

Vowel harmony in Yeyi¹

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Yeyi (Bantu, R41) is an endangered language spoken in northwestern Botswana and northeastern Namibia. Yeyi exhibits two peculiar processes of regressive vowel harmony. The first changes a high front vowel /i/ to a back vowel /u/ when followed by a syllable containing a back vowel /u/, as in *ʃi-púndi* > [ʃúpúndi] ‘brat’, or /o/, as in *ʃi-bowuma* > [ʃubowuma] ‘kind of snake’, or the glide /w/, as in *ʃi-hweta* > [ʃuhweta] ‘conversation’. This paper analyzes these two vowel harmony processes in Yeyi, using data from a wide variety of published sources on different Yeyi regiolects. I will show that the use of vowel harmony differs between regional varieties of Yeyi, with certain varieties using vowel harmony in more phonological contexts than others. The diachronic functioning of vowel harmony is also discussed, comparing vowel harmony involving affixes to vowel harmony involving only lexical roots. Finally, a comparative perspective is taken, showing that regressive vowel harmony as used in Yeyi is rarely seen in Bantu languages of Southern Africa, but occurs sporadically in Khoe languages, suggesting that regressive vowel harmony in Botswana may be an areal phenomenon.

Keywords: Yeyi, vowel harmony, vowel assimilation

1. Introduction

Yeyi, or Shiyeyi, is a Bantu language spoken in the northwestern part of Botswana and northeastern Namibia. Yeyi makes use of two processes of regressive vowel harmony: back vowel harmony, as shown in (1); and front vowel harmony, as shown in (2).

(1) Back vowel harmony

ti-wur-e > tuwure
SM_{IPL}-buy-SBJV
‘Let’s buy.’

(2) Front vowel harmony

ku-mon-a > kumwana
INF-see-FV
‘to see’.

While different in their conditioning and outcome, in both processes vowels influence each other in being either front or back, known as “backness harmony” (Rose & Walker 2011: 251–252). In this paper, I set out the way these two vowel harmony processes occur in Yeyi and offer a hypothesis for the origin of this set of vowel assimilation processes.

This paper is structured as follows. Section 2 introduces the Yeyi language, giving details on the sociolinguistic situation of both Botswana and Namibian Yeyi, its classification, and previous

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research on both Yeyi varieties. In section 3 some basic facts of Yeyi grammar are introduced as they pertain to vowel harmony. In section 4, both vowel harmony processes are discussed, showing that their conditioning varies between speakers, between lexemes, and between Yeyi varieties. Section 5 compares backness harmony in Yeyi to similar processes of vowel assimilation in languages of the Khoe family, some of which are spoken in close vicinity to Yeyi. Section 6 offers tentative conclusions and suggestions for future research.

2. Introduction to Yeyi

Yeyi is a Bantu language spoken in Botswana and Namibia. The language is known as Shiyeyi to its speakers, *shi-* being a prefix of class 7 which is used for words referring to languages. Older sources refer to Yeyi people as (Ma)Kuba or Koba (Livingstone 1851; Passarge 1905), a derogatory name that is, at least in the academic discourse, no longer in use.

Yeyi is spoken in two non-contiguous areas. In Namibia, Yeyi-speaking communities can be found in the Zambezi region (former Caprivi strip), around the villages of Lianshulu, Mbilajwe and Sangwali (Seidel 2005: 209). In Botswana, Yeyi is spoken in Ngamiland, in and along the Okavango delta and river (Sommer & Voßen 1992: 3). There are some linguistic differences between Botswana and Namibian Yeyi (Sommer 2017), but the two Yeyi varieties differ most markedly in their language ecology. In Namibia, Yeyi is in direct contact with several Bantu languages. Totela, Fwe, and Subiya are three relatively closely related languages all classified as Bantu Botatwe (Bostoen 2009). Mbukushu is a less closely related Bantu language that plays a marginal role, as most Mbukushu speakers reside further West in Namibia. Although not widely spoken as a first language, the dominant language of the region is Lozi, a language that is not mutually intelligible with any of the other Bantu languages of the region. Lozi functions as a lingua franca in the Zambezi region and is widely spoken as a second language, also by Yeyi speakers. Finally, English plays a role as a prestige, business and government language, and historically, Afrikaans also carried this function.

In Botswana, Yeyi is spoken in a different sociolinguistic situation. The dominant language of the region is Tswana, and long-term pressure from Tswana has resulted in still ongoing language shift from Yeyi (Nyati-Ramahobo 2000; Sommer 1995). Other languages spoken in Ngamiland include Mbukushu, a Bantu language that is spoken by both long-term residents of the area and refugees from Angola who arrived in the mid-twentieth century, and various varieties belonging to the Khwe cluster, which is part of the Khoe-Kwadi language family, one of the three families subsumed under the non-genealogical label “Khoisan” (Güldemann 2014). In the East of the Okavango, Yeyi is also in contact with another Khoe-Kwadi language, Ts’ixa.

Namibian Yeyi is spoken in a relatively small, contiguous area, and therefore exhibits little regional variation. Gowlett (1997) recognizes two dialects, Mbilajwe and Sangwali, after the villages in which they are spoken, but more recent research by Seidel (2008: 22) found no evidence for dialectal differentiation. Botswana Yeyi, on the other hand, is spoken in a much more spread-out area and therefore exhibits more regional variation. Sommer and Vossen (1995) conducted a detailed study of linguistic variation in mostly the Botswana variety of Yeyi and found extensive variation that correlates not only to region but also to the degree of Yeyi competence that speakers exhibit. Where Yeyi knowledge is lost due to ongoing language shift, variation proliferates.

The classification of Yeyi remains somewhat enigmatic. While the Bantu origin of Yeyi is undisputed, it is unclear what its closest relatives within Bantu are. Previous work has suggested affiliations with the Namibian language Herero (Andersson 1855: 19–20), the Zambian language Luyi (Johnston 1919), or the Bantu Botatwe languages of Zambia (Gowlett 1997; Passarge 1905;

Tlou 1985). Seidel (2005) found Yeyi to show some similarities to the Bantu Botatwe language Fwe but considered Yeyi nonetheless as somewhat of a Bantu isolate. While further research could still shed new light on the classification of Yeyi, the language has likely developed, either through language-internal or contact-induced changes, in isolation from its sister languages for such a long time that any relationship has now become obscured.

Previous research on Yeyi is abundant but also scattered. Already in the 19th century, European travellers and missionaries made mention of the language and collected short vocabularies (Andersson 1855; Livingstone 1851). More systematic linguistic data collection started at the end of the 20th century. Botswana Yeyi has been documented most extensively in the grammar and dictionary by Lukusa (2002; 2009). Sommer's works (Sommer 1995; 2000; 2017; Sommer & Voßen 1992) on Yeyi sociolinguistics also provide a wealth of linguistic data provided by Yeyi speakers from different locations in Botswana. The Shiyeyi orthography proposal by Chebanne et al. (2007) is also a valuable resource on Botswana Yeyi. Fulop et al. (2003) document Botswana Yeyi clicks, and Schapera and van der Merwe (1942) describe the noun class system of Botswana Yeyi. Namibian Yeyi was documented in a thesis by Donnelly (1990), a short grammar sketch by Baumbach (1997), and an extensive grammar by Seidel (2008). While its grammar is well-explored, there is no systematic documentation of Namibian Yeyi vocabulary.

