languages

MDPI

Article

Inheritance and Contact in the Development of Lateral Obstruents in Nguni Languages (S40)

Nina van der Vlugt [1,*] and Hilde Gunnink [1,2]

[1] BantUGent—UGent Centre for Bantu Studies, Ghent University, 9000 Ghent, Belgium; hilde.gunnink@ugent.be
[2] Leiden University Centre for Linguistics, Leiden University, Reuvensplaats 3-4, 2311 BE Leiden, The Netherlands
* Correspondence: nina.vandervlugt@ugent.be

Abstract: This study investigates the development of the lateral fricatives and affricates, to which we jointly refer as 'lateral obstruents', in Nguni (S40) languages of Southern Africa. These lateral obstruents, which include /ɬ, ⁿɬ, ɮ, ⁿɮ, k͡ǁ͡ʰ/, are rare in the Bantu language family, and are not reconstructed for Proto-Bantu. Lateral obstruents are also rare cross-linguistically. They do occur, however, in four sub-branches of Southern Bantu: Shona, Sotho-Tswana, Nguni, and Tsonga. In this paper, we study how Southern Bantu could have acquired such a large inventory of cross-linguistically rare phonemes by investigating their development in Nguni languages, a large but closely related cluster of languages in which lateral obstruents are very frequent. We analyze published data from nine Nguni languages, including languages for which the only available descriptions are dated or of limited scope, in which case we carefully assess the data and their analysis. On the basis of this large database, we show which lateral obstruents are used in Nguni, and the vocabulary in which they occur. Applying the Comparative Method, we show that alveolar lateral obstruents can be reconstructed to Proto-Nguni, where they are the regular reflex of Proto-Bantu palatals *c and *j. The velar lateral affricate, in contrast, cannot be reconstructed to Proto-Nguni, and finds its origin in loanwords, for example, from Khoe languages, where it is used as a click replacement strategy. As a result, we conclude that both inheritance and contact played a role in the development of lateral obstruents in Nguni, likely combined in the case of alveolar lateral obstruents. In order to better understand the contact history, we evaluate existing hypothesized contact scenarios to account for the presence of lateral obstruents in Southern Bantu or Nguni. Given that alveolar lateral obstruents result from a regular sound change, contact does not seem to be as prominent in the development of lateral obstruents as has been proposed before in the literature. This study lays the groundwork for future research into lateral obstruents in Southern Bantu.

Keywords: lateral obstruents; Nguni; Southern Bantu; historical linguistics; contact

check for updates

Academic Editors: Salikoko S. Mufwene, Koen Bostoen, Sara Pacchiarotti and Elena Babatsouli

Received: 16 July 2024
Revised: 22 November 2024
Accepted: 16 January 2025
Published: 24 April 2025

Citation: van der Vlugt, N., & Gunnink, H. (2025). Inheritance and Contact in the Development of Lateral Obstruents in Nguni Languages (S40). *Languages*, *10*(5), 90. https://doi.org/10.3390/languages10050090

1. Introduction

In this paper we describe the development of lateral obstruents in Nguni (S40), a closely related subgroup of the Southern Bantu subfamily spoken in the eastern half of Southern Africa. Nguni languages have many phonological elements that are unusual, both cross-linguistically and within Bantu. The most striking of these are phonemic clicks, which Nguni acquired through contact with Khoisan (Louw, 1974, 1977; Gunnink, 2022). Another remarkable phonological phenomenon of Nguni is the use of lateral fricatives and affricates such as /ɬ, ɮ, tɬ, dɮ, k͡ǁ͡ʰ/, jointly referred to as "lateral obstruents". These lateral obstruents

are also found in certain other Bantu languages of Southern Africa, but very rarely in Bantu languages spoken outside Southern Africa. As lateral obstruents are not reconstructed for Proto-Bantu (Meeussen, 1967), and are rare cross-linguistically, the question arises how Southern Bantu languages have incorporated these sounds in their phonological inventories: have they innovated them as the result of a regular sound change or has language contact played a role in their development? In line with this lies the question of whether Southern Bantu languages have developed this sound jointly or separately. Earlier studies have argued for language contact to account for the occurrence of lateral obstruents in Southern Bantu, for instance with Southern Cushitic (Louw & Finlayson, 1990) or Khoisan languages (Gunnink et al., 2022), and a linguistic area is proposed by Güldemann between Eastern and Southern Africa based on shared linguistic features such as lateral obstruents (Güldemann, 2011, 2019). However, it has also been suggested that at least some lateral obstruents in Southern Bantu developed out of reconstructed palatal stops through regular sound change (Janson, 1991), see also McLaren (1952, p. 187) on Xhosa, Ziervogel (1952, p. 8) on Swati and Northern Ndebele (Ziervogel, 1959, p. 31), and Msimang (1989, pp. 167–171) on Swati, Phuthi, Bhaca, Lala, Northern Ndebele, and Nhlangwini. These earlier studies only consider a subset of Nguni languages and are often based on outdated Bantu reconstructions such as Meinhof (1899). More recent works like Meeussen (1967), Bantu Lexical Reconstructions 3 (Bastin et al., 2002), and Wills (2022) have been updated with regards to palatal obstruents, which is highly relevant for our study on Nguni.

As a first step towards understanding the history of lateral obstruents in Southern Bantu languages, we here focus on the development of lateral obstruents in Nguni. Southern Bantu consists of the Bantu languages of Guthrie's zone S and Lozi (K21), which form a distinct genealogical subgrouping based on lexicon-based genealogical classifications, with Nguni (S40) as one of its subclusters (Bastin et al., 1999; Grollemund et al., 2015; Gunnink et al., 2022). Nguni languages are spoken in South Africa, Lesotho, Eswatini (formerly known as Swaziland), and Zimbabwe (see Figure 1).

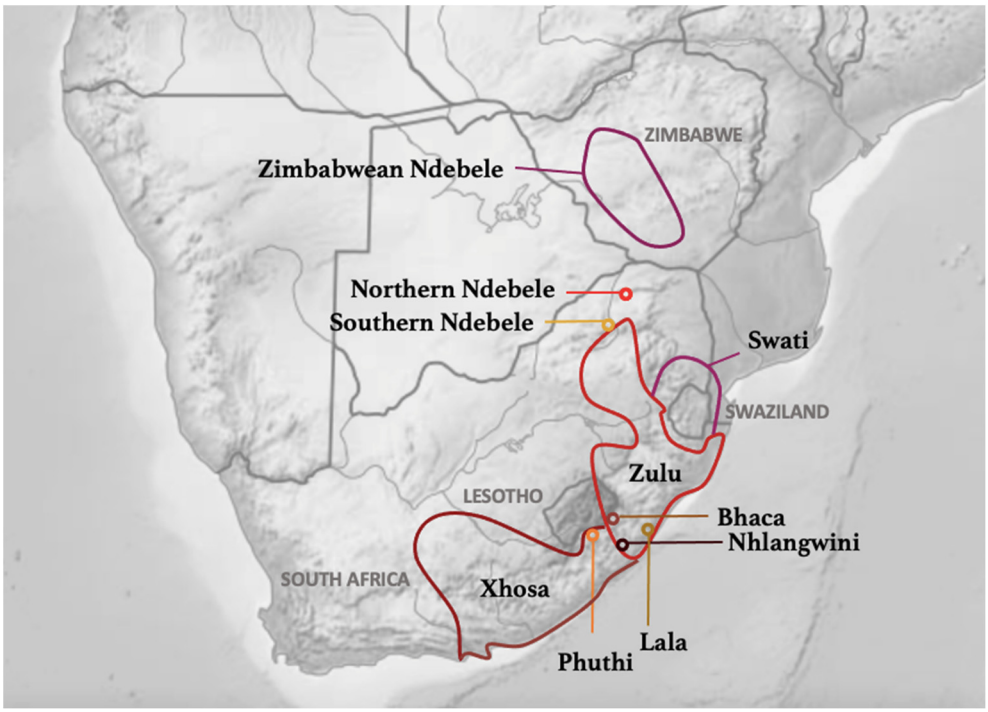

Figure 1. Distribution of modern Nguni languages based on Maho (2009) and Msimang (1989, p. 330) for the location of Lala.

The genealogical unity of Nguni languages is undisputed; they consistently cluster together in lexicon-based classifications, whether they rely on lexicostatistics (Ownby, 1985; Jimenez, 2017) or Bayesian phylogenetics (Gunnink et al., 2022). Details differ but all classifications agree that Phuthi (S404) is the most divergent Nguni language, followed by Northern (S408) and Southern Ndebele (S407).

Nguni forms the ideal subgroup for a diachronic study on lateral obstruents as they occur in almost all languages and are used relatively uniformly (see Section 3). Making use of the Comparative Method, we show that most lateral obstruents in Nguni developed regularly out of reconstructed Proto-Bantu palatals, while some Nguni languages acquired additional lateral obstruents as the result of language contact.

The rest of this paper is structured as follows: In Section 2.1, we introduce lateral obstruents, some of their relevant phonetic properties, and the way they are distributed across languages of the world. In Section 2.2, we discuss lateral obstruents in Nguni and in Section 2.3, we review proposals about their origin. Section 3 contains a comparative investigation of lateral obstruents in Nguni, in which we show that some of them go back to Proto-Nguni, and others are more recent contact-induced innovations. In Section 4, we describe the processes that underly the phonological developments leading to lateral obstruents and the role of inheritance and contact, before providing a summary and recommendations for future research in Section 5.

2. State of the Art

In this background section, we discuss the cross-linguistic use of lateral obstruents (Section 2.1), give an overview of lateral obstruents in Nguni (Section 2.2), and present the proposed origins of Nguni and Southern Bantu lateral obstruents (Section 2.3).

2.1. Lateral Obstruents Cross-Linguistically

The term "lateral obstruents" refers to the combined class of lateral fricatives and lateral affricates (Maddieson, 2013). For fricatives, the channel through which the air flows is narrowed so that the flow of air is turbulent (Ladefoged & Maddieson, 1996, p. 137). In the case of lateral fricatives, i.e., voiceless /ɬ/ and voiced /ɮ/, the airstream flows over one or both sides of the tongue (Ladefoged & Maddieson, 1996, p. 182). Lateral affricates are stops such as /t/, /d/, or /k/ released into a lateral fricative via the lowering of the tongue. Examples include /t͡ɬ/, /d͡ɮ/ or prenasalized /ⁿt͡ɬ/ or /ⁿd͡ɮ/. As lateral is a manner of articulation, lateral obstruents can be articulated at varying places. The alveolar place of articulation is the most common, but some Southern Bantu languages also use a velar lateral affricate (/ k͡ʟ̝̊ /), while certain East African language, such as Hadza (Sands, 2013) and Dahalo (Sands, 2007), have palatal lateral obstruents.

Lateral obstruents are relatively rare in the world's languages. Databases such as the World Atlas of Language Structures (WALS) (Dryer & Haspelmath, 2013), and the Phonetics Information Base and Lexicon (PHOIBLE) (Moran & McCloy, 2019) give us several useful insights into the phonological trends. WALS (Maddieson, 2013) surveys the occurrence of lateral obstruents in 567 languages, which includes a single Southern Bantu language, Zulu (S42). Moreover, 54 (9.5%) of the languages in their sample have lateral obstruents, 51 of which have lateral fricatives and 25 of which have lateral affricates, more frequently voiceless than voiced. Lateral affricates, on the contrary, are less common, only occurring in 25 languages of the sample (4.4%). 22 of these 25 languages also have a lateral fricative in their consonant inventory. The map in Figure 2 visualizes all languages included in the sample of WALS recognized as having lateral obstruents in their phoneme inventory.

