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CLASS 5 ALLOMORPHY IN CIYAO

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Studies of Ciyao, a Bantu language classified as P.21 by Guthrie [1967-71], agree that there are 18 noun classes, each of which determines a primary prefix on the noun, and concord prefixes on elements that agree with head nouns. Most of the primary prefixes have the shape CV- or N- both in Proto-Bantu and in Ciyao. In contemporary Ciyao, class 5 nouns take a prefix which has two allomorphs, the expected CV- *di-* alternating with the isolated CVV- *dii-*, posing the problem of how to explain their source and distribution. The purpose of this paper is to document the realization of Ciyao class 5 in detail, and to demonstrate that the *di-*/*dii-* alternation is prosodically conditioned.

1. Introduction

One of the best known characteristics of the Bantu languages is the regular distribution of the nouns into noun classes. Ciyao, a Bantu language classified as P.21 by Guthrie [1967-71], provides a typical example.[1] Studies of Ciyao [Sanderson 1922, 1954; Whiteley 1961, 1966; Ngunga 1987] are unanimous in agreeing that there are 18 noun classes, each of which determines a primary prefix on the noun

[1] Ciyao is spoken in Malawi, Mozambique, Tanzania and, within the last forty years or so, in some regions of Zambia and Zimbabwe due to massive migration of thousands of Yaos from Malawi to those countries in the late 1940s and early 1950s. This paper is based on the Mozambican dialect as spoken by the author and Maria Bernardete. I would like to thank Larry Hyman for his extensive input into the writing of this paper as well as Sharon Inkelas and Sam Mchombo for their valuable comments on an earlier version. I would also like to thank Dete for insightful discussion of the data, as well as Thilo Schadeberg, Robert Botne, and an anonymous reviewer for their interesting comments on the earlier version. However, I remain solely responsible for any errors. Research on Ciyao has been supported in part by the Eduardo Mondlane University (Mozambique) and conducted in the context of the Comparative On-Line Dictionary (CBOLD) project, partially supported by National Science Foundation Grants #SBR93-19415 and #SBR96-16330.

Table 1. Ciyao noun classes

Class	Noun Prefix		Vb. AGR		Enum. AGR		Examples	
	Ciyao	PB	Ciyao	PB	Ciyao	PB		
1	mu- mw- N'-	ju-mu-[2]	ju-	ju-	ju-	(u-)	*muu-ndu jú-gwĭíle* *mw-aanáce jú-gwĭíle* *m-palú jú-gwĭíle*	'the person fell' 'the child fell' 'the thief fell'
2	va- a-	ba-ba-	(v)a	ba-	va-	ba-	*vaa-ndu á-gwĭíle* *a-palú á-gwĭíle*	'the people fell' 'the thieves fell'
3	mu- mw- N'-	gu-mu-	wu-	gu-	wu-	(u-)	*mu-si wú-gwĭíle* *mw-éési wú-gwĭíle* *n-goómbá wu-gwĭíle*	'the village fell' 'the moon fell' 'the beam fell'
4	mi- my	gi-mi-	ji-	gi-	ji-	(i-?)	*mi-si jí-gwĭíle* *mi-goómbá ji-gwĭíle* *my-éési jí-gwĭíle*	'the villages fell' 'the beams fell' 'the moons fell'
5	di- dii- dy-	di-ɟ-	di-	di-	di-	i-	*di-véélé dí-gwĭíle* *dii-jela dí-gwĭíle* *dy-oolá di-gwĭíle*	'the breast fell' 'the hoe fell' 'the frog fell'
6	ma-	ga-ma-	ga-	ga-	ga-	ma-	*ma-véélé gá-gwĭíle* *ma-jela gá-gwĭíle*	'the breasts fell' 'the hoes fell'
7	ci- c-	ki-ki-	ci-	ki-	ci-	ki-	*ci-ló cí-gwĭíle* *c-áálá cí-gwĭíle*	'the night fell' 'the finger fell'
8	yi- y-	bɟ-bɟ-	yi-	bɟ-	yi-	bɟ-	*yi-ló yí-gwĭíle* *y-áálá yí-gwĭíle*	'the nights fell' 'the fingers fell'
9	N- Ø	ji-n-	ji-	ji-	ji-	(i-?)	*n-juva jí-gwĭíle* *Ø-wuuti jí-gwĭíle*	'the dove fell' 'the gun fell'
10	N- Ø	jɟ-n-	si-	jɟ-	si-	i-	*m-balati sí-gwĭíle* (sg.=11) *n-gomó sí-gwĭíle* (sg.=11) *n-juva sí-gwĭíle* (sg.=9) *Ø-wuuti sí-gwĭíle* (sg.=9)	'the ribs fell' 'the lips fell' 'the doves fell' 'the guns fell'
11	lu- lw-	du-du-	lu-	du-	lu-	du-	*lu-valati lú-gwĭíle* *lu-wuudĭ lú-gwĭíle* *lw-aawú lu-gwĭíle*	'the rib fell' 'the white hair fell' 'the net fell'
12	ka-	ka-ka-	ka-	ka-	ka-	ka	*ka-valati ká-gwĭíle*	'the small rib fell'
13	tu-	tu-tu-	tu-	tu-	tu-	tu	*tu-valati tú-gwĭíle*	'the small ribs fell'
14	wu-	bu-bu-	wu-	bu-	wu-	bu-	*wu-lávídi wu-gwĭíle*	'the flea fell'
15	ku-	ku-ku-	ku-	ku-	ku-	ku-	*ku-dyá kú-gwĭíle*	'the eating fell'
16	pa-	pa-pa-	pa-	pa-	pa-	pa-	*pa-ntwé pá-gwĭíle*	'the top of a head fell'
17	ku-	ku-ku-	ku-	ku-	ku-	ku-	*ku-ntwé kú-gwĭíle*	'the head-rest fell'
18	mu- N'-	mu-mu-	mu-	mu-	mu-	mu-	*mu-ntwé mú-gwĭíle* *mw-iitala mu-saléele*	'in the path is clean' 'in the path is clean'

[2] The first prefix in this column is the augment, a pronominal copy prefixed to noun prefixes having the structure CV-. In many contemporary Bantu languages, the initial C of the augment has been dropped, thereby creating a VCV- prefix sequence, as in the language names, I-ci-bemba, I-si-zulu, O-lu-ganda, where the initial vowels are augments and the CV- syllables are noun class prefixes. Abbreviations: vb=verb, enum.=enumerative, agr.=agreement.

as well as concord prefixes on elements that agree with head nouns. These noun classes are identified and illustrated in Table 1. Also presented in Table 1 are the Proto-Bantu (PB) forms for both noun and concord prefixes, as reconstructed by Meeussen [1967]. Most of these have the shape CV- or N- both in Proto-Bantu and in Ciyao. As one can see, however, class 5 nouns take a prefix which has two allomorphs in Ciyao: an expected CV- form *di-* alternating with the CVV- form *dii-*. The relation between these two allomorphs is the subject of the present study.

Our recent investigation of the Ciyao lexicon is based on a database of 7,714 entries of which there are 3,659 nouns. Of these, 515 are class 5 nouns, out of which 403 take the monomoraic prefix *di-*, while 112 take the bimoraic prefix *dii-*. The discovery of these two allomorphs poses the problem of how to explain the source and the distribution of the class 5 allomorphs in contemporary Ciyao. Having noticed the existence of the class 5 prefix *dii-* in many Bantu languages, Meeussen's [1967] diachronic account is that class 5 nouns were marked by a *di-ɨ- sequence in Proto-Bantu, where *di- is the so-called "augment" and ɨ- the vowel prefix. However, as documented by Kadima [1969], numerous Bantu languages mark class 5 nouns with reflexes of ɨ- rather than with reflexes of *di-. Ciyao is one of the many Bantu languages that has lost the historical augment or "preprefix" (see de Blois [1970]). Thus, although it is likely that Ciyao *dii-* has its diachronic source in *di-ɨ-, such an analysis is not available as a synchronic analysis.

The purpose of this paper is twofold. First, we propose to document the realization of Ciyao class 5 in considerable detail. Second, we shall demonstrate that the inherited system has been restructured in Ciyao in such a way that the *di-/dii-* alternation is now prosodically conditioned. The paper is organized as follows: §2 shows the prosodic conditioning of *di-/dii-* alternation. §3 discusses secondary prefixation, while §4 presents our conclusions.

