

Gender on *n* in Bantu DP structure: from root-derived nominals to locatives

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On the surface, Bantu languages exhibit a considerable amount of variation in nominal structure, particularly in derived nominals such as *diminutives/augmentatives* and *locatives*.

On the other hand, a model of the structure of the DP is ideally uniform across languages.

Goal: By analyzing Bantu nominal structure within the framework of Distributed Morphology, specifically locating the gender feature universally on *n* (Kramer (2014, 2015)), we establish the parameters of variation in Bantu DP structure and determine for each parameter whether it is rooted in the syntax or the spell-out rules.

Outline:

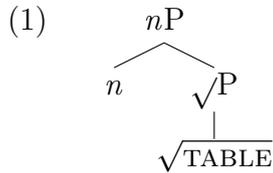
- The basics
- Deverbal nouns: *n* as a nominalizer
- Denominal nouns: diminutives
- Denominal nouns: locatives
- Locus of variation: diminutives vs. locatives

1 The basics: Bantu noun classes and gender on *n*

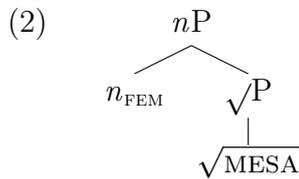
- **(Grammatical) gender** is an abstract categorizing feature that groups nouns according to their shape and/or syntactic behavior.
- Since gender enters into syntactic processes such as agreement, we assume that it must be represented in the syntax.

1.1 Gender on n

- We follow Kramer (2014, 2015), who builds on Kihm (2005) and Ferrari (2005) in locating gender on n .
- In Distributed Morphology, category-less roots merge with a nominalizer n to form a noun, as in (1):



- A root is licensed and spelled out only if a Vocabulary Insertion rule exists that allows its spell-out in the context of an n with a particular gender feature (3).



(3) $\sqrt{\text{MESA}} \rightarrow mesa_{fem} / n_{\text{FEM}}$

- As Kramer notes, there can be **many “flavors” of n** ; for example (un)interpretable masculine and feminine, infinitives, etc. The exact number of n s and the nature of the features of each n is determined by the details of how nouns are assigned to gender categories in individual languages.
- Locating gender on n – a categorizing head – associates gender with derivational power, and this will be crucial in the discussion of diminutives and locatives.
- The analysis of gender on n has been suggested for Bantu (Kihm (2005)) but to our knowledge it has not been developed to its full potential in this language family.

1.2 Gender in Bantu languages

- Bantu languages have on average 12-20 noun classes. ¹
- Noun classes determine concord morphology on nominal modifiers and agreement on verbs. Part of the noun classes form singular-plural pairs.

¹Attempts have been made to provide semantic underpinnings for Bantu gender categories (Richardson (1967), Denny and Creider (1976), Contini-Morava (1997)). Gender A (Class 1/2) appears to consist almost exclusively of human nouns, suggesting there is a semantic core for the system. However, generalizations are harder to made for the remaining genders; we therefore abstract away from semantic properties in how we label the gender categories.

- (4) *Swahili*
- a. **M**-toto hu-**yu** **a**-na-soma.
 1-child DEM-1 1SM-PRES-read
 ‘This child is reading.’²
- b. **Wa**-toto ha-**wa** **wa**-na-soma.
 2-child DEM-2 2SM-PRES-read
 ‘These children are reading.’
- (5) a. **Ki**-tabu hi-**ki** **ki**-na-som-wa.
 7-book DEM-7 7SM-PRES-read-PASS
 ‘This book is (being) read.’
- b. **Vi**-tabu hi-**vi** **vi**-na-som-wa.
 8-book DEM-8 8SM-PRES-read-PASS
 ‘These books are (being) read.’

- A full list of noun classes in Swahili is provided here:

(6) Noun classes in Swahili (Carstens (2008))

Noun class	Example	Gloss
1	<i>m-tu</i>	person
2	<i>wa-tu</i>	people
3	<i>m-ti</i>	tree
4	<i>mi-ti</i>	trees
5	<i>gari</i>	car
6	<i>ma-gari</i>	cars
7	<i>ki-atu</i>	shoe
8	<i>vi-atu</i>	shoes
9	<i>n-yumba</i>	house
10	<i>n-yumba</i>	houses
11	<i>u-bao</i>	board
14	<i>u-kweli</i>	truth
15	<i>ku-soma</i>	to read; reading
16	Noun + locative suffix	specific place
17	Noun + locative suffix	general place
18	Noun + locative suffix	inside place

- We adopt Carstens (1993)’s system of labeling genders (rather than the “class” labeling) in order to better capture the relationship between singular and plural noun classes. For Swahili, a subset of these genders would be as in (7).