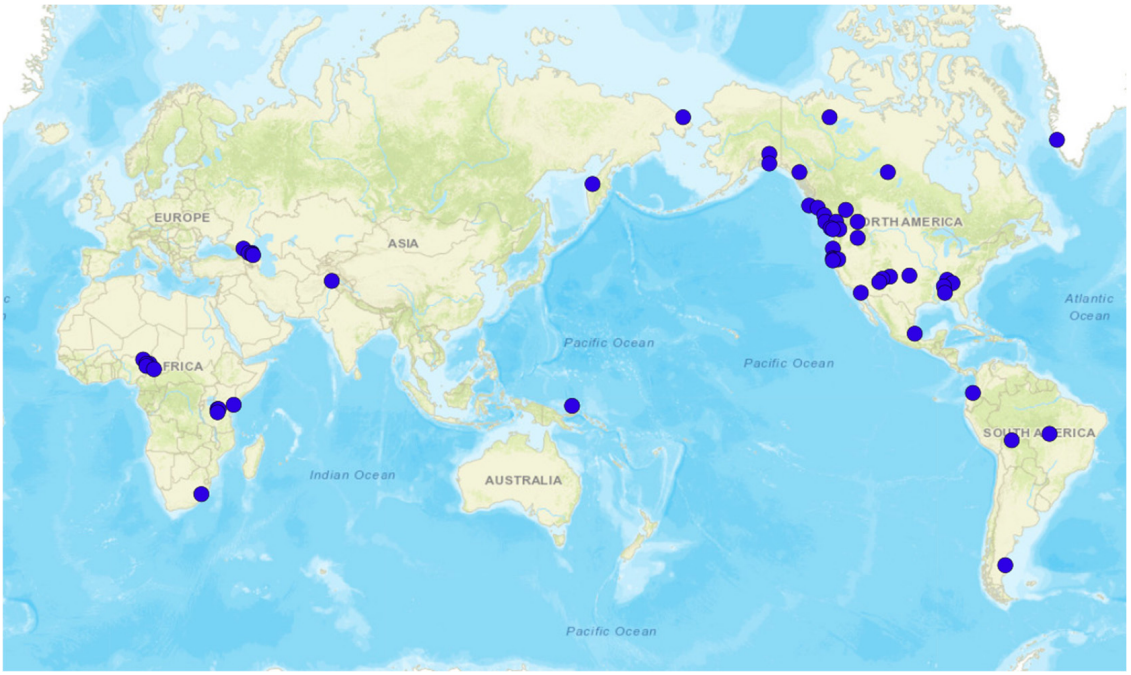

Figure 2. Languages with lateral obstruents (Maddieson, 2013).

The PHOIBLE database has cross-linguistic phonological data from 2186 languages, which includes five Southern Bantu languages, Shona (S10), Zimbabwean Ndebele (S44), Xhosa (S41), Zulu (S42), and Ronga (S54). They report the following frequency of occurrence of lateral obstruents. We have selected lateral obstruents from this database based on whether they also occur as phonemes in Nguni languages, as presented in Table 1.

Table 1. Occurrence of selected lateral obstruents in PHOIBLE.

Phoneme	Occurrence in Sample
ɬ	149 (5%)
ɮ	48 (2%)
t͡ɬ	15 (0%)
t͡ɬʰ	11 (0%)
t͡ɬʼ	28 (1%)
d͡ɮ	4 (0.1%)
k͡ʟ̥	1 (0.03%) [1]

[1] There is one language in the database that contains /kɬ/, i.e., Nivaclé (Paraguay). It is currently unclear whether it is an affricate (as in Nguni, see Section 3.3.2) or a consonant sequence, and if this could be transcribed as / k͡ʟ̥ /.

This database shows a similar picture to WALS: /ɬ/ is the most common lateral obstruent, followed by its voiced counterpart /ɮ/. This is in line with recent work by Shinagawa and Lee (2024), who propose an implicational relation between voiceless and voiced lateral fricatives based on phonetic observations in selected Southern Bantu languages. Lateral affricates are far more uncommon, and the velar lateral affricate /k͡ʟ̥ʼ/ is especially unique. Ladefoged and Maddieson (1996, p. 206) state that the velar lateral ejective affricate is 'an unusual sound' and that it had been described as a palatal lateral ejective because velar laterals were thought not to be possible as speech sounds. However, they explain there is no reason to doubt that these two components of the affricate are velar in articulation and its fricative component is auditorily similar to the velar fricative /x/ but lateral. Within Africa, apart from Southern Africa, lateral obstruents are concentrated around Lake Chad, where they are a feature of Chadic languages (Newman, 1977), and in East Africa, where

they are a feature of the Tanzanian Rift Valley linguistic area (Kießling et al., 2008) and their occurrence across language families may be a case of contact-induced retention (Beer et al., forthcoming). In Southern Africa, lateral obstruents occur in Southern Bantu and in languages of the Kx'a, Tuu, and Khoe-Kwadi families, three separate families subsumed under the areal umbrella term "Khoisan" (Güldemann, 2014). Khoisan languages with lateral obstruents are listed in Table 2.

Table 2. Lateral obstruent inventories of Southern African Khoisan languages.

Language	Lateral Obstruent Inventory	Source
ǁXegwi (Tuu, South Africa/Eswatini)	k͡ɬʰ, d͡l, k͡ɬˀ, ɬ	(Honken, 2020)
ǂHoan (ǂ'Amkoe) (Kx'a, Botswana)	kʟ̥'	(Sands, 2007)
G|ui, G||ana (Khoe-Kwadi, Botswana)	kʟ̥' (as allophone of kχ')	(Nakagawa, 1996)
Kwadi (Khoe-Kwadi, Angola)	tɬ, tɬ', (tɬʰ)	(Fehn & Rocha, 2023)

In Khoisan, lateral obstruents often result from click loss, a sound change changing clicks into non-clicks, for instance in certain varieties of Angolan !Xung (Traill & Vossen, 1997), in Kwadi (Fehn, 2020a; Fehn & Rocha, 2023), and Ju (Fehn, 2020b), and in ǁXegwi, where lateral obstruents correspond to clicks in closely related N|uu (Sands, 2007).

In Southern Bantu, lateral obstruents are attested in some Shona (S10) languages (Mkanganwi, 1972, p. 117; Doke, 1931, pp. 75–79), in some Sotho-Tswana (S30) languages, and in all languages of the Nguni (S40) and Tsonga (S50) subgroups (for a summary, see Doke, 1954, p. 42; Gunnink et al., 2022; Van der Vlugt, 2023). Little is known about the lateral obstruents in Southern Bantu. On the acoustic side, Ladefoged and Maddieson (1996, p. 204–206) present data on Zulu lateral obstruents, including the rare velar lateral affricate, which is only sparsely attested in the world's languages. Based on spectrogram data from a Zulu speaker, they conclude that the alveolar lateral affricate only occurs as an allophone of /ɬ/ after a nasal. Postnasal affrication of fricatives is common in Bantu, attested, for example, in Kongo, Yaka, Tuki, and Venda (Hyman, 2001, pp. 169–170). As discussed in Sections 2.2 and 3.2, this process also seems to apply to at least some Nguni languages.

Shinagawa and Lee (2024) provide a typological overview of the variation of lateral fricatives in the Southern Bantu languages Northern Sotho (S32), Southern Ndebele (S407), Xhosa (S41), Zulu (S42), Swati (S43) and Tsonga (S53), looking into word position and interaction with prenasalization. In contrast to Ladefoged and Maddieson (1996, pp. 204–206), their acoustic data do not show that the prenasalized lateral fricative in Zulu (or any other language in their sample) turns into an affricate. We will elaborate in more detail on Nguni lateral obstruents in the following section.

2.2. Lateral Obstruents in Nguni

Lateral obstruents are known to occur in all Nguni languages on which sufficient documentation is available. Table 3 lists the lateral obstruents described for each Nguni language in the available sources.

Table 3. Overview of lateral obstruents in Nguni languages.

Language	Lateral Obstruents	Reference
Bhaca (S402)	ɬ, ɮ, ᵑɬ, ⁿd͡ɮ	(Jordan, 1953)
	ɬ, ɮ̈, ᵑɬ, ᵑɮ	(Msimang, 1989)
Phuthi (S404)	ɬ, d͡ɮ, t͡ɬ	(Msimang, 1989)
	ɬ, d̈͡l, t͡ɬʼ, t͡ɬʰ	(Donnelly, 2007)
Nhlangwini (S405)	ɬ, ɮ̈, ᵑɬ, ᵑɮ, k͡ǁʼ	(Msimang, 1989)
Southern Ndebele (S407)	ɬ, ɮ, ɮ̈, ᵑɬ, ᵑɮ, t͡ɬʼ, t͡ɬʰ	(Skhosana, 2009)
Northern Ndebele (S408)	ɬ, d͡ɮ, ᵑɬ, ⁿd͡ɮ, t͡ɬʼ, t͡ɬʰ	(Ziervogel, 1959)
	ɬ, d͡ɮ, ᵑɬ, ᵑɮ, t͡ɬʼ, t͡ɬʰ	(Msimang, 1989)
	ɬ, ɮ, ᵑɬ, ᵑɮ, t͡ɬʼ, t͡ɬʰ	(Skhosana, 2009)
Xhosa (S41)	ɬ, ɮ, ⁿt͡ɬ, ⁿd͡ɮ	(McLaren, 1952)
	ɬ, ɮ̈, ⁿt͡ɬʼ, ⁿd͡ɮ	(Finlayson et al., 1990)
Zulu (S42)	ɬ, ɮ, ⁿt͡ɬ, ⁿd͡ɮ, k͡ǁ ~ k͡xʼ, ⁿk͡ʟʼ	(Doke, 1947)
	ɬ, ɮ, ⁿt͡ɬʼ, ⁿd͡ɮ, k͡ǁʼ	(Poulos & Msimang, 1998)
Swati (S43)	ɬ, ɮ, ᵑɬ, ᵑɮ	(Ziervogel, 1952)
	ɬ, ɮ, ᵑɬ, ᵑɮ, k͡ǁʼ	(Msimang, 1989)
Zimbabwean Ndebele (S44)	ɬ, ɮ, ᵑɬ, ᵑɮ, k͡ǁ	(Pelling, 1966)
	ɬ, ɮ, ᵑɬ, ⁿd͡ɮ	(Bowern & Lotridge, 2002)

All Nguni languages make use of lateral obstruents. Voiced and voiceless alveolar lateral obstruents /ɬ, t͡ɬ/, and /ɮ, d͡ɮ/ occur in all languages, but the voiceless velar lateral affricate / k͡ǁ / is restricted to Nhlangwini (S405), Zulu (S42), Swati (S43), and Zimbabwean Ndebele (S44). This velar lateral affricate is often noted to have an allophone /k͡x/, e.g., a central velar affricate, as shown in more detail in Section 3.3.2.