The present work draws in its entirety on published sources on Yeyi. Given the known differences between the Namibian and Botswana varieties of Yeyi, these will be consistently separated in the analysis by marking Namibian Yeyi data with NY and Botswana Yeyi data with BY.

3. Introduction to the linguistic properties of Yeyi

This section introduces some basic properties of the phonology and morphology of Yeyi as relevant to the interpretation of vowel harmony. Yeyi phonology is characterized by a large inventory of consonant phonemes, combined with a simple vowel system. Tone is contrastive in Yeyi, though many sources do not transcribe and/or analyse it consistently (though see the analysis of Namibian Yeyi using the framework of prosodology by Seidel (2008)). In the data cited in this paper, tone notation will be maintained as in the source; when no tone marking is present, tone marking is also lacking in the source.

As this study focuses on vowel assimilation processes, the discussion here focuses on the vowel inventory of Yeyi.

Yeyi has five phonemic vowels, /a, e, i, o, u/, with the mid vowels alternatively being described as low-mid (Chebanne, Rodewald & Nyati-Ramahobo 2007: 11; Donnelly 1990: 26; Seidel 2008: 27) or high-mid (Lukusa 2002: XIII). Unlike the high and mid vowels, the low vowel /a/ does not contrast backness; it is variably described as “mid-back” (Donnelly 1990: 26), “central” (Chebanne, Rodewald & Nyati-Ramahobo 2007: 11), or simply as /a/ (Lukusa 2002: XIII; Seidel 2008: 27), suggesting a front vowel. While it is typical for five-vowel languages to be lacking a front-back contrast in the low vowel, vowel harmony triggered by the front vowels /i, e/ as well as the low vowel /a/ (see 4.2) suggests that /a/ functions as a front vowel in Yeyi.

Vowel length is contrastive. Vowel sequences occur but seem to be rare and mostly restricted to loanwords (Gunnink 2022a). Diphthongs do not occur in Yeyi, but glide-vowel sequences can alternatively be interpreted as diphthongs. Yeyi distinguishes two glides, labiovelar /w/ and palatal

/y/. These glides can be combined with another consonant, as in (3), or form the onset of the syllable by themselves, as in (4). In this case, /w/ combines with a much wider range of consonants than /y/ (Donnelly 1990: 23–24; Seidel 2008: 43–44).

(3) Glides in consonant clusters

- a. mù-twé
NP₃-ashes
'ashes' (BY: Sommer 1995: 403)
- b. kù-lyáy-à
INF-look.at-FV
'to look at' (NY: Donnelly 1990: 24)

(4) Glides as syllable onset

- a. rù-yáyò
NP₁₁-sole
'sole of foot' (NY: Donnelly 1990: 47)
- b. ù-yòyò
NP_{1a}-ant
'ant' (BY: Sommer 1995)
- c. jì-wé
NP₇-boulder
'boulder' (BY: Donnelly 1990: 32)
- d. jù-wáβà
NP₇-mushroom
'sp. of edible mushroom' (NY: Donnelly 1990: 70)

Many glides come from earlier or underlying vowels, with /y/ reflecting an earlier or underlying /i/, and /w/ deriving from a back vowel /u/ or /o/ (Donnelly 1990: 16; Seidel 2008: 43). This process can be historical, as in (5), or a matter of synchronic allophonic variation, as in (6).

(5) Historical glide formation

- a. kù-lyàt-à (<*diat 'tread', Bastin et al. 2002)
INF-tread-FV
'to tread, stomp' (NY: adapted from Seidel 2008: 43)
- b. kù-nw-à (<*nyó 'drink', Bastin et al. 2002)
INF-drink-FV
'to drink' (NY: adapted from Seidel 2008: 36)

(6) Allophonic glide formation

- a. uru-ino > ùrwinó
NP₁₁-tooth
'fang' (NY: Donnelly 1990: 34)
- b. mu-in-dzuwo > mwíndzûwó
NP₁₈-NP₉-house
'in the house' (NY: Seidel 2008: 36)

² In keeping with wide-spread Africanist tradition, the transcription /y/ rather than the IPA standard /j/ will be used here.

Yeyi morphology is highly agglutinative, for nouns but especially for verbs. Nouns typically consist of a nominal root of one, two or more syllables, although roots of more than two syllables are likely to be, at least historically, morphologically complex. Roots are preceded by a prefix indicating noun class, as in (7)-(8).

(7) rù-twá
NP₁₁-crack
'crack' (NY: Donnelly 1990: 80)

(8) mù-ts^hódzò
NP₃-grass
'grass' (NY: Donnelly 1990: 59)

Yeyi has 16 to 18 noun classes (Seidel 2008: 101, Lukusa 2002: 2), which are numbered according to the common Bantu practice. The exact number of noun classes depends on the inclusion of the locative classes, which are considered productive in Namibian Yeyi but not in Botswana Yeyi, and on the existence of a class 20, which is described for Botswana Yeyi but not Namibian Yeyi. Noun class is marked on the noun itself through a nominal prefix (NP), and through agreement on modifiers and verbs.

Verbal roots in Yeyi typically have a CVC shape, such as *fek* 'laugh' and *kun* 'plant'; there is also a handful of shorter verb roots that consist of a consonant only, such as *s* 'dig' and *c* 'dawn'. Verb roots are obligatorily combined with a final vowel suffix; this can be the "default" final vowel suffix *-a*, which occurs in many verbal conjugations (Seidel 2008: 225), or a verbal suffix with a more narrowly defined function, such as the subjunctive *-e*, or the final vowel harmony suffix, which copies the vowel of the verb root (Seidel 2008: 296-298). Between the verb root and the final vowel, verbal derivational suffixes may be used (Seidel 2008: 225; Lukusa 2002: 73). Inflected verbs also take a range of prefixes, marking subject, object, tense and aspect, among others (Lukusa 2002: 67; Seidel 2008: 226).

4. Vowel harmony

In the following sections, two processes of regressive vowel harmony in Yeyi will be discussed: back vowel harmony in section 4.1 and front vowel harmony in 4.2. Both processes show complex phonological conditioning coupled with extensive inter- and intra-dialectal variation, especially in Botswana Yeyi.

4.1. Back vowel harmony. Back vowel harmony changes a high front vowel /i/ to /u/ when followed by a back vowel /u/ or /o/ in the next syllable. This type of vowel harmony has previously been described for Namibian Yeyi by Donnelly (1990: 30-32) and Seidel (2008: 47-48). The latter notes its irregularity and calls for further research on how this feature has spread through and become entrenched in the language. The only description of back vowel harmony in Botswana Yeyi comes from Sommer and Vossen (1995: 437-440), who also note that this type of harmony is only applied very irregularly. In this section, I will first describe back vowel harmony in Namibian Yeyi, where it is more productive, and then provide a comparison with Botswana Yeyi, where back vowel harmony is mostly seen within lexical roots, and rarely across morpheme boundaries.

Back vowel harmony in Yeyi is illustrated with the class 7 nominal prefix: as shown in (9), this prefix is realized as *ʃi-* when used when the first syllable of the noun root contains a vowel /a/, /e/ or /i/. When used with a root with a back vowel /u/ or /o/, however, the class 7 nominal prefix changes to *ʃu-*, as seen in (10).

