

Final Vowel Loss in Lower Kasai Bantu (DRC) as a Contact-Induced Change

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Abstract

In this article, we present a qualitative and quantitative comparative account of Final Vowel Loss (FVL) in the Bantu languages of the Lower Kasai region of the Democratic Republic of the Congo. We argue that this diachronic sound shift rose relatively late in Bantu language history as a contact-induced change and affected adjacent West-Coastal and Central-Western Bantu languages belonging to different phylogenetic clusters. We account for its emergence and spread by resorting to two successive processes of language contact: (1) substrate influence from extinct hunter-gatherer languages in the center of innovation consisting of Bantu B80 languages, and (2) dialectal diffusion towards certain peripheral Bantu B70, C80, H40 and L10 languages.

Keywords

final vowel loss – West-Coastal Bantu – Central-Western Bantu – dialectal diffusion
– substrate influence

1 Introduction

Final Vowel Loss (FVL) has been observed in different parts of the northwestern Bantu domain (cf. Guthrie, 1953; 1967; Hyman, 2019: 130), but its origins and development have not been studied in any systematic way. This article is a first attempt to systematically analyze FVL as a diachronic sound change in a Bantu-speaking region where it is known to be prolific, i.e., the Lower Kasai region of the Democratic Republic of the Congo (DRC) (Daeleman, 1977; Rottland, 1977). An in-depth study of this relatively uncommon Bantu feature within this specific territory is not only desirable from a purely linguistic point of view, but also from a broader cultural historical perspective. In fact, this peculiar phonological feature has drawn the attention of historians such as Vansina (1973–1974: 336–337; 1974) and Hoover (1978: 58–62) who take it as indicative of regional exchange networks and population dynamics in pre-colonial times. However, in order to establish prehistoric (language) contact based on its linguistic effects (cf. Ross, 2003; 2013; Thomason, 2008), it is crucial to have a profound historical linguistic understanding of the potential contact phenomenon in question. The main objectives of this article are first to present the results of a thorough diachronic analysis of FVL in the Lower Kasai region and then to consider the possible socio-cultural historical processes that may have led to its emergence and spread. In Section 2, we discuss the defining features of FVL in the Lower Kasai region. In Section 3, we delimit more specifically the geographic distribution of the phenomenon and consider its time depth with regard to the phylogeny of the Bantu language family. In Section 4, we assess the relative chronology of FVL with regard to other common sound changes in the Lower Kasai region. In Section 5, we present the results of a quantitative study of FVL in order to evaluate its historical impact on the lexicon of the languages concerned. In Section 6, we elaborate on the different historical processes that may have triggered its emergence and diffusion as a contact-induced change. Conclusions are in Section 7.

Before starting the discussion, we present in (1) the key languages considered here along with their alphanumeric code following the referential classification of the Bantu languages (Guthrie, 1971; Maho, 2009; Pacchiarotti et al., 2019) as well as the sources from which we extracted data for this comparative research.

(1) The main languages considered in this study

| | |
|-----------------------------|--|
| Ngungwel B72a | (Ruth Raharamanintsoa p.c.) ¹ |
| Boma Yumu B80z ² | (Burssens, 1999; Koni Muluwa and Bostoen, 2015) |
| Yans B85 ³ | (Swartenbroeckx, 1948; Mufwene, 1973; Rottland, 1977; Nguma-Nanzioke, 1983; Koni Muluwa and Bostoen, 2015) |
| Nsong B85d | (Dibata Mimpya, 1979; Koni Muluwa, 2015; Koni Muluwa and Bostoen, 2015) |
| Mpur B85e | (Mbwetete, 1984; Koni Muluwa and Bostoen, 2015) |
| Nsambaan B85F | (Koni Muluwa, 2014; Koni Muluwa and Bostoen, 2015) |
| Ngwi B861 | (own fieldwork) |
| Lwel B862 | (Khang Levy, 1979; Koni Muluwa and Bostoen, 2015) |
| Mpiin B863 | (Koni Muluwa and Bostoen, 2015) |
| Ngong B864 | (Koni Muluwa and Bostoen, 2015) |
| Nzadi B865 | (Crane et al., 2011; Koni Muluwa and Bostoen, 2015) |
| Ding B86 | (Kitoko Mufanga, 1978; Ebalantshim Masuwan, 1980; Koni Muluwa and Bostoen, 2015) |
| Mbuun B87 | (Mundeke, 1979; Koni Muluwa and Bostoen, 2015) |
| Bushong C83 | (Vansina, 1959; Daeleman, 1977) |
| Lele C84 | (Ngwamashi Kabandji-Bola Kamu, 1979; 1981) |
| Wonk C85 | (Tete Wer Sey, 1975; Koni Muluwa and Bostoen, 2015) |
| Hungan H42 | (Koni Muluwa and Bostoen, 2015) |
| Samba L12a | (Van Acker and Bostoen, 2020) |

2 Defining Features of FVL in the Lower Kasai Region

We define FVL in the Lower Kasai region as the historical loss of the word-final vowel segment in the reflexes of polysyllabic nominal and verbal stems found in the Bantu Lexical Reconstructions (BLR) 3 database (Bastin et al., 2002). These have the shapes *CVCV, where C stands for any consonant including nasals, and *CVNCV, where NC stands for a nasal consonant cluster (e.g., *mb,

1 We are extremely grateful to Ruth Raharimanantsoa from SIL Congo for generously sharing with us an unpublished comparative 600-wordlist of four Teke varieties (Ngungwel B72a, Tyee B73d, Eboo-Nzikou B74, and Kukwa B77a).

2 B80z indicates that Boma Yumu is a Bantu variety not inventoried in Guthrie (1971) or Maho (2009). We tentatively place it in Guthrie's B80 referential group (see Pacchiarotti et al., 2019: 165).

3 For languages like Yans B85, Ding B86 and Mbuun B87, we collapsed several distinct dialectal varieties under a single label. In the Appendix, we inconsistently distinguish only West Yans B85a (Swartenbroeckx, 1948) from East Yans B85b (Mufwene, 1973; Rottland, 1977; Nguma-Nanzioke, 1983; Koni Muluwa and Bostoen, 2015).

**nd, *ŋg*). Throughout this paper C₁, V₁, C₂, V₂ etc. mean e.g., in C(onsonant)₁ position within a C₁V₁C₂V₂ template. This diachronic sound change created closed syllables in final position. As such, FVL in this article includes neither vowel hiatus resolution strategies, e.g., final vowel deletion or epenthetic consonant insertion in vowel sequences across word boundaries that still end in a vowel after vowel deletion (cf. Meinhof and van Warmelo, 1932: 4), nor vowels which get deleted between consonants during fast speech, as reported by Harford and Malambe (2015) for high vowels in Swati S43, for example. Our definition of FVL does not cover phonologically conditioned instances of vowel deletion either, as in Sotho S30 languages and other groups allowing word-final nasals as a result of vowel deletion in /ni/ and /mu/ sequences (cf. Odden, 2015).

In (2), we illustrate FVL in the Lower Kasai region with data from the eastern variety of Ngwi (B861) spoken on the left bank of the Kasai River in the DRC (see Fig. 1). The protoforms in (2) are obtained from the BLR3 database (Bastin et al., 2002). The symbol “>” introduces the Ngwi synchronic reflex of a protoform. We indicate meaning of a reflex only if it differs from that of the protoform.

(2) Ngwi B861

| | | | |
|-------|----------|-----------------------------------|--|
| *CVCV | BLR 2410 | <i>*pàpá</i> ‘wing’ | > <i>ì-pǎβ</i> |
| | BLR 638 | <i>*còbó</i> ‘intestines’ | > <i>ò-sǎβ</i> |
| | BLR 394 | <i>*càbok-a</i> ‘cross (a river)’ | > <i>sǎβ</i> |
| | BLR 3252 | <i>*játò</i> ‘canoe’ | > <i>w-ár</i> |
| | BLR 5395 | <i>*gútù</i> ‘calabash’ | > <i>è-pfĩj</i> |
| | BLR 1674 | <i>*kádí</i> ‘woman, wife’ | > <i>ò-ŋkéàr</i> ‘woman’ |
| | BLR 604 | <i>*cíd-a</i> ‘finish’ | > <i>fír</i> |
| | BLR 897 | <i>*dèdù</i> ‘beard’ | > <i>è-léy</i> |
| | BLR 1798 | <i>*kímà</i> ‘monkey’ | > <i>Ø-ŋkâm</i> |
| | BLR 8211 | <i>*pámi</i> ‘man, male’ | > <i>ò-mpéàm</i> |
| | BLR 2895 | <i>*tímà</i> ‘heart’ | > <i>ò-tâm</i> |
| | BLR 2042 | <i>*kónì</i> ‘firewood’ | > <i>Ø-ŋkûp</i> |
| | BLR 2976 | <i>*tóná</i> ‘spot, speckle’ | > <i>ì-tôn</i> |
| | BLR 6108 | <i>*cikà</i> ‘girl, woman’ | > <i>ò-sǎβ</i> ‘girl, unmarried woman’ |
| | BLR 5455 | <i>*túká</i> ‘banana’ | > <i>è-tsûβ</i> ‘banana bunch’ |
| | BLR 9582 | <i>*dák-a</i> ‘walk’ | > <i>lǎβ</i> |
| | BLR 1248 | <i>*dúg-a</i> ‘paddle (v.)’ | > <i>lûβ</i> |
| | BLR 812 | <i>*dàgá</i> ‘promise’ | > <i>è-lǎβ</i> ‘engagement, promise’ |
| | BLR 1621 | <i>*jògó</i> ‘groundnut’ | > <i>è-yûβ</i> |

| | | |
|--------|---|--------------------------------------|
| | BLR 900 * <i>dègè</i> 'weaver bird' | > <i>è-lɛɛ</i> |
| | BLR 2569 * <i>pígò</i> 'kidney' | > <i>è-pɔɛ</i> 'liver' |
| | BLR 6196 * <i>tígóé</i> 'orphan' | > <i>è-tsɔɛ</i> |
| *CVNCV | BLR 265 * <i>bòmbó</i> 'forehead, nose' | > <i>Ø-mbwɔm</i> |
| | BLR 1054 * <i>dám-b-a</i> 'deceive, get lost' | > <i>dʒɪm</i> 'deceive' |
| | BLR 842 * <i>dám-b-a</i> 'prepare, cook' | > <i>lyâm</i> 'prepare' ⁴ |
| | BLR 1927 * <i>kómbó</i> 'broom' | > <i>ì-kɔm</i> |
| | BLR 1265 * <i>dùmbù</i> 'mouth' | > <i>ò-dzùm</i> |
| | BLR 4299 * <i>còmbò</i> 'bush pig' | > <i>Ø-ntfũm</i> 'wild boar' |
| | BLR 1706 * <i>kàndá</i> 'letter' | > <i>ò-ɲkɛán</i> |
| | BLR 1362 * <i>gènd-a</i> 'walk, travel, go' | > <i>kyɛn</i> 'go' |
| | BLR 1446 * <i>gòndé</i> 'crocodile' | > <i>Ø-ɲkwɔn</i> |
| | BLR 2048 * <i>kóndè</i> 'bean' | > <i>Ø-ɲkwɔn</i> |
| | BLR 1628 * <i>jòndò</i> 'hammer' | > <i>Ø-ndʒún</i> |
| | BLR 579 * <i>cíndí</i> 'squirrel' | > <i>è-fín</i> |
| | BLR 1583 * <i>jénjé</i> 'cricket' | > <i>Ø-ndʒén</i> |
| | BLR 8650 * <i>dàng-a</i> 'like, desire' | > <i>lɛány</i> 'love' |
| | BLR 1332 * <i>gàngà</i> 'medicine man' | > <i>ò-ɲgɛány</i> 'doctor' |
| | BLR 1845 * <i>kíngó</i> 'neck, nape, voice' | > <i>Ø-ɲkín</i> 'neck' |
| | BLR 1128 * <i>dòngà</i> 'river, valley' | > <i>Ø-ndwɔn</i> |
| | BLR 3001 * <i>tòngò</i> 'sleep' | > <i>Ø-lwɔn</i> |
| | BLR 5110 * <i>cóngó</i> 'tree, bark' | > <i>ò-fún</i> 'tree' |
| | BLR 4485 * <i>dòngì</i> 'face, forehead' | > <i>è-lún</i> |
| | BLR 3081 * <i>tóng-a</i> 'build' | > <i>tún</i> |

The data in (2) illustrate three features of FVL shared by almost all Lower Kasai languages that underwent the change (cf. Figure 1).