Most lateral obstruents can be prenasalized, except in Phuthi (S404), due to a loss of prenasalization everywhere in the language (Msimang, 1989, pp. 198–199; Donnelly, 2007, pp. 43–45). Prenasalized lateral obstruents are variably described as fricatives (Ziervogel, 1952, p. 9, on Swati) or affricates (Finlayson et al., 1990, p. 60, on Xhosa; Doke, 1947, p. 17, on Zulu). In the case of Nguni, it might represent a difference in analysis rather than a difference in the phonetic realization of this phoneme between different language varieties because prenasalization tends to change continuants like fricatives into stops or affricates through assimilation to the complete closure of the preceding nasal. This process is described for certain Nguni languages, e.g., Zulu (Poulos & Msimang, 1998, pp. 516–517), but for many other Nguni languages, which are less thoroughly described and analyzed, the effect of prenasalization on continuants and the phonetic and phonological status of prenasalized lateral fricatives or affricates is not discussed. However, there are no Nguni languages for which a phonemic contrast between prenasalized lateral fricatives and obstruents is described, and as seen in Section 3.2, phonemes described as prenasalized lateral affricates in one language typically correspond to phonemes described as prenasalized lateral fricatives in others.

In many nouns, the initial nasal is not part of the lexical root but functions as the noun class prefix of class 9 and 10. This is illustrated for Zulu in (1)–(2), which show a verb being derived into a noun of class 9. This includes the addition of the nasal as the noun class prefix.

(1) *i-n-ɬa^{m}bi*
AUG-NP9-swimmer
'expert swimmer' (Poulos & Msimang, 1998, p. 64)
from -*ɬamba* 'swim'

(2) *i-n-ɬeɓi*
AUG-NP9-slanderer
'slanderer' (Poulos & Msimang, 1998, p. 65)
from *-ɬeɓa* 'slander'

The status of lateral obstruents in Lala (S406) is particularly obscure but of great interest. According to Van Dyk (1960), Lala only has velar lateral affricates. Zungu (1999) does identify alveolar and velar lateral obstruents in Lala, whereas Msimang (1989) attributes alveolar lateral obstruents only to Southern Lala, and notes that they are absent in Northern Lala. Lala varieties or doculects that lack alveolar lateral obstruents make use of velar fricatives instead (cf. Msimang, 1989, p. 109), as shown in (3)–(5), with the original Afrikaans and English translation.

(3) Lala *xala* 'gaan sit [sit down]' (Van Dyk, 1960, p. 8).
Lala *ɬala* 'sit' (Zungu, 1999, p. 45).

(4) Lala *xanu* 'vyf [five]' (Van Dyk, 1960, p. 18).
Lala *ɬanu* 'five' (Zungu, 1999, p. 44

(5) Lala *ɣula* 'oortref [surpass]' (Van Dyk, 1960, p. 8).
North Lala *ɣula* 'surpass, overtake' (Zungu, 1999, p. 51).

This highly variable situation is very relevant for the historic interpretation of lateral obstruents in Nguni. The striking differences between different sources on what is referred to as the same language is likely due to regional variation and possibly changes over time, but also due to the definition of the term "Lala" itself. Rather than describing a speech community using a distinct language variety, the term *ama-lala* may have been used to describe a socially defined class of people (Wright, 2012). The language varieties spoken by people identifying as Lala do therefore not necessarily constitute a linguistically coherent class. Given these difficulties, combined with the relatively small amount of data in the available sources on Nguni varieties named Lala, we have decided to exclude Lala data from the present study. However, when available, the linguistic data on Lala is included in the Supplementary Materials.

2.3. Proposed Origins of Lateral Obstruents in Nguni and Southern Bantu

While systematic and comprehensive approaches on the historical phonological development of Nguni languages are rare, previous work has looked at both regular sound change and contact to explain the presence of lateral obstruents in Nguni. On the one hand, some analyses suggest that certain Nguni lateral obstruents have a Bantu-internal origin. Janson (1991) discusses the phonological development of Southern Bantu languages in comparison with the Makua (P30) cluster of northern Mozambique that shares a number of remarkable developments with certain Southern Bantu languages. Janson (1991, pp. 84–88) shows some evidence for lateral obstruent reflexes of Proto-Bantu palatals in Nguni, but only considers three Nguni languages, i.e., Zulu (S42), Xhosa (S41), and Swati (S43), and does not analyze lateral obstruents that are not the result of regular sound change. Msimang (1989), who studies the reflexes of Proto-Bantu consonants in Nguni languages of the Tekela group[1], identifies /ɬ/ as a reflex of reconstructed *c (Msimang, 1989, pp. 167–168), but with little to no detail on the development of other lateral obstruents. Jimenez (2017, 2022) are mostly concerned with Nguni subclassification, but identifies few sound changes. Her reconstructions are not based on the identification of regular sound correspondences, and therefore shed little light on the diachronic phonology of Nguni.

On the other hand, contact has also been suggested as the possible driving force behind the development of lateral obstruents in Nguni. Louw and Finlayson (1990) consider lateral obstruents in Southern Bantu to be mostly restricted to roots that do not occur in Bantu languages outside zone S, but are rather Southern Bantu innovations. They suggest a Southern Cushitic origin for Southern Bantu lateral obstruents, in which case contact would have taken place in East Africa, where Cushitic languages are spoken. However, as noted by Gunnink et al. (2022, p. 99), no other Southern Cushitic influence is established in Southern Bantu as of yet. Furthermore, as described in Section 3.2, lateral obstruents in Nguni languages are very common in roots of Proto-Bantu origin, which are unlikely to be lexical loans. Thus, Southern Cushitic languages do not seem the most likely donor for lateral obstruents in Southern Bantu.

Instead, Gunnink et al. (2022) propose contact with Khoisan languages as a source for lateral obstruents. Southern Bantu languages have clearly undergone contact-induced changes from Khoisan languages, especially in their phonologies. Clicks occur as loan phonemes in the Sotho-Tswana language Southern Sotho (S33) and almost all Nguni languages (Pakendorf et al., 2017). These contact-induced structural changes likely involved language shift from Khoisan to Bantu, which ties in with genetic evidence for Khoisan admixture in Southern Bantu-speaking groups (Pakendorf et al., 2017; Sengupta et al., 2021). Clicks are the most clear-cut cases of Khoisan phonological influence, but not the only ones, given the much larger phoneme inventories of certain Southern Bantu languages compared to other modern Bantu languages and Proto-Bantu, including many phonemes for which no Bantu origin can be found (Lanham, 1964; Schadeberg, 2009). Furthermore, since lateral obstruents occur in certain Khoisan languages (see Table 2), Khoisan influence may have played a role in their development in Southern Bantu. Gunnink et al. (2022) offer two possible contact scenarios that could account for the development of lateral obstruents in Southern Bantu. Firstly, language contact with Khoisan could have influenced a sound change resulting in lateral obstruents. Secondly, Southern Bantu lateral obstruents may be reflexes of earlier click phonemes, given the frequently found pattern of lateral obstruents resulting from click loss. These possible contact scenarios have not yet been investigated more closely. The possible role of Khoisan contact in the development of lateral obstruents in Southern Bantu therefore remains unknown.

Finally, contact is prominent in the linguistic macro-area theory of Güldemann (2011, 2019) arguing for a pre-Bantu linguistic area uniting Eastern and Southern Africa with lateral obstruents as one of its defining phonological features. Although these features now only occur in some Eastern and Southern African languages, they may once have been more prevalent. Intermediate languages with lateral obstruents may have disappeared following the arrival of Bantu languages, which have a very different typological profile. This theory is relatively similar to proposals of both Cushitic and Khoisan contact. However, as it does not identify specific contact situations or donor languages, it is hard to test.

In conclusion, previous work has proposed that at least some lateral obstruents arose as the result of language-internal, diachronic phonological processes. Alternatively, contact may have played a role in the development of lateral obstruents in Southern Bantu. It is not clear yet what concrete contact situations, donor languages, and linguistic changes could explain the current distribution and use of lateral obstruents.

3. The Historical Development of Lateral Obstruents in Nguni

In this section, we systematically investigate the development of lateral obstruents in Nguni. In Section 3.1, we elaborate on our methodology. We collected lexical data with lateral obstruent phonemes from nine present-day Nguni languages, as introduced in Section 3.1. In Section 3.2, we describe the developments of alveolar lateral obstruents and show that many are reflexes of reconstructed Bantu palatal stops. In Section 3.3 we consider lateral obstruents in roots not corresponding to a Bantu lexical reconstruction.

3.1. Methodology

To establish a more comprehensive analysis of Nguni lateral obstruents, we include all Nguni languages for which sufficient data are available. We furthermore combine a top–down approach linking reconstructed Bantu consonants to Nguni reflexes with a bottom–up reconstruction focusing on Nguni roots and consonants for which no reconstruction is available.

We apply the Comparative Method to modern-day sets of Nguni cognates, which we link to roots from the Bantu Lexical Reconstructions 3 database (BLR 3) (Bastin et al., 2002). Supplement B of the Supplementary Materials contains Nguni lexical data linked to their BLR index. By comparing cognate sets displaying regular sound changes, we can establish which lexical items and phonemes can be reconstructed to Proto-Nguni, and which lexical items have an even deeper Bantu origin. This allows us to identify lateral obstruents in vocabulary of Bantu origin that result from regular sound change, as discussed in Section 3.2, and lateral obstruents in words that do not have an identifiable Bantu origin, as treated in Section 3.3.

The data used for the reconstruction come from secondary sources (see Section 3.2 for more information). As these secondary sources often use a transcription based on or identical to the official orthography of the larger Nguni languages, we have uniformized the notation of all data according to the International Phonetic Alphabet (IPA) based on the description and analysis in the original source. See Supplement A of the Supplementary Materials for a detailed overview of the original orthography used for each lateral obstruent of all the languages in the sample, the IPA re-interpretation, and any additional remarks. We deviate from IPA in the following cases: [j] is typically transcribed as <y> in Bantu languages following the International African Alphabet. Further, we adopt the tone notation from the sources when available. When possible, multiple sources are used for a single language for accuracy.

Working with secondary sources means the available data can be limited in both quantity and quality. As lateral obstruents in Southern Africa form a peculiarity for most researchers, they are described in idiosyncratic ways. Hence, it is not always entirely clear if differences in description are actual differences between languages or merely different analyses of the same phenomenon. This is the case, for instance, with the phonetic effect of prenasalization on alveolar lateral obstruents, which some sources describe as affricates and other as prenasalized fricatives (see Section 2.2). When specific information could not be obtained from a source, this is indicated in the relevant subsection and/or Supplement A. However, the level of phonetic and descriptive detail given in most sources is adequate for an uncontroversial interpretation of the data. In other words, the uncertainty that remains on the correct phonetic description of certain phonemes does not pose a problem for our historical analysis.

All data presented in tables throughout the paper can also be found in the Supplementary Materials where they are sorted by sound change and sources including page numbers.

3.2. Alveolar Lateral Obstruents as Reflexes of Reconstructed Palatals

In this section, we describe the development of alveolar lateral obstruents in Nguni, comparing modern-day sets of Nguni cognates to reconstructions from BLR 3. We show that alveolar lateral obstruents in Nguni regularly developed from reconstructed palatal consonants. The following sound changes have taken place:

- *c > /ɬ/
- *nc > /ɬ/ (Phuthi), /ⁿt͡ɬ/ (other Nguni)
- *nj > /d̪͡l̪/ (Phuthi), /ⁿd͡ɮ/ (other Nguni)

This sound change was not conditioned by the nature of the preceding or following vowels, as shown in Sections 3.2.1–3.2.3. There is one exception: palatal stops followed by a high vowel *i or *u did not change to lateral obstruents, but rather changed into labiodental or alveolar fricatives (Janson, 1991, p. 85; 2007, pp. 115–116), a development known as Bantu Spirantization (Schadeberg, 1994; Janson, 2007; Bostoen, 2008). We therefore focus here on reconstructed palatal consonants followed by non-high vowels.