- (9) Class 7 nominal prefix *ʃi-*
- a. *ʃi-raro*
NP₇-clothing
'piece of clothing' (NY: Seidel 2008: 118)
 - b. *ʃi-yèèyí*
NP₇-Yeyi
'the Yeyi language, culture' (NY: Donnelly 1990: 69)
 - c. *ʃi-sísíná*
NP₇-heel
'heel' (NY: Donnelly 1990: 70)
- (10) Class 7 nominal prefix allomorph *ʃu-*
- a. *ʃu-púndì*
NP₇-brat
'brat' (NY: Donnelly 1990: 31)
 - b. *ʃu-rúngirà*
NP₇-heartburn
'heartburn' (NY: Donnelly 1990: 31)
 - c. *ʃu-bowuma*
NP₇-snake
'kind of snake' (NY: Seidel 2008: 118)

Back vowel harmony is also triggered by a glide /w/, as shown in (11)-(12). This is in line with previously proposed analyses of /w/ as an allophonic realization of a back vowel (see section 3).

- (11) *ʃu-waβa*
NP₇-mushroom
'kind of mushroom' (NY: Seidel 2008: 47)
- (12) *ʃu-hweta*
NP₇-topic
'topic, discussion' (NY: Seidel 2008: 47)

Vowel harmony affects nominal prefixes with a vowel /i/, such as class 7 *ʃi-*, but also class 5 *li-*, as seen in (13), which changes to *lu-* under the influence of a following back vowel, as seen in (14). Similarly, the class 10 prefix *zi-* (see (15)) has an allomorph *zu-*, as seen in (16).

- (13) Class 5 nominal prefix *li-*
- a. *li-!aβa > li!aβa*
NP₅-shoulder
'shoulder' (NY: Seidel 2008: 116)

- b. li-βere > liβèré
NP₅-breast
'breast' (NY: Gowlett 1992: 128)
- c. li-ziβa > liziβa
NP₅-pool
'pool of water' (NY: Seidel 2008: 116)
- (14) Class 5 nominal prefix allomorph lu-
- a. li-vunyu > luvunu
NP₅-maggot
'maggot' (NY: Seidel 2008: 116)
- b. li-g!o > lug!o
NP₅-lower.back
'lower back' (NY: Seidel 2008: 116)
- c. li-yuro > luyuro
NP₅-nose
'nose' (NY: Seidel 2008: 116)
- (15) Class 10 nominal prefix zi(n)-
- a. zin-tóβì
NP₁₀-branch
'branches' (NY: Donnelly 1990: 74)
- b. zi-ŋwaka
NP₁₀-snake
'snakes' (NY: Seidel 2008)
- (16) Class 10 nominal prefix allomorph zu-
- a. zin-kokuna > zunkokuna
NP₁₀-elbow
'elbows' (NY: Seidel 2008: 121)
- b. zin-furo > zunfuro
NP₁₀-knife
'knives' (NY: Seidel 2008: 106)

The nominal prefix of class 9, which has the shape *i(n)-*, does not undergo vowel harmony (Donnelly 1990: 31; Seidel 2008: 47), as seen in (17). This is also the only prefix that begins with a vowel, rather than a consonant.

- (17) i-ŋu
NP₉-flood.season
'flood season' (NY: Seidel 2008: 119)

Vowel harmony also affects verbal prefixes, such as the 1st person plural subject prefix **ti-**, as seen in (18). It also affects the past prefix *riku-*, which is realized as *ruku-* due to the back vowel in the second syllable. Evidence for an underlying form *riku-* comes from alternations with the distal marker *ka-*, which may replace *ku-* in *riku-*, in which case the realization [*rika*] is used, rather than [*ruku*] (Seidel 2008: 314–315).

- (18) ti-wur-e > tùwùré
SM_{IPL}-buy-SBJV
'Let us buy' (NY: Seidel 2008: 47)
- (19) nda-riku-eenda > ndàrùkwèèndà
SM_{ISG}-PST-walk
'I went' (NY: Seidel 2008: 47)

Vowel harmony typically affects a single syllable, but there are rare examples of vowel harmony targeting up to two syllables, as in (20).

- (20) zì-l-ìnó > zùrùnó
NP₈-NP₅-tooth
'rotten teeth' (NY: Donnelly 1990: 31)

Certain examples, presented in (21), suggest that vowel harmony can be triggered by the "reversive suffix" *-ur* (or its allomorph *-un*), a verbal derivational suffix that expresses an action that is reversed, repeated or redone (Seidel 2008: 246-248; Lukusa 2002: 76). However, there are also examples where the reversive suffix does not trigger vowel harmony, as in (22).

- (21) Vowel harmony triggered by the reversive
- a. ku-zik-ur-a > kuzukura
INF-hide-REV-FV
'to pull out (of ground)'
cf. kuzika 'to hide, bury' (NY: Seidel 2008: 47; BY: Lukusa 2002: 76)
 - b. ku-shim-unun-a > kufumununa
INF-tie-REV-FV
'to untie' (NY: Seidel 2008: 250)
- (22) Vowel harmony not triggered by the reversive
- a. -ter-ur-a > terura
pour-REV-FV
'pour something back' (cf. tera 'pour into') (NY: Seidel 2008: 248)
 - b. -tjek-ur-a > tʃekura
close-REV-FV
'open (take the lid from pot)' (cf. tʃeka 'close (put lid on pot)') (NY: Seidel 2008: 248)

In most cases, whether the reversive suffix triggered vowel harmony is impossible to determine because the underived root is not attested.

Another environment in which back vowel harmony may occur is in nouns derived from verbs with the suffix *-o*. When preceded by a causative suffix *-is*, it expresses an instrument noun (Seidel 2008: 136). When preceded by an applicative *-ir*, it expresses a style or method, or a place (Seidel 2008: 136). The vowel /i/ in the causative *-is* is never changed to /u/ under the influence of the following /o/, as shown in (23). The vowel /i/ in the applicative *-ir*, on the other hand, is often changed to /u/ under the influence of the following /o/, as shown in (24), although there is an equally large number of exceptions, as shown in (25).

- (23) No vowel harmony in the causative *-is* under the influence of the deverbal suffix *-o*

- a. ʃi-bey-is-o > ʃibeyiso
NP₇-carve-CAUS-NMLZ
'any instrument used to carve'.
- b. ʃi-hwet-is-o > ʃuhwetiso
NP₇-speak-CAUS-NMLZ
'microphone'.
- c. ʃi-nuk-is-o > ʃunukiso
NP₇-smell-CAUS-NMLZ
'perfume' (NY: Seidel 2008: 136)
- (24) Vowel harmony in the applicative -ir under the influence of the deverbal suffix -o
- a. mu-yend-ir-o > muyenduro
NP₃-walk-APPL-NMLZ
'way of walking'
- b. mu-tand-ir-o > mutanduro
NP₃-hunt-APPL-NMLZ
'way of hunting' (NY: Seidel 2008: 136)
- c. li-yay-ir-o > liyayuro
NP₅-grind-APPL-NMLZ
'where you grind tobacco' (NY: Seidel 2008: 137)
- (25) No vowel harmony in the applicative -ir under the influence of the deverbal suffix -o
- a. mu-wumb-ir-o > muwumbiro
NP₃-thatch-APPL-NMLZ
'way of thatching' (NY: Seidel 2008: 136)
- b. li-terif-ir-o > literifiro
NP₅-cook-APPL-NMLZ
'kitchen, cooking-place' (NY: Seidel 2008: 137)
- c. li-sik-ir-o > lisikiro
NP₅-urinate-APPL-NMLZ
'urinal' (NY: Seidel 2008: 31)

Furthermore, the Namibian Yeyi data presented by Donnelly (1990) never exhibit vowel harmony triggered by the nominalizing suffix -o, as shown in (26).

