Inventory

Niyondagara (1993) distinguishes between basic and derived consonants in Kirundi. The basic consonants are those shown above, while derived consonants are brought by some phonological sound changes. Derived consonants consist of glides and prenasalized stops. Niyondagara notes that derived consonants arise through multiple consonants being adjacent in the input. Prenasalized consonants are attested in Kirundi and are found where a nasal sound appears immediately before a stop in the input. When two consonants appear adjacent and neither is a nasal consonant, Kirundi either uses epenthesis or deletion to break up clusters. Glides arise when two vowels appear adjacent to each other, so the first vowel becomes part of the preceding onset. Glides and prenasalized consonants are allophonic realizations of nasals or vowels. Consonants can also receive coarticulation features such as labialization, velarization, or palatalization, which arise when consonants appear adjacent to an approximant or vowel with those features.

The Kirundi vowel inventory is shown in Figure 2. Kirundi distinguishes between height and backness in its vowel inventory. Roundness does not appear to be a contrastive feature in Kirundi, as all rounded vowels are back and all unrounded vowels are front. In low vowels, there does not seem to be any contrast in backness, as /a/ is the only phonemic low vowel.

All vowels in Kirundi have both long and short forms, making vowel quantity a contrastive feature. Another suprasegmental feature in Kirundi is tone. Kirundi distinguishes between high and low tones and uses tone both lexically and grammatically. Lexical tone in Kirundi involves otherwise homonymic forms distinguished by the presence or placement of a high tone on one form. Grammatical tone is used for morphological purposes, to inflect or derive some word form. For example, the preterite form of most Kirundi verbs is marked by a high tone on the second mora of the word.

1.3 The Noun Class System

A prominent feature of most prototypical Bantu languages is their noun class system. Formally, Van de Velde (2019) defines the Bantu noun class system as a means of sorting nouns into

groups which trigger the same agreement pattern. Thus, Bantu noun classes are often seen as analogous to grammatical gender. However, they tend to feature more noun classes than most stereotypical gender-marking languages (i.e. Indo-European gender-marking languages). The number of noun classes within a language is often a contention among Bantuists. Maho (2009) notes that, on average, most Bantu languages have about fifteen noun classes. This number excludes locative noun classes, generally glossed as any noun class greater than 15. Some Bantuists debate the legitimacy of locative classes as proper noun classes rather than incorporating or cliticized prepositions (see Carstens, 1997; Creissels, 2011; Marten, 2010; Zeller and Ngoboka, 2018). For this reason and practical purposes, I do not consider locative noun classes in my analysis.

In Kirundi and most Narrow Bantu languages, noun classes are realized overtly on nouns with the addition of a noun class prefix. These appear on most nouns, although some proper and human-denoting nouns may appear without the prefix. The Kirundi noun class prefixes are shown in Figure 3, where single noun classes appear on the left and plural/ non-individuated prefixes appear on the right[2]. Locative and infinitive noun class prefixes are omitted. I display the augment in brackets to capture that it is optional but frequently appears, discussed below in section 1.4. Nouns are generally considered to be inherently associated with a particular noun class but may sometimes shift for derivational purposes (Givón, 1972, as cited in Aunio, 2006). I later discuss this further in section 4.3.

[2]Note that I use ɴ to refer to a homorganic nasal unspecified for place of articulation. This is either realized as prenasalization or a nasal stop whose place is determined by the following vowel.

Class	Prefix	Class	Prefix
1	(u)mu-	2	(a)βa-
3	(u)mu-	4	(i)mi-
5	(i)Ø- (i)ri-	6	(a)ma-
7	(i)ki- (i)gi-	8	(i)βi-
9	(i)ɴ- (i)Ø-	10	(i)ɴ- (i)Ø-
11	(u)ru-		
12	(a)ka- (a)ga-	13	(u)tu- (u)du-
14	(u)βu-		

Figure 3: Kirundi Noun Class Prefixes

Kirundi and most Bantu languages express number opposition through noun class shift. Odd-numbered noun class prefixes are often used to refer to singular entities, taking the corresponding even-numbered noun class prefix to express plurality (Ndayiragije et al., 2012; Van de Velde, 2019; Zorc and Nibagwire, 2007; among others)[3]. The set of nouns that a given noun will alternate between to express number alternations is called a noun class pairing. In (2), we see an alternation between singular and plural interpretations of the noun with class 1 and class 2 prefixes. In the proceeding sections, I refer to individual noun classes simply as 'class 1', for example, and the corresponding noun class pairing as 'class 1/2'.

[3]For an alternative analysis, see Mufwene (1980).

(2) a. u-mu-gaβo
A-CL1-man
'man'

b. a-βa-gaβo
A-CL2-man
'men'

1.4 The Augment

The last relevant piece of background for Bantu noun class systems I would like to address is the augment. The exact nature of the augment in Bantu languages is contentious and Van de Velde (2019) claims the role and function of the augment must be evaluated on the basis of individual languages, rather than Bantu languages generally. All that must be said of the augment for this paper is that its form is of an initial vowel appearing before the noun class prefix on nouns. The augment's realization in Kirundi is determined by the following noun class prefix, copying the vowel quality of the vowel in the noun class prefix. The sole exception is in the class 9/10 prefixes, which appear either as prenasalization or as a null element. In this case, the form of the augment is [i].

2 Phonological Conditioning in Noun Class Allocation

Most Kirundi loanwords are lexicalized in class 9/10, as seen in the examples in (3) below. Note that I present all examples with the augment to make clear which noun class a particular noun is a part of, and for the simple fact that most referring nouns do appear with the augment. However, I assume that the augment is morphologically added following noun class prefixes.