As lexical roots in Nguni languages are typically disyllabic, lateral obstruents can occur either as the consonantal onset of the first (C1) or second syllable (C2). All lateral obstruents can occur in C1 and C2 position except for the prenasalized voiceless affricate /ⁿt͡ɬ/, which does not seem to occur in C2 position. Lateral obstruents have so far only been attested in lexical roots, not in grammatical affixes.

As these sound changes affected all Nguni languages in an almost identical manner, we posit that these sound changes already took place in Proto-Nguni. The situation in Phuthi is slightly more complex, as it shows some slight deviations in terms of prenasalization (see Sections 3.2.2 and 3.2.3) and authors differ in their description of the lateral obstruents. Donnelly (2007) describes a voiceless lateral fricative (/ɬ/) and a voiced laterally released stop (/d̪͡l̪/). These laterally released stops correspond to voiced lateral fricatives or affricates in other Nguni languages, for instance Phuthi *ku-d̪͡l̪ála* 'play' and *i-/ti-d̪͡l̪òvù* 'elephant' versus Zimbabwean Ndebele *-ɮala* and *-iⁿɮovu* respectively. Their exact phonetic nature is unclear, as Msimang (1989, p. 121) describes a voiced alveolar lateral affricate /d͡ɮ/ where Donnelly uses /d̪͡l̪/. It is also unclear whether the apparent differences between descriptions of Phuthi represent areal or temporal variation. In spite of these uncertainties, it is still clear that there is a lateral element to the laterally released stops so Phuthi would have participated in the original sound change that changed Proto-Bantu *c and *j to lateral obstruents.

We now present the evidence of the sound changes as posited above. The lateral obstruent reflexes of Proto-Bantu palatal *c, *nc, and *nj suggest that a similar lateral obstruent reflex might be expected for palatal *j, but, as we show in Section 3.2.4, this is not the case, because *j is typically lost in Nguni (or never existed, cf. (Wills, 2022)). In addition, we also propose Proto-Nguni reconstructions for the discussed cognates. We have not reconstructed tone for Proto-Nguni due this often lacking in the original sources.

3.2.1. PB *c > Nguni /ɬ/

The reflex of PB *c is /ɬ/ in C1 and C2 position in all Nguni languages with lateral obstruents. Table 4 shows that this change occurs followed by non-high vowels.[2]

Table 4. Nguni /ɬ/ as reflex of *c in C1.

Proto-Bantu	a	e	o	ʊ
	*cáànù 'five'	*cèk 'laugh'	*cónì 'shame'	*cúngú 'pain, poison, bitterness, anger'
Proto-Nguni	*ɬanu	*ɬek	*ɬoni	*ɬungu
Bhaca	ɬanu	ɬek-a	u-ɬoni	úbú-ɬû^{n}gu
Phuthi	ɬáánù	ɬek-a	i-ɬóní	bu-ɬùgú
Nhlangwini		ɬek-a		ubu-ɬu^{n}gu
S. Ndebele	ɬanu	ɬek-a	i-ɬoni	-ɬu^{n}gu
N. Ndebele	ɬánu	ɬek-a		bú-ɬú^{n}gu
Xhosa	ɬanu	ɬek-a		uɓu-ɬu^{n}gu
Zulu	ɬanu	ɬek-a	ama-ɬoni	uɓu-ɬu^{n}gu
Swati	ɬanu	ɬek-a	éma-ɬôni	ɓu-ɬu^{n}gu
Z. Ndebele	ɬanu	ɬek-a	ama-ɬoni	uɓu-ɬu^{n}gu

In our sample, no Nguni words where /ɬ/ is followed by /i/ have a corresponding Proto-Bantu reconstruction. It is unclear whether this is a phonological restriction or an artifact of sample size. In any event, there is no modern phonological restriction preventing this sequence, e.g., *i^{n}ɬiziyo* 'heart' (see Table 12).

The same sound change has affected *c in C2 position in Nguni, as shown in Table 5.

Table 5. Nguni /ɬ/ as reflex of *c in C2[3].

Proto-Bantu	*pácà 'twin'	*caca 'tree'	*dác 'throw away'	*píc 'hide, cover'
Proto-Nguni	*phaɬa	*ɬaɬa	*laɬ	*fiɬ
Bhaca				fíɬà
Phuthi	lí-p^{h}áɬá		laɬ-a	fiɬa
Nhlangwini		isi-ɬaɬa		fíɬà
S. Ndebele	i-p^{h}aɬa	isi-ɬaɬa	laɬ-a	fiɬa
N. Ndebele		si-ɬaɬa	láɬ-à	
Xhosa			láɬ-à	fiɬà
Zulu	i(li)-p^{h}haɬa	isi-ɬaɬa	laɬ-a	fiɬa
Swati	li-p^{h}aɬa	sí-ɬaɬa	láɬ-a	fíɬà
Z. Ndebele	i-p^{h}aɬa	isi-ɬaɬa	laɬ-a	fiɬa

3.2.2. PB *nc > Nguni /^{n}ɬ, ɬ/

Proto-Bantu *nc changes to /^{n}t͡ɬ/ in most Nguni languages, but to /ɬ/ in Phuthi due to its systematic loss of prenasalization (see Table 6). /^{n}t͡ɬ/ occurs root-initially when the noun is in class 9 or 10, in which case the nasal is the noun class prefix. The number of reflexes of *nc in Nguni seems limited, which makes it difficult to investigate the effect of different vowel environments. Furthermore, more research will have to show whether languages really differ in their phonetic realization of this phoneme as an affricate or a fricative, or whether this is an artifact of language description (see Section 2.2 for more).

There are few instances of root-initial *nc in BLR 3 where the nasal is not a noun prefix of class 9/10. One such example would be *ncè 'all' (see Table 7). A variant form *cè is attested in zones P and S, which might explain *ncè/*cè resulting in varying reflexes in Nguni, as outlined in the table below.

Table 6. Nguni lateral obstruents as reflexes of *nc.

Proto-Bantu	*cóòkò 'face, forehead'	*cambi 'fish'
Proto-Nguni	*n-ɬoko	*n-ɬanzi
Bhaca	ín̩ɬóko	iⁿ-ɬaⁿti
Phuthi	í-ɬɔɔkɔ	i-ɬati
Nhlangwini	iⁿ-ɬoko	íⁿ-ɬàⁿtì
S. Ndebele		
N. Ndebele	ⁿ-ɬɔ̀gɔ̀	ⁿ-ɬàⁿt̪'ì
Xhosa	iⁿ-t͡ɬoko	iⁿ-t͡ɬaⁿzi
Zulu		iⁿ-ɬaⁿzi
Swati	iⁿ-ɬɔkɔ	íⁿ-ɬaⁿti
Z. Ndebele	iⁿ-ɬoko	iⁿ-ɬaⁿzi

Table 7. Nguni reflexes of *nce, *ce 'all'.

Proto-Bantu	*nce, *ce 'all'
Bhaca	ⁿke
Phuthi	ọ̀ɬè
Nhlangwini	
S. Ndebele	
N. Ndebele	ɬe
Xhosa	
Zulu	ⁿke
Swati	
Z. Ndebele	ⁿke

Whether these forms are all cognate and how they have developed will be left for future research. Monosyllabic roots like the one for 'all' can easily develop divergent reflexes at any point in time. Note, however, that there are no reflexes in Nguni containing /ⁿt͡ɬ/, which would have been expected if 'all' is a reflex from *nce. This might point to intermediate changes or forms of 'all' before the sound change would have taken place. Further, no cases were found in which /ⁿt͡ɬ/ occurred in root-medial position in Nguni languages, which corresponds to a lack of root-medial *nc in BLR 3, but also to a general lack of root-medial /ⁿt͡ɬ/ in Nguni languages, except in reduplication.

3.2.3. PB *nj > Nguni /ⁿd͡ʒ, ʒ/

Proto-Bantu *nj changes to /ⁿd͡ʒ/ in most Nguni languages, and to /d̪̈͡l̪̈/ in Phuthi due to its loss of prenasalization. /ⁿd͡ʒ/ occurs root-initially when a noun belongs to class 9 or 10, e.g., 'house' or 'elephant' in Table 8, and can be followed by any vowel. As for /ⁿt͡ɬ/, Nguni languages differ in whether they are described as having a prenasalized affricate /ⁿd͡ʒ/ or a prenasalized fricative /ⁿʒ/, which may differ from language to language or may simply reflect a difference in description (see Section 4.1 for more).[4]

/ⁿd͡ʒ/ also occurs as C2, as seen in Table 9, showing that /ⁿʒ/ is not only the result of noun class morphology, but also occurs root-internally in Nguni.

Table 8. Nguni /ⁿdɮ/ as reflexes of *nj.

Proto-Bantu	a *jàdà 'starvation, hunger'	e *jèbé 'ear, lobe'	o *jògù 'elephant'	i *jìdà 'path'	u *jù 'house'
Proto-Nguni	*n-ɮala	*n-ɮebe	*n-ɮovu	*n-ɮela	*n-ɮu
Bhaca	iⁿɮala	iⁿɮeɓe	íⁿɮovu	iⁿɮela	iⁿɮu
Phuthi		e-/ti-ɖ̤èbé	i-/ti-ɖ̤òvù	ji-/ti-ɖ̤èlà	i-/ti-ɖ̤ù
Nhlangwini	iⁿɮala	iⁿɮebe	iⁿɮovu	iⁿɮela	iⁿɮu
S. Ndebele	ⁿɮala	ⁿɮebe	ⁿɮovu	iⁿɮela	ⁿɮu
N. Ndebele	ⁿɮala	ⁿɮebe	ⁿɮovu	ⁿɮélà, ⁿɮílà	ńɮu
Xhosa	iⁿɮala	iⁿɮebe	iⁿɮovu	iⁿɮela	iⁿɮu
Zulu	iⁿɮala	iⁿɮebe	iⁿɮovu	iⁿɮela	iⁿɮu
Swati	íⁿɮala	iⁿɮɛɓɛ	iⁿɮovu	íⁿɮela	iⁿɮu
Z. Ndebele	iⁿɮala	iⁿɮebe	iⁿɮovu	iⁿɮela	iⁿɮu

Table 9. Nguni lateral obstruents as reflexes of root-medial *nj.