- (7)
- | | |
|---|-----------------------|
| A | stems of classes 1/2 |
| B | stems of classes 3/4 |
| C | stems of classes 5/6 |
| D | stems of classes 7/8 |
| E | stems of classes 9/10 |

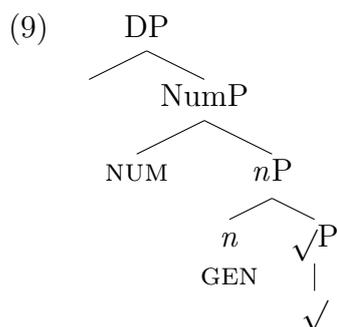
²Where no references are indicated, data are gathered by the authors.

1.3 Applying the n analysis to Bantu languages – the basics

- We label possible n in Bantu languages according to Carstens’ gender groupings.

(8)	n_A	stems of classes 1/2
	n_B	stems of classes 3/4
	n_C	stems of classes 5/6
	n_D	stems of classes 7/8
	n_E	stems of classes 9/10

- We assume the nominal structure in (9) and follow much of the literature in assuming that Number is universally projected above n .



- DM-style VI rules account for two facts:
 - They serve as licensing conditions for roots; the absence of certain licensing VI rules accounts for the absence of illicit stem/gender combinations.³ For Swahili:

- (10)
- | | |
|----|---|
| a. | $\sqrt{\text{PERSON}} \rightarrow \text{-tu} / n_A$ |
| b. | $\sqrt{\text{TREE}} \rightarrow \text{-ti} / n_B$ |

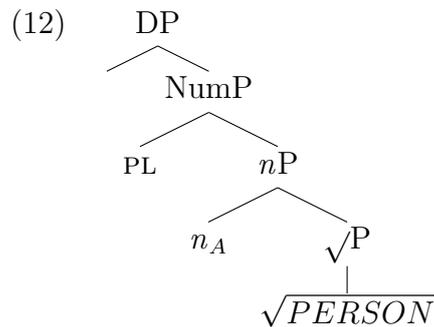
- They specify the spell-out of n as noun class prefixes in specified contexts. For Swahili:

- (11) Vocabulary Insertion Rules of Noun Class Prefix
- | | |
|----|--|
| a. | $n_A \rightarrow \text{m-}$ (Class 1) |
| b. | $n_A \rightarrow \text{wa-} / \text{- PL}$ (Class 2) |

³There are many stems that are not restricted to a single noun class, resulting in different meanings. This suggests some roots are licensed in the presence of more than one flavor of n :

- | | | |
|-----|----|---|
| (i) | a. | chungwa ‘orange, Class 5’ (gender C) |
| | | ma-chungwa ‘oranges, Class 6’ |
| | b. | m-chungwa ‘orange tree, Class 3’ (gender B) |
| | | mi-chungwa ‘orange trees, Class 4’ |

- Putting this together we get *wa-tu* ‘people’ from the tree in (12) and the VI rules from (10a) and (11b):



Looking ahead:

- In the DM literature, *n* can merge with a root to form a noun (a *root-derived* nominal) but it can also merge with a phrase not headed by a root (a *phrase-derived* nominal) (Marantz (2001), Alexiadou (2001), Arad (2003), Borer (2005), and many others).
- “If *n* has a gender feature when it combines with roots, there is no *a priori* reason that it could not carry a gender feature when it combines with phrases” (Kramer 2015:186).
- Expectation: Bantu gender plays a role in phrase-derived nominals, deverbal (nominalizations) as well as denominal (diminutives, augmentatives, locatives).

2 Deverbal nouns: *n* as a nominalizer

- A consequence of Kramer (2015): all nominalizations of a particular category have the same gender, because they are derived by the same flavor of *n*.
- This is seen in Romanian action/state nominals (also known as infinitives), which are always feminine (Iordachioaia and Soare (2008), Alexiadou et al. (2010)), but also in Bantu languages: infinitives are all in class 15 and function as nouns in triggering verb agreement (14):⁴

- (13) *Luganda*
- n-a-lab-a
1SM-PST-see-FV
'I saw.'
 - o-ku-(mu-)lab-a
AUG-15-(1OM)see-FV
'to see (him/her)'

⁴In languages where Class 15 is not used, there is still a single dedicated noun class marker used for infinitives (in the known cases, it is Class 5, as in Kinande (Patricia Schneider-Zioga, p.c.)).