		Kirundi	Gloss	Source
(3)	a.	(i)Ø$_9$-maʃiːne	‘machine’	French, /maʃin/
	b.	(i)Ø$_9$-sukari	‘sugar’	French, /sykr/
	c.	(i)Ø$_9$-farine	‘flour’	French, /farin/
	d.	(i)Ø$_9$-fero	‘iron’	French, /fɛr/
	e.	(i)Ø$_9$-kuruʤeti	‘zucchini’	French, /kurʒɛt/
	f.	(i)Ø$_9$-ko^{n}ʤe	vacation	French, /kõʒe/

An analysis of Kirundi loanword allocation would be quite simple if loanword nouns always appear in class 9/10. There are exceptions to this pattern, however. The first situation we will examine is loanwords with initial segments resembling an existing noun class prefix in Kirundi. In such cases, the initial segment sequence in the loanword is “reanalyzed” as a noun class prefix, allocating the loanword to the corresponding noun class (Niyondagara, 1993; Niyonkuru, 1987). (4) shows examples of this, where the initial segments are repurposed as noun class affixes.

		Kirundi	Gloss	Source
(4)	a.	(u)mu$_3$-sigiti	‘mosque’	Arabic, /masʤid/
	b.	(a)ma$_6$-joneze	‘mayonnaise’	French, /mɛjonɛs/
	c.	(i)ki$_7$-ro	‘kilogram’	French, /kilo/
	d.	(u)βu$_{14}$-re^{n}geti	‘blanket’	English, /blɛmkɪt/
	e.	(i)ki$_7$-nini	‘pill’	French, /kinin/

Kirundi also disallows consonant clusters and has several strategies for resolving them in loanwords. The primary strategy I consider is epenthesis as it relates to the allocation of noun classes. Different criteria may determine the form of the epenthesized vowel. In some cases, the epenthesized vowel is a copy of an adjacent vowel or is derived from place features of the preceding consonant. However, we see instances of the epenthesized vowel differing from the more predictable strategy if another vowel could form a recognizable noun class prefix. I provide a deeper analysis of epenthetic vowel forms in section 3.3.

In the proceeding section, I argue that a simple ranking of alignment constraints and constraints on the realization of morphemes can account for this described behaviour.

3 A Formal Account of Phonological Factors

3.1 Spellout and Boundaries

An observed commonality between the words in (3) and those in (4) has to do with word boundaries. The word-initial segments in all examples from the source language's input maintain their position as being leftward aligned to word boundaries in the loanword, only preceded by the augment. Compare the forms in (3) and (4) with the ill-formed candidates in (5).

		Kirundi	**Gloss**	**Source**
(5)	a.	*(u)mu$_3$-maʃiːne	'machine'	French, /maʃin/
	b.	*(u)mu$_3$-sukari	'sugar'	French, /sykr/
	c.	*(i)ki$_7$-farine	'flour'	French, /farin/
	d.	*(i)ki$_7$-fero	'iron'	French, /fɛr/
	e.	*(i)ki$_7$-kuruʤeti	'zucchini'	French, /kurʒɛt/
	f.	*(u)mu$_3$-ko^{n}ʤe	vacation	French, /kõʒe/

In all the ill-formed candidates shown in (5), extra phonological material appears between the source word's input and the word edge in the form of an overt noun class prefix, altering word boundaries. I posit the ill-formedness of these candidates is explained as the violation of an alignment constraint which maintains word boundaries. This constraint is formalized as:

(6) **Faith-Align-SB**
Maintain word boundaries from the source language in the base language (i.e. the receiving language)

This simple constraint offers an efficient means of predicting into which class most loanwords fall. Class 9/10 is the most common noun class for loanwords, as its prefix is phonologically null in most cases. Class 9/10's null prefixes offer a means to avoid violation of Faith-Align-SB while ensuring the noun still receives proper nominal morphology. Faith-Align-SB can

explain the relative prominence of loanword allocation to class 9/10 when no existing segments are available for repurposing.

This constraint alone cannot account for the forms seen in (4). It would certainly be notably easier to assign all loanwords to a single noun class, and the analysis I have advocated thus far does not offer any explanation why two distinct strategies may be used. Thus, it must be explained why existing segments are reinterpreted as class prefixes when applicable rather than simply assigning every loanword to class 9/10. Our analysis should account for the fact that the potential candidates in (7) are ill-formed compared to those in (4) for not effectively utilizing the existing phonological material given by the source language as a prefix.

		Kirundi	**Gloss**	**Source**
(7)	a.	*(i)Ø$_9$-musigiti	'mosque'	Arabic, /masʤid/
	b.	*(i)Ø$_9$-majoneze	'mayonnaise'	French, /mɛjonɛs/
	c.	*(i)Ø$_9$-kiro	'kilogram'	French, /kilo/
	d.	*(i)Ø$_9$-βure^{n}geti	'blanket'	English, /blɐmkɪt/
	e.	*(i)Ø$_9$-kinini	'pill'	French, /kinin/

To resolve this issue, I follow Aissen's (1999) proposal for a constraint *Ø, which penalizes null morphology. This constraint essentially states that morphological categories must be overtly realized at spell-out.

(8) ***Ø**
No null morphology

I account for Kirundi's preference to utilize existing phonological material for class prefixes rather than inserting a null morpheme with the constraint *Ø. Faith-Align-SB must be ranked above *Ø to explain why violations of *Ø are licensed if doing so avoids a violation of Faith-Align-SB, as demonstrated in (9) and (10). If *Ø were higher, we would expect every loanword to have an overt class prefix, violating Faith-Align-SB.

(9)	/kilo/	FAITH-ALIGN-SB	∗Ø
a. ☞	(i)ki$_7$-ro		
b.	(i)Ø$_9$-kiro		∗!
c.	(u)mu$_3$-kiro	∗!	
b.	(i)ki$_7$-kiro	∗!	