First, the loss of a word final vocalic segment is not phonologically and/or prosodically determined or constrained. As can be seen in (2), FVL occurred in all phonotactically suitable environments (i.e., historical CVCV and CVNCV shapes) regardless of the manner and place of articulation of C2 and of the quality of the reconstructed final vowel. In this sense, FVL in the Lower Kasai is different from FVL in some Bantu languages of Guthrie's (1971) zones A and C, such as Kwakum A91 where stems with more than one syllable lose their final /i/, /u/, /ɛ/ or /ɔ/ in non-prepausal position (Njantcho Kouagang, 2018: 33), and Nkundo C61 where final /i/ and /u/ get deleted if preceded by /m/, e.g.,

4 The diphthong /ya/ in the synchronic form *lyâm* suggests that the protoform giving rise to this reflex had a verbal suffix with a front vowel, perhaps PB applicative *-id, i.e., **dám-b-id* 'to prepare, to cook for someone'.

bònkòmú > *bònkòrn* ‘tree (species)’ (Grégoire, 2003: 353).⁵ It is also different in nature from synchronic phonological processes of final vowel reduction leading to word-final closed syllables (cf. Mous, 2003: 286, for Nen A44; Lovstrand, 2011: 21, for Nyokon A45) in that FVL in the Lower Kasai is not a synchronic process but a diachronic sound change.

Second, before disappearing, certain historical final vowels had assimilation effects on the first vowel of the root/stem. For instance, in Ngwi B861, Proto-Bantu (PB) **o* in V₂ caused the assimilation of a front V₁ to the feature [+back], e.g., **pígò* ‘kidney’ > *è-pɛ̃k*, **úgúé* ‘orphan’ > *è-tsɛ̃k*; see (2). These umlaut phenomena are extremely common in other Lower Kasai languages displaying FVL, such as Yans B85, Ding B86, Mpur B85e, Nsong B85d, Mbuun B87, Mpiin B863 and Ngong B864 (see Bostoen and Koni Muluwa, 2014, for a detailed account). In Ngwi, PB **i* in V₂ caused umlaut involving diphthongization in V₁ position (see Koni Muluwa and Bostoen 2012 for diphthongization in other Lower Kasai languages). This diphthong was apparently later reanalyzed as a sequence of two mid/low vowels e.g., **kádí* ‘woman, wife’ > *ò-ɲkyâr* > *ò-ɲkéâr* ‘woman’, **pámi* ‘man, male’ > *ò-mpéâm*. A historical **i* also palatalized a preceding alveolar nasal, e.g., **kóni* ‘firewood’ > *kúɲ*.

Third, as discussed in Rottland (1977) for Yans B85 and Mundeke (2011) for Mbuun B87, if the tone pattern of the reconstruction was either HL or LH, V₂ was lost but its tone was preserved and created a contour tone by interacting with the tone on V₁, cf. BLR 812 **dàgá* > *dàg’* > Ngwi *lǎk*. This process gave rise to (phonologically contrastive) contour tones in many of the Lower Kasai varieties that underwent FVL, such as Mpur B85e (Mbwetete, 1984), East Ding B86 (Mula, 1977), Ngwi B861 (own fieldwork), Lwel B862 (Khang Levy, 1979), Nzadi B865 (Crane et al., 2011), Bushong C83 (Daeleman, 1977), and Wonk C85 (Tete Wer Sey, 1975).⁶ It is likely that this phenomenon is found in several other languages that lost a final vowel, but a lack of basic phonological descriptions prevents us from drawing firm conclusions. As far as tonal outcome goes, the Lower Kasai languages thus have a tendency to maintain the tone of the lost

5 Grégoire (2003: 353) notes that Meeussen (1952) describes the same phenomenon in Ombo C76.

6 The Ngwi data in (2) is particularly telling in this regard. Most historical **LL* and **HH* noun roots became HL (or Falling when realized on a single, phonetically lengthened vowel) in Ngwi, e.g., BLR 1674 **kádí* ‘woman, wife’ > *ò-ɲkéâr* ‘woman’, BLR 897 **dédù* ‘beard’ > *è-léy*. These tone shifts are still visible on V₁ where they created a contour tone just like it happened with historical **HL* and **LH* roots whose tone patterns were preserved as such, e.g., BLR 2895 **tímà* ‘heart’ > *ò-tâm*, BLR 265 **bòmbó* ‘forehead, nose’ > *ò-ɲbwǎm*. These tonal innovations in Ngwi must have happened before final vowel loss, which is in line with our hypothesis (see Section 4) that final vowel loss must be a relatively late diachronic change.

final vowel or syllable as a feature of the root, often forming a tonal contour when it joined with the preceding root tone.⁷ In this respect, FVL in the Lower Kasai region resembles FVL in Grassfields Bantu (Watters, 2003: 236), as well as in some zone A languages, such as the Manenguba A15 languages (Hedinger, 2006), Mbene A43a (Guthrie, 1967: 56 and ff.), Basaá A43 (Heath, 2003: 257–260), Eton A71 (van de Velde, 2008: 96), Bulu A74, Fang A75 (Guthrie, 1967: 56 and ff.), and the A80 languages (Heath, 2003: 337; Cheucle, 2008; 2014).

While FVL targeted all *CVCV and *CVNCV polysyllabic stems in the Lower Kasai languages concerned, monosyllabic stems reconstructed as *CV, *CVV and *NCV underwent this change very irregularly as shown in (3)–(8). These data show that certain reconstructed monosyllabic stems almost never lose a final vowel, see (3) and (4), while others do lose it across (almost) all languages, see (5) and (6). There are also intermediate cases where the final vowel is lost in roughly half of the languages which have reflexes for that root, see (7) and (8). Note that in some cases, e.g., (5), an erstwhile noun class prefix was reanalyzed in individual languages as being part of the reconstructed *CV stem, making it into a CVCV shape.

(3) Reflexes of BLR 2881 *tí ‘tree, stick, medicine’

| | | | | | |
|------|-------------|------|-------------|------|------------|
| B85b | ò-té/mì-té | B862 | ɲà-tá/mà-tá | C84 | n-té/mì-té |
| B85d | mó-tì | B864 | mó-tì/mí-tì | C85 | n-té/mì-té |
| B85e | ú-tì/í-tì | B865 | ò-té | H42 | mù-tí |
| B85F | má-tì/mí-tì | B86 | mù-té/mì-té | L12a | mù-d/mí-d |
| B861 | è-tá | B87 | ò-té/è-té | | |

(4) Reflexes of BLR 3023 *tóè ‘head’

| | | | | | |
|------|---------|------|---------|------|-----------|
| B80z | mù-tfwé | B862 | ngà-tsá | C83 | n-tswéy |
| B85b | mò-tswé | B863 | mò-tswí | C85 | n-tswé |
| B85d | mó-tswì | B864 | mò-tswé | H42 | mù-twé |
| B85e | ù-ntswé | B865 | ò-tsó | L12a | mù-d/mí-d |
| B85F | mà-twé | B86 | mù-tswé | | |
| B861 | ò-té | B87 | ò-tswé | | |

7 A question that awaits further research is whether contour tones in the Lower Kasai area are hosted on one or two moras or, in other words, whether the loss of a final segment caused compensatory lengthening of the first vowel.

(5) Reflexes of BLR 781 **dá* 'village' (CL14 b0)

| | | | | | | | |
|------|----------------|------|----------------|------|--------------------|-----|------------|
| B85b | <i>bâ:l</i> | B85F | <i>Ø-bwáàl</i> | B864 | <i>Ø-búl</i> | C84 | <i>ból</i> |
| B85d | <i>Ø-bwáàl</i> | B862 | <i>ì-bǎl</i> | B87 | <i>Ø-bǒl/Ø-ból</i> | | |
| B85e | <i>búl</i> | B863 | <i>Ø-bwáàl</i> | C83 | <i>bò-l/mà-l</i> | | |

(6) Reflexes of BLR 3005 **ntò* 'person'

| | | | | | |
|------|---------------------|------|---------------------|------|--------------------|
| B80z | <i>mwù-r/ba-r</i> | B861 | <i>Ø-wûr/a-véar</i> | C83 | <i>mòò-t/bàà-t</i> |
| B85a | <i>mùù-r/bàà-r</i> | B862 | <i>ɲù-r/bàà-r</i> | C84 | <i>mò-tù/bà-tù</i> |
| B85d | <i>mù-nd/bà-nd</i> | B863 | <i>mú-nd/bá-nd</i> | C85 | <i>mòò-t/bàà-t</i> |
| B85e | <i>mbù-r/bàà-r</i> | B864 | <i>mùú-t/bá-t</i> | H42 | <i>mǔ-t/bǎ-t</i> |
| B85F | <i>mbùù-r/bàà-r</i> | B865 | <i>mùù-r/bàà-r</i> | L12a | <i>mú-d/bá-d</i> |
| B86 | <i>mùù-r/bàà-r</i> | B87 | <i>mùù-r/bàà-r</i> | | |

(7) Reflexes of BLR 584 **cí* 'inhabitant'

| | | | | | |
|------|--------------------|------|------------------|------|--------------------|
| B85d | <i>bú-s/bí-s</i> | B863 | <i>bí-s</i> | C85 | <i>n-sí</i> |
| B85e | <i>ú-nsí/ǎ-nsí</i> | B864 | <i>mú-f/bí-f</i> | H42 | <i>mu-fí/bi-fí</i> |
| B862 | <i>ɲǎ-sá</i> | B865 | <i>nsí</i> | L12a | <i>mú-sí</i> |

(8) Reflexes of BLR 1521 **gúá* 'salt'

| | | | | | |
|------|----------------------------|------|--------------|------|--------------|
| B80z | <i>mù-ngbá⁸</i> | B861 | <i>ò-kúá</i> | H42 | <i>mú-ɲ</i> |
| B85b | <i>mù-ngwá</i> | B865 | <i>ò-kpá</i> | L12a | <i>mú-ng</i> |
| B86 | <i>mù-ɲ</i> | B87 | <i>mú-ɲ</i> | | |

Verb roots/stems also deserve a special mention. As shown with Ngwi data in (2), verb stems (minimally in their infinitive form) consistently lost their final vowels in the languages under study. However, there is variation in the treatment of historical derivational verbal suffixes (see also Guthrie, 1967: 60). Depending on the language and on the verb root, some of these suffixes underwent phonological reduction, erosion, metathesis, and/or were the target of phonological mergers (cf. Guthrie, 1960; Rottland, 1970; Bostoen and Mundeke, 2011), as can be seen in (9) – (11).⁹

8 As is the case in several Central-Western Bantu languages of Guthrie's C30-40 groups spoken between the Ubangi and Congo Rivers (Bostoen and Donzo, 2013: 450–451), the sequence *kw* followed by a vowel is occasionally turned into a labial-velar stop in some languages belonging to Guthrie's B80 group.