- (26) No vowel harmony under influence of the deverbal suffix -o in Donnelly's (1990) data
- a. li-sway-ir-o > liswayiro
NP₅-sharpen-APPL-NMLZ
'whetstone, anything for sharpening axes' (NY: Donnelly 1990: 23)
- b. mu-lim-in-o > mulimino
NP₃-cultivate-APPL-NMLZ
'way of cultivating'.
- c. mu-tʃeʃ-ir-o > mutʃeʃiro
NP₃-put_lid-APPL-NMLZ
'way of putting on a lid' (NY: Donnelly 1990: 60)

The deverbal suffix -o can also be used to derive a noun from a verb without any additional verbal suffixes, in which case it never triggers vowel harmony, as shown in (27).

- (27) No vowel harmony in lexical roots under influence of the deverbal suffix *-o*
- $\text{ʃi-βik-o} > \text{ʃiβiko}$
NP_{7-?}-NMLZ
'container' (NY: Seidel 2008: 136)
 - $\text{mu-lik-o} > \text{muliko}$
NP_{3-try}-NMLZ
'test' (NY: Donnelly 1990: 60)

Vowel harmony also occurs root-internally, in which case comparative Bantu evidence is required to show a previous front vowel that was backed as the result of back vowel harmony. Table 1 shows several lexical roots that are reconstructed with *i or *ɪ in the first syllable (both vowels merge into /i/ in Yeyi, Gowlett 1992: 125), followed by a back vowel. Unlike back vowel harmony across morpheme boundaries, which only occurs in Namibian Yeyi, lexical back vowel harmony also affects Botswana Yeyi to a certain degree.

Table 1: Back vowel harmony in lexical roots

Reconstructed root	Namibian Yeyi				Botswana Yeyi	
	Donnelly (1990)	Seidel (2008)	Gowlett (1992)	Baumbach (1997)	Sommer (1995)	Lukusa (2009)
*dídò 'fire'	mù-ndúrò	mù-ndúrò	mù-ndúrò	mù-ndúrò	mù-ndírò	mu-ndírò
*jìkò 'fireplace; country'	li-zìkò	li-ikò	li-zùkò	lii-ko		li:k'ò
*jìmbò 'song'	rù-yùmbó	rù-yùmbó		ru-yimbo	ìn-jìmbó	ru-yimbó
*pígò 'kidney'	ìn-síyò	in-siyo	ìn-síyò	in-síyó	ìn-síyò	
*kíngó 'neck, nape, voice'		in-sungu		in-sungu	ìn-sìngó, ìn-sùngó	
*díngò 'load'		mu-ziyo		mu-zíyó	mù-zíyò	mu-zíyò
*jìb 'forget'		yìbaara	yìbàrà		yìwàrà, yùwàrà	yìwàrà
*jìgu 'hear'	yúvwà 'hear'	yuvwa 'hear, understand'	yúvwà (Gowlett), yívwà (Westphal) ³ 'hear, feel'	yuvwa 'hear'	yívwà 'hear, taste, know'	yuvwa 'hear, feel, understand'
*dímò 'spirit'			mù-zúmù 'ancestral spirit'			mu-zumu 'ancestor, ancestral spirit'

As shown by the data in Table 1, back vowel harmony may apply root-internally, but its occurrence is highly variable between lexemes and between varieties. Most of this variation can be

³ While Gowlett (1992) mostly analyzes his own Yeyi data collected in Namibia, he also occasionally supplements them with unpublished notes by Westphal, who worked on Botswana Yeyi.

attributed to intersecting factors of phonological conditioning and dialectal variation. Firstly, in all Yeyi varieties back vowel harmony is blocked by a following palatal glide, as seen in the uniform realization of *insiyo* ‘kidney’ and *muziyo* ‘load’. An immediately preceding /i/ vowel also blocks back vowel harmony, as seen by the forms *liiko* ‘hearth’. Note that the only reflex which maintained an initial root consonant here has the form *li-zuko*, e.g. with back vowel harmony, presumably enabled by the lack of direct contact with the preceding /i/ vowel. In forms where back vowel harmony is not blocked for phonological reasons, a tendency appears for Namibian Yeyi varieties to realize back vowel harmony more consistently than Botswana Yeyi varieties.

Vowel harmony in Botswana Yeyi is not only rare root-internally but is virtually absent in all other contexts as well. Vowel harmony in noun class prefixes is not recorded in Botswana Yeyi data from Sommer (1995), Lukusa (2009), or Chebanne et al. (2007), and no vowel harmony is seen in verbal prefixes in Lukusa’s (2002) grammar of Botswana Yeyi. In Sommer and Vossen’s (1995) study, which includes data from 12 Yeyi speakers from different regions in Botswana (as well as one Namibian Yeyi speaker), only six words are documented that exhibit back vowel harmony across morphemes, produced by three different speakers. These data confirm that back vowel harmony in Botswana Yeyi is highly marginal, with the non-application of back vowel harmony clearly the preferred choice.

However, Botswana Yeyi does seem to display a tendency towards harmony triggered by the reversive suffix: out of the 85 verbs in Lukusa’s Yeyi dictionary (2009) that contain an apparent reversive suffix (e.g. that consist of a (C)VC root followed by a sequence *-ur* or *-un*), only 3 verbs contain a front vowel in their initial syllable, as listed in (28).

- (28) (Apparent) reversive verbs with a front vowel in their root
- a. *fewura*
‘destroy’ (Lukusa 2009: 193)
 - b. *zetura*
‘take more than one’s share of food’ (Lukusa 2009: 317)
 - c. *femuna*
‘give birth’ (Lukusa 2009: 191)

While verbs with a reversive suffix are often not attested in their underived form, thus making it impossible to detect the effect of vowel harmony, this tendency does suggest that harmony between the reversive and the verb root, while not obligatory, is preferred in Botswana Yeyi.

4.2. Front vowel harmony. Front vowel harmony is also regressive and involves changing the vowel /o/ to a glide /w/ under influence of a front vowel in the following syllable, as well as the copying of the triggering vowel into the target syllable. Front vowel harmony has been described for Namibian Yeyi by Seidel (2008: 48-49), and diachronically by Gowlett (1992), and, as I will show in this section, also occurs in Botswana Yeyi. The exact nature of this process is more complex than implied by the term vowel harmony, as the target vowel is diphthongized rather than harmonized, and the trigger vowel is copied after the diphthong. However, for simplicity’s sake and to highlight the similarities to back vowel harmony, the term “front vowel harmony” is used here to refer to this process, rather than the more accurate but also more cumbersome “diphthongization and vowel copying”.