Swahili

- (14) **Kw**-enda hu-ko **ku**-li-ni-saidia ku-wa Rais.
 15-go DEM-17 15SM-PST-1SG.OM-help 15-be 1.president
 ‘To go/going there helped me to become president.’

- This suggests we need to add a ‘flavor’ of n to our set for Bantu languages:

- (15) n_{inf} | takes a verbal stem and returns an action/state nominal

- Evidence that this n_{inf} merges with a verbal phrase of some sort, not just a root:

- The possibility of the object marker in (14b)
- Infinitives can also contain negation (Setswana examples from Creissels and Godard (2005))...

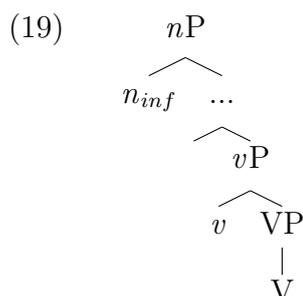
- (16) a. υ -lím-á
 S3:1-plough-FIN
 ‘(s)he ploughs / is ploughing’
 b. $\chi\upsilon$ -lím-à
 15-plough-FIN
 ‘to plough’

- (17) a. $\chi\grave{a}$ -á-lím-i
 NEG-S3:1-plough-FIN
 ‘(s)he does not plough / is not ploughing’
 b. $\chi\upsilon$ - $s\grave{a}$ -lím-à
 15-NEG-plough-FIN
 ‘not to plough’

- ... and modal morphology (Setswana examples from Creissels and Godard (2005)).

- (18) a. υ -**ká**-lím-á
 S3:1-POT-plough-FIN
 ‘(s)he can/may plough’
 b. $\chi\upsilon$ -**ká**-lím-à
 15-POT-plough-FIN
 ‘to be able to plough’

- We therefore posit that the structure of infinitives in Bantu languages is as in (19), where n_{inf} is added to an initially verbal projection.



- This verbal projection can be as small as a *vP*, assuming object markers to reflect ϕ features on *v* (Iorio 2014, Van der Wal 2015, a.o.)...
 - ... or somewhat larger, including higher inflectional heads like negation and mood (but not T).
- Infinitives and other deverbal nominals (see Appendix 6) in Bantu thus carry gender features, in line with the analysis of gender on *n*.

3 Denominal nouns: diminutives and augmentatives

- In addition to deverbal nouns, denominal nouns can also be formed via *n* merging with an *nP*.
- This has been proposed as an analysis for diminutives in languages such as German and Russian (Wiltschko and Steriopolo (2007), among others).
- We argue for the same *n* analysis for diminutives and augmentatives in Bantu languages, arguing that variation is in the spell-out rather than the structure.
- Pattern I: We see transparent stacking of nominal morphology in some Bantu languages in the formation of diminutives and augmentatives, as in Shona below (20).
- A diminutive interpretation of a noun can be obtained by prefixing an additional class marker onto an already well-formed noun, i.e. one that already has its usual noun class prefix. The most widespread strategy for deriving diminutives is to use Class 12/13 (gender G), but this is language-specific (Gibson et al. (2017)).

(20) *Shona* (Déchaine et al. 2014:35)

- a. mu-kómáná
1-boy
'boy'
- b. **va**-kómáná
2-boy
'boys'
- c. **ka-mu**-kómáná
12-1-boy
'tiny boy'
- d. **tu-va**-kómáná
13-2-boy
'tiny boys'

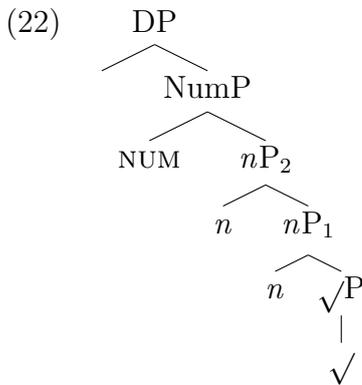
- Augmentatives are formed in a similar fashion, most commonly with Class 7/8 (Gender D) (Gibson et al. (2017)).