2. Prosodically conditioned allomorphy

In this section we will demonstrate that the *di-/dii-* alternation is prosodically conditioned. As was mentioned earlier, Meeussen [1967) reconstructs the class 5 augment+prefix as *di-ɨ-. Since Ciyao has lost the augment in all noun classes, class 5 should be realized currently as the reflex of *ɨ-. However, while most noun class prefixes are direct reflexes of the forms reconstructed for PB, neither of the two class 5 prefix allomorphs *di-/dii-* is a direct reflex of the historical prefix *ɨ-. The two forms *di-/dii-* suggest that class 5 is the only case where an augment has been retained in Ciyao. However, we shall show that bimoraic *di-ɨ- has been restructured as a monomorphemic prefix, with the *dii-* allomorph being prosodically conditioned.

2.1. Monomoraic noun stems. As evident in Table 1, the class 5 prefix marks a singular noun. Nouns of this class are pluralized by affixing the class 6 *ma-*

prefix which is attached to the stem, as shown in (1).[3] The noun stems in (1a) are trimoraic, while those in (1b) have more than three moras. Based on these data, we can safely conclude that polymoraic stems in class 5 take the monomoraic prefix *di-*.

(1) a. Trimoraic stems

Class 5		Class 6 (pl)
di-wííwi	'chicken'	*ma-wííwi*
di-kúuga	'group of people'	*ma-kúuga*
di-véélé	'breast'	*ma-véélé*
di-sejele	'bead apron'	*ma-sejele*
di-lámúsí	'order'	*ma-lámúsí*

b. Longer stems

di-saamulo	'comb'	*ma-saamulo*
di-pálásila	'float'	*ma-pálásila*
di-comeela	'game-pit'	*ma-comeela*
di-jóngóólo	'centipede'	*ma-jóngóólo*
di-palapaato	'scraping'	*ma-palapaato*
di-púlúpúútwa	'butterfly'	*ma-púlúpúútwa*
di-piikanilo	'ear'	*ma-piikanilo*
di-váándámá	'spleen'	*ma-váándámá*
di-puundúgulú	'cloud'	*ma-puundúgulú*
di-púúluulu	'bush'	*ma-púúluulu*
di-sókódikóko	'husk of rice'	*ma-sókódikóko*
di-pweeteceela	'tomato'	*ma-pweeteceela*

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[3] Class 6 can, under certain circumstances, be used to mark the plural form of nouns which belong to different classes in order to indicate collectivity. These nouns may or may not have other plural forms. In still other cases, *ma-* may be attached to nouns which do not have singular forms. It appears that nouns which accept the plural prefix *ma-* sometimes allow backformation to derive a class 5 singular form marked by one of the allomorphs *di-* or *dii-* as in the following examples:

a)	nyuúmba (9/10) 'house/s'	→	ma-juúmba (6) 'many houses (collective)'	→	di-juúmba (5) 'very big house'
b)	—	→	ma-mila 'nasal mucus'	→	dii-mila (5) 'very dense nasal mucus'
c)	lu-soónga (11/10) 'pointed stick'	→	ma-soónga (6) 'many pointed sticks'	→	di-soónga (5) 'big pointed stick'
d)	wu-gadi (14) 'stiff porridge'	→	ma-gadi (6) 'types of stiff porridge'	→	dii-gadi (5) 'huge amount of stiff ...'
e)	ci-pyá (7) 'debris/ashes from bush-fire'	→	yi-pyá (8) 'debris/ashes from bushfire'	→	dii-pyá (5) 'huge amount of 'debris/ ashes...'

Observe that the class 5 nouns which result from backformation convey a special meaning (augmentative). We shall see that even in such cases, the *di-/dii-* alternation is prosodically conditioned, i.e., di+CVCV nouns derived by backformation, show the same lengthening opposition.

Now consider the nouns in (2), whose stems are monomoraic. Differing from the nouns in (1), where we saw that polymoraic stems take the monomoraic class 5 prefix *di-*, the monomoraic stems in (2) select the bimoraic prefix *dii-*. We see here the first indication that the *di-/dii-* alternation is prosodically conditioned.

(2) -CV stems

Singular (cl. 5)		Plural (cl. 6)	
dii-pé	'spear grass'	*ma-dii-pé*	*ma-pé
dii-sí	'side of a river'	*ma-dii-sí*	*ma-sí
dii-wú	'ashes'	*ma-dii-wú*	*ma-wú

In addition, we note that the plural of the nouns in (2) is derived by "preprefixing" the plural marker to the singular prefix. At least two hypotheses might be entertained to explain this fact. First, one might hypothesize that plural prefixes cannot be directly attached to monomoraic stems. However, the data in (3), where the singular nouns belong to classes other than class 5, show that this hypothesis cannot be maintained. Note that there are very few -CV stems; in classes 1/2, for example, there are none at all.

(3) -CV stem (other than class 5)

Singular		Plural		
mu-si (3)	'village'	*mi-si* (4)		*mi-mu-si
ci-pi (7)	'darkness'	*yi-pi* (8)		*yi-ci-pi
ci-pó (7)	'pimple (on the face)'	*yi-pó* (8)		*yi-ci-pó

As is evident from these examples, even though the stems are monomoraic, the plural form of the nouns in (3) is obtained by affixing the plural prefix directly to the stem. This process is schematized in (4).

(4) a. $[\text{-si}]_{sg}$ → mu-si
b. [-si]pl → mi-si
c. $[\,[\text{-si}]_{sg}]_{pl}$ → *mi-mu-si

We see in (4a-b) what can be regarded as an unmarked relationship between singular and plural forms in Ciyao. Illustrated via classes 3/4, singular *mu-* and plural *mi-* are directly spelled out on the noun stems carrying the features [sg] and [pl], respectively. Thus, the general (unmarked) situation is where both the singular and the plural prefixes are attached directly to the stem. It thus cannot be the monomoraicity of their stems *per se* that prevents the examples in (2) from deriving the plural forms by attaching the plural marker directly to the stems. We therefore reject the first hypothesis.

The second hypothesis to account for the double prefixation in (2) refers to the specific identity of the class 6 plural prefix. Perhaps *ma-* cannot be affixed to monomoraic stems in general, i.e., independently of the class 5 singular problem. According to this hypothesis, the presence of *dii-* in the plurals in (2) would be due to a minimality condition that *ma-* requires at least two moras following it. The data in (5) provide a test of this hypothesis.

(5) a. *ma-nyí* (6) 'excrement'
ma-tá (6) 'saliva'

b. *ma-wu-pyá* 'wild fires' < *wu-pyá* (14) (*ma-pyá)
ma-wu-syó 'foreheads' < *wu-syó* (14) (*ma-syó)

The nouns in (5a) are the only two class 6 nouns with monomoraic stems found in the database that do not have singular counterparts.[4] As shown, the class 6 prefix *ma-* is attached directly to these stems. If there were a pervasive constraint that *ma-* must be followed by at least two moras, we might have expected either the repetition of the prefix (**ma-ma-nyí*) or reduplication of the stem (**ma-nyinyí*) to meet the minimal size requirement. While this may suggest that the "preprefixation" of plural *ma-* to the singular nouns in (2) is not a property of the class 6 prefix, the examples in (5b) tell a different story. The nouns in (5b) are the only two class 6 nouns with a monomoraic stem derived from a singular other than class 5—in this case class 14. As indicated, *ma-* may not be attached directly to the monomoraic stem, but rather must occur outside the singular prefix *wu-* (cl.14). Comparing the examples in (5) with those in (2), we arrive at the following generalization: a derived plural in class 6 requires that *ma-* be followed by at least two moras. So, what we have in (2) and (5b) can be represented as in (6), below.

(6) a. $[\text{-pé}]_{sg}$ → dii-pé
$[\text{-pyá}]_{sg}$ → wu-pyá

b. $[\text{-pé}]_{pl}$ → *ma-pé
$[\text{-pyá}]_{pl}$ → *ma-pyá

c. $[[\text{-pé}]_{sg}]_{pl}]$ → dii-pé → ma-dii-pé
$[[\text{pyá}]_{sg}]_{pl}]$ → wu-pyá → ma-wu-pyá

d. $[\text{-nyí}]_{pl}$ → ma-nyí
$[\text{-tá}]_{pl}$ → ma-tá

In (6a) we see that the singular prefixes *dii-* and *wu-* can be spelled out directly onto a stem which is marked [sg]. In (6b), however, we see that one cannot derive the class 6 plurals directly from a stem marked [pl]. Instead, as shown in (6c), the singular is first spelled out with *dii-* and *wu-*, based on the

[4] This database was originally extracted from Sanderson [1954], which I marked for vowel length and tone, revised, added words to, and entered into Filemaker Pro™ with additional fields for noun classes, perfective verb stems, etc. At the time of the writing of this paper, the resulting Ciyao dictionary consists of 7,714 entries, of which 3,659 are nouns. I would like to thank John Lowe, without whose help this effort could not have been realized.

stem feature [sg]. This singular then serves as input to the spelling out of the [pl] feature as *ma-*. This "spell-out" rule does not apply to "inherent" (i.e., non-derived) prefixes such as the two inherent class 6 nouns in (6d), which have no corresponding singulars. The plural of these, as illustrated in (6d), are derived directly from the stem, as we proposed in (4) for both singular and plural classes other than class 6.[5]

Returning to the class 5 prefix, it is important to note that *di-/dii-* allomorphy is an exclusive property of class 5 nouns and not of other syntactic categories which take class 5 concord. That is, there is no *di-/dii-* alternation when the class 5 prefix is attached to demonstratives, verbs, or other parts of speech, even when the following stem is monosyllabic, as illustrated in (7).