(10)	/bætəɹi/	FAITH-ALIGN-SB	∗Ø
a. ☞	(i)Ø$_9$-βtiri		∗
b.	(i)ki$_7$-βtiri	∗!	
c.	(u)mu$_3$-βtiri	∗!	

3.2 Consonant and Vowel Alternation

Compare the attested forms in (11) and (13) with the ill-formed candidates in (12) and (14).

		Kirundi	**Gloss**	**Source**
(11)	a.	(i)Ø$_9$-farine	'flour'	French, /farin/
	b.	(i)Ø$_9$-pine	'tire'	French, /pnø/
	c.	(i)Ø$_9$-faːta	'Fanta'	English, /fænta/

(12)	a.	*(a)ma$_6$-rine	‘flour’	French, /farin/
	b.	*(i)βi$_8$-ne	‘tire’	French, /pnø/
	c.	*(a)ma$_6$-ːta	‘Fanta’	English, /fænta/

(13)	a.	(u)mu$_3$-dari	‘medal’	French, /mədajə/
	b.	(u)mu$_3$-sigiti	‘mosque’	Arabic, /masʤid/
	c.	(u)mu$_3$-doka	‘car’	English, /modəɹcɑɹ/
	e.	(i)Ø$_9$-kuruʤeti	‘zucchini’	French, /kurʒɛt/
	f.	(i)Ø$_9$-ko^{n}ʤe	vacation	French, /kõʒe/

(14)	a.	*(i)ki$_7$-ruʤeti	‘zucchini’	French, /kurʒɛt/
	f.	*(i)ki$_7$-^{n}ʤe	vacation	French, /kõʒe/

To avoid the potential problematic candidates in (12) and derive the optimal ones in (11), it is crucial to determine the ranking of faithfulness constraints relative to the aforementioned Faith-Align-SB and *Ø. Kirundi loanwords could conceivably alter some segments in the input for it to resemble a class prefix. Indeed, forms such as those in (13a-c) indicate this happens with certain vowels. The same process does not happen to all vowels and does not happen for any consonants, however. There is no evidence that rounding is a contrastive feature in Kirundi vowels, as all vowels that differ in roundness also differ in height or backness, so it is nonessential for our analysis. I propose the constraints IdentV(Bk)-SB, IdentV(Hi)-SB, and IdentC-SB, for back and high vowels and consonants, respectively.

(15) **IdentV(Bk)-SB**

Do not change the backness of any vowels from the source language in the base language

(16) **IdentV(Hi)-SB**

Do not change the height of any vowels from the source language in the base language

(17) **IdentC-SB**

Do not change any consonants from the source language in the base language

As the consonant never changes to match a class prefix, IdentC-SB must outrank both Faith-Align-SB and *Ø. Given that vowel quality can change to match some existing class prefix, some vowel faithfulness constraint should be ranked lower than Faith-Align-SB and *Ø. In (13), we see only vowel height change and not backness, suggesting *Ø outranks IdentV(Bk)-SB. This is demonstrated in the tableaux below.

(18)	/farin/ 'flour'	IdentC	Faith-Align	*Ø	IdentV(Bk)
a. ☞	(i)Ø$_9$-kiro			*	
b.	(a)ma$_6$-rine	*!			
c.	(a)βa$_2$-rine	*!			

However, we do find some forms with variation. For example, (19a) and (19b) show it is possible to change the vowel to fit some existing class prefix, but also acceptable to keep a faithful vowel while adding a covert class prefix. To account for this variation, we can stipulate that there is no critical ranking between *Ø and IdentV(Hi). The tableaux in (21) shows that both possible forms are considered optimal candidates.

		Kirundi	**Gloss**	**Source**
(19)	a.	(i)Ø$_9$-modoka	'car'	English, /motəˠkɑɹ/
	b.	(u)mu$_3$-doka	'car'	English, /motəˠkɑɹ/

(21)	/motəˠkɑɹ/	IdentC-SB	FaithAlign-SV	*Ø	IdentV(Hi)-SB
a. ☞	(u)mu$_3$-doka				*
b. ☞	(i)Ø$_9$-modoka			*	
c.	(i)ki$_7$-modoka		*!		
d.	(u)β$_1$4-modoka	*!			

We can account for the observed asymmetry between back and front vowels by distinguishing IdentV(Bk)-SB and IdentV(Hi)-SB. We see in (13a-c) that back vowels can change in

height to resemble a class prefix. Examples (13d-e) and (14a-b) show that back vowels cannot be fronted to achieve the same result. Thus, IDENTV(BK)-SB outranks at least *Ø, as demonstrated in the tableaux below.

(21) /kurʒɛt/ 'zucchini'	IDENTC-SB	FAITHALIGN-SB	IDENTV(BK)-SVB	*Ø	IDENTV(HI)-SB
a. ☞ (i)Ø$_9$-kuruʤeti				*	
b. (i)ki$_7$-ruʤeti			*!		

3.3 Epenthetic Vowels

Kirundi loanwords often use vowel epenthesis to break up complex syllable sequences (Niyondagara, 1993). Niyondagara (1993) claims that the Kirundi syllable structure can best be characterized as (C)V(V), the second V being an additional mora in long vowels. Kirundi also allows glides to appear following consonants in onsets. (22) shows examples of vowel epenthesis breaking up syllable clusters.