(21) *Nsenga* (Simango 2012:178)

- a. **mu**-nda
3-garden
'garden'

- b. **mi**-nda
4-garden
'gardens'
- c. **chi-mu**-nda
7-3-garden
'big garden'
- d. **vi-mi**-nda
8-4-garden
'big gardens'

- Based on the analysis above, we argue that the structure of Bantu diminutives and augmentatives is the following, where the higher n corresponds to the diminutive/augmentative prefix:



- Such stacking of multiple n s can be seen crosslinguistically, for instance in English nouns like *father-hood* and *owner-ship*, Italian *pizz-eria*, and German *Lehr-er-in* 'female teacher' (for which Kramer proposes the structure in (22)).
- In these derived nouns "the highest gender wins" (see Kramer), i.e. agreement with DP-external elements (the verb) can only be determined by the highest gender feature, which follows directly from minimality.
- The gender of the highest n (corresponding to the outermost class prefix) percolates to DP, where it is accessible to external probes, allowing for agreement with the verb.

(23) *Shona (Déchaine et al. (2014), adapted)*

- a. *chì-mù-kómáná à-nò-fámbá
7-1-boy 1SM-HAB-walk
Intended: '(The) slim boy walks.'
- b. chì-mù-kómáná **chì**-nò-fámbá
7-1-boy 7SM-HAB-walk
'(The) slim boy walks.'

- Note that the denominal structure only features **one Number projection**, accounting for the fact that the lower and higher n have the same value for number, e.g. gender D-B combination can be noun classes 7-3 (singular) or 8-4 (plural) for the stacked augmentatives but not 7-4 or 8-3.

- We assume Number to be privative: singular is the absence of plural (Nevins (2011)). For our VI rules, this means that singular is the default or contextless spell-out, whereas plural is conditioned.
- Furthermore, we assume that spell-out can be sensitive not just to adjacent NumP but to any nearest NumP, as in (24) (see Moskal (2015), Moskal and Smith (2016), and papers in Kastner and Moskal (2018) for sensitivity to non-adjacent heads):

(24) Vocabulary Insertion Rules for stacking diminutives

- $n_G \rightarrow \text{ka-}$ (Class 12)
- $n_A \rightarrow \text{mu-}$ (Class 1)
- $n_G \rightarrow \text{tu- / ...PL}$ (Class 13)
- $n_A \rightarrow \text{va- / ...PL}$ (Class 2)

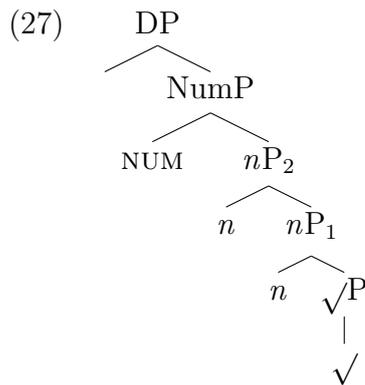
- (25)
- ka-mu-kómáná
12-1-boy
'tiny boy'
 - tu-va-kómáná
13-2-boy
'tiny boys'

- We can thus account for the derivation of stacking diminutives.
- Pattern II: Apart from the 'stacking' languages like Shona, there are also languages in which diminutives are formed by 'non-stacking' prefixes:

(26) *Chindamba* (Edelsten and Lijongwa 2010:36-38)

- li-piki
5-tree
- ma-piki
6-tree
- ka-piki
12-tree
'small tree'
- tu-piki
13-trees
'small trees'

- Diminutives in these languages still have the same structure, that is, the variation between stacking and non-stacking is not due to nP vs root complement of diminutive n :



- We propose that the parametric difference between stacking and non-stacking diminutives should be captured in VI rules: non-stacking languages include a VI rule whereby n is spelled out as null in the context of another n .

(28) Vocabulary Insertion Rules for non-stacking diminutives

- $n_G \rightarrow \text{ka-}$ (Class 12)
- $n_C \rightarrow \text{li-}$ (Class 5)
- $n_G \rightarrow \text{tu-} / \dots\text{PL}$ (Class 13)
- $n_C \rightarrow \text{ma-} / \dots\text{PL}$ (Class 6)
- $n \rightarrow \emptyset / n$

- A strong argument that the variation in stacking vs non-stacking is in the VI rules – and *not* in the structure – is the mixed system in languages like Rangi: some noun classes form non-stacking diminutives as in (29a), and other classes stacking, as in (29b):

		mw-aana ‘child, 1’	>	ka-ana ‘small child, 12’
		m̥-hiinja ‘girl, 1’	>	ka-hiinja ‘small girl, 12’
(29)	a.	i-baanda ‘hut, 5’	>	ka-baanda ‘small hut, 12’
		n-joka ‘snake, 5’	>	ka-joka ‘small snake, 12’
		nyenyeeri ‘star, 9’	>	ka-nyenyeeri ‘small star, 12’
		m̥-ti ‘tree, 3’	>	ka-m̥-ti ‘small tree, 12’
		kɪ-nt̥ ‘thing, 7’	>	ka-kɪ-nt̥ ‘small thing, 12’
	b.	ʊ-loongo ‘lie, 11’	>	ka-ʊ-loongo ‘small lie, 12’
		kʊ-lʊ ‘foot, 15’	>	ka-kʊ-lʊ ‘small foot, 12’

- In fact, since there are no syntactic correlates of the morphological difference, the (gender-specific) VI rules are the most attractive location to posit this variation, as in (30).