Proto-Bantu	*gàⁿja 'hand'	*gàⁿja 'strength'	*páⁿjà 'baldness'
Proto-Nguni	*ganɮa	*ganɮa	*pʰanɮa
Bhaca	ís-áⁿɮa	ámá-ⁿɮa	
Phuthi	s-/t-àɖ̤à	em-àɖ̤à	ì-phàɖ̤á
Nhlangwini	is-aⁿɮa	ama-ⁿɮa	
S. Ndebele	is-aⁿɮa	ama-ⁿɮa	i-paⁿɮa
N. Ndebele	sí-aⁿɮa, s-áⁿɮa		
Xhosa		ama-ⁿɮa	
Zulu	is-aⁿɮa	ama-ⁿɮa	im-paⁿɮa
Swati			ím-phaⁿɮà
Z. Ndebele	is-aⁿɮa	ama-ⁿɮa	

3.2.4. PB *j

As lateral obstruents in Nguni are found to be reflexes of *c, *nc, and *nj, it might be expected that the reflex of *j would be /ɮ/. While Nguni languages do make use of /ɮ/, it is not the systematic reflex of *j, because *j has typically been lost in Nguni (or never existed, cf. Wills, 2022), as shown in the verbs in (6)–(9). The examples show Proto-Bantu reconstructions and the reflexes of *j followed by different vowels, to show that phonological environment does not influence loss of *j. Note that there are a handful of exceptions where *j seems to have a glide reflex, for example, for Phuthi and Northern Ndebele in 'build'.[5]

(6) *jak 'build'
a. *aakʰa* Xhosa (McLaren, 1952, p. 227)
b. *akʰa* Swati (Msimang, 1989, p. 169)
c. *yakʰa* Phuthi (Donnelly, 2007, p. 1113), Northern Ndebele (Msimang, 1989, p. 169)

(7) *jíb 'steal'
a. *úkw-éba* Bhaca (Msimang, 1989, p. 315)
b. *ebá* Nhlangwini (Msimang, 1989, p. 169)
c. *ukw-eba* Zulu (Msimang, 1989, p. 315)
d. *ba/eba* Swati (Msimang, 1989, p. 315)

(8) *jot 'bask'
a. *ot^{h}a* Xhosa (McLaren, 1952, p. 108)
b. *wóótʃ́a* Phuthi (Donnelly, 2007, p. 162)
c. *otʃ́á* Lala (Msimang, 1989, p. 169)

(9) *jém, jím 'stand'
a. *ma* Xhosa (McLaren, 1952, p. 237), Swati (Whelton, 2013, p. 458)
b. *(i)ma* Phuthi (Msimang, 1989, p. 169)
c. *(i)má* Bhaca (Msimang, 1989, p. 169)

Recent work suggests that *j may not have been part of the Proto-Bantu phoneme inventory at all (Wills, 2022). Even if *j can be reconstructed, it is clear that *j was lost in Nguni, possibly already before the development of lateral obstruents, which would explain why the expected /ɮ/ reflex of *j is not attested.

3.2.5. Alveolar Lateral Obstruents with No Palatal in Proto-Bantu

Two words of apparent Bantu origin in the sample have alveolar lateral obstruents in Nguni that do not correspond to a reconstructed palatal, as listed in Table 10.

Table 10. Lateral obstruents as apparent reflex of non-palatal consonants.

Proto-Bantu	*kómbè 'shoulder blade; pit of stomach'	*dí 'eat'
Bhaca		ɮá
Phuthi		d̪̈l̪á
Nhlangwini		ɮa
S. Ndebele	ɬo^{m}be	ɮa
N. Ndebele		
Xhosa		ɮa, tyá
Zulu	i-ɬo^{m}be 'shoulder' (i-khombe 'wing of a bird; swelling of the belly')	ɮa
Swati	li-ɬo^{m}be	ɮa
Z. Ndebele	i-ɬo^{m}be	ɮa

As we have found only two cases of such an anomalous development of lateral obstruents in Nguni, we do not consider them a counterargument to the regular development of lateral obstruents out of reconstructed palatals, but rather suggestive of additional, secondary processes. The lateral fricative reflexes of *k result from a separate sound change triggered by a preceding glide (Wills this volume). In the case of the lateral obstruent reflex for *dí 'eat', the monosyllabic nature may play a role in its phonological development. We leave these questions for future research.

3.3. Lateral Obstruents in Roots Without Identifiable Bantu Etymologies

As shown in the previous section, alveolar lateral obstruents clearly occur as regular reflexes of reconstructed *c, *nc, and *nj. However, alveolar lateral obstruents also occur in roots which cannot straightforwardly be linked to existing Bantu reconstructions, as shown in Section 3.3.1. Furthermore, some Nguni languages have velar lateral obstruents, which occur exclusively in roots that do not have a Bantu origin, as shown in Section 3.3.2.

3.3.1. Alveolar Lateral Obstruents in Roots Without Identifiable Bantu Etymologies

Nguni languages attest numerous roots with alveolar lateral obstruents for which no corresponding Bantu reconstruction can be found. Tables 11–13 give examples of the occurrence of /ɬ, ^{n}t͡ɬ, ɮ/, which also occur as the regular reflexes of reconstructed *c, *nc, and *nj, in roots for which no corresponding Bantu reconstruction could be found.

Table 11. /ɬ/ in Nguni roots without Bantu etymologies.

Meaning	'beautiful'	'sit'	'shoe'	'white'
Proto-Nguni	*ɬe	*ɬal	*ɬangu	*mɬop^{h}e
Bhaca	ɬé	ɬala	ísí-ɬaŋgu	mɬóp^{h}e
Phuthi	ɬé	ɬààlà		
Nhlangwini	ɬe	ɬala		m-ɬop^{h}e
S. Ndebele	ɬe	ɬala		mɬop^{h}e
N. Ndebele	(n)ɬe	ɬálà		
Xhosa	ɬe	ɬálà	isi-ɬa^{n}gu	
Zulu	ɬe	ɬálà	isi-ɬa^{n}gu	mɬop^{h}e
Swati	ɬe			m-ɬop^{h}e
Z. Ndebele	ɬe	ɬálà		mɬop^{h}e

Table 12. /n(t)ɬ/ in Nguni roots without Bantu etymologies.

Meaning	'heart'
Proto-Nguni	*n-ɬiziyo
Bhaca	í^{n}ɬítíyo
Phuthi	iɬítííyɔ̀
Nhlangwini	iti^{n}ɬitiyo
S. Ndebele	ɬiziyo
N. Ndebele	^{n}ɬitiwo
Xhosa	i^{n} t͡ɬiziyo
Zulu	i^{n}ɬiziyo
Swati	i^{n}ɬitiyo
Z. Ndebele	i^{n}ɬiziyo

Table 13. /ɮ/ in Nguni roots without Bantu etymologies.

Meaning	'play'	'bag'	'pass'	'nest'	'ancestral spirit'
Proto-Nguni	*ɮal	*goɮa	*jeɮul	*ɮeke	*ɮozi
Bhaca	ɮala		ɮula		
Phuthi	d̤l̤ála	mu-/mi-god̤l̤a			
Nhlangwini	ɮala				
S. Ndebele	ɮala	um-goɮa	ɮula	isi-ɮeke	i-ɮozi
N. Ndebele	ɮal-úk-a	mú-goɮa	ɮùlà		
Xhosa	ɮala	um-gòɮà	ɮúlà		ama-ɮozi 'generation'
Zulu	ɮala	um-goɮa	ɮula	isi-ɮeke	i-ɮozi
Swati	ɮala	si-t͡ʃoɮa	éɮula	sí-ɮeké	lí-ɮoti
Z. Ndebele	ɮala	um-goɮa	ɮula, eɮula	isi-ɮeke	i-ɮozi

Secondly, as noted in Section 4.2, Nguni /ɮ/ does not occur as the reflex of *j. The data in Table 13 show comparative series of Nguni roots with /ɮ/, which follow regular correspondences, suggesting that /ɮ/ too can be reconstructed to Proto-Nguni, as reflected in the tentative reconstructions given in the table.

The fact that no likely Bantu etymologies could be found for these Nguni roots with alveolar lateral obstruents does not necessarily mean that these roots are not of foreign origin but could also be due to missing Proto-Bantu reconstructions. However, it could also be the case that these words were introduced at a later stage in the development of (a subgroup of) Southern Bantu languages or at any other intermediate stage. The fact that most of these roots occur throughout Nguni in highly similar forms shows that they can at least be reconstructed to Proto-Nguni. A comparison with reflexes of other Southern Bantu subgroups would be insightful.

3.3.2. Velar Lateral Affricates / k͡ɬ /, / k͡ɬʼ /

Some Nguni languages use a velar lateral affricate/ k͡ɬ /, which may or may not be ejective, in addition to alveolar lateral obstruents. The velar lateral affricate is also often found with varying transcriptions such as /kl/ or /kɬ/ (see Supplement A), but as Nguni languages typically do not allow consonant clusters, we reinterpret these as velar lateral affricates using the IPA transcription / k͡ɬ / or / k͡ɬʼ /, depending on whether the affricate is ejective or not. However, further detailed phonetic research is needed to verify this reanalysis. Velar lateral affricates are attested in Nhlangwini, Zulu, Swati, and Zimbabwean Ndebele, as shown in Table 14.

Table 14. / k͡ɬ / in Nguni roots without Bantu etymologies.

Nhlangwini	Zulu	Swati	Z. Ndebele
k͡ɬʼwɛba ‘scratch’	k͡ɬʼweba~ k͡xweba ‘scratch’	k͡ɬwɛβ̞a̤ ‘scratch’	k͡ɬebha ‘rip open, tear up’
	ⁿk͡ɬʼiⁿk͡ɬʼiza ‘breathe with difficulty’ ukunk͡ɬinkliza ‘to make a choking noise’		nk͡ɬink͡ɬiza ‘choke, be strangled’
		k͡ɬʼɛtʼa ‘to milk into the mouth’	k͡ɬeza ‘drink straight from the cow’

In Zulu, the velar lateral affricate is reported to be a free allophone of the velar central affricate /k͡x/ (Doke, 1947, p. 17). For Lala, Zungu (1999, p. 62) reports velar lateral affricates for North Lala only, corresponding to central velar affricates in South Lala, as in (10).

(10) ‘mark site’
a. *k͡ɬama* (North Lala)
b. *kxama* (South Lala)

For Swati, some sources report only a central velar affricate (Ziervogel, 1952, p. 7), others only a velar lateral affricate (Taljaard et al., 1991, p. 8; Taljaard & Snyman, 1991; Msimang, 1989, p. 98). However, velar lateral affricates correspond to central velar affricates in Swati, as shown in (11)–(12), suggesting that this difference may be dialectal, idiolectal, or possibly the result of ongoing language change.

(11) a. *kxʼwɛba* ‘scratch’ (Ziervogel, 1952, p. 7)
b. *klʼwebha* [k͡ɬʼwebʰa] ‘scratch, scrape’ (Whelton, 2013, p. 410)

(12) a. *kxʼatʼula* ‘incise’ (Ziervogel, 1952, p. 7)
b. *klʼatula* [k͡ɬʼatula] ‘split, cut lengthwise’ (Whelton, 2013, p. 407)

Xhosa does not make use of velar lateral affricates, but does have a central velar affricate, which occurs in certain words that are used with a velar lateral affricate in other Nguni languages, as illustrated in (13)–(14).

(13) 'rumble'
a. *k͡ɮukɮuza* (Zulu, Doke et al., 1990, p. 435)
b. *kxukxuza* (Xhosa, Mini et al., 2003) (Xhosa, Mini et al., 2003)

(14) 'tear'
a. *kxazula* (Xhosa, Mini et al., 2003, pp. 146–147)
b. *k͡ɮatúla* (Swati, Rycroft, 1981, p. 52)

The velar lateral affricate in Nguni is more marginal than the alveolar lateral obstruents. For instance, Ziervogel (1952, pp. 7–8) notes for Swati that it is found in a few words, is of unknown origin and is not derived from Proto-Bantu. We also were not able to identify Bantu reconstructions corresponding to any Nguni words with velar lateral affricates. Together with its restricted occurrence in only a subset of Nguni languages, this suggests that velar lateral affricates cannot be reconstructed to Proto-Nguni but rather would have entered its daughter languages after the divergence of Proto-Nguni.