9 Obviously not all verbal derivational suffixes undergo the same sound changes in one and the same variety. For instance, in Nzadi B865 **cón-ík* 'write +stative' > *ò-sònkà* 'write', **táng-ic* 'read +causative' > *ò-táɲsá* 'to teach', but **càk-ud* 'weed + reversive' > *ò-sàkùl* 'to clear ground'.

| | | | | | |
|---|--------------------------------------|------|-----------------|------|-----------------|
| (9) Reflexes of BLR 662 * <i>cóník</i> ‘draw a line, write’ | | | | | |
| B80z | ò- <i>sónikà</i> | B85e | ò- <i>són</i> | L12a | <i>sónìg</i> |
| B85b | ò- <i>sòn</i> | B865 | ò- <i>sònkà</i> | | |
| B85d | <i>sònìk</i> | B87 | ò- <i>sòn</i> | | |
| (10) Reflexes of BLR 8257 * <i>jánam</i> ‘dry, be spread out’ | | | | | |
| B85b | <i>kù-yáán</i> | B86 | <i>kù-yáŋ</i> | | |
| B85d | <i>kù-yáná</i> | B865 | ò- <i>yáŋ</i> | | |
| B85F | <i>kà-wáná</i> | B87 | <i>kà-wáná</i> | | |
| (11) Reflexes of BLR 394 * <i>càbòk</i> ‘cross river’ | | | | | |
| B80z | ó- <i>sàkàb</i> | B861 | <i>sǎβ</i> | C85 | <i>kù-sàp</i> |
| B85b | ó- <i>sàkàb</i> ~ ó- <i>sàbòk</i> | B862 | ò- <i>sàb</i> | H42 | <i>kù-sábák</i> |
| B85F | <i>kà-sàbà</i> | B864 | <i>kò-sábál</i> | L12a | <i>sábúg</i> |

3 Distribution of FVL inside and outside the Lower Kasai Region

Figure 1 shows the geographical distribution of the Lower Kasai languages displaying different degrees of FVL as defined in Section 2. The Bantu subgroups and their colors in Figure 1 correspond to the phylogenetic clades identified in Grollemund et al. (2015): North-Western Bantu (NWB), Central-Western Bantu (CWB), South-Western Bantu (SWB) and West-Western Bantu, to which we refer here as ‘West-Coastal Bantu’ (WCB) (in line with Vansina, 1995; Bastin et al., 1999; Bostoen et al., 2015; de Schryver et al., 2015; Bostoen and de Schryver, 2018a, b; Pacchiarotti et al., 2019). In order to show that the distribution of FVL in the Lower Kasai region is geographically constrained and absent in surrounding languages, we also plot on Fig. 1 Bantu languages spoken around the Lower Kasai region which do not lose final vowels.

As can be observed in Fig. 1, WCB varieties with FVL in the Lower Kasai region of the DRC are confined to the left bank of the Kasai River and the lands west and south of it, roughly between the cities of Bandundu and Ilebo (between 17.38, -3.31 and 20.58, -4.33), mostly in today’s Kwilu Province. Detached from that bunch of contiguous FVL languages, but still in the same macro-region, Ngungwel B72a is the only WCB language in the Republic of the Congo also displaying this sound change. Certain Teke varieties, such as Bwala B70y (Bollaert, 2019), Mosieno B76a (Bastin et al., 1999), Wuumu B78 (Bastin et al., 1999) and

Boma Nkuu B8ox (Nsuka Nkutsi, 1990), which are geographically midway between Ngungwel B72a and the Lower Kasai FVL cluster, sporadically manifest FVL, as far as the very scanty available sources (mostly wordlists) allow us to observe. Due to the paucity of the data, we do not include them in the case study in Section 5.¹⁰

The geographic concentration of FVL in the Lower Kasai region is all the more apparent if one considers that these languages are surrounded in all cardinal directions by languages not having undergone this change. To the west, FVL is absent from the rest of WCB, as it is from the remainder of CWB to the east. To the north, neither the NWB nor the CWB languages bordering WCB (to which most Lower Kasai FVL languages belong) attest the phenomenon. Final vowel devoicing has been reported in Leke C14, Zamba C322 (Grégoire, 2003: 353) and the B30 languages (van der Veen, 2003: 378), but without loss. Phonologically (un)conditioned FVL has been reported in several NWB languages, all considerably further north: A15 (Hedinger, 2006); A40: Basaá A43 (Janssens, 1982), Mbene A43a (Guthrie, 1967), Nen A44 (Janssens, 1993; Mous, 2003), Nyokon A45 (Lovestrand, 2011); A70: Eton A71 (van de Velde, 2008), Bulu A74 (Guthrie, 1967), Fang A75 (Guthrie, 1967; Medjo Mvé, 1997); A80 (Heath, 2003: 337; Cheucle, 2008; 2014); and Kwakum A91 (Njantcho Kouagang, 2018). Given the huge geographical distance separating these zone A languages from the Lower Kasai region, the most plausible assumption is to posit FVL as an independent development. To the south, phonologically unconditioned FVL is absent from the SWB languages immediately adjacent to the Lower Kasai region. It is only common in the SWB languages Kanyok L32 (Mukash Kalel, 1982) and Ruund L53 (Vincke, 1966; Hoover, 1978: 58–62; Nash, 1992). According to Hoover (1978: 59–61), there is some degree of FVL also in Kete L21 and in some varieties of Luba L31a there is a “marked deemphasis on final vowels”. Since these SWB languages are spoken several hundred kilometers to the southeast of the Lower Kasai languages, we assume that FVL arose there too as an independent development, parallel to languages which undergo the same phenomenon in the northwest.

¹⁰ We also note that Guthrie (1968: 103) reports the existence of a so-called “latent vowel” in the WCB language Nzebi B52 spoken in Gabon. He indicates this by means of parentheses around the vowel in question, e.g., *mēed(i)* ‘oil’. Guthrie argues that in Nzebi B52 and other languages of the area, there are at least two speech styles, which he calls “normal” and “deliberate”. Sentences pronounced in “normal” speech contain words without final vowels in his transcription, while sentences pronounced in “deliberate” speech contain words with final vowels. We do not know the robustness or extent of this phenomenon, but it is certainly not a case of diachronic FVL as defined in Section 2.

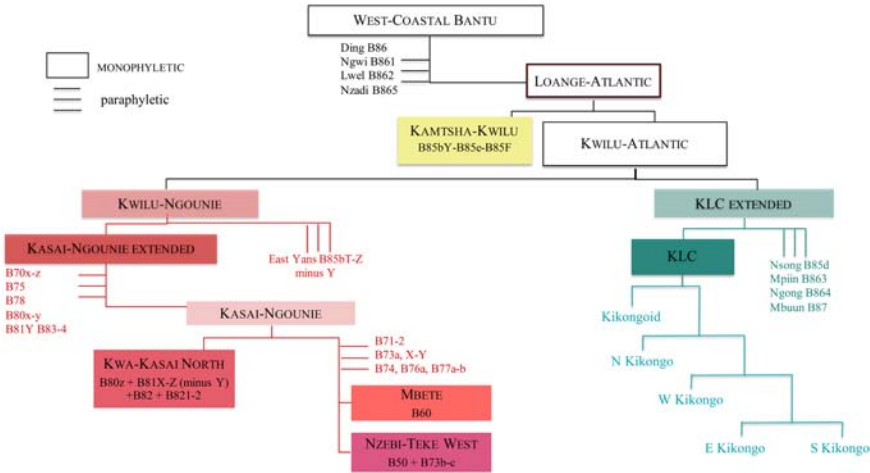


FIGURE 2 Internal lexicon-based phylogenetic classification of WCB (de Schryver et al., 2015; Pacchiarotti et al., 2019)

With regard to the phylogeny of the Bantu family (Grollemund et al., 2015), the Lower Kasai FVL languages belong to two distinct major clades, i.e., WCB and CWB. While the vast majority is part of WCB, three of them are CWB, i.e., Bushong C83, Lele C84 and Wonk C85. The rest of Guthrie’s C80 group, i.e., Dengese C81 (Goemaere, 1984) and Hendo C82 (Motingea Mangulu, 1990), as well as other CWB languages, i.e., Guthrie’s entire zone C and some zone D languages (cf. Grégoire, 2003), do not undergo FVL at all (see Section 2 for details). Within WCB, taking into account the phylogenies of de Schryver et al. (2015; for the Kikongo Language Cluster, henceforth KLC) and Pacchiarotti et al. (2019; for the entire WCB branch) summarized in Fig. 2, FVL is distributed unevenly across different subclades.

There is only one monophyletic group in which FVL occurs in all languages, i.e., Kamtsha-Kwilu, but it only consists of three varieties, i.e., Mpur B85e, Nsambaan B85F and one doculect of East Yans B85bY. Within the monophyletic Kwilu-Atlantic superclade, parallel to Kamtsha-Kwilu, FVL is attested in its two subclades, i.e., Kwilu-Ngounie and KLC Extended, but in a very patchy way. Only three Kwilu-Ngounie languages underwent it as a regular diachronic sound shift and they all belong to different subgroups within the subclade: Yans B85 (Kwilu-Ngounie ~ paraphyletic),¹¹ Boma Yumu B80z (Kwilu-Ngounie

11 In phylogeny, members of a clade belonging to a paraphyletic grade have no more recent common ancestor than the most recent common ancestor of the entire clade. This contrasts with members of a monophyletic group or subclade, which share a common ancestor that is more recent than the one at the origin of the entire clade.

> Kasai-Ngounie > Kwa-Kasai North) and Ngungwel B72a (Kwilu-Ngounie > Kasai-Ngounie ~ paraphyletic). Within the KLC Extended, FVL occurs in all paraphyletic languages at the top of the subclade, i.e., Nsong B85d, Mpiin B863, Ngong B864, Mbuun B87, and in only two languages of the KLC subgroup, i.e., Samba L12a and Hungan H42 (KLC Extended > KLC > Kikongoid). Finally, FVL is also attested in the first paraphyletic offshoots of the ancestral WCB node, i.e., Ding B86, Ngwi B861, Lwel B862, and Nzadi B865.

The uneven distribution of FVL across WCB subgroups suggests first that this is a relatively late innovation and second that it is rather areal than inherited. Apart from the very small Kamtsha-Kwilu subclade, it cannot be reconstructed back to the most recent common ancestor of any of the WCB subclades. Although varieties with FVL are scattered throughout the phylogenetic tree, in each of the branches where they are found, there are varieties which *never* lose their final vowels. Because it is unconceivable that languages from different WCB subclades would have independently reinserted the same ancestral final vowels, the reconstruction of FVL at some node of WCB is impossible, except maybe in Proto-Kamtsha-Kwilu. The fact that the languages sharing FVL not only belong to different WCB subgroups, but are also geographically contiguous is a further indication that this innovation is areal, i.e., contact-induced, rather than regularly inherited. Its presence in a small number of adjacent CWB languages only adds to this assumption.

In the following sections, we further substantiate these two claims, i.e., that FVL is a late innovation and that it is a contact-induced change. In Section 4, we consider the relative chronology of FVL with regard to other sound changes that characterize the Lower Kasai languages with FVL. In Section 5, we present a quantitative study of FVL in the languages concerned to better understand the specific kind of language contact scenario that could account for the current-day distribution of FVL in the Lower Kasai region.

4 Relative chronology of FVL in the Lower Kasai Region

In this section we consider the relative chronology of FVL with respect to other historical sound changes in the Lower Kasai area. There is evidence that FVL did not occur in noun and verb stems which underwent the intervocalic loss of a consonant or nasal consonant cluster. In other words, FVL did not target CVV-shaped roots which evolved out of historical *CVCV and *CVNCV, as shown in (12) with Ngwi data. Note that while intervocalic loss of PB **d* is a mostly regular sound change in Ngwi, the loss of an intervocalic PB **b* occurred only very sporadically. Similarly, while the loss of the merged Proto-WCB reflex **k* of PB

velar stops **k* and **g* in C2 is very common throughout WCB (cf. Pacchiarotti and Bostoen, 2020), the loss of Proto-WCB **k* in C2 in Ngwi occurs in a very limited number of words.