(30) Vocabulary Insertion Rules for mixed diminutives

- $n_A \rightarrow \text{m̥-}$ (Class 1)
- $n_A \rightarrow \emptyset / n$
- $n_D \rightarrow \text{kɪ-}$ (Class 7)
- $n_G \rightarrow \text{ka-}$ (Class 12)

- The interpretation forms another argument to assume a uniform n - n -Num structure for diminutives and locate variation in the VI rules: nouns inherent to class 12 are not necessarily small, but derived nouns do have a predictable diminutive meaning.

(31) *Luganda (Judith Nakayiza, p.c.)*

- a. aka-tale ‘market, cl.12’
aka-saale ‘arrow, cl.12’
- b. aka-solo ‘small animal, cl.12’ (cf. eci-solo ‘animal, cl.7’)
aka-sajja ‘small man, cl.12’ (cf. omu-sajja ‘man, cl.1’)

- We can think of this as follows: the root and the first n P are the domain for idiomatic interpretation (cf. Marantz (1996)); a secondly merged n will contribute predictable meaning (diminutive).
- This is captured if diminutives (and augmentatives) have the same structure across the board, regardless of their non-stacking or stacking spell-out.

Interim conclusion:

- At this point we have seen that the n analysis of gender can be successfully applied to root-derived nominals in Bantu languages, as well as to deverbal nouns (infinitives) and denominal nouns (diminutives and augmentatives).
- The variation in diminutives is argued to be located in the VI rules rather than in the underlying structure.

4 A special kind of denominal noun: Bantu locatives

- Locatives are part of the noun class system (typically noun classes 16, 17, and 18):

(32) *Bemba (Marten 2012:433)*

- a. **pa**-n-gánda
16-9-house
‘at the house’
- b. **kú**-n-gánda
17-9-house
‘to the house’
- c. **mu**-n-gánda
18-9-house
‘in the house’

- In the majority of Bantu languages, locatives function as DPs, not PPs. This can be seen in their ability to trigger subject and object marking (see Marten (2010) for full discussion).

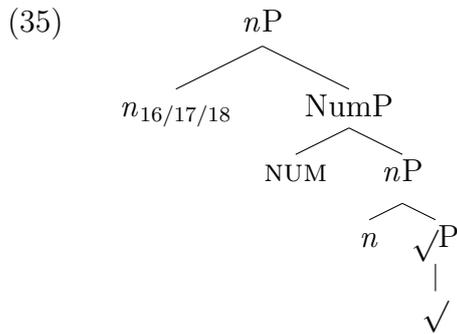
(33) *Chichewa (Ron Simango p.c. and (Bresnan 1991:58))*

- a. **Mu**-nyumba **mu**-na-yera.
18-9.house 18SM-PST-white
'Inside the house is clean.'
- b. Ndí-ma-**ku**-kóndá **ku** San José.
1SG.SM-PRES.HAB-17OM-love 17 San Jose
'I like (it) (in) San José.'

- As before, we posit three new flavors of n for our inventory:

(34) n_{loc16} | forms locative nouns, interpretation "at"
 n_{loc17} | forms locative nouns, interpretation "to"
 n_{loc18} | forms locative nouns, interpretation "in"

- Locatives in languages like Bemba and Chichewa thus have the structure in (35), where the lower n spells out as the inner prefix, and the higher $n_{16/17/18}$ as the locative prefix:



4.1 Variation: No prefix but suffix

- In some languages locatives are marked not by a prefix but by the suffix $-(i)ni$, especially in Bantu zones E and (south) G (Grégoire (1975)).