Front vowel harmony targets the back vowel /o/, and is triggered by a vowel /a, e, i/ in the following syllable. It causes the back vowel /o/ to turn into a glide /w/ and copies the triggering

vowel in the second syllable to the target syllable. An example is given with the verb root *mon* ‘see’ in (29): its underlying vowel is realized in (29)a, where the root is used with a final vowel harmony (FVH) suffix indicating past tense. When combined with the default final vowel (FV) suffix *-a*, such as in the infinitive, the vowel /o/ changes to /w/ and the /a/ of the suffix is copied to the preceding syllable, as in (29)b. The subjunctive suffix *-e*, used in (29)c, also causes glide formation, combined with a copy of the vowel /e/.

(29) Vowel harmony affecting the verb root *mon* ‘see’.

- a. ndà-mòn-ú
SM_{1SG}.PST-see-FVH
‘I have seen.’
- b. ku-mon-a > kùmwàná
INF-see-FV
‘to see’.
- c. ndi-mon-e > ndìmwèné
SM_{1SG}-see-SBJV
‘I should see.’ (Seidel 2008: 48)

Front vowel harmony triggered by /i/ differs slightly in that the vowel /i/ is not copied into the target syllable, which is rather realized with a vowel /e/, as shown in (30).

(30) i-mon-i > imweni
NP₉-see-AG
‘pupil (of eye)’ (Seidel 2008: 48)

/i, e, a/ are all non-back vowels, but descriptions of Yeyi are unclear on whether /a/ is considered a front vowel, a central vowel, or a vowel unspecified for frontness (see section 3). However, as /a/ joins the front vowels /i/ and /e/ in triggering vowel harmony, the most parsimonious analysis would be to assume that /a/ functions as a front vowel in Yeyi.

Seidel (2008: 49) suggests that front vowel harmony is restricted to the penultimate syllable. However, front vowel harmony in other syllables also occurs, as shown in (31), but not always, as shown in (32).

(31) Front vowel harmony in syllables other than the penultimate

- a. mon-an-a > mwanana
see-REC-FV
‘see each other’ (NY: Seidel 2008: 255)
- b. mon-is-is-a > mwenisisa
see-CAUS-CAUS-FV
‘look properly’ (NY: Seidel 2008: 263)
- c. ʃom-aar-a > ʃwamaara
poke-EXT-FV
‘remove/draw out repeatedly’.
- d. t^hoy-is-is-a > t^hweyisisa
hate-CAUS-CAUS-FV
‘cause somebody to hate somebody’ (NY: Seidel 2008: 262)

- (32) Non-application of front vowel harmony in syllables other than the penultimate
- a. horongan-a
become.ruinous-FV
'become physically or aspectually ruinous' (NY: Seidel 2008: 257)
 - b. yop-ir-a
fear-APPL-FV
'look for shelter; flee (to a place of refuge)' (NY: Seidel 2008: 230)

Like back vowel harmony, front vowel harmony is not applied with absolute regularity in Yeyi. There is some intradialectal variation, as illustrated for Namibian Yeyi in (33) and for Botswana Yeyi in (34).

- (33) Namibian Yeyi
- a. ku-i-tweli / ku-ra-tweli
INF-?-weak
'become weak' (NY: Seidel 2008: 266)
 - b. toli
'weak (adj.)' (NY: Seidel 2008: 143)
- (34) Botswana Yeyi
- a. nong-is-a
be.wet-CAUS-FV
'to make wet'.
 - b. nweng-is-a
be.wet-CAUS-FV
'to make wet' (BY: Lukusa 2009: 138-139)

There is also variation between dialects, with Namibian Yeyi showing a stronger tendency towards front vowel harmony than Botswana Yeyi. Table 2 shows the extent of front vowel harmony across different Namibian and Botswana Yeyi varieties.

Table 2: Front vowel harmony in Yeyi dialects

Gloss	Namibian Yeyi				Botswana Yeyi		
	Donnelly (1990)	Seidel (2008)	Gowlett (1992)	Baumbach (1997)	Sommer 1995	Lukusa 2009	Chebann et al. 2007
'be afraid'	ywàpá	ywapa	ywàpá		yùápá, yòpá	yopa	yopa
'drum'	ìngwám à		ìngwám à	ingwama	ìngwámà, ìngòmá	ingwáma, ingóma	
'see'	mwàná	mwàná	mwàná	mwana	mwàná	mwana	
'blood'	mà- rwápà	ma- rwapa	mà- rwápà	ma- rwapa	mà-rópá, mà-rùápá	ma-rópa	
'snake'	ìnywàkà	inywaka	ìnywàkà	inywaka	ìnyùákà, ìnyókà	inywaká	inywaka
'python'	ìmbwám à	imbwama	ìmbwám à	imbwama	ìmbwámà, ìmbómà	imbwama	

'tears'			zìn-ǰòzì, zìn- ǰwèzì	in-ǰózi	mì-ǰwèzì, mì-ǰòzì	mi-ǰwézi	mi-ǰwezi
		indwezi 'fetish, magic gun'	mù- rwézi, mù-rózi 'witch'		ìndwézi, ìndózi 'witchcraft '	in-dwézi 'witchcraft ', mu-róyi 'witch'	
'shame, shyness ,	zìn-ǰóní		zìn- ǰwèní		zìn-ǰwèní		zìn- ǰweni

Table 2 shows that front vowel harmony in Namibian Yeyi is applied consistently when the triggering vowel is /a/. Front vowel harmony triggered by /i/ shows more variability. Data on front vowel harmony triggered by /e/ are too limited to make generalizations. Gowlett (1992: 127–128) considers this a dialectal variation within Namibian Yeyi, but, as the data in Table 2 show, this variation extends to Botswana Yeyi as well.

In Botswana Yeyi, the application of front vowel harmony varies regardless of the triggering vowel. Chebanne et al. (2007: 17) note this as a dialectal difference between Yeyi as spoken on the Western side of the Okavango delta, with words like *maqoma* 'papyrus' and *wayoni* 'visitors', as opposed to the Seronga/Sankuyu dialect which realizes these words as *maqwama* and *wayweni* respectively.

Front vowel harmony is also applied irregularly to loanwords. Here too, Namibian Yeyi shows a stronger tendency towards front vowel harmony than Botswana Yeyi. Examples of the application of front vowel harmony in loanwords in Namibian Yeyi are given in (35), with examples of loanwords that failed to undergo front vowel harmony in (36).

(35) Namibian Yeyi: application of front vowel harmony in loanwords

- a. kù-pwétír-à
INF-visit-FV
'to visit' (NY: Donnelly 1990: 23)
from Lozi ku potela 'visit someone' (Burger 1960: 161)
- b. kù-t^hwày-á
INF-hate-FV
'to hate' (NY: Seidel 2008)
from Lozi ku toya 'to hate' (Burger 1960: 72)
- c. ù-dònkí ~ ù-dwènkí
NP_{1a}-donkey
'donkey' (NY: Seidel 2008)

(36) Namibian Yeyi: non-application of front vowel harmony in loanwords

- a. mù-pólísà / mu-polisa
NP₁-police
'policeman' (NY: Donnelly 1990: 50; Seidel 2008)
- b. ǰì-!ózá
NP₇-Xhosa
'Xhosa language' (NY: Donnelly 1990: 69)

In Botswana Yeyi, only a single example of front vowel harmony in a loanword is attested (37). In all other cases, front vowel harmony does not affect loanwords, as in the examples in (38).

