

A typology of the use of clicks

Matthias Brenzinger 

Department of African Languages, University of the Free State, South Africa
E-mail: mabrenzinger@gmail.com

Sheena Shah 

Department for Language, Literature and Culture, TU Dortmund University, Germany
Department of African Languages, University of the Free State, South Africa
E-mail: sheena.shah@tu-dortmund.de

1. Introduction

Click speech sounds were first identified as consonants in the 17th century. On his voyage to India in 1627, the English traveller and historian Sir Thomas Herbert stopped in southern Africa, where he met with Khoekhoe speakers at the Cape. He noticed that clicks were regular consonants in their language and represented them as such in his travelogue (Herbert 1638). Since then, click consonants have received thorough scholarly attention by linguists, many of whom have dedicated their lives to the study of click consonants. Click speech sounds are consonants in phoneme inventories of about 30¹ of the approximately 6,500² languages spoken in the world today. These few languages, henceforth referred to as click-consonant-using (CU) languages, are found in southern and eastern Africa.

Click consonants are complex speech sounds. According to Miller (2011:416),

Clicks exhibit at least three major areas of complexity that are not found in most other consonants: (1) the double place of articulation features; (2) the overlap of the two constrictions for the length of the segments; and (3) the non-pulmonic airstream mechanism.

Click consonants are distinguished by their click type (e.g., bilabial, dental, lateral, etc.) with reference to the front constriction. A second, back constriction in the basic click production is either velar or uvular (Sands 2020:3). When these constrictions are released, an ingressive airstream makes the “characteristic popping sound” (Miller 2011:416) or “suction noise known

¹ This number varies as some scholars include languages with few click-containing words, such as Cicopi or Rukwangali, to the list of click-consonant-using languages, while others do not.

² Figures for the total number of languages of the world vary significantly. 6,500 (Hammarström 2016) is a more conservative estimate. The 25th edition of the Ethnologue lists 7,151 languages (Eberhard, Simons & Fennig 2022), while the Glottolog (4.6) catalogue lists 8,565 languages (Hammarström, Forkel, Haspelmath & Bank 2022).

as a click” (Sands 2020:2). This ingressive airflow produced by the movements of the tongue is the main source of noise in the production of click consonants (Sands 2020:3). Click consonants are furthermore identified by their accompaniments (e.g., voicing, aspiration, nasalisation, glottalisation, etc.)³.

Many non-CU languages use non-phonemic clicks. These speech sounds have often been called “para-linguistic clicks”, for example by Gil (2013). Gil (2013) defines the “para-linguistic” nature of such clicks as follows:

Phonetically, they [para-linguistic clicks] involve sounds lying outside ordinary phonemic inventories. Grammatically, they are not integrated into morphological and syntactic structures. And semantically, they convey a very restricted range of meanings, some of which are associated with the expression of emotions.

While click consonants are employed in less than 0.5% of the world’s languages, non-phonemic, non-consonantal clicks⁴ seem to be rather common throughout the world, “with people sometimes leap[ing] to the assumption that they are universal” (Gil 2013). The use of these non-consonantal clicks is, however, very limited, as they appear exclusively in interactives. This applies not only to non-CU languages, but also to CU languages. Heine defines interactives as “extra-clausal expressions of linguistic discourse”, which “have a grammar distinct from sentence grammar, referred to as interactive grammar” (Heine 2023: back cover).

The above-mentioned term “para-linguistic clicks” is not appropriate for at least two reasons. First, “para-linguistic” suggests that these clicks are “*alongside* language ... not *within* it” (Pillion et al. 2019:304, emphasis added), thus downplaying the importance of the interactive grammar in communication. Grenoble, Martinović and Baglini (2015:112) rightfully state that “the term paralinguistic is misleading in that some [...] gestures, including Gil’s yes/no clicks, substitute for lexical items and so are not truly paralinguistic but linguistic.” Second, the notion of “para-linguistic clicks” is even more problematic with CU languages, as they do not employ additional non-consonantal clicks as “para-linguistic clicks” in or as interactives. Instead, they commonly⁵ use click consonants which are members of their phoneme inventories, also in the interactive grammar (in Gil’s terms, “paralinguistically”).

Non-consonantal clicks in non-CU languages, but also click consonants in CU languages, often appear in the interactive grammar as click-only utterances, i.e., as click speech sounds without accompanying vowels. While standalone click consonants or sequences of click consonants violate the phonotactic constraints of word formation in the sentence grammar of CU languages (Güldemann & Nakagawa 2018), these clicks nevertheless remain true phonemes of these CU languages as they are employed as regular consonants in the sentence grammar otherwise⁶.

³ For a detailed description of the production of click consonants, see Sands (2020).

⁴ While all non-consonantal clicks are non-phonemic, not all non-phonemic clicks are non-consonantal, as discussed in our typology below.

⁵ In Section 3, we discuss the only example of a non-consonantal click used as an interactive in a CU language which is known to us.