(12) Ngwi B861 (WCB, own fieldwork data)

| | | |
|--------------|--|---|
| <i>*CVCV</i> | BLR 5638 <i>*jìbù</i> ‘mushroom’ | > Ø- <i>vù</i> |
| | BLR 6882 <i>*jòbó</i> ‘civet cat’ | > Ø- <i>dzùó</i> |
| | BLR 7003 <i>*kódó</i> ‘snail’ | > Ø- <i>ηkúó</i> ‘snail, cowry’ ¹² |
| | BLR 1490 <i>*gòdò</i> ‘leg’ | > è- <i>kù</i> |
| | BLR 893 <i>*dédé</i> ‘white man’ | > ò- <i>ndié</i> |
| | BLR 1294 <i>*gádà</i> ‘nail’ | > è- <i>kíà</i> |
| | BLR 1662 <i>*kádà</i> ‘embers, charcoal’ | > ì- <i>kíà</i> |
| | BLR 1378 <i>*gìdì</i> ‘egg’ | > ì- <i>kí</i> |
| | BLR 3961 <i>*pùd</i> ‘dig’ | > <i>fíú</i> ‘plant, sow’ |
| | BLR 647 <i>*còká</i> ‘axe’ | > ì- <i>fíà</i> |
| | BLR 7413 <i>*cókì</i> ‘saliva’ | > à- <i>súi</i> |
| | BLR 1179 <i>*dók</i> ‘vomit’ | > <i>lúà</i> |
| | BLR 2642 <i>*pókò</i> ‘mouse’ | > Ø- <i>mfíù</i> |

As can be seen from the reflexes in (12), there is no evidence that CVV structures originating from **CVCV* structures further reduced to CV. Even in languages where this were the case, we would not consider evolutions such as CVV > CV as instances of FVL based on our definition, because this development does not create closed syllables in word-final position. In terms of seriation of change, FVL must have happened after the loss of intervocalic segments in Lower Kasai languages targeted by this phenomenon. Otherwise, we would not end up with the observed synchronic outcomes. For instance, if the reflexes of BLR892 **dédé* ‘white man’ or BLR2642 **pókò* ‘mouse’ had undergone first FVL and only afterwards the loss of C2, the chain of changes would not end up with the vowel sequences synchronically attested in Ngwi, e.g., we would have instead **dédé* > *déd* > *dé*; **pókò* > *fúk* > *fú* ~ *fù*. This chronology holds minimally for all WCB varieties which underwent FVL and the loss of a velar (cf. Pacchiarotti and Bostoen, 2020) or some other consonant in C2 position (see for instance Crane et al., 2011: 255–270 for Nzadi B865). Sources on the Lower Kasai CWB languages suggest that loss of C2 (including nasal consonant

¹² Although beyond the scope of this paper, preliminary evidence from vowel deletion processes at the NP level suggests that the two-vowel sequences in the reflexes in (12) should be treated as a sequence of two vowel phonemes and not as phonetically complex single units (i.e., diphthongs). Two vowel sequences are extremely common in Ngwi and in other so-called “Bantu languages of the Forest” (Grégoire, 2003: 352).

clusters) is not widespread in C83-C85 (cf. Vansina, 1959; Tete Wer Sey, 1975; Daeleman, 1977; Ngwamashi Kabandji-Bola Kamu, 1979).

The data in (13) illustrate *cV̥V̥* and *cvv* shapes resulting from historical **CVNcV* shapes in Ngungwel B72a. In WCB, the loss of PB nasal consonant clusters in C2 position, especially **ng* and irregularly **mb*, is widespread in several Teke varieties spoken in the Republic of the Congo; vowel nasalization only occurs in Ngungwel as the result of the loss of **mb*, **m* and sometimes **nd* (Hombert, 1986; 1987; Paulian, 1994; Raharimanantsoa, 2012a; 2016).¹³

(13) Ngungwel B72a (WCB, Ruth Raharimanantsoa, p.c.)

| | | |
|---------------|---|-----------------|
| <i>*CVNcV</i> | BLR 1719 <i>*káng</i> ‘fry, roast’ | > <i>káà</i> |
| | BLR 1450 <i>*gòngò</i> ‘back(bone)’ | > <i>gwò</i> |
| | BLR 739 <i>*cóngé</i> ‘moon, month’ | > <i>swí</i> |
| | BLR 242 <i>*bimbà</i> ‘corpse’ | > <i>è-bĩ</i> |
| | BLR 2761 <i>*támí</i> ‘sole, footprint’ | > <i>è-tá̃</i> |
| | BLR 3196 <i>*jàmbé</i> ‘God’ | > <i>ndzyá̃</i> |

In Ngungwel B72a, FVL did not target syllable shapes such as *cV̥V̥* and *cvv*, but only *CVCV* (see Appendix). This is additional evidence for the proposed seriation of intervocalic consonant (and nasal consonant cluster) loss followed by FVL.

In sum, the relative chronology of FVL with regard to other diachronic sound shifts in the Lower Kasai indicates that it happened comparatively late and that it only targeted final vowels of minimally disyllabic roots which did not lose their C2 intervocalically.

5 Quantitative FVL study in the Lower Kasai: Data and Methodology

In this section, we present the results of a quantitative study of lexical items targeted by FVL in each of the Lower Kasai languages displaying this phenomenon. These are in Table 1 where N/A means ‘does not apply’. For each language variety in our sample, we linked a varying number of synchronic lexemes (~100 to ~500) to reconstructions in the BLR3 database (Bastin et al., 2002).

13 Only PB **ng* gets lost in some WCB languages spoken in the DRC. These are Mfinu B83 and possibly other varieties spoken in the vast plateau northeast of Kinshasa, as well as all the languages belonging to the Kwa-Kasai north subgroup (Pacchiarotti et al., 2019), namely Tiene B81, Boma Yumu B80z, North Boma B82, Mpe B821 and Nunu B822. In virtually all other WCB languages outside of the Kikongo Language Cluster, PB nasal consonant clusters are simplified, e.g., **NC* > *N*. In Mpiin B863 (KLC extended), the nasal resulting from this simplification is also lost and creaky voice develops on the remaining vowels perhaps as a compensatory strategy, e.g., BLR1332 **gàngà* ‘medicine man’ > B863 *ngágá*.

TABLE 1 Percentages of FVL across lexemes in languages within the Lower Kasai region

| Variety | Branch | # of reflexes | CV(v) shapes | NC2 loss | C2 loss | others | # of targetable reflexes | % of reflexes without FVL |
|---------------|---------------------|---------------|-----------------|------------------|-------------------------|--------|-----------------------------|------------------------------|
| Ngungwel B72a | WCB_Kasai-Ngounie | 362 | 48 | 95 ¹⁴ | | 0 | 219 | 26/219 (11.9%) |
| Boma Y. B80z | WCB_Kwa-Kasai-North | 264 | 41 | 9 (*ng) | N/A | 8 | 206 | 45/206 (21.8%) |
| Yans B85 | WCB_Kwilu-Ngounie | 348 | 46 | N/A | N/A | 4 | 296 | 3/296 (1%) |
| Nsong B85d | WCB_KLC extended | 373 | 25 | N/A | 25 (*k,*g) | 0 | 323 | 1/323 (0.3%) |
| Mpur B85e | WCB_Kamtsha-Kwilu | 332 | 36 | N/A | 25 (*k,*g) | 2 | 269 | 4/269 (1.5%) |
| Nsambaan B85f | WCB_Kamtsha-Kwilu | 304 | 42 | N/A | 20 (*k,*g) | 2 | 240 | 6/240 (2.5%) |
| Ngwi B86i | WCB | 550 | 53 | N/A | 26 (*d,*c) | 1 | 470 | 17/470 (3.6%) |
| Lwel B862 | WCB | 385 | 40 | N/A | 37 (*k,*g,*c) | 0 | 308 | 9/308 (2.9%) |
| Mpiin B863 | WCB_KLC extended | 339 | 39 | N/A | 24 (*k,*g) | 1 | 275 | 3/275 (1.09%) |
| Ngong B864 | WCB_KLC extended | 393 | 38 | N/A | N/A | 1 | 354 | 9/354 (2.5%) |
| Nzadi B865 | WCB | 406 | 47 | N/A | 65 (*k,*g,*d, *b,*c) | 0 | 294 | 19/294 (6.4%) |
| Ding B86 | WCB | 397 | 50 | N/A | 43 (*k,*g) | 0 | 304 | 12/304 (3.9%) |
| Mbuun B87 | WCB_KLC extended | 384 | 45 | N/A | 35 (*k,*g) | 0 | 304 | 8/304 (2.6%) |
| Hungan H42 | WCB_KLC | 521 | 51 | N/A | N/A | 2 | 468 | 8/468 (1.7%) |
| Samba L12a | WCB_KLC | 435 | 28 | N/A | 1 (*p) | 0 | 406 | 61/406 (15%) |
| Bushong C83 | CW | 278 | 2 | N/A | 4 (*k,*g) | 0 | 272 | 0/272 (0%) |
| Lele C84 | CW | 113 | 6 | N/A | N/A | 0 | 107 | 54/107 (50.5%) |
| Wonk C85 | CW | 242 | 17 | N/A | N/A | 1 | 224 | 80/224 (35.7%) |

14 Consistent loss of *c, *l, *g, *ng in C2. Occasional loss of *m, *mb, *n, *nd, *b, *p and *d.

By linking reflexes to actual protoforms, we could rely on diachronic evidence to claim the presence vs. absence of a final vowel in the synchronic form of a given variety because we know to what syllable shape a given reflex goes back to. In the Appendix, we provide a list of 60 widespread BLR reconstructions with their corresponding reflexes to substantiate our claim that FVL occurs in all the varieties included in this study and that it is phonologically unconditioned (i.e., it occurs regardless of the manner of articulation of C₁, C₂ or NC₂, the quality of V₁ and/or V₂ and the tone pattern of the reconstruction). Cognate sets in the Appendix are ordered according to the BLR protoform number (lower to higher) of which we believe they are a reflex. Each cognate set starts with the BLR protoform index number, form and meaning, followed by the synchronic reflexes we could identify. We mark both H and L tone as [á] and [à], respectively. Absence of tone on a reflex means that the original source does not note tone. We indicate the meaning of reflexes only if they differ with respect to the meaning(s) assigned to the corresponding protoform in BLR. The symbol ‘-’ next to an alphanumeric code representing a variety means that the variety has a reflex of another protoform for a given concept. A question mark means lack of data.

After having gathered the biggest possible number of linked reflexes based on available materials, we systematically excluded from our counting all lexemes whose syllable shapes could not be targeted by FVL in each of the varieties in question (see columns CVV, C₂ loss, NC₂ loss in Table 1). This step requires language/branch-specific knowledge of diachronic sound changes. As can be seen in Table 1, several WCB varieties lose velars in C₂, a sound change which creates CVV syllable shapes which are not suitable targets for FVL (cf. Section 4). Other WCB varieties are more extreme in that they lose velars alongside consonants with other places of articulation (see e.g., Nzadi B865, Ngwi B861). We also excluded cases of reduplication and borrowing (see column Others in Table 1). After this step, we ended up with a language-specific variable number of lexemes with syllable shapes which could be targeted by FVL. We then proceeded to count the number of lexemes still displaying a final vowel in each of the varieties in our dataset. To uniformize the differing numbers of lexical tokens we could retrieve per language, we calculated the percentage over the total amount of lexemes per variety.

Figure 3 summarizes the results of our quantitative analysis. In Figure 3, percentages of FVL for each variety are represented by means of pie charts.

Based on the percentages in Table 1, we identify three “degrees” of FVL across the dataset.

Systematic FVL: languages with only 0–6% of lexemes having a final vowel, i.e., Yans B85,¹⁵ Nsong B85d, Mpur B85e, Nsambaan B85F, Ngwi B86i, Lwel B862,¹⁶ Mpiin B863, Ngong B864, Nzadi B865, Ding B86, Mbuun B87, Hungan H42, and Bushong C83;

Pervasive FVL: languages with 10–30% of lexemes having a final vowel, i.e., Boma Yumu B80z,¹⁷ Samba L12a, Ngungwel B72a;¹⁸

Frequent FVL: languages with 30–50% of lexemes having a final vowel, i.e., Lele C84, Wonk C85.¹⁹

6 Dialectal Diffusion and Substrate Influence in the History of FVL

In Sections 3–5, we gathered several pieces of evidence indicating that FVL in the Lower Kasai region emerged and spread as a contact-induced change. In this section, we review this evidence to assess which processes of language contact underlie its current-day distribution. We distinguish between two scenarios which we believe to have occurred sequentially in time, i.e., substrate influence and dialectal diffusion respectively.