- (37) Botswana Yeyi: application of front vowel harmony in loanwords
- a. ʃi-kwéré
NP₇-school
'school' (Lukusa 2009)
- (38) Botswana Yeyi: non-application of front vowel harmony in loanwords
- a. li-pɔliʃi
NP₅-police
'policeman' (Lukusa 2009)
 - b. u-kópi
NP_{1a}-cup
'cup' (Lukusa 2009)
 - c. u-dɔŋgi
NP_{1a}-donkey
'donkey' (Lukusa 2009)

In modern Yeyi, not all sequences of /wa/ or /we/ followed by a syllable with a vowel /a, e, i/ (e.g. forms that may result from front vowel harmony), are the result of actual front vowel harmony, as attested by comparative data. (39) shows examples of /wa/ sequences that derive from a historical *o, as attested by their Proto-Bantu reconstructions. The examples in (40), however, derive from historical sequences of a back vowel combined with /a/ in the same syllable. These are therefore historically not the result of front vowel harmony.

- (39) Historical glide formation
- a. kù-mwàn-á
INF-see-FV
'to see' (Donnelly 1990: 89)
< *bón 'see'.
 - b. mà-rwápà
NP₆-blood
'blood' (Donnelly 1990: 67)
< *dòpà 'blood'
 - c. bwàr-à
rot-FV
'to rot' (Lukusa 2009)
< *bòd 'be rotten'.
- (40) Historical diphthongs
- a. fwàn-á
resemble-FV
'resemble; be fit, appropriate' (Lukusa 2009)
< *púan 'resemble each other'

- b. twàr-à
bring-FV
'take something/someone to' (Lukusa 2009)
< *tóád 'carry on the head; carry; bring; carry away; be chief; include'
- c. rwàn-à
fight-FV
'fight, do battle' (Lukusa 2009)
< *dòàn 'fight'.

However, even /wa/ sequences that do not historically arise from vowel harmony are reanalysed in modern Yeyi as consisting of an underlying /o/. This can be seen from the form these verb roots take in the past tense. The past tense is marked by a "final vowel harmony" suffix, which consists of a copy of the vowel of the verb stem. As this suffix is identical to the vowel of the verb root, this verb tense allows the underlying vowel of the verb root to surface. As the comparison between (41) and (42) shows, both /wa/ sequences that are the result of harmony and those that are reflexes of original vowel sequences surface as /o/ in this context.

- (41) Past forms of /wa/ sequences that arise from vowel harmony
- a. mon-o
see-FVH
PAST of mwana 'see' (< *bón 'see')
- b. bor-o
rot-FVH
PAST of bwara 'rot' (< *bòd 'be rotten')
- (42) Past forms of /wa/ sequences that derive from historical diphthongs
- a. fon-o
resemble-FVH
PAST of fwana 'resemble' (< *púan 'resemble each other')
- b. ron-o
fight-FVH
PAST of rwana 'fight' (< *dòàn 'fight')

5. The origin of backness harmony in Yeyi

As shown in 4, back vowel harmony and front vowel harmony are subject to complex phonological conditioning, but also to free and regional variation. In most cases, Botswana Yeyi was shown to display more variation than Namibian Yeyi. As noted in section 2, Botswana Yeyi and Namibian Yeyi differ in terms of their language ecology. Botswana Yeyi is endangered through ongoing pressure from, and language shift to, Tswana. This leads to language loss, and Sommer and Vossen (1995) describe its effect on linguistic variation, creating more variation as speakers' Yeyi knowledge deteriorates. The more stable sociolinguistic situation of Namibian Yeyi may have contributed to more homogenous language use. Furthermore, Botswana Yeyi is spread over a large area, with speakers living all along the fringes of the wide-spread Okavango delta. Namibian Yeyi, however, is reportedly spoken only in the southern part of the Zambezi region, in adjacent villages at most 50 kilometres apart (Seidel 2005). The potential for regional variation in Botswana Yeyi is

therefore much bigger. Seidel (2008: 22) also found little evidence for regional variation within Namibian Yeyi.

Vowel harmony processes described here for Yeyi are not typical for Bantu languages. The most common vowel harmony in Bantu languages is progressive vowel height harmony, typically seen in verbal derivational suffixes, which contain a high vowel that is lowered after a verb root containing a mid-vowel (or sometimes also a low vowel) (Greenberg 1951; Hyman 1999; 2019; Goes & Bostoen 2019). This type of vowel harmony is also seen in many Bantu languages surrounding Yeyi, such as Fwe (Gunnink 2022: 66-70), Totela (Crane 2019: 668), Subiya (Jacottet 1896: 6), and Mbukushu (Fisch 1998: 128). Other types of vowel height harmony have been innovated in some languages of the Sotho-Tswana cluster (S30) (Gowlett 2003: 612-613). Vowel height harmony in verbal derivational suffixes, or anywhere else in the grammar, is not seen in Yeyi, as shown in (43), which shows that the applicative suffix *-ir* is consistently realized with a high vowel, even with verb roots that contain a mid-vowel.

(43) No vowel height harmony in Yeyi derivational suffixes

- a. ruʃ-ir-a
weave-APPL-FV
'weave on behalf of' (NY: Seidel 2008: 230)
- b. hwet-ir-a
speak-APPL-FV
'speak on behalf of' (NY: Seidel 2008: 230)
- c. yop-ir-a
fear-APPL-FV
'look for shelter; flee' (NY: Seidel 2008: 230)

Backness harmony, on the other hand, is less common in Bantu languages. Hyman (2019: 134) notes three Bantu languages with back vowel harmony, but considers these to be “innovating”, confirming that, unlike vowel height harmony, this is not a well-attested process in Bantu. “Umlaut”, a regressive vowel assimilation process triggered by front vowels, is described for Kwilu Bantu languages (B80) spoken in the western part of the Democratic Republic of the Congo (Bostoen & Koni Muluwa 2014). Given the uncertain position of Yeyi within Bantu, it is not possible to compare vowel assimilation processes in Yeyi to those of its closest linguistic relatives. However, other Bantu languages spoken in Botswana and Namibia do not have processes of backness harmony. Fwe (K402), spoken in Zambia and Namibia, only has an unproductive process of regressive back vowel harmony affecting the impositive suffix **-am**, but no other cases of regressive vowel harmony (Gunnink 2022b: 259–260). Given the relatively rare status of backness harmony in Bantu languages, in general as well as in the Southern African region in particular, it is likely that backness harmony is a Yeyi innovation.