(7) a. Demonstratives

dí-vaatá di-la 5-duck 5-that	'that duck'	(cf. *dii-la)
di-saamulo dí-la 5-comb 5-that	'that comb'	(cf. *dii-la)

b. Adjectives

di-wiiwí dyá dí-wé 5-chicken 5.that 5-dead	'dead chicken'	(cf. *díí-wé)
di-vaatá dyá dí-pyé 5-duck 5.that 5-dead	'burnt duck'	(cf. *díí-pyé)

c. Numerals

di-vaatá di-mo 5-duck 5-one	'one duck'	(cf. *dii-mo)
dii-saamulo dí-mo 5-comb 5-one	'one comb'	(cf. *dii-mo)

d. Subject marker (SM)

di-wiiwí cí-dí-dye 5-chicken FUT-5-eat	'the chicken will eat'	(cf. *dii-dye)
di-saamulo cí-dí-pye 5-comb FUT-5-burn	'the comb will burn'	(cf. *dii-pye)

[5] There are, of course, other ways to derive this effect, including non-derivational ones. Larry Hyman (pers. comm.) has thus suggested that these facts could be nicely handled by invoking the "correspondence theory" of OT (McCarthy and Prince [1995]: There is a (violable) bimoraic stem constraint requiring class 6 *ma-* to be followed by at least two moras. When a stem is monomoraic, this constraint is satisfied by invoking the corresponding singular. Where there is no corresponding singular, such correspondence, of course, cannot be invoked, and the result is a violation of the bimoraic stem constraint.

e. Object marker (OM)

cí-tú-di-pé di-wííwi 'we will give the chicken' (cf. *cí-tú-dii-pé)
FUT-we-5-give 5-chicken

cí-tú-di-dyé ɗí-vaáta 'we will eat the duck' (cf. *cí-tú-dii-dyé)
FUT-we-5-eat 5-duck

In (7) the class 5 prefix, in boldface, is attached to the monomoraic stems of a demonstrative (7a), an adjective (7b), and a numeral (7c). In (7d) and (7e), the class 5 prefix appears on verbs, as subject marker and object marker, respectively. As one can see, *di-* is the only allomorph allowed in spite of the size of the stems.[6] Thus, there is something very specific about the class 5 prefix *dii-* that occurs exclusively before monomoraic noun stems.

This having been said, we should note that there is one context—reduplication— in which the final vowel of all demonstratives is lengthened, in which case the extra mora functions as a "bridge" between the base and the reduplicant, as in (8).

(8) *a-vá-á-vá* 'these very X (cl.2)'
a-ɗí-í-ɗí 'this very Y (cl.5)'
a-mú-ú-mú 'in this very Z (cl. 18)'

The capital letters X, Y, Z, in (8) stand for any nouns belonging to classes 2, 5, and 18, respectively. Thus, the length of the final vowel of the base cannot be regarded as a property of class 5, since it occurs with all prefixes in this context.

For comparison, we present the corresponding plurals of the forms in (7), with the exception of numerals, in (9).

(9) a. Demonstratives

ma-vaatá ga-la 'those ducks' (cf. *ga-dii-la)
6-duck 6-DEM

ma-saamulo gá-la 'those combs' (cf. *ga-dii-la)
6-comb 6-DEM

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[6] Note that a bimoraic *dii-* may appear in the verb complex as a reflexive marker. This reflexive *-dii-*, which should not be confused with the class 5 allomorph *-dii-*, is the same for all nouns regardless of class, as illustrated in the following examples:

(a) *mw-aaɗí ju-kú-dii-totela deléesi* 'the girl (cl.1) has sewn herself a dress'
(b) *n-cíímbo wu-ɗíí-kámwíile nciwúnu* 'the old baboon (cl.3) has grabbed itself on the hips'
(c) *dii-janí ɗí-kú-ɗíí-páka wútope* 'the baboon (cl.5) is smearing itself with mud'
(d) *c-oómé cí-ɗíí-potéece* 'the cat (cl.7) has hurt/injured itself'

As shown, reflexive *-ɗíí-* is realized as such regardless of the number of moras following it in the verb stem. Interestingly, Hyman and Ngunga [1994] present a tonal argument in favor of representing the reflexive as bipartite: *-di-i-*.

b. Adjectives

ma-wiiwí gá gá-wé 6-chicken 6.that 6-dead	'dead chickens'	(cf. *gá-díí-wé)
ma-vaatá gá gá-pyé 6-duck 6.that 6-dead	'burnt ducks'	(cf. *gá-díí-pyé)

c. Subject marker

ma-wiiwí cí-gá-dye 6-chicken FUT-6-eat	'the chickens will eat'	(cf. *ga-dii-dye)
ma-saamulo cí-gá-pye 6-comb FUT-6-burn	'the combs will burn'	(cf. *ga-dii-pyẽ)

d. Object marker

cí-tú-ga-pé má-wíiwi FUT-we-6-give 6-chicken	'we will give the chickens'	(cf. *cí-tú-ga-dii-pé)
cí-tú-ga-dyé má-vaáta FUT-we-6-eat 6-duck	'we will eat the ducks'	(cf. *cí-tú-ga-dii-dyé)

The agreement marker of class 6 nouns is *ga-* and not *ma-*. As can be seen in (9), *ga-* is attached directly to the monomoraic stems of demonstratives, verbs, and adjectives. That is, it does not require the presence of the class 5 singular marker as is the case of class 6 plural nouns with monosyllabic stems. If this had been the case, the incorrect starred forms in parentheses would have been derived. Another important point to note is that, although adjectives might be expected to have the same prefixal morphology as nouns, the examples in (9a-b) show that adjectival inflection is essentially the same as demonstrative inflection (e.g., *ju-* not *mu-*, and *ga-* not *ma-*, in classes 1 and 6, respectively).

2.2. Bimoraic noun stems. To summarize thus far, the allomorph *dii-* is used before class 5 monomoraic noun stems. In addition, *dii-* is present in the corresponding class 6 plurals, because plural *ma-* requires that at least two moras follow. This effect of monomoraic stems is not present in other parts of speech (demonstratives, adjectives, numerals, verbs), which take exclusively the allomorph *di-*, as do noun stems having three or more moras.

Thus far nothing has been said about bimoraic noun stems. As shown in (10), these also take the allomorph *dii-* in class 5. In (10a) we see that *dii-* is not retained in the corresponding plurals. Instead, the prefix *ma-* is attached directly to the stem since the latter has the requisite two moras. A similar situation is seen in (10b), where the prefix *wu-* of class 14 nouns also drops when the class 6 plural prefix *ma-* is affixed.

(10) -CVCV stems

a. Class 5		Class 6 (pl.)
dii-tivi	'valley'	*ma-tivi*
dii-túnu	'hyena'	*ma-túnu*
dii-jela	'hoe'	*ma-jela*
dii-jóká	'snake'	*ma-jóká*
dii-janí	'baboon'	*ma-janí*

b. Class 14		Class 6 (pl.)
wu-gadi	'stiff porridge'	*ma-gadii*
wu-vígó	'game-fence'	*ma-vígó*
wu-tope	'mud'	*ma-tope*
wu-nyólo	'metal chain'	*ma-nyólo*
wu-kuní	'bird's tail'	*ma-kuní*

These data, along with those in (1) and (2), provide us with evidence that the *di-/dii-* alternation is conditioned by the number of moras in the stem. That is, as we saw in (1), if the stem has more than two moras, the class 5 prefix is monomoraic. But if, on the other hand, the stem is at most bimoraic, as in (2) and (10), the class 5 prefix is bimoraic. As for the plural forms, it was mentioned above that *ma-* cannot derive plural nouns (from singular) by its direct prefixation to the monomoraic stems, in which case the prefix *ma-* is preprefixed to the *dii*-CV and *wu*-CV nouns in (2) and (5), respectively. The plural forms of the nouns in (10) do not keep their singular marker because their stems satisfy the minimality requirement the input must satisfy before they are pluralized: bimoraic stem.