We start with the process of dialectal diffusion. Our classification of the FVL phenomenon into three degree categories in Section 5, i.e., systematic vs. pervasive vs. frequent, indicates that FVL is widespread in the Lower Kasai region, but that this phonological innovation did not affect the lexicon of all languages concerned in an equal way (see Figure 2). Only in the ‘systematic FVL’ languages did this sound shift consistently shorten all targetable lexical items, some rare

15 In Yans B85, Nsong B85d, Mpur B85e, Nsambaan B85F, Nzadi B865 and Mbuun B87 all lexemes with a final vowel (excluding borrowed nouns) are verb stems with a frozen derivational suffix, e.g., B85d *kù-yáná* ‘be dry’, B85e *ù-yáná* ‘be dry’, B85F *kàwáná*, B87 *kàwáná* ‘spread’ (< BLR 8257 **jánám* ‘dry in the sun, be spread out’); B865 *ò-kàṅsà* ‘collect, put together, fold, tie’ (< BLR 1331 **gàng* ‘tie up’), *ò-mònkà* ‘be visible, shine’ (< BLR 2206 **món* ‘see’).

16 In Ding B86, Lwel B862 and Ngong B864 most words with a final vowel are nouns and some of these might be borrowed (e.g., plant/animal names), e.g., B86 *ṽkùkà* ‘wild pigeon’, *mbòkò* ‘forest antelope, sp.’, B862 *kùkè* ‘pigeon’, B864 *mpòndó* ‘millet’ (< BLR 6702 **pòndó*).

17 In Boma Yumu B80z verb roots preserve a final vowel more often than noun roots.

18 In Ngungwel B72a, most items with a final vowel are verbs with a frozen derivational suffix as well as nouns where V1 elides or is hardly audible yielding a CCV shape, e.g., *ndzʷrú* ‘body’ < BLR 1635 **jótò*. In Ngungwel, reflexes of *CV and *CVV never lose their final vowel.

19 In Lele C84 and Wonk C85, all items with a final vowel belong to a syntactic category other than verbs, i.e., nouns, adjectives, numerals.

exceptions notwithstanding, for instance loan words from languages not undergoing FVL such as Kikongo or Lingala, the main vehicular languages of the Lower Kasai region. As shown in Fig. 2, the ‘systematic FVL’ languages not only constitute the majority of the FVL languages, but also form a geographical cluster with regard to the two other types of FVL languages with the apparent exception of Bushong C83 to which we return below. The ‘pervasive FVL’ and ‘frequent FVL’ languages, in which considerably more lexical items have escaped the innovation, are mostly situated to the west and to the east of the ‘systematic FVL’ cluster. Ngungwel B72a is the most extreme western outlier, especially if we do not consider geographically intermediate Teke varieties such as Bwala B70y, Mosieno B76a, Wumu B78 and Boma Nkuu B80x, in which FVL sporadically occurs, but whose sources are far too insufficient for a statistically relevant quantitative analysis (cf. Section 3).

In other words, the ‘systematic FVL’ languages could be considered as the core of innovation in whose periphery the two other types of FVL languages are situated as instances of less systematic innovation. This kind of geographic pattern, i.e., a ‘centrality vs. peripherality’ (Trudgill, 2011: 7–8) or ‘core vs. periphery’ (Winford, 2003: 288, 348), is a classic in (historical) dialectology and has a long tradition in contact linguistics. More central languages constitute the center of innovation, while more peripheral languages are (more) conservative in that they resisted the change (more). In this sense, all ‘no FVL’ languages surrounding the Lower Kasai FVL languages form the most extreme periphery which remained untouched by the innovation.

Telling with regard to the ‘core vs. periphery’ pattern is that certain varieties of what we consider to be FVL languages do not attest FVL at all despite being situated at the margins of the Lower Kasai FVL isogloss. This is the case of the southern FVL languages Hungan H42 and Samba L12a, both members of the Kikongoid subgroup of the Kikongo Language Cluster (see Figure 2). Although we classify the Kipuka variety of Hungan considered here (see also Takizala, 1974) among the ‘systematic FVL’ languages, the Kwilu-Kimbata variety (see for example Batusisa Bibinda, 1972) did not undergo the innovation (cf. Bostoen and Koni Muluwa, 2011: 253–254). This also holds for Hungan’s close relative Samba L12a, which we included in the ‘pervasive FVL’ languages. Unlike in the Kimafu variety included here (see also Van Acker, 2018), the innovation is entirely absent from more (south)eastern varieties of the language (cf. Van Acker, 2016).

The same is true for the CWB language Bushong C83, which is the easternmost ‘systematic FVL’ language, separated from the other languages of that type by two closely related ‘frequent FVL’ languages, i.e., Lele C84 and Wonk C85. The Bushong variety considered here is the central one spoken in

Mushenge (DRC) described by Vansina (1959), who distinguishes northwestern and southern dialects (see also Vansina, 1958). Older sources describing the language, aka Kuba after the eponymous kingdom, consistently write lexical items with final vowels (cf. Brown-Edmiston, 1932; Maes, 1934). This could indicate that there are dialectal differences in terms of FVL. However, this could also just reflect evolving orthographic practices. This is very likely considering that Brown-Edmiston (1932: 6–7) notes that “[i]n a large number of words throughout the language the final vowel is never sounded except in certain constructions or unless the words are spoken slowly and distinctly or emphatically”.²⁰ On the other hand, Vansina (1974: 177) observes without providing further details that the loss of the final vowel is not systematic in all Bushong dialects and is absent from Lele C84 (possibly in a different variety than the one considered here). Hence, a dedicated dialectal survey of Bushong would be useful in this respect. For the time being, FVL in the wider Bushong area turns out to be less systematic than what the data from the central variety would lead one to believe at first sight. We elaborate below on the historical reasons evoked by Vansina (1974) to account for the systematicity of FVL in the central Bushong variety closely linked with the Kuba kingdom.

In sum, Bushong C83, Hungan H42 and Samba L12a can all be excluded from the FVL core, as each of these languages has varieties which escaped the innovation. As a consequence, the FVL core actually includes only eastern B80 languages. Given that the core vs. periphery pattern in the geographical distribution of FVL in the Lower Kasai languages suggests a classical scenario of dialectal diffusion (Andersen, 1988), the eastern B80 languages must have been the center of innovation or focal area from which this innovation gradually spread to more peripheral relic areas in the east, west and south. Because the FVL core stretches along the south bank of the Kasai River, the latter probably constituted a natural boundary to its northward diffusion.

The hypothesis that the center of innovation of FVL must have been along the south bank of the Kasai River in the DRC has been incipiently set forth by Vansina (1973–1974: 336–337), who argues that what he calls the “Lower Kulu peoples” (i.e., our center of innovation) were at some point in history in a role of prestige and influenced their northern, eastern and western neighbors. As

20 The fact that Maes (1934) also writes vowels for B80 varieties, such as Ding B86 and Mbuun B87, equally suggests that it is indeed a matter of orthography or rather prescriptivism, especially if one considers that in almost contemporaneous dictionaries of B80 languages, such as those of Mertens (1939) and Swartenbroeckx (1948), final vowels are consistently omitted.

discussed above, their influence did not extend so much to the north, but rather to the east, west and south. As for Bushong, Vansina (1974: 179–181) attributes the innovation to the cultural hero *Shyaam aMbulangoong*, a king of Mbuun origin, who would have conquered the Kuba kingdom around the 1640s and subsequently reformed and enlarged it. Although his dynasty soon adopted the local language, the Mbuun way of speaking characterized by dropping final vowels became vested with prestige and gradually trickled from the capital to more remote parts of the kingdom. As Bushong was the language of communication between the central and local authorities within the kingdom, Vansina (1974: 181) interprets the range of the FVL phenomenon within the wider Kuba C80 group as a reflection of how far the royal power extended. This would explain why it is irregularly attested in languages such as Lele C84 and Wonk C85 and entirely absent from Ndengese C81 and Hendo C82. Hence, the Kuba kingdom constituted a secondary center of dialectal diffusion for FVL after it was introduced through a new dynasty from the Kwilu-Kasai region where this phonological innovation actually originated. This explains why Bushong is a ‘systematic FVL’ language that is geographically somewhat disconnected from the FVL core. In contrast to the contact-induced spread of noun prefix reduction in the KLC from the capital of the Kongo kingdom (cf. Bostoen and de Schryver, 2015), only a minor part of the current-day distribution of FVL can be accounted for as a prestige-driven diffusion from the capital of the Kuba kingdom.

In contrast to the Kuba area to the east of the FVL core, historical data to explain the dialectal diffusion of this innovation to the lands south (e.g., Hungan H42 and Samba L12a) and west (e.g., Ngungwel B72 and Boma Yumu B80z) are unfortunately missing. Given the systematicity of the FVL in the eastern B80 core, dialectal diffusion also does not explain how it initially emerged there as a contact-induced sound change.

As we showed in Section 3, the B80 languages which constitute the FVL core are geographically clustered, but they do not form a genetic unit within the WCB branch of the Bantu family; quite the opposite. Their distribution zone between the Kwilu and Kasai Rivers is the area of highest linguistic diversity within WCB and includes the branch’s putative homeland between the Kamtsha and Kasai Rivers (Pacchiarotti et al., 2019). Given that FVL is absent from the remainder of WCB, it must have emerged after the major WCB subbranches had started to expand away from the homeland towards the Atlantic. As discussed in Section 4, the seriation of FVL with regard to other common sound changes in B80 languages suggests that it is a relatively late innovation. Given that the B80 languages attesting FVL belong to distinct WCB subbranches, they cannot have inherited this phonological innovation from

a most recent common ancestor. Moreover, given their geographic adjacency, it would be highly unlikely, and in contradiction with the law of parsimony (a.k.a. Occam's razor), to assume that they independently underwent it as a language-internal change. Therefore, exposure to a shared external source through language contact seems to us the most plausible explanation to account for a feature shared across languages spoken in the same area but belonging to distinct subgroups. If that feature is purely lexical, especially non-basic vocabulary, the most plausible scenario is borrowing through cultural contact between neighboring speech communities. Such exchange of loanwords may easily happen without bi- or multilingualism among the speakers in contact. For example, many loanwords from French, Portuguese, English and Dutch made it into WCB languages without most of their speakers having any command of those foreign languages (Kwenzi-Mikala, 1989; Yome Aya, 1997; Yengo-ki-Ngimbi, 2004; Elala Moke, 2008; Brinkman and Bostoen, 2018). However, if the shared feature is structural, especially phonological or syntactic, borrowing without bi- or multilingualism does not suffice as an explanation. In such a case, the contact-induced change points towards shift-induced interference or substrate influence (Thomason, 2006). The transfer of phonological features and rules between languages, if not through inheritance, is often considered to be highly constrained and to happen only through intense contact and a high degree of bilingualism (Winford, 2003: 54–56). This suggests partial acquisition of a target language by shifters (Thomason, 2008) or 'imposition' under 'source language agentivity' (Van Coetsem, 1988), i.e., L1 speakers leaving a structural impact on their L2, initially in the process of language acquisition and ultimately through language shift. In the case of FVL, substrate influence is all the more likely, because it concerns a phonological pattern and not actual phonemes. Although foreign sounds in borrowed vocabulary usually get nativized (Calabrese and Wetzels, 2009: 1), the integration of loan phonemes into the phonology of the recipient language may happen if there is widespread bilingualism in a society (Bondarko, 2000: 56; Dimmendaal, 2011: 182). The CWB language Ngombe C41, for example, started to acquire labial-velar stops through the massive adoption of Ubangi loanwords (Bostoen and Donzo, 2013). However, given that FVL systematically targets inherited Bantu vocabulary, large-scale borrowing of foreign vocabulary cannot account for its systematicity.²¹ This kind of systematicity rather points towards the imposition of a foreign phonological pattern on native Bantu vocabulary, i.e., non-Bantu speakers imposing closed final

21 In fact, we find virtually no non-Bantu lexical items in the lexicon of the Bantu languages considered in this paper with the notable exception of Lwel B862.

syllables on Bantu languages due to incomplete language acquisition in the process of language shift. The shift of L2 speakers to L1 must have been considerably high for the foreign phonological pattern to be transmitted to the next generation of L1 speakers. Conceivably, several L1 and L2 were at play and the shifting process spanned several generations. However, if so, the extinct L2 varieties must have shared the tendency to closed syllables judging from the uniform phonological outcome of the language shift.