		Kirundi	**Gloss**	**Source**
(22)	a.	(i)Ø$_9$-petero:ri	'gasoline'	French, /pɛtrɔl/
	b.	(i)Ø$_9$-po:sita	'post office'	French, /pɔstə/

The epenthetic vowel in Kirundi can appear in several potential forms. The two most common strategies involve copying an adjacent vowel or using the epenthetic vowel [i]. Firstly, the epenthesized vowel can copy another adjacent vowel in the input. This strategy is shown in (22a), where the epenthesized vowel [e] is a copy of the previous syllable's nucleus. Kirundi loanwords show that the copied vowel can be on the left or right side of the epenthetic vowel. The other strategy, shown in (22b), uses an epenthetic vowel [i]. Niyondagara (1993) notes that the most common epenthetic vowel in Kirundi is [i] and is the form seen when the consonant that would form the potential onset of a newly created syllable is /s/. We also see some instances in Kirundi where the epenthetic vowel is variable, giving two possible forms derived from the same source word. This is seen in (23a) and (23b), both acceptable and attested forms. Thus, we must account for (23a) and (23b) being variable. I deal with this variability in section 5.

		Kirundi	Gloss	Source
(23)	a.	(u)βu$_{14}$-re^{n}geti	'blanket'	English, /blɛmkɪt/
	b.	(i)βi$_{8}$-re^{n}geti	'blanket'	English, /blɛmkɪt/

As my primary focus is not consonant cluster resolution, I refer to Rose and Demuth's (2006) constraints and ranking to account for epenthesis in Kirundi loanwords. Rose and Demuth focus on Sesotho consonant cluster resolution, but I will briefly show that their analysis can be successfully applied to Kirundi with minor modifications. The relevant constraints and ranking they suggest for Sesotho is:

(24) **OK(σ) » CrispEdge(CV, σ) » Dep(VPl) » AgrL(VPl) » AgrL(CPl) » AgrR(VPl)**

Dep(VPl) simply states that no new vowel place features may be added. In other words, if a vowel is added to the source word's input, it should avoid adding new features by using the same features of some adjacent segment. AgrL(VPl) and AgrR(VPl) are constraints which indicate which side's vowel the epenthetic position is a copy of. AgrL(CPl) states that segments should agree with consonants to the left. CrispEdge(CV, σ) (shown in tableaux as CE((CV, σ)) prevents consonant-vowel agreement across syllable boundaries. Thus vowels only agree with the features of consonants in their syllable's onset. These constraints are given in (25-30) and the success of this ranking is shown in the tableaux in (31).

(25) **Dep(VPl)** (Rose & Demuth, 2006)
Every output VPlace specification has an input correspondent

(26) **AgrL(VPl)**
The place feature of the epenthetic vowel must agree with the place feature of the vowel immediately to its left.

(27) **AgrL(VPl)**
The place feature of the epenthetic vowel must agree with the place feature of the vowel immediately to its left.

(28) **AgrL(CPl)**

The place feature of the epenthetic vowel must agree with the place feature of the consonant immediately to its left.

(29) **CrispEdge(CV, σ)**

Consonant–vowel feature sharing cannot occur across syllables.

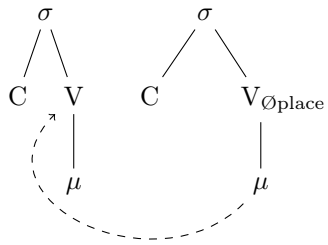
(30) **OK(σ)**

Portemanteau constraint ensuring syllable well-formedness in output (adapted) forms

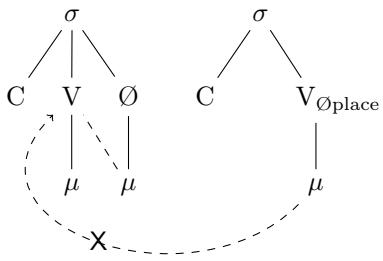
(31)	/pɛtrɔl/	OK(σ)	CE(CV, σ)	Dep(VPl)	AgrL(VPl)	AgrL(CPl)	AgrR(VPl)
a. ☞	(i)Ø$_9$-petero:ri						*
b.	(i)Ø$_9$-petro:ri	*!					
c.	(i)Ø$_9$-petoro:ri				*!	*	
d.	(i)Ø$_9$-petiro:ri				*!		*
e.	(i)Ø$_9$-petaro:ri			*!	*	*	*
e.	(i)Ø$_9$-peturo:ri			*!	*	*	*

Rose and Demuth (2006) do not discuss the role of vowel length in epenthetic forms. From the data, Kirundi epenthetic vowels do not seem to agree with long vowels to their left. To understand this, I propose the syllable structure and agreement relations shown in (32). In this structure, long vowels consist of two morae, the latter floating without being inherently associated to a vowel but becoming linked to the preceding segment (Zec, 1995).

(32) a.



b.



(32a) shows an acceptable agreement relationship between two vowels. (32b) shows an ill-formed agree relationship between two vowels. By understanding long vowels as a vowel associated with two morae, we add the boundary of an additional mora that is not inherently associated with a vowel between the epenthetic site and the preceding vowel. This unspecified mora blocks the epenthetic vowel from probing backwards for a vowel to copy its place features from. Agreement between the epenthetic vowel and the left adjacent vowel is no longer possible, and a new agreement target is sought. This evaluation is shown in (33). Note that no candidates trigger a violation of AGRL(VPL) as the input does not see any vowel immediately left of the epenthetic site[4].

(33)	/pɔstə/ 'post office'	OK(σ)	CE(CV, σ)	DEP(VPL)	AGRL(VPL)	AGRL(CPL)	AGRR(VPL)
a. ☞	(i)Ø$_9$-poːsita						∗
b.	(i)Ø$_9$-poːsta	∗!					
c.	(i)Ø$_9$-poːsata					∗!	
d.	(i)Ø$_9$-poːsota					∗!	∗

	Kirundi	**Gloss**	**Source**
(34) a.	(u)mu$_1$-perezida	'president'	French, /prezidə/

Lastly, I propose an additional constraint to account for forms such as (34). We see that the class prefix (u)mu- is not a potential goal for vowel agreement, avoiding the form [(u)mupurezida]. I propose the constraint *AGRMORPHBD(PL). This allows us to rule out the epenthetic vowel agreeing with the vowel seen in noun class prefixes, shown in the tableaux in (36). We must rank

[4]I leave the augment in tableaux to make the noun class more explicit, but it can be omitted and should not be seen as a potential goal for agreement.

this constraint above AGRL(VPL), but its relative ranking to lower constraints is not crucial from the data observed.