While it is largely true that the *di-/dii-* alternation is prosodically conditioned, there is one exceptional case of a -CVCVVNCV stem which inexplicably takes the bimoraic prefix *dii-*, as shown in (11).

(11) -CVCVVNCV stem

Class 5		Class 6 (pl.)
dii-pujuungu	'vapor, steam, hot air'	*ma-pujuungu*

This is the only such case out of 112 class 5 nouns which takes a bimoraic prefix. In the plural form, the bimoraic singular prefix is "replaced" by a monomoraic *ma-* as in all other cases where the class 5 noun prefix is at least bimoraic.[7]

[7] Thilo Schadeberg (per. comm.) suggested to me that the length of the class 5 prefix in *dii-pujuungu* "would be explained if it were a compound: dii-pu-juungu", although *-pu-* does not exist as a noun stem in the language. This proposal is an interesting one for it implies that the lengthening of the class 5 prefix sees the internal structure of the compound. However, although it seems to work for this

2.3. NC-initial stems. For the sake of completeness, let us consider a very different source of prefix length, NC-stems, illustrated by the examples in (12).

(12) -NC...stems

a. Class 5

		Class 6 (pl.)
dii-mbáciiga	'swollen gland'	*maa-mbáciiga*
dii-mbanaanga	'splendor'	*maa-mbanaanga*
dii-ngáanje	'rind of corn-stalk'	*maa-ngáanje*
dii-ngóleenga	'trace of liquid on body'	*maa-ngóleenga*
dii-njawuule	'kind of dance'	*maa-njawuule*

b. Other classes

muu-ndálaanga	(3)	'kind of dance'
mii-ngúti	(4)	'kind of tree'
cii-ndógoodya	(7)	'fruit of a rubaceous tree'
yii-ndógoodya	(8)	'fruits of a rubaceous tree'
luu-ngumbisi	(11)	'poor sight'
muu-ngokwe	(18)	'in the granary'

Since the stems of the examples in (12a) are polymoraic, the *dii-* allomorph is unexpected. However, these nouns share the property of having a homorganic nasal+consonant (NC) sequence in stem-initial position. In many Bantu languages, including Ciyao, homorganic nasals condition preceding vowel length by a process of compensatory lengthening [Clements 1986, Hayes 1989, Hubbard 1993, 1994, 1995, Hyman and Katamba 1997, Maddieson 1993, Maddieson and Ladefoged 1993], further illustrated by the examples in (12b). Here, then, the vowel length in the prefixes in (12) is conditioned by the nature of the following segment. That is, *dii-* in (12a) derives from /di-/ when the latter is followed by a moraic nasal (Hyman and Ngunga 1997 [this issue]).

Other evidence for this is the fact that the vowel of the plural prefix *ma-* is also lengthened in this position. As we saw previously, prefix length conditioned by the mora count of the noun stem is an exclusive feature of the class 5 prefix, other prefixes remaining monomoraic. However, in (12a) we have *maa-* (cl.6), and in (12b) *muu-* (cl.3, 18), *mii-* (cl. 4), *cii-* (cl.7), *yii-* (cl.8), and *luu-* (cl.11),

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particular case, other examples in which we find actual compounding do not support it. Consider the following examples:

a. *di-wúmáámbula* (< -wúmá + mbula) 'bleed at noses'
b. *di-kálάángulo* (< -kálá + ngulo) 'sore throat'

In these examples we have clear cases of compounds where the stem of the first member has the structure -CVCV. The fact that the prefixes of these compound nouns fail to lengthen tells us that unlike Schadeberg's suggestion, the process treats compounds like underived nouns with polysyllabic stems, and does not care about their internal structure.

which suggests that vowel length in all the examples in (12) is conditioned by the same environmental factor, the initial NC sequence of the stem.

With other noun stems, however, prefix lengthening fails to apply, even though the phonological environment is similar to that observed in (12). As in (12), the prefix precedes a stem-initial NC sequence, yet the prefix vowel does not lengthen as it does in the examples in (12).

(13)

Singular		Plural
a. -NCVVCV stem		
(cl.5)		(cl.6)
di-mbaala	'gruel'	*ma-mbaala*
di-mboonda	'edible gourd'	*ma-mboonda*
di-ndoóndwa	'drop'	*ma-ndoóndwa*
di-nduútu	'popped corn'	*ma-nduútu*
di-ngoole	'coconut'	*ma-ngoole*
di-ngwíita	'bracelet or anklet'	*ma-ngwíita*
di-mbooko	'ophtalmia'	*ma-mbooko*
b. -NCV... stem		
(cl.7)		(cl.8)
ci-mbádi	'unjustified expectation'	yi-mbádi
ci-mbanďiingwa	'piece of broken gourd'	yi-mbanďingwa
ci-ngelengeele	'bell'	yi-ngelengeele
(cl.12)		(cl.13)
ka-ndúndúdimya	'hillock'	tu-ndúndúdimya

One factor inhibiting lengthening of the prefix vowel appears to be the presence of a long vowels in the stem-initial syllable, as suggested by the examples in (13a). While we cannot predict with complete certainty which initial NC sequences will condition lengthening of the prefix vowel, with very few exceptions, the existence of a long vowel in the initial syllable of the stem precludes lengthening of the prefix vowel (Ngunga 1995).[8]

In (13b) we have nouns from other classes with homorganic nasal sequences in stem-initial position and short vowel in the first syllable. Even though all the conditions are apparently met for compensatory lengthening to apply to the prefix vowel, it does not. This failure of compensatory lengthening to apply reveals that what we actually have in stem-initial position in (12) and (13) are two different

[8] From this point of view, the noun *dii-ngáanje* (pl.: *maa-ngáanje*) 'rind of corn stalk' (12a), which has all the characteristics of the nouns in (13a) except that it takes a bimoraic prefix, is an exceptional case in having a moraic nasal followed by a long vowel in the next syllable.

kinds of preconsonantal nasals in Ciyao. As argued by Hyman and Ngunga [1997 (this issue)], nouns such as those in (12) have *moraic* preconsonantal nasals in stem-initial position which give up their moras in favor of the prefix vowel, allowing it to lengthen. In (13) the stem-initial preconsonantal nasals are non-moraic and therefore do not trigger the lengthening of the prefix vowel. In the following table we provide the statistics of the class 5 nouns with preconsonantal nasals in stem-initial position.

Table 2. Statistical account of the distribution of class 5 allomorphs before NC-initial stems.

Class 5 Allomorphs	Noun stem shapes		Total
	-NCVV(N)CV	-NCVCVV(N)CV	
di-	18	—	18
dii-	1	5	6
Total	19	5	24

Table 2 shows that the distribution of *di-/dii-* before NC-initial stems is conditioned by the length of the stem-initial syllable. That is, if the stem-initial syllable is long (e.g., -NCVV...), the vowel of the prefix is short (*di-*), but if the stem-initial syllable is short (-NCVC...), the vowel of the prefix is long (*dii-*). Out of the 19 class 5 nouns with -NCVV...-initial stems, eighteen select the short class 5 allomorph *di-* and, exceptionally, one selects the long class 5 allomorph *dii-*. In contrast, all of the five nouns with -NCVC... in stem-initial position select long class 5 allomorph (*dii-*). Thus, Table 2 demonstrates that, just as in the cases previously discussed, before -NC-initial stems, the length of the class 5 prefix vowel is highly predictable. In the next section we discuss the affixation of class 5 allomorphs before vowel-initial stems.

2.4. -VCV stems. Let us consider class 5 nouns that have -VCV stems, as illustrated in (14). The nouns in (14a) have a high front vowel in stem-initial position; those in (14b) begin with a non-front vowel. The last two nouns in (14b) have no plural forms and were included here for the sake of exhaustiveness. It should be pointed out that there are no non-derived vowel-initial stems longer than those given in (14).

Since the stems of the class 5 nouns in (14) are bimoraic, their class 5 prefix should in principle be *dii-*. However, it is not possible to test this hypothesis, since a trimoraic combination of /dii+V/ would in any case have to be pared down to conform with the bimoraic maximum on Ciyao syllables. It should also be pointed out that the /i/ of the prefix glides to [y] before vowels other than /i/.