In contrast to the northern Bantu borderland, where Bantu languages are in touch with languages of all major African phyla, and the southern Bantu borderland, where they are in close connection with Khoisan, only Bantu languages are spoken in the current-day Lower Kasai region. If FVL was indeed induced by a non-Bantu substrate, the most likely candidates would be the 'pre-Bantu' languages of autochthonous hunter-gatherers of which no trace has been left (Bahuchet, 2012). In the FVL core area, no Central-African forager groups, aka 'Batwa' or 'Pygmies', have persisted. They do still exist in the neighboring Mai-Ndombe and Kasai provinces (von Wissman et al., 1891; Hiernaux, 1966; Omasombo Tshonda, 2019: 66). However, as far as the limited available sources show, the Bantu languages of those Batwa groups did not undergo FVL (cf. Motingea Mangulu, 2010; Chabiron et al., 2013). One might then wonder whether it is plausible to attribute FVL to the integration of language shifting hunter-gatherers into Bantu B80 speech communities if the Bantu languages of today's closest relic hunter-gatherer groups do not manifest the phenomenon. On the other hand, it is completely unknown how high the linguistic diversity was among autochthonous hunter-gatherers before they shifted to Bantu languages. Strikingly, zone A languages undergoing FVL (cf. Section 3) also have hunter-gatherer groups in their close vicinity. Hence, substrate influence from pre-Bantu hunter-gatherer languages seems a possible scenario to account for the development of FVL in the region. This would imply a relatively massive shift of hunter-gatherers to Bantu B80 languages as well as the assimilation of their speakers into the Bantu speech communities concerned. Although it is impossible to substantiate this hypothesis with hard linguistic evidence, new evolutionary genetic data might shed light on this question.

In sum, we propose here a two-stage evolution for the development of FVL in the Lower Kasai region. This relatively late innovation originated as the outcome of substrate interference, most likely from pre-Bantu hunter-gatherer languages, in the FVL B80 core, and subsequently spread from that focal area of innovation to more peripheral areas through a process of dialectal diffusion.

7 Conclusions

In this article, we characterized FVL in the Lower Kasai region of the DRC as the historical loss of the word-final vowel segment in the reflexes of polysyllabic nominal and verbal stems reconstructed with the shape *CV(N)CV (cf. Bastin et al., 2002). Unlike in other parts of the Bantu domain, FVL in the Lower Kasai region was not a phonologically constrained sound change. The change targeted all words with a suitable syllable structure regardless of the manner and place of articulation of consonants, the quality of vowels and the tone pattern of the reconstructed stem.

We demonstrated that FVL must have taken place after the loss of certain intervocalic consonants in some WCB languages spoken around and south-eastwards of Bandundu (city) along the Kasai River in the current DRC province of the Kwilu, namely: Yans B85, Nsong B85d, Mpur B85e, Nsambaan B85f, Ding B86, Ngwi B86i, Lwel B862, Mpiin B863, some varieties of Ngong B864, Nzadi B865 and Mbuun B87. In these varieties (and in some varieties of Bushong C83), this diachronic phonological process created word final closed syllables (*CVCV > CVC) in all phonotactically suitable environments.

As these FVL languages belong to distinct subgroups but are geographically clustered in the WCB homeland region, we argued that they must have acquired this feature through language contact. Due to the systematicity of the innovation and the fact that it concerns a structural phonological pattern, we posited that it must be the outcome of substrate interference from language shifters incompletely acquiring their new language(s). Although we lack hard evidence to substantiate this claim, we propose that non-Bantu-speaking hunter-gatherers massively shifting – either from the same or from different non-Bantu L1 – to one or several Bantu B80 L2 may have initiated this sound change. If this relatively late innovation was indeed induced through contact with autochthonous hunter-gatherer communities, this could indicate that interactions between these and migrating Bantu-speakers were initially rather limited and became gradually more intensive once the newcomer groups were well settled and started to have an increasing impact on the environment (cf. Marks et al., 2015). As conclusive linguistic evidence to prove this hypothesis has vanished, only new evolutionary genetic data can help us assess its validity.

Once FVL was firmly rooted in the eastern B80 core area, the innovation spread from this epicenter as a “dialectally-diffused” contact-induced change to the geographically contiguous WCB varieties Boma Yumu B80z, Hungan H42, and Samba L12a and to the CWB varieties Bushong B83, Lele C84 and Wonk C85.

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Appendix: Cognate Series Proving Phonologically Unconditioned FVL in the Lower Kasai Bantu Languages

- (1) BLR 93 *bàndà 'valley': B72a?, B80z –, B85b –, B85d *mó-bân*, B85e –, B85F *má-bân*, B861 –, B862 –, B863 –, B864 *mó-bân*, B865 –, B86 *mu-bàn*, B87 *u-bân*, C83 *là-bàn*, C84?, C85 *rù-bàntá*, H42 *kí-wànd*, L12a *mó-wàndà*.
- (2) BLR 212 *bíndà 'calabash': B72a –, B80z –, B85b *mbiin*, B85d *mbîn*, B85e *mbín*, B85F *mbyín*, B861 –, B862 *mbín*, B863 *mbîn*, B864, B865 *mbín*, B86U *mbúin*, B87 *mbîn*, C83 *mbyéén*, C84 *mbéndà*, C85 *mpéntá*, H42 *mù-bín* 'calabash nutmeg', L12a –.
- (3) BLR 265 *bòmbó 'forehead, bridge of nose, nose': B72a –, B80z *mbwòm*, B85b *mbòòm*, B85d *mbôm*, B85e *mbó:m*, B85F *mbóóm*, B861 Ø-*mbwòm*, B862 *bwãm*, B863 *mbôm*, B864 *mbôm*, B865 *m-bwòm*, B86U *mbôm* ~ *mbwãm*, B87 *mbôm*, C83 –, C84?, C85 –, H42 *mbôm*, L12a *mbómb*.
- (4) BLR 275 *bóngó 'knee': B72a *búó*, B80z *ì-bwó*, B85b *ì-bóŋ*, B85d *è-bóng*, B85e *bwáŋ*, B85F *è-bóŋ*, B861 *ì-bwóŋ*, B862 *bóŋ*, B863 *b₂*, B864 *bóŋ*, B865 *ímóŋ*, B86 *è-bóŋ*, B87 *ì-bóŋ*, C83 *ì-yóóŋdì*, C84 *ì-mòngò*, C85 *ì-mónkó*, H42 *bóŋ*, L12a *bòng*.
- (5) BLR 346 *bót 'bear child, fruit': B72a *b^urú* 'give birth' B80z *ò-búra*, B85b *bót* 'bear child', B85d *kò-bútúk* 'be born', B85e?, B85F *kà-búr* 'raise (an animal)', B861wûr, B862 *bwár* 'give birth', B863?, B864 *kò-bútúk* 'be born', B865 *ò-búr* 'give birth', B86 *bór*, B87 *kà-bór*, C83 *à-bót*, C84?, C85, H42 *kù-bút* 'give birth', L12a *gù-búd* 'give birth'.
- (6) BLR 351 *bótó 'seed': B72a *e-b^urú*, B80z –, B85b *lì-bór*, B85d *mbút*, B85e *mmbór*, B85F *mbúr*, B861 –, B862 *là-búr*, B863 *mbúr*, B864 *lò-bút*, B865 –, B86 *mbúr*, B87 *là-bór*, C83 –, C84?, C85 *rù-mpót*, H42 *mbút*, L12a –.

- (7) BLR 406 *cádá 'feather': B72a è-sál, B80z lè-sál, B85b lè-sál', B85d lì-sál, B85e lì-sál, B85F là-sál, B861 è-sià, B862 sál, B863 lù-ntsál, B864 lè-sál, B865 è-sáá, B86 lù-sál, B87 là-sál, C83?, C84 hàlà, C85 ru-sara, H42 lù-sál, L12a ntsàl.
- (8) BLR 475 *càngà 'island': B72a?, B80z ì-sàà, B85a è-sàà 'oasis', B85d è-sàṇṇ, B85e isàṇ ḡda, B85F –, B861 –, B862 kè-sàṇ, B863 kì-sḡ:, B864 kè-sḡ:, B865 è-sàṇ, B86 è-sàṇ, B87 ì-sàṇ, C83 ì-fààṇ, C84?, C85 isàànké, H42 kì-sǎṅ, L12a sǎṅ.
- (9) BLR 479 *càngò 'news': B72a ntsià, B80z mù-sàà, B85b mù-sàà, B85d mósàṇ, B85e lí-sàṇ, B85F là-sàṇ, B861 –, B862 lè-sàṇ 'announcement', B863 –, B864 –, B865 è-sàṇ, B86U lù-sàṇ, B87 nsàṇ, C83 –, C84?, C85 rù-sàànk, H42 sǎṅ, L12a Ø-ntsángù.
- (10) BLR 496 *cátò 'three' ~ BLR 2811 tátò 'three': B72a è-tyél, B80z sár:r, B85b tát', B85d tár, B85e tár, B85F tár, B861 ár, B862 sár, B863 tár, B864 tát, B865 ísár, B86 sár, B87 tár, C83 fét, C84 hátù, C85, H42 tát, L12a tátù.
- (11) BLR 638 *cóod 'choose': B72a súàl, B80z ò-swál, Bì-85b –, B85d kò-sól, B85e ù-sól, B85F kà-sól, B861 –, B862 ò-fwál, B863 kù-fǒl, B864 kò-sól, B865 –, B86 kù-sól, B87 kà-sól, C83 à-fǒl, C84?, C85 kù-sór, H42 kù-sól, L12a sól.
- (12) BLR 655 *còmb 'borrow, lend': B72a suòn, B80z ò-swòm, B85a swèm 'lend money', B85b kò-sòm, B85e ù-sòm, B85F kà-sòm, B861 tfwòm, B862 ò-swàm, B863 kò-sòm, B864 kò-sòm, B865 –, B86 kù-swòm, B87 kà-sòm, C83 à-fwèèmi, C84 ù-hòmb, C85 kù-sòm, H42 –, L12a –.
- (13) BLR 664 *cònì 'shame': B72a –, B80z –, B85a nsón 'shameful', B85d?, B85e?, B85F?, B861 è-ntsḡṇ, B862 cán, B863?, B864?, B865 n-tsôn, B86Q nsón, B87 –, C83 bu-fǒn', C84?, C85?, H42 tsón, L12a Ø-ntsòn 'shame, taboo'.
- (14) BLR 893 *ndédé 'whiteman': B72a ò-ndyâl, B80z mù-ndél, B85b mu-ndel, B85d mò-ndél, B85e ù-ndél, B85F mà-ndél, B861 ò-ndié, B862 ṇà-ndél, B863 mù-ndél, B864 –, B865 òndyéé, B86 mù-ndél, B87 ù-ndél, C83 –, C84 –, C85 –, H42 mù-ndél, L12a mù-ndél.
- (15) BLR 897 *dèdù 'beard, chin': B72a ndyèl, B80z –, B85b ndèy, B85d ndèts, B85e ndwèy, B85F ndèy, B861 è-léy, B862 là-lèy, B863 kì-léts, B864 kè-léts, B865 –, B86 ndzèy, B87 ndwèts, C83 ndél, C84 ndènù, C85 dùntèn, H42 kì-lèf, L12a gí-lèf.
- (16) BLR 973 *dímì 'tongue, language, flame': B72a è-lâm, B80z lè-lím, B85b lèm, B85d lè-lèm, B85e lù-lím, B85F là-lém, B861 è-lâm, B862 là-lám, B863 lù-dím, B864 lù-lém, B865 è-lùm, B86 lù-lém, B87 là-lím, C83 ì-ném, C84?, C85 dù-rém, H42 –, L12a lù-lím.
- (17) BLR 1046 *dím 'be extinguished, extinguish, get lost': B72a, B80z –, B85b zím, B85d kò-dzím, B85e ù-dím, B85F kà-dzím, B861 dzím, B862 ò-dám,