A possible source for velar affricates in Nguni is clicks. According to Doke (1947, p. 18), the velar lateral affricate in Zulu has been mistaken for a click, suggesting acoustic similarity. Etymologically, a number of Nguni words with velar lateral affricates are borrowings from !Ora or Khoekhoe, both languages of the Khoekhoe branch of the Khoe family, in which the Nguni velar lateral affricate corresponds to a Khoe click and /k͡x/ in Xhosa. In these cases, the Khoe source words have a click that is either aspirated or accompanied by a dorsal fricative or affricate.

(15) 'spit' < *ǂχ′ara* 'speien [spit out]' (!Ora) (!Ora; Meinhof, 1930, p. 103)
a. *k͡ɮ′aza* 'spurt out; produce shrill sound' (Zulu, Doke et al., 1990, p. 431)
b. *k͡ɮ′aza* 'squirt, spurt' (Swati, Rycroft, 1981, p. 52)
c. *k͡ɮ′aza* 'sing' (esp. of bridal party)' (Zim. Ndebele, Pelling, 1966, p. 42)
d. *kxasa* 'sing with a shrill voice' (Xhosa, Mini et al., 2003, p. 145)

(16) 'queue' < *!hə̀rì-b* 'queue' (Khoekhoe; Haacke & Eiseb, 2002, p. 332)
a. *k͡ɮ′ela* 'stand in line' (Zulu, Doke et al., 1990, p. 432)
b. *kxela* 'stand in a queue' (Xhosa, Mini et al., 2003, p. 147)

(17) 'tear' < *ǀkhàű* (Khoekhoe; Haacke & Eiseb, 2002, p. 212)
a. *k͡ɮ′azula* (Zulu, Doke et al., 1990, p. 431)
b. *k͡ɮ′atula* (Swati, Rycroft, 1981, p. 52)
c. *kxazula* (Xhosa, Mini et al., 2003, p. 146)

There are also cases where velar lateral affricates in certain Nguni languages correspond to clicks in Xhosa, as illustrated with Zulu in (18)–(19).

(18) Zulu *k͡ɮ′aŋgalasa* 'scream' (Doke et al., 1990, p. 431), Xhosa *nǁaŋgaza* 'scream' (Mini et al., 2003, p. 649)

(19) Zulu *k͡ɮ′abela* 'cut up' (Doke et al., 1990, p. 429), Xhosa *ǁabela* 'cut up' (Pahl et al., 1989, p. 558)

The acoustic and articulatory similarity between clicks and lateral affricates was also noted for the East African click languages Hadza and Sandawe (Maddieson et al., 1999, pp. 71–72; Ladefoged & Traill, 1994, p. 39; Wright et al., 1995, pp. 6–7). Furthermore, lateral

affricates are known to result from click loss in other languages as well (see Section 2.1). However, as Nguni languages also make use of phonemic clicks, the adaptation of clicks in loanwords to non-click velar lateral affricates is unexpected. Furthermore, clicks in Nguni languages were already adopted at the Proto-Nguni level (Gunnink, 2022), whereas velar lateral affricates, occurring only in a subset of Nguni languages, are most likely of a later date. It is therefore very likely that Khoe loanwords that were adapted with velar lateral affricates only entered Nguni languages after the incorporation of clicks. Furthermore, the aspiration or dorsal fricative accompaniment of the click in the Khoe source word may have given rise to the velar lateral affricate adaptation because, even though Nguni languages do have aspirated clicks in their phoneme inventories, they do not make use of clicks with a dorsal fricative or affricate accompaniment.

4. Discussion: Inheritance and Contact in the Development of Nguni Lateral Obstruents

In the previous section, we have shown lateral obstruents in Nguni languages to be the result of a combination of language-internal regular sound changes and contact-induced phonological adaptations. We propose that alveolar lateral obstruents can be reconstructed for Proto-Nguni, whereas velar lateral obstruents are a more recent development due to language contact.

In this section, we discuss lateral obstruents from a wider Southern Bantu perspective (Section 4.1). We further discuss the processes that underly the phonological developments, and the roles that regular diachronic sound change and language contact would have played in the innovation of lateral obstruents in Section 4.2.

4.1. Lateral Obstruents in Southern Bantu

As noted in Section 1, lateral obstruents are not unique to Nguni, but also occur in other Southern Bantu languages of the Shona (S10), Sotho-Tswana (S30), and Tsonga (S50) clusters. While the use of lateral obstruents in Shona appears to be limited to a small number of varieties (see for instance Ndau and the Mhari and Nyubi dialects of Karanga (Mkanganwi, 1972, p. 117), they regularly occur in Sotho-Tswana (Table 15) and Tsonga languages (Table 16). Large lateral obstruent inventories are attested for all Tsonga languages, as shown in Table 16, which also includes numerous lateral obstruent phonemes that are absent in Nguni, such as non-prenasalized lateral affricates. The picture for Sotho-Tswana languages is more varied: lateral obstruents are absent in Lozi (K21), Tawana (S31C), Tjhauba (S311), and Lobedu (S32B), and, as shown in Table 15, the remaining Sotho-Tswana languages have different lateral obstruent inventories.

Previous research has suggested that, like in Nguni, lateral obstruents in Sotho-Tswana and Tsonga are reflexes of reconstructed palatals (Doke, 1954, p. 42; Janson, 1991). However, more detailed historical-comparative work is needed to identify the phonological developments in these language groups, especially Sotho-Tswana, given the restriction of lateral obstruents to a subset of the Sotho-Tswana languages. A closer investigation of lateral obstruents in Sotho-Tswana and Tsonga will show whether lateral obstruents were innovated in Proto-Nguni, or whether Proto-Nguni inherited this innovation from an earlier stage in the diversification of Southern Bantu languages. A shared innovation between Sotho-Tswana, Nguni, and Tsonga languages would be in line with the lexicon-based phylogeny by Gunnink et al. (2022), which showed a close relation between the three subgroups.

Table 15. Overview of lateral obstruents in Sotho-Tswana (S50) languages.

Language	Sounds	Source
Kutswe (S302)	ɬ, t͡ɬʰ, ⁿt͡ɬʰ, k͡ɭˀ, ᵑk͡ɭˀ, k͡ɭʰ	(Ziervogel, 1954, pp. 117–118)
Pai (S303)	ɬ, k͡ɭˀ, k͡ɭʰ	(Taljaard, 1997, pp. 68–76)
	ɬ, ⁿd͡ɮ, k͡ɭˀ, ᵑk͡ɭˀ	(Ziervogel, 1954, pp. 20–21)
Pulana (S304)	ɬ, k͡ɭˀ, ᵑk͡ɭˀ	(Ziervogel, 1954, pp. 117–118)
Tswana (S31)	t͡ɬʰ, t͡ɬˀ	(Krüger & Snyman, 1986, pp. 66, 68)
Kgalagadi (S311)	t͡ɬʰ (?)	(Lukusa & Monaka, 2008, p. 10)
Northern Sotho (S32)	ɬ, t͡ɬˀ, t͡ɬʰ (Standard) k͡ɭʰ, k͡ɭˀ (Eastern dialect) k͡ɭˀ (East-Central dialect)	(Louwrens et al., 1995, pp. 9–13, 16)
Southern Sotho (S33)	ɬ, t͡ɬ, t͡ɬʰ	(Mabille & Dieterlen, 1961, p. x)

Table 16. Overview of lateral obstruents in Tsonga (S60) languages.

Language	Sounds	Source
Tswa (S51)	ɬ, ɬʷ, ɮ, ⁿɮ, ⁿɮʷ, k͡ɭˀ, ⁿk͡ɭˀ, k͡ʟʰ	(Persson, 1932, p. 19)
Tsonga/Shangaan (S53)	ɬ, ɬʷ, t͡ɬ, t͡ɬʰ, t͡ɬʷ, t͡ɬʰʷ, ɮ, ɮʷ, d͡ɮ	(Baumbach, 1987, pp. 5, 10, 13)
	ɬ, ɬʷ, ⁿɬ, ⁿɬʷ, t͡ɬ, t͡ɬʰ, t͡ɬʷ, t͡ɬʰʷ, ⁿt͡ɬ, ⁿt͡ɬʰ, ⁿt͡ɬʷ (?) [1], d͡ɮ, ⁿd͡ɮ, ⁿd͡ɮ̤ [2]	(Janson, 2001, pp. 19, 25)
	ɬ[3], t͡ɬ, t͡ɬʰ, d͡ɮ, d͡ɮ̤	(Quintão, 1951, p. 9)
Ronga (S54)	ɬ, ɬʷ, t͡ɬ, t͡ɬʰ, d͡ɮ, d͡ɮʷ	(Hargus, 1999, pp. 5–6)

[1] As Janson (2001, p. 19) includes this phoneme with a question mark in his consonant chart, we follow his analysis; [2] Janson (2001, p. 19) uses the following transcription of this sound: /ⁿdlʰ/. Sequences of /dl/ typically refer to /d͡ɮ/, especially in the case of prenasalization (cf. Section 2.2). As discussed by Janson (2001, pp. 19–20), the aspiration probably represents breathiness, which is how we retranscribe it here. [3] Quintão (1951, p. 9) uses <xl> to transcribe this phoneme, which is likely grounded in Portuguese spelling conventions, where <x> is used to refer to /ʃ/, leading to an orthographic representation of /ʃl/, which is close to /ɬ/ in how it sounds.

4.2. The Origin of Lateral Obstruents in Southern Bantu

Coming back to the research question of this paper, how Nguni languages developed lateral obstruents, both inheritance and contact seem to have played a role in the development of lateral obstruents. We will discuss the possibility of these two scenarios, or a combination, in the following sections.

4.2.1. Internal Sound Change

As Janson (1991) already pointed out for Zulu, Xhosa, and Swati, part of the lateral obstruents in Nguni can be explained as reflexes of Proto-Bantu palatals. The development of alveolar lateral obstruents from Proto-Bantu *c and *j is not a common sound change from a wider Bantu perspective. While lateral obstruents occur in different Southern Bantu subgroups, they are very rare in Bantu languages outside Southern Africa. The only other Bantu languages to use them are two Taita Bantu Taita languages spoken in the Taita Hills of Kenya, Davida and Saghala (E74, E741), which have acquired the sounds via different ways (Beer et al., forthcoming), as explained in Section 2.1. The voiced lateral obstruents in Davida Weruga and Davida Mbale are the result of the spirantization of Common Bantu *d (which resulted in /l/ or/ r/ outside these North Davida languages) before high *i and *u

(Weruga) and high *u (Mbale) (see Beer et al., forthcoming). While Bantu Spirantization itself is a common sound change, it did not create lateral obstruents in languages other than Davida. In Saghala, lateral obstruents are not the result of regular sound change but were acquired through contact with Taita Cushitic (cf. Beer et al., forthcoming). The development of lateral obstruents in Nguni is therefore distinct from that in the Taita languages. Apart from the geographic distance, this points towards two separate innovation events.