(14) -VCV stems

	Singular		Plural	
a.	*dí-íná*	'name'	*méénáá*	(< /ma+ina/)
	dí-ínó	'tooth'	*méénó*	(< /ma+ino/)
	dí-ísó	'eye'	*méésó*	(< /ma+iso/)

	Singular			Plural	
b.	*dy-aája*	(< /di-ája/)	'African breadfruit'	*ma-ája*	(< /ma-ája/)
	dy-oóla	(< /di-óla/)	'frog'	*m-oóla*	(< /ma-óla/)
	dy-uúngu	(< /di-úngu/)	'pumpkin'	*m-oóngu*	(< /ma-úngu/)
	dy-úúvá	(< /di-úvá/)	'sun, day'	*m-óóvá*	(< /ma-úvá/)
	dy-óósí	(< /di-ósí/)	'smoke'		
	dy-óogo	(< /di-ogo/)	'first bath after circumcision'		

In (15) we see how the forms in (14) are derived. We begin in both (15a) and (15b) with sequences of *di-* followed by a -VCV stem. Had we begun with *dii-*, we would most likely have lost one of the two moras of the prefix when it is followed by a vowel-initial stem. In (15a) the /i/ of *di-* joins the initial /i/ of the stem /-ina/ to form a bimoraic syllable [dii]. In (15b) the vowel /i/ of the prefix glides to [y] and the following non-high front vowel is compensatorily lengthened. The result is a bimoraic syllable [dyaa].

(15) a. μ μ μ → μ μ μ
d i i n a → d i n a

b. μ μ μ → μ μ μ
d i a j a → d y a j a

In the case of the corresponding singular forms, the /a/ of *ma-* fuses with the initial /i/ of the nouns stems in (14a), while it deletes before other vowels in (14b). What is important for our understanding of the problem at hand is that *ma-* is not added to fused class 5 prefixes to form the plural. That is, we do not obtain **ma-dí-íná*, **ma-dy-áaja*, etc.

The discussion developed so far can be summarized as follows. The class 5 prefix in Ciyao has two allomorphs, *di-* and *dii-*, whose distribution is determined by the number of moras in the stem. With the exception reported in (11), no stem with more than two moras selects the bimoraic prefix, although this and other prefixes may acquire a long vowel if followed by a moraic nasal. In order to further test the proposed prosodic conditioning of *dii-*, we consider secondary prefixation in the next section.

3. Secondary prefixation

In this section we examine the so-called secondary prefixation which refers to the processes of diminutivization and locativization.

3.1. Diminutivization of class 5 nouns. The singular class 12 prefix (*ka-*) and its corresponding plural class 13 prefix (*tu-*) are diminutivizers in Ciyao. In general these prefixes occur in the place of the inherent noun class prefix of the input (non-diminutive) noun. This process can be transparently observed in (16), where there are polymoraic -CVVCV stems in (16a), longer stems in (16b). The diminutive prefixes are attached directly to the noun stems, "replacing" the inherent singular and plural prefixes.

(16)

Class 5		Class 12 (sg.)	Class 13 (pl.)
a. Trimoraic stems			
di-wíiwi	'chicken'	*ka-wíiwi*	*tu-wíiwi*
di-kúuga	'group of people'	*ka-kúuga*	*tu-kúuga*
di-sejele	'bead apron'	*ka-sejele*	*tu-sejele*
di-lámúsí	'order'	*ka-lámúsí*	*tu-lámúsí*
b. Longer stems			
di-saamulo	'comb'	*ka-saamulo*	*tu-saamulo*
di-pálásila	'float'	*ka-pálásila*	*tu-pálásila*
di-piikanilo	'ear'	*ka-piikanilo*	*tu-piikanilo*
di-puundúgulú	'cloud'	*ka-puundúgulú*	*tu-puundúgulú*
di-sókódikóko	'husk of rice'	*ka-sókódikóko*	*tu-sókódikóko*
di-pweeteceela	'tomato'	*ka-pweeteceela*	*tu-pweeteceela*

Examples of diminutivization of class 5 nouns whose stems have a preconsonantal nasal in initial position are given in (17). As in (16), the diminutive prefixes in (17) are also attached directly to the noun stem. Compensatory lengthening yields *kaa-/tuu-* forms of the diminutive prefixes (17a) where the noun stems begin with moraic nasal. In (17b) the rule does not apply, since the preconsonantal nasal of these stems is non-moraic.

(17)

-NC initial stems			
Class 5		Class 12 (sg.)	Class 13 (pl.)
a. *dii-mbáciiga*	'swollen gland'	*kaa-mbáciiga*	*tuu-mbáciiga*
dii-mbanaanga	'splendor'	*kaa-mbanaanga*	*tuu-mbanaanga*
dii-ngáanje	'rind of corn-stalk'	*kaa-ngáanje*	*tuu-ngáanje*
dii-ngóleenga	'trace of liquid on the body'	*kaa-ngóleenga*	*tuu-ngóleenga*
dii-njawuule	'kind of dance'	*kaa-njawuule*	*tuu-njawuule*

	Class 5		Class 12 (sg.)	Class 13 (pl.)
b.	*di-ngwíita*	'bracelet'	*ka-ngwíita*	*tu-ngwíita*
	di-mbaala	'gruel'	*ka-mbaala*	*tu-mbaala*
	di-mboonda	'edible gourd'	*ka-mboonda*	*tu-mboonda*
	di-ndoóndwa	'drop'	*ka-ndoóndwa*	*tu-ndoóndwa*
	di-nduútu	'popped corn'	*ka-nduútu*	*tu-nduútu*
	di-ngoole	'coconut'	*ka-ngoole*	*tu-ngoole*
	di-mbooko	'ophtalmia'	*ka-mbooko*	*tu-mbooko*

Now contrast the above situation with the examples in (18). Even though the prefixes of the nouns in (18) are bimoraic, their corresponding diminutive is realized in the same manner as observed in (16) and (17b), where *ka-* (singular) and *tu-* (plural) occur in the place of the classes 5 and 6 primary prefixes, respectively. Once again it is only the class 5 prefix that shows prosodic conditioning of a long vowel allomorph.

(18)	Class 5		Class 12 (sg.)	Class 13 (pl.)
a.	-CVCV stems			
	dii-tivi	'valley'	*ka-tivi*	*tu-tivi*
	dii-jóká	'snake'	*ka-jóká*	*tu-jóká*
	dii-túnu	'hyena'	*ma-túnu*	*tu-túnu*
	dii-jela	'hoe'	*ma-jela*	*tu-jela*
	dii-janí	'baboon'	*ma-janí*	*tu-janí*
b.	-CVCVVNCV stem			
	dii-pujuungu	'vapor, hot air'	*ka-pujuungu*	*tu-pujuungu*

Now consider the forms in (19), in which nouns having stem-initial vowels diminutivize by adding the diminutive prefix outside the inherent prefix.[9] It is important to observe that in the plural forms there are two ways to express diminutivization, both accepted by the native speakers.

(19)	Cl.5 (sg.)		Cl.12 (sg.)	Cl.13 (pl.)	Cl.13 (pl.)
	-VCV stems				(alternative)
	dí-iná	'name'	*ka-dí-iná*	*tu-dí-iná*	*tu-mééná*
	dí-inó	'tooth'	*ka-dí-inó*	*tu-dí-inó*	*tu-méénó*
	dí-isó	'eye'	*ka-dí-isó*	*tu-dí-isó*	*tu-méénó*
	dy-áaja	'African breadfruit'	*ka-dy-aája*	*tu-dy-aája*	*tu-máaja*
	dy-oóla	'frog'	*ka-dy-oóla*	*tu-dy-oóla*	*tu-moóla*
	dy-uúngu	'pumpkin'	*ka-dy-uúngu*	*tu-dy-uúngu*	*tu-moóngu*
	dy-úúvá	'sun, day'	*ka-dy-úúvá*	*tu-dy-úúvá*	*tu-móóvá*

[9] This differs from the behavior of *ma-*, which, as was seen in (14), cannot be added before a fused class 5 prefix, e.g., *ma-dí-iná, *ma-dy-áaja, etc.

For the purpose of comparison, see in (20) the diminutivization of nouns having vowel-initial stems but not belonging to class 5. The stems of the nouns in (20a) have the shape -CVCV or longer. The prefixes of these nouns are not replaced by the diminutive prefixes. In contrast, in (20b) the prefixes of the nouns with vowel-initial stems keep their inherent noun class prefix in the diminutivization process. Thus, we can say that the double prefixation with vowel-initial stems is not specific to class 5. The explanation of these facts has to be found in the syllable structure of the -CV-VCV(CV) nouns.

(20) Stems (other than class 5)

a. -CVCV...