On the other hand, regressive vowel assimilation is a feature of the Khoisan languages of the Kalahari Basin Area. The Tuu language !Xoon and the Khoe-Kwadi language Glui both have very complex sets of conditions on vowel assimilation, which can be triggered by preceding or following consonants, and by the nature of the following vowel. This can result in complete or partial regressive vowel assimilation (Lionnet 2018). Regressive vowel assimilation also occurs in Khwe, a language cluster belonging to the Khoe-Kwadi family, that is spoken in northwestern Botswana, northeastern Namibia, and adjacent areas in Zambia and Angola (Brenzinger 1998), partially overlapping with Yeyi. Linguistic influence from Khwe specifically, but also the wider Khoe family

in general, has been identified in Yeyi (Sommer & Voßen 1992; Gunnink et al. 2015; Gunnink 2022a), and close relationships between some Khoe speaking communities and Yeyi speakers are still ongoing in some areas (Gunnink 2022a: 30). Vowel harmony in Khwe occurs in disyllabic roots, where Khwe displays a tendency towards absolute harmony between the vowels of both syllables. This also includes roots where the first syllable contains a diphthong with an off-glide that is identical to the vowel of the second syllable (Kilian-Hatz 2008: 28-32).

- (44) Vowel harmony in Khwe disyllabic lexical roots
- a. kx'ára 'impala' (Kilian-Hatz 2008: 29)
 - b. nɔgere 'sharpen' (Kilian-Hatz 2008: 32)
 - c. lóéve 'kiss' (Kilian-Hatz 2008: 32)

This tendency towards vowel harmony is reminiscent of vowel harmony in Yeyi; like in Yeyi, the Khwe process appears to be regressive, and in both languages this process may result in (apparent) diphthongs, though in Yeyi these are analyzed as glide-vowel sequences. Furthermore, Khwe, like Yeyi, displays variation in the application of vowel harmony (Kilian-Hatz 2008: 32), some of which is considered dialectal.

- (45) Variation in the application of vowel harmony in Khwe
- a. wòrèe ~ wèrèe 'scoop, ladle out (liquid)' (Kilian-Hatz 2003: 140)
 - b. †qóévé ~ †qóvé 'frog' (Kilian-Hatz 2003: 93)
 - c. góámá ~ gómá 'forearm' (Kilian-Hatz 2003: 46)

Regressive vowel harmony is not restricted to Khwe but is noted to be “extremely common” throughout the Khoe family (Voßen 1997: 371). For instance, Naro, a Khoe language spoken in Botswana’s Ghanzi district, displays a tendency for vowels to be copied from the second to the first syllable of a word, resulting in a diphthong in the initial syllable (Visser 2013: 64), as illustrated in (46).

- (46) Regressive vowel assimilation in Naro
- a. /!nona/ > [!noana] ‘three’
 - b. /lore/ > [loere] ‘play’
 - c. /koba/ > [koaba] ‘Koba (name)’ (Visser 2013: 64)

Vowel assimilation in Khoe and other Kalahari Basin languages provides some striking similarities with vowel harmony in Yeyi; vowel assimilation is regressive, is not restricted to vowel height but often involves copying the complete vowel, and often results in diphthongs, similar to the glide-vowel sequences created in Yeyi through front vowel harmony. A thorough and systematic study of the use of regressive vowel assimilation across Khoe and other Kalahari Basin languages would reveal the extent to which this process applies, its phonological conditioning, and perhaps its synchronic and/or diachronic regularity. This would enable us to understand better to what extent the development of regressing backness harmony in Yeyi was a contact-induced change.

6. Conclusion

In this paper two regressive vowel harmony processes in Yeyi have been discussed, back vowel harmony and front vowel harmony. Both rules are subject to complex phonological conditioning, but also to extensive variation. This variation can be linked to the sociolinguistic situation of Yeyi, which is characterized by multilingualism, language shift and language loss. The relatively more stable application of vowel harmony in Namibian Yeyi also correlates with less regional variation and less language shift. Furthermore, regressive backness harmony is not a very common process in Bantu languages. Vowel assimilation processes similar to what occurs in Yeyi are instead seen in languages of the Kalahari Basin Area, including some languages with which Yeyi is and has been in contact. This hints at regressive vowel assimilation functioning as an areal phenomenon, crossing the boundaries of languages and language families.

The analysis of regressive vowel harmony in Yeyi not only sheds light on past and present situations of contact and multilingualism, but also helps identify or strengthen previously unknown or tenuous non-Bantu etymologies for Yeyi words. Yeyi has adopted large numbers of loanwords from languages of the Khoe family and the Ju cluster, but for the majority of words of apparent non-Bantu origin, as attested by their use of foreign phonemes or (fossilized) foreign morphemes, no specific etymology could be proposed (Gunnink et al. 2015; Gunnink 2022a). Internal reconstruction of the non-harmonized forms of Yeyi lexemes may reveal otherwise obscure correspondences with non-Bantu source words. An example is Yeyi *n! 'ípít-à* 'kiss' (Donnelly 1990: 21); if the initial /i/ is an underlying /u/ which became fronted under influence of the following /i/, the potential Okongo !Kung source *l'oba* 'kiss' (Heikkinen 1986: 23) becomes more plausible⁴.

Abbreviations

AG	agentive
APPL	applicative
CAUS	causative
EXT	extensive
FV	default final vowel suffix
FVH	final vowel harmony suffix
INF	infinitive
NMLZ	nominalizer
NP	nominal prefix
PST	past
SBJV	subjunctive
SM	subject marker

References

- Andersson, Charles J. 1855. Explorations in South Africa, with Route from Walfish Bay to Lake Ngami, and Ascent of the Tiogé River. *Journal of the Royal Geographical Society of London* 25. 79–107.
- Bastin, Yvonne, André Coupez, Evariste Mumba & Thilo C. Schadeberg. 2002. *Bantu Lexical Reconstructions 3*. Tervuren: Royal Museum for Central Africa, online database: <http://linguistics.africamuseum.be/BLR3.html>. Last accessed: 25-04-2023.

⁴ I am grateful to an anonymous reviewer for bringing this to my attention.