(35) ***AGRMORPHBD(PL)**

Do not agree with the place of segments across morpheme boundaries.

(36) /prezidə/ 'president'	OK(σ)	CE(CV, σ)	*AGRMOBD(PL)	DEP(VPL)	AGRL(VPL)	AGRL(CPL)	AGRR(VPL)
a. ☞ (u)mu$_9$-perezida					*	*	
b. (u)mu$_9$-prezida	*!						
c. (u)mu$_9$-purezida		*!					

4 Semantic Factors in Noun Class Allocation

In addition to the phonological factors discussed above, Kirundi noun class allocation of loanwords is conditioned by various semantic factors of the loanword. Although Bantu noun classes are rarely entirely semantically coherent, we see strong restrictions and general tendencies affecting a noun's class allocation. Thus, we cannot account for the distribution of noun class prefixes to loanwords with phonological criteria alone. In fact, we should consider how the semantics of the noun class system interact with the relevant phonological constraints. In this section, I outline notable patterns in the semantic effects of noun class allocation in Kirundi loanwords. In section 5, I propose an analysis capable of reconciling the conflict between semantics and phonology, demonstrating a capability for one interface to account for both.

4.1 Animacy

I first view the effect of animacy on Kirundi noun class allocation for a simple reason: [±human] is the only semantic feature that seems to correlate perfectly with a particular noun class. Zorc and Nibagwire (2007; among others) have noted that nouns of class 1/2 always denote human entities with no exceptions. Not all human nouns belong in class 1/2, as there are some human nouns in other classes, but every noun in this class is a human.

We see a general tendency in Kirundi loanwords to be allocated to class 1/2 if the noun denotes a human. Often, this involves overtly adding the class 1 prefix to an existing input to mark that noun as belonging to that noun class, as seen in (37). In (37a), the overt class 1 prefix, /umu-/ is added to the source word, incurring a violation of FAITH-ALIGN-SB. There

are also instances where existing segment sequences are reinterpreted as noun class prefixes, as we have seen before with other loanwords. For example, in (37d), the loanword /mʊs.ləm/ is incorporated to the language as /mu$_1$-silamu/, using the existing source word material to form the class 1 prefix.

		Kirundi	**Gloss**	**Source**
(37)	a.	(u)mu$_1$-perezida	'president'	French, /prezidə/
	b.	(u)mu$_1$-furatiri	'brother'	Latin, /frater/
	c.	(u)mu$_1$-kirisito	'christian'	Christian
	d.	(u)mu$_1$-silamu	'muslim'	Arabic, /mʊs.ləm/
	e.	(u)mu$_1$-seːneri	'mister'	French, /məsjø/

Because class 1/2 is reserved solely for human nouns, we see instances where loanwords with initial segment sequences that resemble a class 1/2 prefix are put into other classes. An example of this is shown in (38a), where the homophonous class 3 prefix is used instead of the class 1 prefix. In (38b), the class 2 prefix is avoided despite having phonological material in the source language matching that prefix's form.

		Kirundi	**Gloss**	**Source**
(38)	a.	(u)mu$_3$-sigiti	'mosque'	Arabic, /mas.ʤid/
	b.	(i)Ø$_{10}$-βata	'duck'	Swahili, /bata/

We can establish that those nouns in (37) are given class 1 prefixes rather than the homophonous class 3 prefixes on the basis of noun class agreement with other elements in the sentence and their non-singular noun class alternation. The sentences below show both indicators.

(39) a. U-mu-seːneri a-fis-e a-βa-ána be-nshi
A-CL1-mister 1SM-have-PFV A-CL2-child CL2-many
'The man has many children.'

b. A-βa-seːneri ba-fis-e a-βa-ána be-nshi
A-CL2-mister 2SM-have-PFV A-CL2-child CL2-many
'The men have many children.'

(40) a. U-mu-sigiti mu-fis-e a-βa-ntu be-nshi
A-CL3-mosque 3SM-have-PFV A-CL2-person CL2-many
'The mosque has many people.'

b. I-mi-sigiti i-fis-e a-βa-ntu be-nshi
A-CL4-mosque 4SM-have-PFV A-CL2-person CL2-many
'The mosques have many people.'

In (39a), *umuse:neri* is the subject, triggering subject agreement on the verb in the form of the class 1 subject agreement prefix *a-*. In (39b), the same noun is made plural and given a class 2 prefix, triggering class 2 subject agreement on the verb. In (40a), *umusigiti* triggers class 3 subject agreement on the verb and alternates with the class 4 prefix when made plural in (40b).

4.2 Cumulativity

Another mostly semantically coherent aspect of noun class assignment is the property of cumulativity. Oliver and Kinchsular (2022) note that even-numbered noun classes in Kirundi all denote entities with cumulative reference[5]. Thus, only pluralities or non-atomic entities (i.e. mass nouns) are found in these classes. Class 6 is often where substance-denoting nouns are found and is understood as a 'polyplural' class in Bantu languages (Maho, 2009; Oliver & Kinchsular, 2022; Zorc & Nibagwire, 2007). Cumulative reference is a property shared by individuated plural nouns and non-individuated/mass nouns.