			Cl.12 (sg.)	Cl.13 (pl.)
n-sáku	(3)	'bag'	*ka-sáku*	*tu-sáku*
ci-juni	(7)	'bird'	*ka-juni*	*tu-juni*
n-gúku	(9)	'hen'	*ka-kúku*	*tu-kúku*
n-kayidi	(1)	'prisoner'	*ka-kayidi*	*tu-kayidi*
lu-kolomá	(11)	'ditch'	*ka-kolomá*	*tu-kolomá*
wu-lombeelá	(14)	'marriage'	*ka-lombeelá*	*tu-lombeelá*

b. -VCV...

			Cl.12 (sg.)	Cl.13 (pl.) (alternative)	Cl.13 (pl.)
mw-iisi	(3)	'pestle'	*ka-mw-iisi*	*tu-mw-iisi*	*tu-mi-isi*
mw-éésí	(3)	'moon'	*ka-mw-éésí*	*tu-mw-éésí*	*tu-my-éésí*
c-áálá	(7)[10]	'finger'	*ka-c-áálá*	*tu-c-áálá*	*tu-y-áálá*
mw-aanáce	(1)	'child'	*ka-mw-aanáce*	*tu-mw-aanáce*	*tu-va-anáce*
c-eenjelele	(7)	'soot'	*ka-c-eenjelele*	*tu-c-eenjelele*	*tu-y-eenjelele*
c-aanáasa	(7)	'mercy'	*ka-c-aacáasa*	*tu-c-aanáasa*	*tu-y-aanáasa*

The two ways of deriving a plural diminutive having a vowel-initial stem are illustrated in (21).[11]

(21) a.

singular		diminutive		plural
dí-íná	→	*ka-dí-íná*	→	*tu-dí-íná*
mw-aanáce	→	*ka-mw-aanáce*	→	*tu-mw-aanáce*

b.

singular		plural		diminutive
dí-íná	→	*m-éénà*	→	*tu-m-éénà*
mw-aanáce	→	*va-anáce*	→	*tu-va-anáce*

[10] Class 7 *ci-* becomes *cy-* before a vowel, which is then simplified to the alveopalatal affricate [č].

[11] Although we present a derivational account of the facts here, this is not a necessary feature of the analysis. The insight we wish to express is that the "correspondences" between the input noun and the derived plural diminutive may be perceived either as a pluralization of a derived diminutive or as a diminutivization of a plural.

In (21a), we first diminutivize (by prefixing diminutive singular *ka-* to the nouns) and then pluralize (by replacing the diminutive singular prefix *ka-* by the corresponding plural *tu-*). In (21b) pluralization precedes diminutivization, in the sense that we first replace the normal singular marker *di-* by the normal plural marker *ma-*. Then we diminutivize by adding to the plural nouns the diminutive plural marker *tu-*. We thus see that there are two "paths" to plural diminutivization.

The order in which the diminutivization and pluralization processes are applied can be seen by the order of the inner prefixes present in the output. When diminutivization precedes pluralization, the end result presents the diminutive plural prefix attached to the inherent singular marker as in (21a). When pluralization precedes diminutivization the output comes with the diminutive marker attached to the inherent plural marker, as in (21b). The availability of two such paths to plural diminutivization is not evident with stems which begin with a consonant. In this case, both orders yield the correct results.[12]

Now consider in (22) the diminutive of monosyllabic stems. In (22), we see that the diminutive prefixes *ka-* and *tu-*, like the plural prefix *ma-*, cannot be directly prefixed to a class 5 monomoraic -CV stem. As a result, forms are obtained with the double prefixes *ka-dii-* and *tu-dii-*.

(22) -CV stem

Cl.5 (sg.)		Cl.12 (sg.)	Cl.13 (pl.)	Cl.13 (pl.) (alternative)
dii-pé	'spear grass'	*ka-dii-pé*	*tu-dii-pé*	**tu-ma-dii-pé*
dii-sí	'side of a river'	*ka-dii-sí*	*tu-dii-sí*	**tu-ma-dii-sí*
dii-wú	'ashes'	*ka-dii-wú*	*tu-dii-wú*	**tu-ma-dii-wú*

In (23) we exemplify the two paths by which plural diminutives are formed from nouns having -CV stems.

(23) a.

singular		plural		diminutive
dii-pé	→	*ma-dii-pé*	→	*tu-dii-pé*
dii-wú	→	*ma-dii-wú*	→	*tu-dii-wú*

b.

singular		diminutive		plural
dii-pé	→	*ka-dii-pé*	→	*tu-dii-pé*
dii-wú	→	*ka-dii-wú*	→	*tu-dii-wú*

When *ma-dii-pé* is diminutivized, as in (23a), or when *ka-dii-pé* is pluralized, as in (23b), the outer prefix is replaced in the process. We therefore do not obtain

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12 This fact can be seen in the following derivations yielding equivalent outputs:
(a) *di-wíiwi* 'chicken' → *ka-wíiwi* 'small chicken' → *tu-wíiwi* 'small chickens' (Dim ⊃ Plur)
(b) *di-wíiwi* 'chicken' → *ma-wíiwi* 'chickens' → *tu-wíiwi* 'small chickens' (Plur ⊃ Dim)

forms with three prefixes, such as **tu-ma-dii-pé*, since the bimoraic condition on the base to which *tu-* is prefixed is met by the singular prefix *dii-* plus the monomoraic stem. Thus, *ma-* must be truncated as in other cases of diminutivization.

Consider next a set of data illustrating nouns having -CV stems but from classes other than class 5. The process of diminutivizing is similar to what was seen in (20) and (21). The one difference is that plural prefixes such as *mi-* (cl.4) and *yi-* (cl.8) are attached directly to the stem (vs. class 6 *ma-* which requires the singular prefix to be present).

(24) -CV stem (other than class 5)

		Cl.12 (sg.)	Cl.13 (pl.)	Cl.13 (pl.) (alternative)
mu-si (3)	'village'	*ka-mu-si*	*tu-mu-si*	*tu-mi-si*
ci-pi (7)	'darkness'	*ka-ci-pi*	*tu-ci-pi*	*tu-yi-pi*
ci-pó (7)	'pimple'	*ka-ci-pó*	*tu-ci-pó*	*tu-yi-pó*

There are, then, two possible paths (25) to forming plural diminutives: diminutivization may precede pluralization or, vice-versa, pluralization may precede diminutivization, though the resulting output differs. Both sets of output are well-formed, since *tu-* is followed by two moras. The derivation in (25) is similar to the one seen previously with vowel-initial stems in (21).

(25) a.

singular		diminutive		plural
mu-si	→	*ka-mu-si*	→	*tu-mu-si*
ci-pó	→	*ka-ci-pó*	→	*tu-ci-pó*

b.

singular		plural		diminutive
mu-si	→	*mi-si*	→	*tu-mi-si*
ci-pó	→	*yi-pó*	→	*tu-yi-pó*

In this section we have seen that, while the *di-/dii-* alternation has no independent effect on the diminutivization process, diminutivization on -CV noun stems is dependent on the mora count in the stem. We conclude from the data in (21), (22), and (24) that Ciyao diminutivizers cannot be attached directly to monomoraic stems. Rather, they are attached to a prefixed noun, thereby satisfying the minimality requirement of two moras. On the other hand, *ka-/tu-* are prefixed directly to stems if they are at least bimoraic. When the stem is vowel-initial, the rules which apply to -CV stems are expanded to these roots and double prefixation is obtained. This, we assume, is due to the fusion processes which take place at the boundary between the prefix and the -VCV stem. This conclusion can also be extended to Cimwera [Harries 1950, Stump 1992], which has some of the same properties as Ciyao, its closest relative.

3.2. Morphologically conditioned allomorphy. Thus far we have shown that there are two allomorphs of class 5 prefix in Ciyao whose selection is prosodically conditioned based on mora count. In this section we will show how the occurrence of these allomorphs is, in some contexts, morphologically conditioned, based on the locativization process of class 5 nouns.

In Ciyao there are three locative class prefixes, namely, *pa-* (cl.16), *ku-* (cl.17) and *mu-* (cl.18), which roughly mean 'at', 'to', and 'in', respectively. In this section we investigate how the locative prefixes affect the morphology (and phonology) of class 5 nouns. Consider the forms in (26), where the locative prefixes *pa-*, *ku-*, and *mu-* are prefixed to nouns which take monomoraic prefix *di-*.