The fact that a sound change is rare does not mean that it is unlikely to have occurred language-internally without contact having played a role. From a typological perspective, lateral obstruents are seen to sometimes develop out of sibilants, e.g., in the Uralic language Khanty, where a sound shift from *s to *ɬ took place in Iranian loanwords in Khanty, possibly with an intermediate stage of *θ, whilst the related language Mansi shifted from *s > *θ > *t (Sampsa Holopainen, personal communication). A similar sound change from /s/ to /ɬ/ is also noted from Proto-Tai to one of the Central Tai dialects, where reflexes of /s/, /t^h/, and /ɬ/ are attested (Li, 1977, p. 152). However, in many other language families, modern lateral obstruents are thought to be reflexes of reconstructed lateral obstruents, such as in Semitic, where reconstructed lateral obstruents are lost in the great majority of daughter languages (Steiner, 1977; Kogan, 2011). In order to evaluate whether the sound change to lateral obstruents was influenced by contact or not, we need more data on other Southern Bantu subgroups. Once we can reconstruct the Proto-Southern-Bantu realization of *c and *j, we can establish the actual sound change that took place and resulted in lateral obstruents to evaluate its (ir)regularity.

4.2.2. Language Contact in the Development of Lateral Obstruents

As lateral obstruents are relatively rare, both cross-linguistically and in Bantu, we now turn to language contact as a possible factor in this phonological development. While we have rejected the possibility of Southern Cushitic influence (Louw & Finlayson, 1990), and do not consider the linguistic area proposed by Güldemann (2011, 2019) to be sufficiently specific to be tested through investigation of the linguistic data, we do find some evidence for the role of contact with Khoisan in the development of lateral obstruents (Gunnink et al., 2022).

As we have shown in Section 3.3.2, the Khoisan origin for velar lateral obstruents is clear, which would have entered specific Nguni languages through lexical borrowings from Khoe languages, where the click with aspiration or a dorsal fricative/affricate accompaniment in the source word would have been replaced by a velar lateral affricate. In contrast to velar lateral affricates, alveolar lateral obstruents in Nguni do not result from lexical borrowing from Khoisan languages, but rather from a regular sound change that affected phonemes in inherited lexemes. If contact with Khoisan languages played a role in this sound change, it would have involved Khoisan speakers shifting to Proto-Nguni, who would not have been able to produce whatever the reflexes of *c and *j were at the Proto-Nguni stage and, instead, the nearest approximation could have been a type of lateral obstruent. To substantiate this scenario, we need to understand what the reflexes of reconstructed palatal stops were at the pre-Proto-Nguni stage, in order to investigate whether these sounds would have been absent in the Khoisan languages whose speakers shifted to Nguni, and whether lateral obstruents would be a phonetically plausible replacement. What further complicates this question is that many Khoisan language have become extinct, which may well include the language(s) that provided the Nguni substrate. Moreover, as outlined in 2.1, lateral obstruents in Khoisan languages often result from click loss and thus might be more recent additions to their phonological inventories.

An alternative to a Khoisan substrate hypothesis, which needs further research to be substantiated, is that the development of alveolar lateral obstruents in Nguni may have

been the result of multiple causation (Thomason, 2020), where inheritance and contact would have conspired to result in the sound change to lateral obstruents in Nguni. At the level of Proto-Nguni, and possibly already earlier, the reflexes of Proto-Bantu palatals must have had a phonetic value that could have developed into lateral obstruents. This development may have then be triggered and/or strengthened by contact with speakers of languages, presumably Khoisan, where lateral obstruents were more common. Further study of the development of lateral obstruents in other Southern Bantu subgroups is needed to understand how this phonological innovation emerged and what, if at all, the role of contact with Khoisan languages was in its occurrence.

5. Conclusions

This study set out to research lateral obstruents (/ɬ, ⁿɬ, ɮ, ⁿɮ, k͡ʟ̥ʲ /) in Nguni. Given that they are not reconstructed for Proto-Bantu, and their cross-linguistic rarity, the question how Nguni languages developed them is highly relevant to the diversification of Southern Bantu languages and the historical development of lateral obstruents. The results of this study indicate that alveolar lateral obstruents can be reconstructed to Proto-Nguni where they are the result of a regular sound change of Proto-Bantu palatal *c, *nc, and *nj. What the actual phonetic realization of these reconstructed palatals was before their development into lateral obstruents is currently unknown. This needs to be established through comparative data from all relevant Southern Bantu languages. The velar lateral affricate is not reconstructable to Proto-Nguni because its occurrence is less widespread and restricted to loanwords, where it replaces clicks with an aspirated or dorsal fricative/affricate accompaniment in the source word. The adoption of velar lateral affricates in Nguni was clearly the result of contact with Khoisan, but the development of alveolar lateral obstruents is more complex. It may have been the result of a combination of language-internal and -external factors.

This paper lays the groundwork for future research into lateral obstruents in Southern Bantu. The findings from this study make several contributions to the field. It is the only empirical study to date to collect and reinterpret data from a large number of secondary sources. It has led to a better understanding of the distribution of lateral obstruents in modern Nguni languages and in their most common recent ancestor, Proto-Nguni. Expanding our focus from Nguni to other subclades featuring lateral obstruents will help us to establish a greater degree of accuracy on their history within Southern Bantu, and to gain more insight into the diversification and internal coherence of Southern Bantu.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/languages10050090/s1, Supplement A: Description of Nguni lateral obstruents; Supplement B: Alveolar lateral obstruents as reflexes from Proto Bantu; Supplement C: Alveolar lateral obstruents of non-Bantu origin; Supplement D: Velar lateral affricate (/ k͡ʟ̥ʲ /) of non-Bantu origin.

Author Contributions: Conceptualization: N.v.d.V.; methodology, N.v.d.V.; investigation; writing–original draft preparation, N.v.d.V. and H.G.; writing–review and editing, N.v.d.V. and H.G. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by a doctoral and postdoctoral mandate by the Flanders research organization (FWO) (11Q2S24N; 12P8423N).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data on which this paper is based can be found in the accompanying Supplementary Materials.

Acknowledgments: We are grateful to Maarten Mous and Koen Bostoen for providing helpful feedback on previous versions of this paper. We would also like to thank three anonymous reviewers, and the audience of the Colloquium on African Languages and Linguistics (2022) for useful comments and questions on earlier versions of this research.

Conflicts of Interest: The authors declare no conflict of interest.

Notes

1 Phonologically, an opposition has been identified between *Tekela* and *Zunda* languages, which corresponds to the use of /t/ in Tekela languages where Zunda languages use /z/. Gunnink et al. (2022) show that the Zunda/Tekela distinction does not map onto other phonological or lexical innovations, and is furthermore not restricted to Nguni languages but also affects languages of the Tsonga cluster (S50).

2 To fully confirm the unconditioned sound change from *c to /ɬ/ in C1, we would need the reflexes of *cɪ.

3 Data on /ɬ/ in C2 mostly consists of lexemes where this phoneme is followed by /a/. A sound change conditioned by the nature of the following vowel can therefore not yet be disproven.

4 Thanks to Isaac Eaton for pointing out there might be a restriction on the sound change from *nj to /ⁿdʒ/, where this could only happen when the following vowel has a low tone. This question will be left for future research for now.

5 A notable exception is found in some imperative forms, where Zulu and Zimbabwean Ndebele for examle have forms like *yakha* 'build' and *yeba* 'steal', thus presevering glide reflexes of PB *j. We assume the sound change from *j to /y/ would have preceded the sound change from Proto-Bantu palatals to alveolar lateral obstruents, meaning this sound did not exist anymore at the time of the sound change and was thus not targeted.

References

Bastin, Y., Coupez, A., & Mann, M. (1999). *Continuity and divergence in the Bantu languages: Perspectives from a lexicostatistic study*. Royal Museum for Central Africa.

Bastin, Y., Coupez, A., Mumba, E., & Schadeberg, T. C. (2002). *Bantu lexical reconstructions 3*. Royal Museum for Central Africa. Available online: https://www.africamuseum.be/en/research/discover/human_sciences/culture_society/blr/any_lexicon_dictionary (accessed on 21 June 2021).

Baumbach, E. J. M. (1987). *Analytical Tsonga grammar*. University of South Africa.

Beer, S. J., Harvey, A., Mous, M., Rapold, C., & Schrock, T. (in press). Lateral obstruents in East Africa from an areal and historical perspective: A case for contact-induced non-change.

Bostoen, K. (2008). Bantu Spirantization. Morphologization, lexicalization and historical classification. *Diachronica*, *25*(3), 299–356. [CrossRef]

Bowern, C., & Lotridge, V. (2002). *Ndebele*. Lincom Europa.

Doke, C. M. (1931). *A Comparative study of Shona phonetics*. Witwatersrand University Press.

Doke, C. M. (1947). *Textbook of Zulu grammar*. Longmans, Green.

Doke, C. M. (1954). *The Southern Bantu languages*. Oxford University Press for the International African Institute.

Doke, C. M., Malcolm, D. M., Sikakana, J. M. A., & Vilakazi, B. W. (1990). *English—Zulu, Zulu—English dictionary*. Witwatersrand University Press.

Donnelly, S. (2007). *Aspects of tone and voice in Phuthi* [Ph.D. Thesis, University of Illinois].

Dryer, M. S., & Haspelmath, M. (Eds.). (2013). *WALS Online* (v2020.4) [Data set]. Zenodo. [CrossRef]

Fehn, A.-M. (2020a). Click loss in Khoe-Kwadi. In B. Sands (Ed.), *Click consonants* (pp. 291–335). Brill.

Fehn, A.-M. (2020b). Click replacement and loss in Ju. In B. Sands (Ed.), *Click consonants* (pp. 336–355). Brill.

Fehn, A.-M., & Rocha, J. (2023). Lost in translation: A historical-comparative reconstruction of Proto-Khoe-Kwadi based on archival data. *Diachronica*, *40*(5), 609–665. [CrossRef]

Finlayson, R., Jones, J., Podile, K., & Snyman, J. W. (1990). *An introduction to Xhosa phonetics*. Marius Lubbe.

Grollemund, R., Branford, S., Bostoen, K., Meade, A., Venditti, C., & Pagel, M. (2015). Bantu expansion shows that habitat alters the route and pace of human dispersals. *Proceedings of the National Academy of Sciences*, *112*(43), 13296–13301. [CrossRef]

Gunnink, H. (2022). The early history of clicks in Nguni. *Diachronica*, *39*(3), 311–368. [CrossRef]

Gunnink, H., Chousou-Polydouri, N., & Bostoen, K. (2022). Divergence and contact in Southern Bantu language and population history: A new phylogeny in cross-disciplinary perspective. *Language Dynamics and Change*, *13*(1), 74–131. [CrossRef]

Güldemann, T. (2011). Proto-Bantu and Proto-Niger-Congo: Macro-areal typology and linguistic reconstruction. In O. Hieda, C. König, & H. Nakagawa (Eds.), *Geographical typology and linguistic areas. With special reference to Africa* (pp. 109–141). John Benjamins.

Güldemann, T. (2014). "Khoisan" linguistic classification today. In T. Güldemann, & A.-M. Fehn (Eds.), *Beyond "Khoisan": Historical relations in the Kalahari basin* (pp. 1–40). John Benjamins.