We see instances where nouns with cumulative reference can have initial segment sequences reanalyzed as noun class prefixes, as seen in (41). Typically, this is the case with nouns resembling class 6 nouns, but other noun classes also show cumulative reference. There are also instances where loanwords having sounds resemblant to a non-individuated noun class prefix may not be interpreted as those class prefixes if they lack cumulative reference. Instead, these nouns can either take an overt prefix or, more commonly, take the covert class 9 prefix. This is seen in (42). Unlike human-denoting nouns allocated to class 1, we do not see instances of nouns with cumulative reference being automatically allocated to class 6.

[5]Noun classes above 10 are exceptions to this rule. However, this is simply a consequence of them being derivational classes and thus should not be understood as regular in regard to the individuated/non-individuated contrast.

		Kirundi	Gloss	Source
(41)	a.	(a)ma$_6$-joneze	'mayonnaise'	French, /mɛjonɛs/
	b.	(i)Ø$_{10}$-βata	'duck'	Swahili, /bata/
(42)	a.	(i)Ø$_9$-mandata	'mandata'	French, /mɑ̃da/
	b.	(i)Ø$_9$-maʃiːne	'machine'	French, /maʃin/

4.3 Abstract and Diminutive Nouns

Less semantically coherent but still salient semantic categories are those of abstract nouns and diminutives. Zorc and Nibagwire (2007) observe that class 14 is largely comprised of abstract nouns, while classes 12 and 13 are primarily nouns with diminutive meanings. Kimenyi (1980) notes the same for Kinyarwanda. An example of a diminutive interpretation of a class 12 noun is given below in (43).

(43) a. i-gi-tabo
A-CL7-book
'book'

b. a-ga-tabo
A-CL12-book
'pamphlet'

5 Phonosemantic Interface

In this section, I propose an analysis to account for the interaction we see between semantic principles of Kirundi noun classes and phonological factors. I use an optimality theoretic approach, with crucially ranked phonological and semantic constraints. I will propose constraints to explain the general tendencies of noun classes to house nouns with some semantic cohesion. As noted before, Kirundi's noun classes are not usually fully semantically cohesive. However, an optimality theoretic ranking system is very well-equipped to handle the lack of complete semantic cohesion, as different semantic constraints may vary in their ranking, allowing for violations to prevent a violation of some higher-ranked constraint. In sections 5.1-5.3, I propose constraints

and crucial rankings that can account for the semantic factors described above. In 6, I consider an alternative analysis where a division between the semantic and phonological interfaces is upheld. I make an argument for why this analysis is unsuitable for the data shown in Kirundi.

5.1 Human Constraints

I first propose a constraint to derive the human semantics of class 1/2 as it is the most clearly semantically cohesive. Any constraint proposed must capture that human nouns are strongly preferred in class 1/2 and that only human nouns can comprise class 1/2. Thus, I use the following constraint;

(44) **HUMAN↔1/2**
All and only human nouns in class 1/2.

The value of a constraint-based approach to noun class semantics can be seen in viewing the necessary ranking between semantic and phonological constraints. As noted in 4.1, there are instances where human-denoting nouns beginning with segments resembling class 1/2 prefixes may have those segments reinterpreted as class 1/2 prefixes. This is no problem for our previous analysis. However, I have also noted cases where human-denoting nouns without any segments that resemble class 1/2 prefixes can have an overt prefix assigned. This happens with nouns taking prefixes resemblant of class 1 and 2 prefixes. This is seen in (37) with [umuperezida]. It becomes clear from this evidence that our semantic constraint must interact with the previous constraints proposed. To ensure class 1/2 membership is prioritized for human nouns over phonological conditioning, we need only rank HUMAN↔1/2 higher than *ø and FAITH-ALIGN-SB. In [umuperezida], for example, a violation of FAITH-ALIGN-SB is incurred to avoid triggering a potential violation of HUMAN↔1/2 that would arise without assigning the noun to class 1/2. If FAITH-ALIGN-SB were ranked higher, we would expect the noun to be allocated to class 9/10 with a covert noun class marker.

(45)	/prezidə/ 'president'	HUM↔1/2	IDENTC-SB	*Ø	FAITHALIGN-SB	IDENTV-SB
a. ☞	(u)mu_1-perezida				*	
b.	(i)$Ø_9$-perezida	*!		*		

5.2 Cumulative Constraints

Next, we can account for the tendency for even-numbered noun classes to only house nouns with cumulative reference. This is the case for at least noun classes 1-10, where all even-numbered class prefixes denote plurals or mass nouns. It is not the case that even-numbered higher-class prefixes always have nouns with cumulative reference, but this is simply an effect of the standard conventions for counting noun classes and the fact that the higher classes are mostly derivational in nature.

To contain the discussion, I only consider class 6 loanwords. As mentioned earlier, class 6 houses many substance-denoting nouns and serves as the irregular plural for many. I introduce the following constraint to account for this property of class 6;

(46) **CUMULATIVE↔6**

All and only nouns with cumulative reference are allocated to class 6

Despite what our constraint phrasing may suggest, not all substance-denoting loanwords are in class 6, as seen in (47), where the substance-denoting noun [isukari] ('sugar') is realized with a class 10 prefix. A possible alternative would have this noun be realized as [*amasukari]. That [isukari] is the preferred form suggests that the constraint penalizing candidates with unfaithful word boundaries outranks our semantic constraint for class 6. This is demonstrated in the tableaux below.

(47)	/sykr/ 'sugar'	IDENTC-SB	FAITHALIGN-SB	CUMULATIVE↔6	*Ø	IDENTV-SB
a. ☞	(i)$Ø_9$-sukari			*	*	
b.	(a)ma_6-sukari		*!			