(26) a. *di*-CVVCV stems

di-wííwi 'chicken'

Class 16	Class 17	Class 18
i. *pa-di-wííwi*	*ku-di-wííwi*	*n'-di-wííwi*
ii. *p-ee-wííwi*	*kw-ii-wííwi*	*mw-ii-wííwi*

di-kúuga 'group'

Class 16	Class 17	Class 18
i. *pa-di-kúuga*	*ku-di-kúuga*	*n'-di-kúuga*
ii. *p-ee-kúuga*	*kw-ii-kúuga*	*mw-ii-kúuga*

b. *di-* with longer stems

di-piikanilo 'ear'

Class 16	Class 17	Class 18
i. *pa-di-piikanilo*	*ku-di-piikanilo*	*n'-di-piikanilo*
ii. *p-ee-piikanilo*	*kw-ii-piikanilo*	*mw-ii-piikanilo*

di-puundúgulú 'cloud'

Class 16	Class 17	Class 18
i. *pa-di-puundúgulú*	*ku-di-puundúgulú*	*n'-di-puundúgulú*
ii. *p-ee-puundúgulú*	*kw-ii-puundúgulú*	*mw-ii-puundúgulú*

As shown in both (26a) and (26b), there are two acceptable ways of locativizing the respective nouns. In (i) we have the locativizer plus *di-* and in (ii) the locativizer plus *i-*. The same variation in form occurs when /di-/ is followed by a preconsonantal nasal, as in (27).

(27) a. *di-* with moraic NC-initial stems
dii-mbáciiga 'swollen gland'

	Class 16	Class 17	Class 18
i.	*pa-dii-mbáciiga*	*ku-dii-mbáciiga*	*n'-dii-mbáciiga*
ii.	*p-ee-mbáciiga*	*kw-ii-mbáciiga*	*mw-ii-mbáciiga*

dii-mbanaanga 'splendour'

	Class 16	Class 17	Class 18
i.	*pa-dii-mbanaanga*	*ku-dii-mbanaanga*	*n'-dii-mbanaanga*
ii.	*p-ee-mbanaanga*	*kw-ii-mbanaanga*	*mw-ii-mbanaanga*

b. *di-* with non-moraic NC-initial stems
di-ngwíita 'bracelet'

	Class 16	Class 17	Class 18
i.	*pa-di-ngwíita*	*ku-di-ngwíita*	*n'-di-ngwíita*
ii.	*p-ee-ngwíita*	*kw-ii-ngwíita*	*mw-ii-ngwíita*

di-mbaala 'gruel'

	Class 16	Class 17	Class 18
i.	*pa-di-mbaala*	*ku-di-mbaala*	*n'-di-mbaala*
ii.	*p-ee-mbaala*	*kw-ii-mbaala*	*mw-ii-mbaala*

The data in (26) and (27) thus show that, unlike pluralization via class 6 and diminutivization through classes 12 and 13 whose prefixes usually "replace" the inherent noun class prefix, locative prefixes are always attached to the nouns and not to the stems. This fact suggests that we look at the locatives as secondary prefixes "par excellence". Semantically, they provide secondary, adverbial, information about the noun they are attached to—localization in space or time—and, morphologically, they do not interfere significantly with the structure of the noun. The word *significantly* is important here because, as shown in (ii), the affixation of the locatives to the class 5 nouns appears to trigger an optional deletion of the consonant of the class 5 prefix through a process which can be represented as in (28).

(28) pa + di → pai → pee (cl.16)
ku + di → kui → kwii (cl.17)
mu + di → mui → mwii (cl.18)

The derivational schema in (28) illustrates our analysis in which a d-deletion rule applies optionally to the class 5 prefix when locative prefixes are attached to class 5 nouns. As a consequence, the inherent class 5 prefix vowel is left unprotected and fuses with the locative prefix, triggering the regular rules of

vowel coalescence *a + i → ee* (when the locative marker is *pa-*) and gliding *u + i → wii* (when the locative marker is *ku-* or *mu-*). No other noun class prefix may delete its consonant under locativization as does class 5, as illustrated by the examples in (29).

(29)

			Class 16	Class 17	Class 18
muu-ndu (1)	'person'	i.	*pa-muu-ndu*	*ku-muu-ndu*	*m-muu-ndu*
		ii.	**p-oo-ndu*	**ku-u-ndu*	**mu-u-ndu*
vaa-ndu (1)	'persons'	i.	*pa-vaa-ndu*	*ku-vaa-ndu*	*mu-vaa-ndu*
		ii.	**pa-a-ndu*	**kw-aa-ndu*	**mw-aa-ndu*
mu-si (3)	'village'	i.	*pa-mu-si*	*ku-mu-si*	*mu-mu-si*
		ii.	**p-oo-si*	**ku-u-si*	**mu-u-si*
mi-si (4)	'villages'	i.	*pa-mi-si*	*ku-mi-si*	*m-mi-si*
		ii.	**p-ee-si*	**kw-i-si*	**m-i-si*
ma-wútá (6)	'oil'	i.	*pa-ma-wútá*	*ku-ma-wútá*	*m-ma-wútá*
		ii.	**pa-a-wútá*	**kw-a-wútá*	**mw-a-wútá*
ci-tútu (7)	'ashpit'	i.	*pa-ci-tútu*	*ku-ci-tútu*	*n'-ci-tútu*
		ii.	**p-ee-tútu*	**kw-i-tútu*	**mw-i-tútu*
yi-tútu (8)	'ashpits'	i.	*pa-yi-tútu*	*ku-yi-tútu*	*n'-yi-tútu*
		ii.	**p-ee-tútu*	**kw-i-tútu*	**mw-i-tútu*
m-bwá (9/10)	'dog(s)'	i.	*paa-m-bwá*	*kuu-m-bwá*	*muu-m-bwá*
		ii.	**pa-bwá*	**ku-bwá*	**mu-bwá*
lu-kújú (11)	'fig'	i.	*pa-lu-kújú*	*ku-lu-kújú*	*n'-nu-kújú*
		ii.	**p-oo-kújú*	**ku-u-kújú*	**mu-u-kújú*
ka-pwá (12)	'puppy'	i.	*pa-ka-pwá*	*ku-ka-pwá*	*n'-ka-pwá*
		ii.	**pa-a-pwá*	**kw-a-pwá*	**mw-a-pwá*
tu-wúpá (13)	'sm. bones'	i.	*pa-tu-wúpá*	*ku-tu-wúpá*	*n'-tu-wúpá*
		ii.	**p-oo-wúpá*	**ku-u-wúpá*	**mu-u-wúpá*
wu-úji (14)	'gruel'	i.	*pa-wu-úji*	*ku-wu-úji*	*mu-wu-úji*
		ii.	**p-oo-úji*	**ku-u-úji*	**mu-u-úji*

With this fact established, let us consider examples of class 5 nouns which take bimoraic prefix *dii-* (30). Here we observe that the process of affixation of locative prefixes to class 5 nouns whose prefixes are bimoraic does not differ from what we saw in (26) and (27). Again there are two acceptable ways of locativizing a class 5 nominal. It would thus appear that the number of moras in the prefix does not affect the output of affixation of locative prefixes to class 5 nouns.

(30) a. *dii-* with -CVCV stems

			Class 16	Class 17	Class 18
dii-tivi	'valley'	i.	*pa-dii-tivi*	*ku-dii-tivi*	*n'-dii-tivi*
		ii.	*p-ee-tivi*	*kw-ii-tivi*	*mw-ii-tivi*
dii-jóká	'snake'	i.	*pa-dii-jóká*	*ku-dii-jóká*	*n'-dii-jóká*
		ii.	*p-ee-jóká*	*kw-ii-jóká*	*mw-ii-jóká*

b. *dii-* with -CVCVVNCV stem

			Class 16	Class 17	Class 18
dii-pujuungu	'vapor'	i.	*pa-dii-pujuungu*	*ku-dii-pujuungu*	*n'-dii-pujuungu*
		ii.	*p-ee-pujuungu*	*kw-ii-pujuungu*	*mw-ii-pujuungu*

Affixation of the locatives to the bimoraic class 5 prefix raises the question of what is deleted. Is it the consonant /d/ as was suggested above or it is the full mora *di-*? While we have spoken of a rule of d-deletion thus far, the facts in (30) suggest another hypothesis which is truer to the historical events that produced this situation. Recall from §1 that Meeussen reconstructs *ɨ- as the class 5 noun prefix and an augment + prefix sequence *di-ɨ-. Our hypothesis is that we do not have a rule of d-deletion, but rather a specific class 5 allomorph *i-* that shows up only under locativization. This allomorphy produces the output forms in (31).