- B863 *kù-dzím*, B864 *kò-dzím*, B865 *ò-zím*, B86 –, B87 *kà-dzím*, C83 *ànim*, C84?, C85 *kù-ním*, H42 *kù-dzím*, L12a *gù-dzím*.
- (18) BLR 1052 **dímb* ‘forget’ or BLR 1054 **dímb* ‘deceive, (cause to) get lost’: B72a *dzéén* ‘forget’, B80z –, B85b *zím* ‘forget’, B85d *kò-dzím* ‘forget’, B85e *ù-dím* ‘forget’, B85F *kà-dzím* ‘forget’, B861 *dzím* ‘deceive’, B862 *ò-dzím* ‘forget, deceive, get lost’, B863 *kù-dzím* ‘forget’, B864 –, B865 *ò-dzím* ‘deceive’, B86 *kù-dzím* ‘forget’, B87 *kà-dzím* ‘forget’, C83 *à-dím* ‘lose’, C84 *ù-dímb* ‘deceive’, C85 *kù-rímp* ‘forget’, H42 –, L12a –.
- (19) BLR 1080 **dó* ‘sleep (n.)’ ~ BLR 2963 **tòdó* ‘sleep (n.)’: B72a *twál*, B80z *tòl*, B85b *tòl*, B85d *tòl*, B85e *twàl*, B85F *tòl*, B861 –, B862 *twàl*, B863 *tòl*, B864 *tòl*, B865 *tòl*, B86 *tòl*, B87 *tòl*, C83 –, C84 –, C85 –, H42 *kì-lò*, L12a *gì-lù*.
- (20) BLR 1088 **dób* ‘fish with line’: B72a *lób* ~ *làb*, B80z?, B85b *kù-lób*, B85d *kò-lób*, B85e *ù-lób*, B85F *kà-lób*, B861 *lób*, B862 *ò-lób*, B863 *kò-lób*, B864 *kò-lób*, B865 –, B86 *kù-lób*, B87 *kà-lób*, C83?, C84?, C85 *kù-róp*, H42 *kù-lób*, L12a –.
- (21) BLR 1093 **dóbò* ‘fish-hook’: B72a, B80z *ndòb*, B85b *ndòb*, B85d *ndòb*, B85e *indòb*, B85F *ndòb*, B861 *Ø-ndòb*, B862 *ndòb*, B863 *ndòb*, B864 *ndòb*, B865 *ndòb*, B86U *ndòb*, B87 *ndòb*, C83 *ì-lóp*, C84 –, C85 *iróp*, H42 *ndòb*, L12a *Ø-ndòb*.
- (22) BLR 1223 **dóngó* ‘(red) pepper’: B72a *èndúú*, B80z?, B85b –, B85d *è-lúnj*, B85e *ndúnj*, B85F *ndúnj*, B861 *è-lúnj*, B862 *là-lúnj*, B863 –, B864 –, B865 *è-dúnj*, B86 *lù-lúnj*, B87 *ndúnj á ntân*, C83 –, C84 *lùndzòngò*, C85 *nsónkó*, H42 *ndúng*, L12a *ndúng*.
- (23) BLR 1274 **gàb* ‘divide, give away, make present’: B72a *kàb* ‘share’, B80z *ó-kàb* ‘share, divide in portions’, B85b *ku-kab* ‘share’, B85d *kò-kàb* ‘divide’, B85e *ù-kàb* ‘share’, B85F *kà-kàb* ‘share’, B861 *kàb*, B862 *kàb* ‘share, divide’, B863 *kù-kàb* ‘share’, B864 *kò-kàb* ‘share’, B865 *ò-kàbùl* ‘share, split’, B86 *kàb* ‘to share’, B87 *kà-kàb* ‘share’, C83 *à-kàp*, C84 *ù-kàp*, C85 *kù-kàb*.
- (24) BLR 1321 **gàndá* ‘clan’: B72a, B80z –, B85 –, B85d *è-kànd*, B85e?, B85F *kì-kàn*, B861 *ò-ɲkèán* ‘grandchild’, B862 *kàn*, B863 *kì-kànd*, B864 *kè-kànd*, B865 –, B86, B87 *ì-kànd*, C83 –, C84?, C85 *ì-kànt*, H42 *kì-kànd*, L12a *gì-gánd*.
- (25) BLR 1326 **gàndó* ‘crocodile’ ~ BLR 1446 **gòndé* ‘crocodile’: B72a *ɲáán*, B80z *ngàn*, B85b *ngwen*, B85bS *ngaan*, B85d *ngwên*, B85e *ɲáán*, B85F *ngwên*, B861 *Ø-ɲkwǎn*, B862 *nkwaàn*, B863 *ngwên*, B864 *ngwǎn*, B865 *ɲkwǎn*, B86 *ngààn*, B87 *ngààn*, C83 *kwǎn*, C84 *kwèndè*, C85 *kwénté*, H42 *ngánd*, L12a *Ø-ngánd*.
- (26) BLR 1362 **gènd* ‘walk, travel, go’ ~ 3303 **jènd* ‘walk, travel, go’: B72a –, B80z –, B85b *kù-wèn*, B85d –, B85e –, B85F *kà-wén*, B861 *kyén*, B862 –, B863 *kò-kwèn*, B864 *kò-wén*, B865 *dzyèn* ‘walking’, B86 *wèn* ‘go, leave’, B87 *wèn*, C83 *yèèn* ‘go’, C84 *wènd*, C85 –, H42 *kù-kwènè*, L12a *èndà lùd* ‘walk’.

- (27) BLR 1368 *gí 'egg' ~ 1378 *gídí 'egg': B72a –, B80z *íkyèl*, B85b *íkye*, B85d *é-kyè*, B85e *à-kiè*, B85F *è-kiè*, B861 *ì-kíl*, B862 *kyè~kíl*, B863 *kyè*, B864 *lí-kè*, B865 *íkyě*, B86 *è-kyè*, B87 *í-kyè*, C83 *kèl*, C84?, C85 *i-kèré*, H42 *kè*, L12a *ge/még*.
- (28) BLR 1398 *gídá 'blood': B72a *àkèl*, B80z *mà-kíllà*, B85a *mà-kíl*, B85d *má-tsíl*, B85e *á:kíl*, B85F *má-tsíl*, B861 –, B862 *kál*, B863Z *má-tsíl*, B864 *mátsíl*, B865 *ì-kèl*, B86 *mákíl*, B87 *à-tsíl*, C83 *mà-kèl*, C84?, C85 *mà-kèrà*, H42 –, L12a –.
- (29) BLR 1429 *gòmà 'drum': B72a, B80z *ngòm*, B85b *ngóm*, B85d *ngóm*, B85e *ngwàm*, B85F *ngòm*, B861 *Ø-ngóm*, B862 *ngòm*, B863 *ngóm*, B864 *ngóm*, B865 *ngòm*, B86 *ngòm*, B87 *ngóm*, C83 *ngòm*, C84?, C85 *nkòm*, H42 *ngóm*, L12a *Ø-ngóm*.
- (30) BLR 1445 *gòndè ~ BLR 1447 *gòndò 'moon, month': B72a –, B80z *ngòn*, B85b *gwn`* 'month', B85d *ngòn*, B85e *ngòn*, B85F *ngòòn*, B861 *Ø-ngwòn*, B862 *ngwàn*, B863 *ngóón*, B864 *ngón*, B865 *ngwèn*, B86 *ngòòn*, B87 *ò-ngòòn*, C83 *ngwòòn*, C84 *ngòndù*, C85 *nkòònt*, H42 *ngóni*, L12a *ngónd*.
- (31) BLR 1509 *gòndà 'forest, garden, luxuriant vegetation': B72a *ngũũn* 'field', B80z –, B85a *ngwũũn* 'field', B85d –, B85e –, B85F –, B861 *ò-kùn* 'forest for cultivation', B862 –, B863 –, B864 *ngũn* 'field', B865 –, B86 –, B87 *mvũn* 'field', C83 *ngwòòn* 'field', C84 *ngòndò* 'field', C85 *nkòntó* 'field', H42 *ngũn* 'field', L12a *ngúnd* 'field'.
- (32) BLR 1514 *gòngà 'bell, cuphorn': B72a *ngòngà* (borrowing), B80z *ngún-gà* (borrowing), B85b *ngunga* (borrowing), B85d *ngùñ*, B85e *ngùñ*, B85F *ngùñ*, B861 –, B862 –, B863 –, B864 –, B865 *ngùñ*, B86 *ngùñ*, B87 –, C83 *ngwòòñ*, C84 *ngòng*, C85 *nkòñ*, H42 *ngùñg*, L12a *Ø-ngùñg*.
- (33) BLR 1532 *gùbò ~ BLR 1480 *gùbú 'hippopotamus': B72a *mbvǎb*, B80z *ngùb*, B85b *ngub*, B85d *ngùb*, B85e –, B85F *ngùb*, B861 *Ø-ngùú*, B862 *ngàb*, B863 *ngùb*, B864 *ngùb*, B865 *ngwùú*, B86R *ngùú*, B87 *ngùb*, C83 *ngùp*, C84?, C85 *nkùbú*, H42 *ngùf*, L12a –.
- (34) BLR 1558 *jádà 'fingernail, toenail, claw' BLR 1294 *gádà 'fingernail, toenail, claw': B72a –, B80z *lé-nzál*, B85b *zál*, B85d *lì-nzál*, B85e *lí-gyál*, B85F *là-dzál*, B861 *è-kíà*, B862 *là-dzál*, B863 *kì-nzál*, B864 *kè-nzál*, B865 *è-dzàà*, B86 *lù-dzál*, B87 *là-dzál*, C83 *yǎàl*, C84?, C85 *yáár*, H42 *kì-nsár*, L12a *gí-ntsál*.
- (35) BLR 1628 *jòndò 'hammer, anvil, axe, iron': B72a?, B80z *nzwùn*, B85b *nzùùn*, B85d *nzù:n*, B85e *nzùn*, B85F *nzwòn*, B861 *Ø-ndzùn*, B862 *ndzù:n*, B863 *nzù:n*, B864 *nzù:n*, B865 –, B86 *ndzù:n*, B87 *ndzùn*, C83 *ntfòòn*, C84?, C85 *nsòn*, H42 *nsùn*, L12a *nzù:n* 'iron, hammer'.
- (36) BLR 1674 *kádí 'woman, wife': B72a *ò-kál* 'woman', B80z *mù-kér* 'woman, wife', B85b *mu-kyay* 'wife', B85d *mó-kéts* 'wife', B85e *ù-kyáy* 'wife', B85F *ma-kés* 'wife', B861 *ò-ηkèár* 'woman', B862 *ηkál* 'femme', B863 *mó-kéts* 'wife', B864 *mó-káts* 'wife', B865 *mù-kál* 'wife, woman', B86 *mù-kyáy* 'wife',