Cumulative-reference nouns with initial segments resemblant to the class 6 prefix can be allocated to that class with their initial segments repurposed as a class prefix. However, nouns without cumulative reference that bear initial segments resembling the class 6 prefix cannot, as seen in (42a-b). This suggests that CUMULATIVE↔6 must be ranked higher than *Ø, as violations of *Ø can occur to avoid violations of CUMULATIVE↔6. The difference in treatment is shown in (48) and (49).

(48)	/mɛjonɛsə/ ‘mayonnaise’	IdentC-SB	FaithAlign-SB	Cumulative↔6	*Ø	IdentV-SB
a. ☞	(a)ma_6-joneze					*
b.	(i)$Ø_9$-mejoneze			*!	*	

(49)	/maʃinə/ ‘machine’	IdentC-SB	FaithAlign-SB	Cumulative↔6	*Ø	IdentV-SB
a. ☞	(i)$Ø_9$-maʃine				*	
b.	(a)ma_6-ʃine			*!		

5.3 Abstract and Diminutive Constraints

To further support my claims of unity between the semantic and phonology interface, I consider some of the derivational noun classes in Kirundi. Classes 12/13 and 14 behave differently from other Kirundi noun classes. Class 12/13 is the diminutive noun class. As demonstrated previously in (43), diminutive interpretations are given to nouns by replacing their inherent class prefix with a class 12 prefix if singular or a class 13 prefix if plural/cumulative. Class 14 is mostly reserved for abstract nouns. Thus, the nominalization of abstract qualities can be expressed by replacing the inherent class prefix of other nouns with the class 14 prefix or assigning verbal roots to class 14.

The number of nouns that belong to either class inherently is highly limited compared to other noun classes, and are often lexicalized nouns that can be traced back to some derived form (Zorc & Nibagwire, 2007). I bring these noun classes into the discussion because their use as derivational noun classes with clearly associated meanings makes them clearly semantically cohesive. Following similar treatment for previous noun classes considered, I introduce the following two constraints to account for these classes' semantic cohesion:

(50) **Diminutive↔12/13**
All and only diminutive nouns in class 12/13

(51) **Abstract↔14**
All and only abstract nouns in class 14

As has been the case before, we have examples of loanwords that begin with sequences of

segments resembling class 12/13 or class 14 prefixes that are not semantically cohesiveness with other nouns in those classes. With [imaʃiːne], the semantic constraint takes precedence over the phonological constraint to ensure that the noun is not inappropriately allocated to class 6. We see the opposite with class 12/13 and 14 loanwords, where semantic constraints are clearly violated to prioritize phonological constraints. For example, in (52) [akaβati] ('cabinet') is allocated to class 12, despite not having any diminutive sense, and [uβu$_{14}$re^{n}geti] ('blanket') is allocated to class 14, despite being a concrete noun. From this, we can determine that the semantic constraints for class 12/13 and class 14 must be ranked lower than phonological constraints determining noun class. This is shown in (53) and (54).

		Kirundi	**Gloss**	**Source**
(52)	a.	(a)ka$_{12}$-βati	'cabinet'	English, /kæbnɪt/
	b.	(a)ka$_{12}$-βare	'cabaret'	English, /kæbəreɪ/
	c.	(u)βu$_{14}$-re^{n}geti	'blanket'	English, /blemkɪt/

(53) /blemkɪt/ 'blanket'	OK(σ)	FaithAlign-SB	*Ø	AgrL(CPL)	Abst↔14	Dim↔12/13
a. ☞ (u)βu$_{14}$-βure^{n}geti				*		
b. (i)Ø$_{9}$-βure^{n}geti			*!			
c. (i)ki$_{7}$-re^{n}geti		*!				

(54) /kæbnɪt/ 'cabinet'	OK(σ)	FaithAlign-SB	*Ø	Abst↔14	Dim↔12/13
a. ☞ (a)ka$_{14}$-βati					*
b. (i)Ø$_{9}$-kaβati			*!		

Thus, we clearly see that semantic and phonological constraints relevant to noun class allocation can vary in ranking. This further supports the proposal that the semantic and phonology interface work as one in noun class allocation. We arrive at the following ranking hierarchy in (55).

(55) **Human↔1/2, IdentC-SB » FaithAlign-SB » Cumulative↔6 » *Ø » Abstract↔14, Diminutive↔12/13**

In considering the abstract class 14, we can also gain insight into how our semantic and phonological noun class constraints rank relative to the constraints determining vowel epenthesis. As noted in section 3, [uβu$_{14}$re^{n}geti] and [iβi$_{8}$re^{n}geti] are both accepted forms in Kirundi, and variability between these forms should be properly accounted for. Knowing that a vowel must be epenthesized to resolve the consonant cluster in 'blanket', the relevant phonological constraint for determining the form of that vowel is AGRL(CPL), which penalizes candidates where vowels do not agree with the place of the consonant to the left. In [uβu$_{14}$re^{n}geti], the epenthetic vowel is rounded to agree with the consonant, but [iβi$_{8}$re^{n}geti] triggers a violation of AGRL(CPL) for its lack of rounding. Considering semantic constraints, we know that [uβu$_{14}$re^{n}geti] triggers a violation of ABSTRACT↔14, as the noun is not abstract in nature, while [iβi$_{8}$re^{n}geti] avoids a violation of the constraint by allocating the noun to a different class.

To account for variation between these candidates, we can assert there is no critical ranking between AGRL(CPL) and ABSTRACT↔14, allowing both candidates to be considered equally optimal. This is demonstrated in (56).

(56)	/blemkɪt/	OK(σ)	HUM↔1/2	FAITHALIGN-SB	*Ø	AGRL(VPL)	ABST↔14	AGRL(CPL)
a. ☞	(u)βu$_{14}$-βure^{n}geti						*	
b.	(i)β$_{8}$-re^{n}geti							*
c.	(i)Ø$_{9}$-βure^{n}geti				*!			
d.	(i)Ø$_{9}$-βre^{n}geti	*!						
e.	(u)βu$_{2}$-re^{n}geti		*!					
f.	(i)βi$_{8}$-βure^{n}geti			*!				