(31) pa + -i → pa-i → pee (cl.16)
ku + -i → ku-i → kwii (cl.17)
mu + -i → mu-i → mwii (cl.18)

Although Ciyao has lost the historical Bantu augment, historically *pa-, *ku-, and *mu- replaced the augment *di- that preceded the prefix *ɨ-. Or, put slightly differently, locative prefixes were followed by augmentless prefixes: pa-ɨ-, not pa-di-ɨ-. Since other cases of *dii-* have been reanalyzed as monomorphemic (conditioned by mora count), we suggest a further restructuring whereby *i-* became a third allomorph of the class 5 prefix in present-day Ciyao: When preceded by one of the above three locative prefixes, a class 5 noun prefix which is normally *di-* or *dii-* (determined by prosodic considerations) can optionally be *i-*.[13]

[13] As pointed out to me by Larry Hyman (pers. comm.), a similar allomorphy *di-/i-* appears in Kinande where the normal class 5 prefix *di-* surfaces as *i-* rather than *di-* when the class 5 noun is localitivized. So, in both languages there is historical evidence that the class 5 prefix vowel which surfaces when the noun is locativized is a relic of the Proto-Bantu *ɨ-. The major difference between the two languages however, is that in Kinande *di-* and *i-* are in complementary distribution. The allomorph *di-* never surfaces after locative prefix, contexts where allomorph *i-* is the only realization regardless of the structure of the noun stem. In Ciyao, as mentioned above, the vestige of Proto-Bantu *ɨ- appears optionally only when the noun stem is at least bimoraic and has a consonant in stem-initial position. Another language where we find a similar situation is Luba-Kasai. In this language the class 5 prefix has two allomorphs, *i-* and *di-*. The former occurs optionally, just like in Ciyao, with some forms of locative [Kadima, 1969:38] and the latter occurs elsewhere.

From the analysis presented here we can conclude that the class 5 prefix has three allomorphs in Ciyao, listed in (32).

(32) Class 5 → i- / locative __ (optional)
dii- / __ noun stem [μ(μ)]
di- / elsewhere

To complete this discussion, consider locativization of class 5 nouns with -VCV stems given in (33).

(33) -VCV stems			Class 16	Class 17	Class 18
a. *ɗí-íná*	'name'	i.	*pa-ɗí-íná*	*ku-ɗí-íná*	*n'-ɗí-íná*
		ii.	**p-ee-ná*	**kw-ii-ná*	**mw-ii-ná*
ɗí-ínó	'tooth'	i.	*pa-ɗí-ínó*	*ku-ɗí-ínó*	*n'-ɗí-ínó*
		ii.	**p-ee-nó*	**kw-ii-nó*	**mw-ii-nó*
ɗí-ísó	'eye'	i.	*pa-ɗí-ísó*	*ku-ɗí-ísó*	*n'-ɗí-ísó*
		ii.	**p-ee-só*	**kw-ii-só*	**mw-ii-só*
b. *dy-aája*	'Afr. breadfruit'		*pa-dy-aája*	*ku-dy-aája*	*n'-dy-aája*
dy-oóla	'frog'		*pa-dy-oóla*	*ku-dy-oóla*	*n'-dy-oóla*
dy-uúngu	'pumpkin'		*pa-dy-uúngu*	*ku-dy-uúngu*	*n'-dy-uúngu*
dy-úúvá	'sun, day'		*pa-dy-úúvá*	*ku-dy-úúvá*	*n'-dy-úúvá*
dy-óogo	'first bath...'		*pa-dy-óogo*	*ku-dy-óogo*	*n'-dy-óogo*
dy-óósí	'smoke'		*pa-dy-óósí*	*ku-dy-óósí*	*n'-dy-óósí*

In this case there is only one correct result: prefixation of *pa-*, *ku-*, or *n'-* to the fused class 5 prefix *di-* or *dy-*. These data may be interpreted as further evidence that the "unprotected" vowel /i/ is a relic of class 5 prefix *ɨ- and not part of *di-* which remains behind when /d/ is deleted. As proposed by Hyman and Katamba [1997], it appears that *di- was also used as the basic class 5 prefix before stems beginning with a vowel—whether inherited from Proto-Bantu or obtained by deletion of *j. Thus, the reason we fail to obtain intermediate forms such as *pa-i-iná*, *pa-i-ája*, etc. in (33) is that the *ɨ- prefix never occurred in this position. Synchronically, what this means is that there must be a further condition on the first allomorph in (32), which must not be available when the following noun stem is vowel-initial.

Compare this with the locativization of nouns having -CV stems. The data in (34) behave like those in (33); the locative prefix can only be attached to the class 5 *dii-* allomorph. The data in (34b) constitute evidence that locatives are attached not only to class 5 nouns, but to nouns belonging to any class, without deleting the prefix.

(34)

			Class 16	Class 17	Class 18
a. -CV stem (class 5)					
dii-pé	'spear grass'	i.	*pa-dii-pé*	*ku-dii-pé*	*n'-dii-pé*
		ii.	**p-ee-pé*	**kw-ii-pé*	**mw-ii-pé*
dii-sí	'side of a river'	i.	*pa-dii-sí*	*ku-dii-sí*	*n'-dii-sí*
		ii.	*p-ee-sí*	**kw-ii-sí*	**mw-ii-sí*
dii-wú	'ashes'	i.	*pa-dii-wú*	*ku-dii-wú*	*n'-dii-wú*
		ii.	**p-ee-wú*	**kw-ii-wú*	**mw-ii-wú*
b. -CV stem (other than class 5)					
mu-si (3)	'village'		*pa-mu-si*	*ku-mu-si*	*m-mu-si*
ci-pi (7)	'darkness'		*pa-ci-pi*	*ku-ci-pi*	*n-ci-pi*
ci-pó (7)	'pimple'		*pa-ci-pó*	*ku-ci-pó*	*n-ci-pó*

A comparison of the data in (33)-(34) on the one hand, with those in (26)-(27) and (30) on the other hand, allows us to see that locatives do not discriminate among nouns in terms of the mora count. Both in (26)-(27) and (30) and in (33)-(34), locative prefixes are attached to nouns through the inherent prefix regardless of the number of moras in the noun stem. However, it is important to note that, with the exception of *p-ee-sí* (33a) which means 'across', the third class 5 allomorph *i-* never surfaces when the stem is monomoraic. That is, if the noun stem has fewer than two moras, the *i-* allomorph is not available. Thus the complete statement on the *i-* allomorph must be as in (35).

(35) Class 5 → *i-* / locative __ [Cμμ...] (optional)

The class 5 prefix may optionally be spelled out as *i-* if it is preceded by a locative prefix and if its stem begins with a consonant and contains at least two moras.[14]

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[14] In the interest of completeness, we note that locative and diminutive prefixes can co-occur in the same word not only with the primary prefixes (*di-* and *ma-* in our case), but also with each other, as in the following examples:

(a)	*pa-ka-díínó*	'at the small tooth'	(b)	*ku-ka-díínó*	'to the small tooth'
	pa-tu-dyuúngu	'at the small pumpkins'		*ku-tu-dyuúngu*	'to the small pumpkins'
	pa-tu-diiwú	'at the small ashes'		*ku-tu-diiwú*	'to the small ashes'
	pa-kaa-mbanaanga	'at the small light'		*ku-kaa-mbanaanga*	'to the small light'
	pa-tu-páta	'at the sm. temp. dams'		*ku-tu-páta*	'to the sm. temp. dams'

(c)	*n-ka-díínó*	'in the small tooth'
	n-tu-dyuúngu	'in the small pumpkins'
	n-tu-diiwú	'in the small ashes'
	n-kaa-mbanaanga	'in the small light'
	n-tu-páta	'in the small temporary dams'

continued on next page...

4. Conclusion

From the preceding discussion we conclude the following about Ciyao:

First, class 5 has three allomorphs, namely, *i-*, which surfaces optionally after locatives when the noun stems are consonant-initial and at least bimoraic; *dii-*, which is prosodically conditioned (requiring that the noun stem be bimoraic at most); and monomoraic *di-*, which occurs elsewhere.

Second, the diminutive prefixes *ka-* and *tu-* behave like class 6 prefix *ma-* in that they count the number of moras in the stem before their affixation. If the noun stem contains at least two moras, the diminutive prefixes are attached to the stems. If the noun stem is subminimal (i.e., monomoraic), *ka-* or *tu-* is attached to the full noun (i.e., inherent prefix + stem).

Third, locatives behave as genuine secondary prefixes. They are always attached to full nouns, not to the stems, regardless of the number of the moras in the stem.

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The order in which the prefixes appear on the surface forms cannot be reversed. From the observation of the examples above it is reasonable to conclude that among the secondary prefixes a distinction is necessary to draw between those which are attached at the lexical level and those that are added post-lexically. In the former group we could have the diminutives and in the latter the locatives. We thus can propose that primary prefixes are added at a stratum 1, diminutives prefixes at stratum 2, and locative prefixes (proclitics?) at stratum 3, i.e. as per their surface order.

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