(36) *Gikuyu (Mugane 1997:33)*

- a. mũ-twe
3-head
'a/the head'
- b. mũ-twe**ĩ**
3-head-LOC
'by/on the head'
- c. ma-nyũmba
6-9.house
'houses (collective)'
- d. ma-nyũmba-**ĩ**
6-9.house-LOC
'by/on/in the houses (collective)'

- Crucially, these locatives do still show evidence for the same noun classes (the three types of n_{loc}): we always see agreement in locative noun class 16, 17, 18 on verbs, and concord on nominal modifiers:

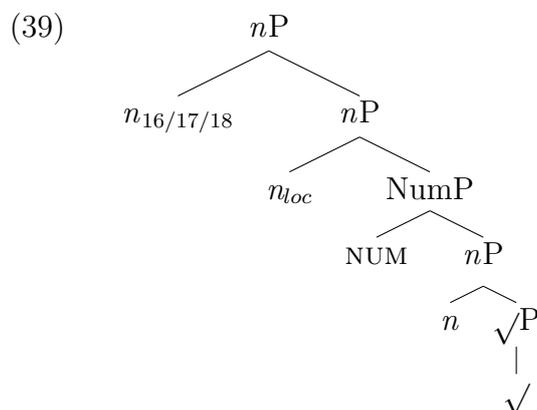
- (37) *Swahili (Carstens 1997:402)*
- nyumba-ni **p**-angu **pa**-zuri
9.house-LOC 16-my 16-good
'in/at my good house'
 - nyumba-ni **kw**-angu **ku**-zuri
9.house-LOC 17-my 17-good
'in/at my good house'
 - nyumba-ni **mw**-angu **m**-zuri
9.house-LOC 18-my 18-good
'in/at my good house'

- (38) Nyumba-ni **pa-/ku-/m**-na watu wengi.
9.house-LOC 16SM/17SM/18SM-with 2.people 2.many
'In/at the house are many people.'

- This suggests two possibilities for the analysis of locatives with $-(i)ni$:
 1. Either the structure is the same as in (35), but $n_{16/17/18}$ are all spelled out as $-(i)ni$;
 2. Or there is structural variation where $-(i)ni$ represents an additional head, $n_{16/17/18}$ being silent (i.e. the VI rules dictate that it will not be overtly pronounced).
- We will argue for option 2.

4.2 What is $-ni$?

- We propose a **stacked- n analysis** for locatives marked by $-ni$, as in (39):
 - The lower n derives a **locative noun with no further specification**.
 - The higher n provides the **interpretable gender features** of locative 'on, near' (class 16), 'at, to' (class 17), or 'in' (class 18).



- Evidence for this structure (1):

- Languages in which locative nouns take the suffix $-(i)ni$ may have a class of inherently/semantically locative nouns that do not need the $-(i)ni$ marker but show locative behavior otherwise.⁵

(40) *Kivunjo-Chaga (Moshi 1995:131)*

- a. **Mesa-nyi** ha-wozre shitapu na ma-karitasi.
9.table-LOC 16SM-have 8.books and 6-papers
'On the table, there are books and papers.'
- b. **Sangazra** ha/ku-wozre soko na malruwu.
9.market 16SM/SM-have 9.beans and 6.bananas
lit. 'At the market has beans and bananas.'

- The existence of such (semantically as well as functionally) locative nouns without $-(i)ni$ suggests that the function of the suffix is merely to derive an underspecified locative noun.

- Evidence for this structure (2):

- There are languages in which locatives have both the noun class prefix and the suffix.
- In Makhuwa and Cwabo, the prefix is obligatory, and the suffix is omitted if the noun has a locative meaning inherently:

(41) *Cwabo (Guerois 2014:170-171)*

- a. Oo-mótt-él-a **mu**-má-ánjé-**ní** kíbííí.
1SM.PFV.DJ-fall-APPL-FV 18-6-water-LOC IDEO
'She fell into the water "splash!"'
- b. Rāpáási oo-vény' **óo**-kobélâ...
1a.boy 1SM.PFV.DJ-leave 17-9a.bank
'The boy left the river bank...'

- The existence of languages where both pre- and suffix are visible suggest that the two must be separated in the structure.

- We thus see the following parametric variation in Bantu locatives:

- CROSS-LINGUISTIC: Presence vs. absence of n_{loc}
(Are locatives (ever) marked by $-(i)ni$?)
- CROSS-LINGUISTIC: Null spell-out of $n_{16/17/18}$
(Are locatives marked by a prefix?)
- LANGUAGE-INTERNAL: Null spell-out of n_{loc}
(Are locatives always marked by $-(i)ni$?)