6 Interface Implications

In the preceding sections, I have argued that semantics and phonology can be construed as using one and the same interface. Using an Optimality Theory framework, I have demonstrated that semantic and phonological factors and constraints can be intertwined and ranked in relation to each other in the same way that simple phonological constraints can. In this section, I consider an alternative analysis that may be offered as an explanation for the data presented. Such an analysis may posit that the phonology and semantic interface do not interact directly, but one 'feeds' the other, giving it input for evaluation. I evaluate the shortcomings of this approach

and attempt to show that viewing the semantic and phonology interface as one is much more favourable. I return to [imaʃiːne] to make note of an important behaviour that lends support to this hypothesis.

If we consider the analysis where phonology feeds the semantic interface, we could explain much of the data observed as simple cases of derivation. In this approach, loanwords are first allocated to a particular noun class based on phonological principles. After the loanwords have been allocated, some semantic evaluation system would determine whether or not that noun class is an acceptable placement for the loanword based on its lexical content. If it is deemed acceptable, the loanword would maintain the given class prefix, if unacceptable, noun class derivation could be used to move that noun to a more suitable noun class. Crucially, this would involve phonology incorporating the noun into the morphological system before the semantic interface could evaluate whether the morphology assigned to that noun is appropriate.

In [imaʃiːne], the sequence resembling the class 6 prefix is retained, and the source word is simply augmented with a class 9 prefix. The approach described above cannot account for this behaviour. To arrive at the form seen, we must realize that both semantic and phonological constraints can be violated in favour of the other in certain conditions.

If there were indeed two distinct interfaces that did not interact, we would expect a form closer to [*iʃiːne]. The phonological interface could first analyze the existing sequence of segments in /maʃinə/. After the appropriate sound changes occur, we would expect the morphophonological form to enter the Kirundi lexicon as /ma$_6$-ʃiːne/. The tableaux in (57-58) demonstrate EVAL within this approach, where semantic constraints do not interact with phonology. This would separate the loanword into root and affix before any semantic factors are considered. The semantic interface could then evaluate the lexical item [ma$_6$-ʃiːne], determine that class 6 is not a semantically appropriate class for the item in question, and replace the prefix with any prefix that does not indicate cumulative reference. This could give us the form [ø$_9$-ʃiːne], to which the augment would be added afterward. This is shown in (57) and (58).

Phonology Eval

(57)	/maʃinə/	IdentC-SB	FaithAlign-SB	*Ø	IdentV-SB
a.	(i)Ø$_9$-maʃine			∗!	
b. ☞	(a)ma$_6$-ʃine				

Semantic Eval

(58)	/maʃinə/	Human↔1.2	Cumulative↔6
a. ☞	(i)$Ø_5$-ʃine		
b.	(a)ma_6-ʃine		∗!
c.	(u)mu_1-ʃine	∗!	

The forms we see suggest that specific phonological and semantic constraints can be overridden by the other. The only way to properly account for these forms is by concluding one of two things. I propose that semantics and phonology either have the same interface, where semantic and phonological constraints are crucially ranked with respect to each other, or the distinct interfaces are intertwined to the degree that it becomes undesirable and ineffective to view them separately.

7 Conclusion

In the preceding sections, I hope to have shown an analysis of Kirundi loanwords that demonstrates a unity between semantics and phonology is possible within an optimality theory framework. I have focused on how semantic and phonological factors contribute to the allocation of Kirundi loanwords into the rich noun class system.

In sections 2 and 3, I first focused on phonological patterns in Kirundi noun class allocation of loanwords. The tendency for loanwords in Kirundi to be allocated primarily to noun classes with null prefix morphemes or to use existing phonological material in the source language can be understood as primarily the result of constraints seeking to maintain faithful word boundaries from source to the base language and constraints requiring that morphology must be overt. These constraints, in addition to other faithfulness constraints penalizing the alteration of segments, can fairly reliably predict the designation of Kirundi loanwords to the noun class system.

In addition, epenthesis and syllable structure constraints interact with these faithfulness constraints. The restrictions set on well-formed syllables in Kirundi often lead loanwords to require some sort of syllable restructuring. In the process of incorporating these loanwords into the noun class system, Kirundi can exploit some syllabification processes to ensure that the output fits well within the noun class system.

In section 4, I showed that semantic conditioning and noun class restrictions factor into determining how a loanword is assigned a noun class. Semantic factors of the loanword can

cause irregularities in the phonological patterns of noun class allocation described in the previous section. In section 5, I addressed this by providing an account of Kirundi loanword allocation that takes both semantic and phonological factors into consideration. The analysis I proposed is one where phonology and semantic conditioning of noun classes essentially play different roles in the same system.

An asymmetric ranking of semantic noun class constraints within an optimality theoretic approach accounts for the observed asymmetry in the semantic cohesion of Kirundi noun classes. Therefore, certain tendencies of Kirundi noun classes to be stronger than others are explained by constraints that may be violated to avoid violating higher-ranked constraints, whether semantic or phonological. There are numerous instances both of higher-ranked semantic constraints leading to the violation of some phonological constraints and the violation of lower semantic constraints incurred by avoiding the violation of phonological constraints.

This paper is by no means a conclusive study of the phonology of Kirundi noun class prefixes or the semantic factors of Kirundi noun classes. I hope to have made some small contribution towards an understanding that semantics and phonology can be interconnected to a greater degree than is regularly granted. The analysis I have proposed lends credence to an argument that semantic and phonological patterns can be accounted for within the same system, and there is a clear benefit to doing such as any alternative can not as effectively capture the interaction between the two.

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