- B87 ò-kéts ‘woman’, C83 *ngád^j* ‘female’, C84 *ngátù* (?), C85 *jár* ‘wife’, H42 *mù-kás* ‘woman’, L12a *mu-gátf*.
- (37) BLR 1706 *kàndà ‘letter’: B72a, B80z *mù-kán*, B85 *mù-kán*, B85d *mò-kànd* ‘announcement’, B85e *kààn*, B85F –, B861 ò-*ηkèàn*, B862 –, B863 *mú-kànd* ‘announcement’, B864 *mó-kànd* ‘letter, book’, B865 ò-*ηkààn*, B86 –, B87 –, C83 *nkààn*, C84?, C85 –, H42 –, L12a *mù-gánd*.
- (38) BLR 1793 *kídà ‘tail’: B72a ò-*kál*, B80z *mù-kílà*, B85b *mú-kíl*, B85d *mókíl*, B85e *ùkyíl*, B85F *mà-kél*, B861 ò-*yîr*, B862 *ngèkyél*, B863 *mùkíl*, B864 *mòkíl*, B865 ò-*kyá*, B86 *mù-kíl*, B87 ò-*kíl*, C83 *ηgél*, C84?, C85 *nyèr*, H42 *mú-kír*, L12a *mú-kíl ~ mú-gíl*.
- (39) BLR 1798 *kímá ‘monkey’: B72a *ηkyâm*, B80z *nkímà*, B85b *nkém*, B85d *nkím*, B85e *nkím*, B85F *nkím*, B861 Ø-*nkâm*, B862 *nkyám*, B863 *nkím*, B864 *nkím*, B865 *η-kêm*, B86 *nkyam*, B87 *nkím*, C83 *nkém*, C84 *kém*, C85, H42 *khúm*, L12a *kím ~ gím*.
- (40) BLR 1818 *kíd ‘do’: B72a –, B80z ò-*kírà*, B85b *kèt*, B85d *kò-kír*, B85e ù-*ky-ír*, B85F *kà-kír*, B861 *kiè*, B862 *kyàr*, B863 *kù-kír*, B864 *kò-kít*, B865 ò-*kèr*, B86Q ò-*kèr*, B87 *kà-kír*, C83 à-*kèl*, C84 *kél*, C85 *kù-kér*, H42 *kù-kít*, L12a –.
- (41) BLR 1939 *kòndò ‘banana’: B72a –, B80z –, B85b *kwàn*, B85d *é-kón*, B85e *kón*, B85F *é-kwón ~ é-kwáàn*, B861 –, B862 –, B863 *kón*, B864 *kón*, B865 –, B86U ò-*kònn*, B87 *i-kón*, C83 ò-*kwònn*, C84 *kóndù*, C85 –, H42 *dì-khòn*, L12a *góndo*.
- (42) BLR 2041 *kón ‘plant, sow’: B72a *kwên*, B80z ò-*kúnà*, B85b *kón*, B85d *kò-kún*, B85e ù-*kón*, B85F *kà-kún*, B861 *kún*, B862 ò-*kwán*, B863 *kò-kún*, B864 *kò-kwín*, B865 ò-*kùn*, B86Q *kón*, B87 *kà-kún*, C83 *wóon*, C84 ù-*ηjún*, C85 *kù-ηjún*, H42 *kù-kún*, L12a *gún*.
- (43) BLR 2048 *kóndè ‘bean’: B72a?, B80z –, B85b *nkwéén*, B85d *è-kú:nd*, B85e –, B85F –, B861 *è-kwón*, B862 *kwán*, B863 –, B864 –, B865 *ηkwôn*, B86 *nkwén*, B87 *là-kwân*, C83 *là-kwónn*, C84?, C85?, H42 –, L12a –.
- (44) BLR 2118 *kú mú ‘chief, medicine man, rich person’: B72a *mpfám*, B80z *nkùm*, B85b *nkùm* ‘cattle owner’, B85d *mpfúm*, B85e *mpfúm*, B85F *mfúm*, B861 Ø-*ηkúm*, B862 *nkám*, B863 *mfúm*, B864 *mfúm*, B865 *ηkúm*, B86 *mfúm*, B87 *mfúm*, C83 *kúm*, C84 *kúmù*, C85 *kúmú*, H42 *pfúm*, L12a *pfúm*.
- (45) BLR 2206 *món ‘see’: B72a *mwên*, B80z ò-*món*, B85b *món*, B85d *kò-món*, B85e –, B85F –, B861 –, B862 *mwán*, B863 *kù-món*, B864 *kù-món*, B865 ò-*môn*, B86 *mwán*, B87 *kà-món*, C83 à-*món*, C84 *món*, C85 –, H42 *kù-món*, L12a *mòn*.
- (46) BLR 2212 *mòtí ‘one’: B72a –, B80z *mòy*, B85b *mòy*, B85d *mwès*, B85e *mwèy*, B85F *mbès*, B861 –, B862 –, B863 *mbwès*, B864 *kè-mòs*, B865 *ómòtúk*, B86 –, B87 *mwès*, C83 *mmócy*, C84 *m-ótfi*, C85 *mwèts*, H42 *mòf*, L12a *móf*.

- (47) BLR 2255 **nénè* 'big': B72a *nén*, B80z *nínin*, B85b *néén*, B85d *nén*, B85e –, B85F –, B861 *nínên*, B862 *nín*, B863 *nén*, B864 *nén*, B865 –, B86 *nén*, B87 *ò-nén*, C83 *nén*, C84 *nênè*, C85 *nén*, H42 *nén*, L12a *néné*.
- (48) BLR 2443 **pémbá* 'white clay, kaolin' ~ BLR 2448 *pémbé* 'white clay, white color': B72a?, B80z *mpéém*, B85b *le-pyem*, B85d *mpém*, B85e *lì-pém*, B85F?, B861 –, B862 *là-pyám*, B863 *mpé:m*, B864 *mpéémb*, B865 *mpémbé*, B86 *mpéém*, B87?, C83 *yéém*, C84 *yèém*, C85 *lù-pémpé*, H42 *lu-pémb*, L12a *p'hémb*.
- (49) BLR 2621 **pòcò* 'skin' ~ BLR 5264 **pòcò* 'bark, husk': B72a –, B80z –, B85b *pòy* 'skin', B85d *è-pùs* 'bark', B85e *pòy* 'bark, skin', B85F *è-wùs* 'raffia palm tree', B861 *è-pùy* 'skin', B862 *kà-pùj ntà*, B863 *kì-pùs* 'bark', B864 *kè-pùs* 'bark', B865 *mpwè* 'bark, peeling, skin', B86 *ì-pùy* 'bark', B87 *è-pòs* 'bark', C83 *yòòf* 'bark', C84?, C85 *pòòs* 'skin (animal), peel', H42 *kì-pùs* 'skin, peel' ~ *hùs* 'raffia palm tree', L12a *gí-pùs* 'skin'.
- (50) BLR 2731 **tádi* 'long': B72a *è-tél*, B80z *tál*, B85b –, B85d –, B85e *étál*, B85F –, B861 *ò-têy*, B862 *ò-tál*, B863 –, B864 –, B865 *ò-tál*, B86 *tél*, B87 –, C83 *tádj*, C84 *tàlè* 'big', C85 *bù-taré*, H42 –, L12a –.
- (51) BLR 2761 **támbí* 'sole of foot, footprint': B72a *è-táá* 'foot', B80z *ì-táám* 'footprint', B85b *ì-tèám* 'footprint', B85d *lò-tém* 'footprint', B85e *lù-tém* 'footprint', B85F *kì-tám* 'footprint', B861 –, B862 *táám* 'foot', B863 *lù-tém* 'footprint', B864 *lò-tám* 'footprint', B865 –, B86U *lù-tyám*, B87 *là-tám*, C83?, C84?, C85 *ì-támpí*, H42 *lù-tám*, L12a *lù-dámbí*.
- (52) BLR 3081 **tóng* 'put through; thread on string; plait; sew; tie up; build; close (in)': B72a *túú* 'build', B80z *ò-twù* 'braid (hair)', B85b *bwó* 'build, braid (hair)', B85d *kò-túnj* 'build, braid (hair)', B85e *ù-túnj* 'build, braid (hair)', B85F *kà-túnj* 'build, braid (hair)', B861 *túnj*, B862 *ò-túnj* 'build', B863 *kù-túj* 'build, braid (hair)', B864 *kò-túnj* 'build, braid (hair)', B865 *ò-túnj* 'build, braid (hair)', B86 *túnj* 'build, braid (hair)', B87 *kà-tún* 'build, braid (hair)', C83 *à-tóóng* 'braid (hair)', C84?, C85 *kù-tónk* 'build, braid (hair)', H42 *kù-túnj* 'build', L12a *gù-dúng* 'build'.
- (53) BLR 3101 **túd* 'hammer, forge': B72a *tswâl/tʃɔl*, B80z –, B85b *sýl*, B85d *kò-tsúl*, B85e *ù-tsúl*, B85F *kà-tsúl*, B861 –, B862 *ò-túl*, B863 *kò-tsúl*, B864 *kò-tsúl*, B865 –, B86 *kù-tsúl*, B87 *kà-tsúl*, C83 *à-túl*, C84 *ù-túl*, C85 *kù-túr*, H42 *kù-fúl*, L12a *kù-fúl*.
- (54) BLR 3252 **játò* 'canoe': B72a *bvuâl*, B80z *vàr*, B85b *bwâr*, B85d *bwâr*, B85e *bwâr*, B85F *bwáár*, B861 *w-âr*, B862 *bwâr*, B863 *bwâr*, B864 –, B865 *wáâr*, B86U *bwáár*, B87 *bwâr*, C83 *bwàat*, C84 *bwàtù*, C85 *bwät*, H42 *bwât*, L12a *bwâd*.
- (55) BLR 3472 **jínò* 'tooth': B72a *dziñ*, B80z *džín*, B85b *zín*, B85d *è-džín*, B85e *gyín*, B85F *è-džín*, B861 *dz-ân*, B862 *Ø-džón*, B863 *Ø-džín*, B864 *Ø-džín*,

- B865 *ì-dzîn*, B86 *ì-dzín*, B87 *ì-dzîn*, C83 *dũn*, C84 *dùnnù*, C85 *dûn*, H42 *dîn*, L12a *lín*.
- (56) BLR 3579 *jót 'warm oneself': B72a?, B80z *ò-zwár*, B85b *ò-yòr*, B85d *kò-wór*, B85e *ù-yól*, B85F *kà-wár*, B861 – B862 *ò-zór*, B863 *kò-wór*, B864 *kò-wór*, B865 *ò-ḡwár*, B86 *kù-yór*, B87 *kà-wór*, C83 *wɔɔk tèy*, C84?, C85 *kù-wót*, H42 –, L12a?.
- (57) BLR 3598 *jócì 'river': B72a –, B80z –, B85b *mwêy*, B85d *mwêts*, B85e *mwêy*, B85F –, B861 –, B862 –, B863 *mbwêts*, B864 *mwêts*, B865 –, B86U –, B87 –, *mbwêts*, C83 –, C84 –, C85 –, H42 *mwěf*, L12a *mwêts*.
- (58) BLR 6024 *bít 'lie down': B72a?, B80z *ò-bér*, B85b *kò-bír*, B85d *kò-bír*, B85e *ù-bír*, B85F *kà-bír*, B861 *vâr* 'sleep', B862 *ò-bár*, B863 *kù-bír*, B864 *kò-bít*, B865 *ò-bér tòó*, B86 *bít* (*tɔɔl*), B87 *kà-bír*, C83 –, C84?, C85 *kù-bés*, H42 –, L12a –.
- (59) BLR 8242 *nàn 'pull, stretch': B72a –, B80z –, B85bS *ò-nàn* 'straighten', B85d *kò-nàn* 'pull', B85e *ù-nà:n*, B85F *kà-nàn*, B861 –, B862 –, B863 –, B864 *kù-nàn*, B865 *ò-nân* 'big, wide, stretched', B86U *kù-nàn*, B87 *kà-nàn*, C83 *à-nàn*, C84 *ù-nân*, C85 *kù-nàn*, H42 *kùnàn* 'make bigger, stretch', L12a –.
- (60) BLR 8255 *jáná 'palm wine': B72a?, B80z *má:n*, B85b –, B85d *mán má mbà*, B85e *mán ǵ bà*, B85F *mán*, B861 *v-èán*, B862 *màn*, B863 *mán*, B864 *mán má mbà*, B865 *máán*, B86 *mán*, B87 *mân*, C83 *mààn*, C84 *mà-àn*, C85 *mán má saampa*, H42 –, L12a –.