Güldemann, T. (2019). The linguistics of Holocene High Africa. In Y. Sahle, H. Reyes-Centeno, & C. Bentz (Eds.), *Modern human origins and dispersal* (pp. 285–313). Kerns Verlag.

Haacke, W. H. G., & Eiseb, E. (2002). *A Khoekhoegowab dictionary*. Gamsberg Macmillan Publishers.

Hargus, S. (1999). Ronga linguistics: Introduction. In S. Hargus, & M. Da Conceição (Eds.), *Ronga linguistics* (pp. 1–7). University of Washington Working Papers in Linguistics. University of Washington.

Honken, H. (2020). ǁX'egwi. In R. Vossen, & G. J. Dimmendaal (Eds.), *The Oxford handbook of African languages* (pp. 670–681). Oxford University Press. Available online: https://academic.oup.com/edited-volume/38608/chapter/334729005 (accessed on 23 April 2024).

Hyman, L. (2001). The Limits of Phonetic Determinism in Phonology: *NC revisited. In E. Hume, & K. Johnson (Eds.), *The role of speech perception in phonology* (pp. 141–185). BRILL.

Janson, T. (1991). Southern Bantu and Makua. *Sprache und Geschichte in Afrika*, *12/13*, 63–106.

Janson, T. (2001). Consonants in Changana/Tsonga. *South African Journal of African Languages*, *21*(1), 16–32. [CrossRef]

Janson, T. (2007). Bantu spirantisation as an areal change. *Africana Linguistica*, *13*(1), 79–116. [CrossRef]

Jimenez, R. (2017). *Rites of reproduction: Gender, generation and political economic transformation among Nguni-speakers of southern Africa, 8th–19th century CE* [Ph.D. Thesis, Northwestern University].

Jimenez, R. (2022). Food production, environment, and mobility among Late Iron Age Nguni-speakers of South Africa. *Quaternary International*, *611–612*, 211–219. [CrossRef]

Jordan, A. C. (1953). *Some features of the phonetic and grammatical structure of Baca* [Master's Thesis, University of Cape Town].

Kießling, R., Mous, M., & Nurse, D. (2008). The Tanzanian Rift Valley Area. In B. Heine, & D. Nurse (Eds.), *A linguistic geography of Africa* (pp. 186–227). Cambridge University Press.

Kogan, L. (2011). Proto-Semitic phonetics and phonology. In S. Weninger (Ed.), *The Semitic languages* (pp. 54–151). De Gruyter.

Krüger, C. J. H., & Snyman, J. W. (1986). *The sound system of Setswana*. Via Afrika.

Ladefoged, P., & Maddieson, I. (1996). *The sounds of the world's languages*. Blackwell Publishers.

Ladefoged, P., & Traill, A. (1994). Clicks and their accompaniments. *Journal of Phonetics*, *22*(1), 33–64. [CrossRef]

Lanham, L. W. (1964). The proliferation and extension of Bantu phonemic systems influenced by Bushman and Hottentot. In H. G. Lunt (Ed.), *Proceedings of the Ninth International Congress of Linguists* (pp. 382–391). Mouton.

Li, F. K. (1977). *A handbook of comparative Tai*. University of Hawai'i Press.

Louw, J. A. (1974). The influence of Khoe on the Xhosa language. *Limi*, *2*(2), 45–62.

Louw, J. A. (1977). Clicks as loans in Xhosa. In J. W. Snyman (Ed.), *Bushmen and Hottentot linguistic studies 1975* (pp. 82–100). UNISA.

Louw, J. A., & Finlayson, R. (1990). Southern Bantu origins as represented by Xhosa and Tswana. *South African Journal of African Languages*, *10*(4), 401–410. [CrossRef]

Louwrens, L. J., Kosch, I. M., & Kotzé, A. E. (1995). *Northern Sotho*. Lincom.

Lukusa, S. T. M., & Monaka, K. C. (2008). *Shekgalagari grammar: A descriptive analysis of the language and its vocabulary*. CASAS Book Series 47. CASAS.

Mabille, A., & Dieterlen, H. (1961). *Southern Sotho—English dictionary*. Morija Sesuto Book Depot.

Maddieson, I. (2013). Lateral consonants. In M. S. Dryer, & M. Haspelmath (Eds.), *WALS online*. Max Planck Institute for Evolutionary Anthropology. Available online: http://wals.info/chapter/8 (accessed on 28 January 2022).

Maddieson, I., Ladefoged, P., & Sands, B. (1999). Clicks in East African languages. In R. Finlayson (Ed.), *African mosaic: Festschrift for J. A. Louw* (pp. 59–91). University of South Africa.

Maho, J. F. (2009). *NUGL Online: The online version of the New Updated Guthrie List, a referential classification of the Bantu languages (4 June 2009)*. Available online: https://brill.com/fileasset/downloads_products/35125_Bantu-New-updated-Guthrie-List.pdf (accessed on 28 January 2022).

McLaren, J. (1952). *A Xhosa grammar: Revised and re-written in the new orthography*. Longmans, Green.

Meeussen, A. E. (1967). Bantu grammatical reconstructions. *Africana Linguistica*, *3*(1), 79–121. [CrossRef]

Meinhof, C. (1899). *Grundriß einer Lautlehre der Bantusprachen*. Dietrich Reimer.

Meinhof, C. (1930). *Der Koranadialekt des Hottentottischen*. Dietrich Reimer.

Mini, B. M., Tshabe, S. L., Shoba, F. M., & van der Westhuizen, P. N. (2003). *The greater dictionary of Xhosa. Vol 2: K to P*. University of Fort Hare.

Mkanganwi, K. G. (1972). The relationships of Coastal Ndau to the Shona dialects of the interior. *African Studies*, *31*(2), 111–138. [CrossRef]

Moran, S., & McCloy, D. (Eds.). (2019). *PHOIBLE 2.0*. Jena: Max Planck Institute for the Science of Human History. Available online: http://phoible.org (accessed on 15 January 2025).

Msimang, C. T. (1989). *Some phonological aspects of the Tekela Nguni dialects* [Ph.D. Thesis, University of South Africa].

Nakagawa, H. (1996). An outline of ǀGui phonology. *African Study Monographs*, *22*, 101–124.

Newman, P. (1977). Lateral fricatives ("hlaterals") in Chadic. In P. Newman, & R. M. Newman (Eds.), *Papers in Chadic linguistics* (pp. 107–119). Afrika-Studiecentrum.

Ownby, C. P. (1985). *Early Nguni history: The linguistic evidence and its correlation with archaeology and oral tradition* [Ph.D. Thesis, University of California].

Pahl, H. W., Pienaar, A. M., & Ndungane, T. A. (1989). *The greater dictionary of Xhosa*. University of Fort Hare.

Pakendorf, B., Gunnink, H., Sands, B., & Bostoen, K. (2017). Prehistoric Bantu-Khoisan language contact: A cross-disciplinary approach. *Language Dynamics and Change*, *7*(1), 1–46. [CrossRef]

Pelling, J. N. (1966). *A practical Ndebele dictionary*. Daystart Publications.

Persson, J. A. (1932). *Outlines of Tswa grammar* (2nd ed.). Central Mission Press.

Poulos, G., & Msimang, C. T. (1998). *A linguistic analysis of Zulu*. Via Afrika.

Quintão, J. L. (1951). *Dicionários xironga-português e português-xironga*. Agência geral das colónias.

Rycroft, D. K. (1981). *A concise SiSwati dictionary*. J. L. van Schaik.

Sands, B. (2007). The contribution of language documentation to historical phonology. In P. K. Austin, O. Bond, & D. Nathan (Eds.), *Proceedings of Conference on Language Documentation and Linguistic Theory* (pp. 209–219). SOAS.

Sands, B. (2013). Hadza phonetics and phonology. In R. Vossen (Ed.), *The Khoesan languages* (pp. 38–42). Routledge.

Schadeberg, T. C. (1994). Spirantization and the 7-to-5 vowel merger in Bantu. In M. Dominicy, & D. Demolin (Eds.), *Sound Change* (pp. 73–84). John Benjamins.

Schadeberg, T. C. (2009). Appendix: On the origin of Zulu depressor consonants. *Language Sciences*, *31*, 193–198.

Sengupta, D., Choudhury, A., Fortes-Lima, C., Aron, S., Whitelaw, G., Bostoen, K., Gunnink, H., Chousou-Polydouri, N., Delius, P., Tollman, S., Gómez-Olivé, F. X., Norris, S., Mashinya, F., Alberts, M., AWI-Gen Study, H3Africa Consortium, Hazelhurst, S., & Schlebusch, C. M. (2021). Genetic substructure and complex demographic history of South African Bantu speakers. *Nature Communications*, *12*(1), 2080. [CrossRef]

Shinagawa, D., & Lee, S. J. (2024). A typological overview of lateral fricatives in Southern Bantu languages. *Journal of Asian and African Studies*, *4*, 69–89. [CrossRef]

Skhosana, P. B. (2009). *The linguistic relationship between Southern and Northern Ndebele* [Ph.D. Thesis, University of Pretoria].

Steiner, R. C. (1977). *The case for fricative-laterals in Proto-Semitic*. American Oriental Society.

Taljaard, P. C. (1997). *The Pai language of Eastern Mpumalanga and its relation to Swati* [Ph.D. Thesis, Unisa].

Taljaard, P. C., & Snyman, J. W. (1991). *An introduction to SiSwati phonetics*. Marius Lubbe.

Taljaard, P. C., Khumalo, J. N., & Bosch, S. E. (1991). *Handbook of Siswati*. J. L. van Schaik.

Thomason, S. (2020). Contact explanations in linguistics. In R. Hickey (Ed.), *The handbook of language contact* (2nd ed., pp. 31–49). Wiley.

Traill, A., & Vossen, R. (1997). Sound change in the Khoisan languages: New data on click loss and click replacement. *Journal of African Languages and Linguistics*, *18*(1), 21–56. [CrossRef]

Van der Vlugt, N. H. V. (2023). *The development of lateral obstruents in Nguni languages (S40, Southern Bantu): A diachronic study* [Master's Thesis, Leiden University].

Van Dyk, R. P. (1960). *'n Studie van Lala: sy fonologie, morfologie en sintaksis* [Ph.D. Thesis, Stellenbosch University].

Whelton, M. J. (2013). *SiSwati-English dictionary* (5th ed.). RedOyster Media.

Wills, J. (2022). Sorting out Proto-Bantu *j. In K. Bostoen, G.-M. de Schryver, R. Guérois, & S. Pacchiarotti (Eds.), *On reconstructing Proto-Bantu grammar* (pp. 59–101). Language Science Press.

Wright, J. (2012). A. T. Bryant and the "Lala". *Journal of Southern African Studies*, *38*(2), 355–368. [CrossRef]

Wright, R., Maddieson, I., Ladefoged, P., & Sands, B. (1995). A phonetic study of Sandawe clicks. *UCLA Working Papers in Phonetics*, *91*, 1–24.

Ziervogel, D. (1952). *A Grammar of Swazi (siSwati)*. Witwatersrand University Press.

Ziervogel, D. (1954). *The Eastern Sotho*. Van Schaik.

Ziervogel, D. (1959). *A grammar of Northern Transvaal Ndebele*. Van Schaik.

Zungu, E. M. (1999). *A comparative phonological and morphological analysis of the North and South Lala dialects of Tekela Nguni* [Ph.D. Thesis, University of South Africa].