	$n_{16/17/18}$ overt	$n_{16/17/18}$ null
n_{loc} absent	Chichewa pa-nyanja	(unlearnable?)
n_{loc} overt	Cwabo o-mabasa-ni	Swahili nyumba-ni
n_{loc} null	Cwabo oo-kobela	Chaga sangazra

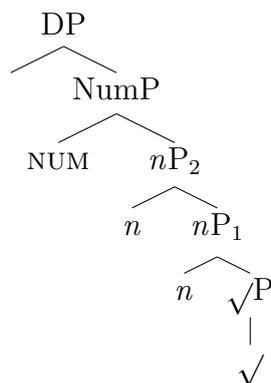
⁵A crosslinguistic note: see Myler (2013) on *come the pub*

- Further variation is found in the status of locatives as DP or PP (Marten (2010)), and the complement that n_{loc} takes (Fuchs and vdWal in preparation).

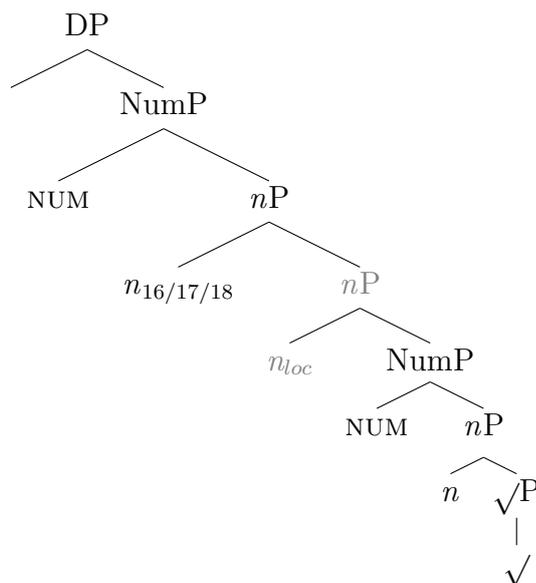
5 Differences between locatives and diminutives

- We proposed two different structures for diminutives and locatives:

(42) Bantu diminutives



(43) Bantu locatives



- The crucial difference is the presence of NumP above the innermost n .
- This explains two differences between diminutives and locatives that hold across Bantu:
 1. Diminutives can be stacking or non-stacking, whereas locatives are always stacking.
 2. Locatives can show alternative concord, but diminutives do not.
- The absence of non-stacking locatives is explained as follows:
 - n_{loc} always selects a NumP complement.
 - Innermost n will therefore never be adjacent to another n .

- So even if the language has a VI rule for null-spell out of n in the context of another n for diminutives, in locatives it will never trigger null spell out.
- As for the second property, modifiers of locatives may exhibit concord with either the inner noun class (innermost n) or the outer noun class (top n):

- (44) *Karanga-Shona* (Myers 1987:104)
- pa-mu-shá **apo** p-ósé p-a-ká-chén-a
16-3-home 16.that 16-all 16-white
'at that whole white home'
 - pa-mu-shá **uyo** p-ósé p-a-ká-chén-a
16-3-home 3.that 16-all 16-white
'at that whole white home'
 - pa-mu-shá **uyo** w-ósé p-a-ká-chén-a
16-3-home 3.that 3-all 16-white
'at that whole white home'
 - *pa-mu-shá **apo** w-ósé p-a-ká-chén-a
16-3-home 16.that 3-all 16-white
'at that whole white home'

- Diminutives and augmentatives do not allow alternative concord:

- (45) *Shona*
- mu-suma **mu**-refu
3-tree 3-tall
'tall suma tree'
 - zi-mu-suma **zi**-refu
21-3-tree 21-tall
'tall big suma tree'
 - *zi-mu-suma **mu**-refu
21-3-tree 3-tall
intended: 'tall big suma tree'

- If modifiers attach to NumP, then diminutives have one attachment site, but locatives two, explaining the absence of alternative concord in diminutives and its presence in locatives.⁶
- We speculate that NumP is the projection responsible for **individuation** (see e.g. Harley and Ritter (2002)): the inner and outer n refer to the same individual for diminutives (we now just know it's a small individual), but this is different for locatives, which refer to the entity and the location (say, a table and the location on the table).
- Suggestive evidence comes from non-diminutive nominalizations in Shona: these have two points of individuation, therefore two NumPs, and these do allow alternative concord:

⁶This also explains that fact that modifiers never show concord with the intermediate n_{loc} .