- Baumbach, E.J.M. 1997. Bantu languages of the Eastern Caprivi. In Haacke, W.H.G. & E.E. Elderkin (eds.), *Namibian languages: Reports and papers*, 307-451. Köln: Rüdiger Köppe.
- Bostoën, Koen. 2009. Shanjo and Fwe as part of Bantu Botatwe: a diachronic phonological approach. In Ojo, Akinloye & Lioba Moshi (eds.), *Selected proceedings of the 39th Annual Conference of African Linguistics*, 110-130. Somerville: Cascadilla Proceedings Project.
- Bostoën, Koen & Joseph Koni Muluwa. 2014. Umlaut in de the Bantu B80 languages of the Kwilu (DRC). *Transactions of the Philological Society* 112(2). 209-230.
- Brenzinger, Matthias. 1998. Moving to survive: Kxoe communities in arid lands. In Schladt, Matthias (ed.), *Language, identity and conceptualization among the Khoisan*, 321-357. Köln: Rüdiger Köppe.
- Burger, J.P. 1960. *An English-Lozi vocabulary*. Morija - Basutoland: Morija Printing Works.
- Chebanne, Andy Monthusi, Mike Rodewald & Lydia Nyati-Ramahobo. 2007. *Mutjango wu Shiyeyi (The Shiyeyi Writing System)*. Gaborone: The Botswana Society.
- Crane, Thera. Totela K41. In Van de Velde, Mark, Koen Bostoën, Derek Nurse & Gérard Philippson (eds.), *The Bantu languages*, 645-691. Second edition. London/New York: Routledge.
- Donnelly, Simon Scurr. 1990. *Phonology and Morphology of the Noun in Yeeyi*. Cape Town: University of Cape Town BA thesis.
- Fehn, Anne-Maria. 2019. Phonological and lexical variation in the Khwe dialect cluster. *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 169(1). 9-38.
- Fisch, Maria. 1998. *Thimbukushu grammar*. Windhoek: Out of Africa publishers.
- Fulop, Sean A., Peter Ladefoged, Fang Liu & Rainer Vossen. 2003. Yeyi clicks: Acoustic description and analysis. *Phonetica* 60. 231-260.
- Goes, Heidi & Koen Bostoën. 2019. Progressive vowel height harmony in Proto-Kikongo and Proto-Bantu. *Journal of African Languages and Linguistics* 40(1). 23-73. <https://doi.org/10.1515/jall-2019-0003>.
- Gowlett, Derek F. 1992. Yeyi reflexes of proto-Bantu. In Gowlett, Derek F. (ed.), *African Linguistic Contributions: Presented in honour of Ernst Westphal*, 122-188. Pretoria: Via Afrika.
- Gowlett, D.F. 1997. Aspects of Yeyi diachronic phonology. In Haacke, W.H. G. & E.E. Elderkin (eds.), *Namibian languages: Reports and papers*, 235-263. Köln: Rüdiger Köppe.
- Gowlett, Derek. 2003. Zone S. In Nurse, Derek & Gérard Philippson (eds.), *The Bantu languages*, 609-638. First edition. London/New York: Routledge.
- Greenberg, Joseph H. 1951. Vowel and nasal harmony in Bantu languages. *Zaire* 5. 813-820.
- Güldemann, Tom. 2014. 'Khoisan' linguistic classification today. In Güldemann, Tom & Anne-Maria Fehn (eds.), *Beyond 'Khoisan': Historical relations in the Kalahari basin*, 1-40. Amsterdam/Philadelphia: John Benjamins.
- Gunnink, Hilde. 2022a. Morphological Khoisan influence in the Southern African Bantu language Yeyi. *Journal of African Languages and Linguistics* 43(1). 3-35. <https://doi.org/10.1515/jall-2022-8892>.
- Gunnink, Hilde. 2022b. *A grammar of Fwe*. Berlin: Language Science Press.
- Heikkinen, Terttu. 1986. Phonology of the !Xū dialect spoken in Ovamboland and western Kavango. *South African Journal of African Languages* 6(1). 18-28.
- Hyman, Larry. 1999. The historical interpretation of vowel harmony in Bantu. In Hombert, Jean-Marie & Larry Hyman (eds.), *Bantu historical linguistics: Theoretical and empirical perspectives*, 235-295. Standford: CSLI publications.

- Hyman, Larry. 2019. Segmental phonology. In Van de Velde, Mark, Koen Bostoen, Derek Nurse & Gérard Philippson (eds.), *The Bantu languages*, 128–149. Second edition. London/New York: Routledge.
- Jacottet, E. 1896. *Études sur les langues du Haut-Zambèze: Grammaires soubiya et louyi*. Paris: Ernest Leroux.
- Johnston, Harry H. 1919. *A comparative study of the Bantu and semi-Bantu languages*. Oxford: Oxford University Press.
- Kilian-Hatz, Christa. 2003. *Khwe dictionary*. Köln: Rüdiger Köppe.
- Kilian-Hatz, Christa. 2008. *A grammar of modern Khwe (central Khoisan)*. Köln: Rüdiger Köppe.
- Lionnet, Florian. 2018. Phonological teamwork in Kalahari Basin languages. *Africana Linguistica* 24. 75-97.
- Livingstone, David. 1851. *Comparative vocabulary of eight Bantu languages: Bakhoba (Bayeyi), Bashubea, Balojazi, Ba(ma)ponda, Barotse, Batoka, Banyenko, Betshwana*. Handwritten manuscript, ref. MSB 305-1. Cape Town: Grey Collection, South African Public Library. Pp 35.
- Lukusa, Stephen T.M. 2002. *Groundwork in Shiyeyi grammar with a Shiyeyi-English glossary*. Frankfurt am Main: Peter Lang.
- Lukusa, Stephen T.M. 2009. *Shiyeyi - English dictionary*. München: Lincom.
- Nyati-Ramahobo, Lydia. 2000. Linguistic and cultural domination: The case of the Wayeyi of Botswana. In Batibo, Herman & Birgit Smieja (eds.), *Botswana: The future of the minority languages*, 217-234. Frankfurt: Peter lang.
- Passarge, S. 1905. Das Okavangosumpfland und seine Bewohner. *Zeitschrift für Ethnologie* 37. 649-716.
- Rose, Sharon & Rachel Walker. 2011. Harmony Systems. In John Goldsmith, Jason Riggle & Alan C. L. Yu (eds.), *The Handbook of Phonological Theory*, 240–290. 2nd edn. Malden: Wiley Blackwell. <https://doi.org/10.1002/9781444343069.ch8>.
- Schapera, I. & D. F. van der Merwe. 1942. *Notes on the noun-classes of some Bantu languages of Ngamiland (Yeei, Subiya, Gova, and Gcereku)*. (Communications from the School of African Studies, 2). Cape Town: University of Cape Town.
- Seidel, Frank. 2005. The Bantu languages of the Eastern Caprivi: A dialectometrical analysis and its historical and sociolinguistic implications. *South African Journal of African Languages* 4. 207-242.
- Seidel, Frank. 2008. *A grammar of Yeyi*. Köln: Rüdiger Köppe.
- Sommer, Gabriele. 1995. *Ethnographie des Sprachwechsels: Sozialer Wandel und Sprachverhalten bei den Yeyi (Botswana)*. Köln: Rüdiger Köppe.
- Sommer, Gabriele. 2000. Aspects of Yeyi (R 41) verbal morphology. Voßen, Rainer, Angelika Mietzner & Antje Meißner. "Mehr als nur Worte..." *Afrikanistische Beiträge zum 65. Geburtstag von Franz Rottland*, 623-638 Köln: Rüdiger Köppe.
- Sommer, Gabriele. 2017. Variation in Shiyeyi (Botswana/Namibia). (Ed.) Raija Kramer & Roland Kießling. *Mechthildian approaches to Afrikanistik: Advances in language based research on Africa. Festschrift für Mechthild Reh*, 321-337. Köln: Rüdiger Köppe.
- Sommer, Gabriele & Rainer Voßen. 1992. Schnalzwörter im Yei (R.41). *Afrika und Übersee* 75. 1–42.
- Sommer, Gabriele & Rainer Vossen. 1995. Linguistic variation in Siyeyi. In A. Traill, R. Vossen & M. Biesele (eds.), *The complete linguist. Papers in memory of Patrick J. Dickens*, 407–479. Köln: Rüdiger Köppe.

- Tlou, Thomas. 1985. *A history of Ngamiland. 1750 to 1906. The formation of an African state.* Gaborone: Macmillan.
- Visser, Hessel. 2013. *Naro: Phonology.* In Vossen, Rainer (ed.), *The Khoesan languages*, 60-64. London: Routledge.
- Voßen, Rainer. 1997. *Die Khoe-Sprachen. Ein Beitrag zur Erforschung der Sprachgeschichte Afrikas.* Köln: Rüdiger Köppe.

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