- (46) chi-hw-aná u-díki
 7-14-child 14-little
 ‘the ways of small children’ (Fortune 1985: 93, via (Myers 1987:102))
- (47) a. sá-dunhu uyu
 1a-5-district DEM.1
 ‘this district head’
 b. sá-dunhu iri
 1a-5.district DEM.5
 ‘this head of this district’ (Myers 1987: 105)

6 Conclusions & Implications

- In applying the n analysis of gender to Bantu languages and exploring its explanatory power, we found that the proposal provides a toolbox for analyzing noun classes as well as derived nominals such as nominalizations, diminutives, and locatives.
- We found evidence for positing multiple n in the derivation of diminutives as well as locatives.
- A unified analysis of gender on n can also capture the variation found in Bantu nominal morphosyntax. Parametric variation is demonstrated to be located in the structure as well as in the spell out. Proposed parameters for cross-linguistic variation are:
 - null spell out of n when adjacent to another n : absent in stacking systems, present in non-stacking ones
 - null spell out of the higher $n_{16loc/17loc/18loc}$: present where locatives only have a suffix, absent when pre- and suffix possible.
 - NumP above the innermost n : absent for diminutives, present for locatives
 - a general n_{loc} : absent where locatives only have prefixes, present where locatives have *-ini*
 - the complement of $n_{16loc/17loc/18loc}$: NumP or DP (not presented here)
- There is a wealth of variation in Bantu DP structure, and many theoretical questions and predictions still to be investigated here...

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Appendix A: Productivity of nominalizations

- The same noun class markers used in root-derived nouns in Section 1 are also used to derived nominalizations that fit into the general semantics of each noun class.
- Mletshe (2017) illustrates the productivity of this nominalization process.

	class 1	class 3	class 5	class 7	class 8	class 9	class 11	class 14
<i>lamba</i> 'be hungry'	<i>umlambi</i> 'hungry person'	<i>umlambo</i> 'state of becoming hungry'	<i>ilamba</i> 'chronically hungry person'	<i>isilambi</i> 'severely hungry/poor person'	<i>izilambi</i> 'severely hungry/poor people'		<i>ulambo</i> 'hunger'	<i>ubulambo</i> 'quality of hunger'
<i>godola</i> 'shiver'	<i>umgodoli</i> 'shivering person'			<i>isigodoli</i> 'extremely shivering person'	<i>izigodoli</i> 'extremely shivering people'	<i>ingodoli</i> 'expert shiverer'		
<i>khuthala</i> 'be diligent'	<i>umkhuthali</i> 'diligent person'			<i>isikhuthali</i> 'extremely diligent person'	<i>izikhuthali</i> 'extremely diligent people'	<i>inkuthalo</i> 'act of being diligent'		
<i>tyeba</i> 'be fat'			<i>ityeba</i> 'rich person'	<i>isityebi</i> 'extremely rich person'	<i>izityebi</i> 'extremely rich people'			
<i>bhitya</i> 'be thin'			<i>ibhityo</i> 'thin person'					
<i>luphala</i> 'be old'	<i>umluphali</i> 'old person'		<i>iluphala</i> 'old person'	<i>isiluphali</i> 'old person'	<i>iziluphali</i> 'old people'			
<i>bola</i> 'rot'	<i>umboli</i> 'rotten person'			<i>isiboli</i> 'extremely rotten person'	<i>iziboli</i> 'extremely rotten people'		<i>ubolo</i> 'state of rot'	<i>ububolo</i> 'quality of rot'
<i>phakama</i> 'rise'	<i>umphakami</i> 'conceited person'			<i>isiphakami</i> 'extremely conceited person'	<i>iziphakami</i> 'extremely conceited people'	<i>impakamo</i> 'act of being conceited'	<i>uphakamo</i> 'state of being conceited'	
<i>thula</i> 'quiet'	<i>umthuli</i> 'quiet person'			<i>isithuli</i> 'extremely quiet person'	<i>izithuli</i> 'extremely quiet people'	<i>intulo</i> 'act of being quiet'	<i>uthulo</i> 'state of being quiet'	

Appendix B: Evidence for NumP

- To motivate the existence of a Number Projection (NumP), it would be desirable to have evidence that NUM is sometimes spelled out independently of gender.
- Consider how the plural augmentative is formed in (48b) from (48a):

(48) *Shona, Déchaine et al. (2014)*

- a. **zi**-chi-kwepá
21-7-pipe
'big pipe'
- b. **ma-zi-zvi**-kwepá
6-21-8-pipe
'big pipes'

- In Shona, like in many Bantu languages, *ma-* (Class 6) functions as a default plural marker, suggesting that when the plural number feature is not reflected in the regular class prefix, NUM is spelled out independently as the default plural morpheme.
- We take this to be evidence that NUM heads its own projection in the syntax.