⁶ Similarly, the affricate *pf* [pf] in German as a singleton may be used as an interjection signalling disapproval of a statement made by someone else. While the utterance of a standalone affricate *pf* violates the constraints of word formation in the German sentence grammar, *pf* is at the same time also used as a consonant in German lexemes

Click phoneme inventories, and consequently the use of click consonants, are language-specific, as is the use of non-consonantal clicks. This means that the same click speech sound, for example, a voiceless lateral click consonant *x*, is a regular click consonant in isiXhosa in the interjection expressing disappointment but is a non-consonantal click when used in English as an interjection encouraging a horse to trot.

Non-consonantal clicks were detected and studied already as early as the 19th century, for example as click interjections in French (Ballu 1868), and continue to receive scholarly attention, for example as click discourse markers in English (Wright 2011). Nevertheless, non-consonantal clicks in contrast to click consonants have been studied far less systematically in terms of their production and use in the world's languages. The approaches applied to study non-consonantal clicks and click consonants belong to different research traditions which, until recently, seem to have taken little notice of each other. This has changed in some respects with research conducted on non-consonantal clicks in the West African language, Wolof (Grenoble et al. 2015), and the Chadian language, Laal (Lionnet 2020), as well as on the tongue pop, a non-consonantal click employed by drag queens in several unrelated lavender languages (Pratchett 2021).

In terms of their production, Bradfield (2014:3) claims that all five click types represented in the International Phonetic Alphabet are also used as non-consonantal clicks. The large number of click accompaniments which have been described for click consonants in some of the CU languages seems, however, not to be utilised with non-consonantal clicks. These clicks seem to be less complex in this regard as they tend to be plain clicks, i.e., voiceless and unaspirated.

Proctor et al. (2020:229) state that “we do not yet know if all clicks produced for paralinguistic purposes have equivalents in phonological systems”. What we do know, however, is that some of the speech sounds in the interactive grammar which are referred to as “clicks” are not employed as consonants in any CU languages. Among them are also speech sounds which do not comply with the basic features described in the production of click consonants and which might therefore be more appropriately labelled as “click-like articulations” (Lionnet 2020:422).

Lionnet (2020) observes that several of the non-consonantal clicks and “non-phonemic click-like articulations” which he reports for Laal, a language isolate of Chad, are shared among West and Central African languages more widely. For example, one of the click-like speech sounds, described by Lionnet (2020:427–432) for Laal as a “back-released velar click”, is used as a backchanneling strategy to express approval also in Wolof (see also Pillion et al. 2019). In terms of its production, this click-like speech sound shares several features with click consonants, such as the non-pulmonic airstream mechanism, the back and front closures, and the tongue movement which plays an important role in the sound production. There are, however, two significant differences between this click-like speech sound and non-consonantal clicks/click consonants. First, there is full lip closure throughout the sound production, i.e., the front constriction is not released. Second, instead of the front closure being released, as described for all click consonants, it is the velaric back closure which is released, and the airstream enters the mouth from the back (Lionnet 2020:427–432). Our use of the generic terms “clicks”/“click

such as *Pferd* ‘horse’ and *Pfeife* ‘pipe’. The affricate *pf* in the interjection is – at least to our knowledge – not a different, additional speech sound but the regular consonant of the German phoneme inventory. We assume that the same applies with CU languages, i.e., that click speech sounds which are employed as click-only interactives are regular consonants of the phoneme inventory.

speech sounds” is based on the definition of the production of click consonants (see Miller 2011 above). In order for speech sounds to be called clicks, we expect that even non-consonantal clicks share at least the basic features identified in the production of click consonants. Since this is not the case with the so-called “back-released velar click”, the term “non-phonemic click-like articulation” rather than “non-consonantal click” seems more appropriate.

In the following, we propose a typology of the different uses of click speech sounds in human communication.

2. A typology of the use of clicks

Click consonants seem to have the longest history in the languages of the Kx’a, Tuu and Khoe-Kwadi families in southern Africa as well as in the linguistic isolates Hadza and Sandawe⁷ in eastern Africa (Güldemann 2014). While click consonants are not part of the shared phonemic heritage of the Bantu language family, about half of today’s CU languages are Bantu languages spoken in southern Africa. These Bantu languages borrowed click-containing words from languages of the Kx’a, Tuu and Khoe-Kwadi families or from each other. In some of these Bantu languages, click phonemes became regular consonants of “standard” phoneme inventories. A few – most likely also borrowed – click-containing words are found in Dahalo, an endangered Cushitic language spoken in Kenya. The use of click consonants is confined to this small number of CU languages⁸.

The proposed typology in Table 1 attempts to account for all uses of click speech sounds that occur in the languages of the world. At the first level, two categories are distinguished, namely click consonants and non-consonantal clicks, with the former being confined to CU languages only and the latter being almost exclusively documented for non-CU languages. At the second level, two subcategories of click phonemes are identified, namely regular and non-regular click consonants. The non-regular consonants are further subcategorised into remnant, borrowed and special click consonants. Non-consonantal clicks are set apart in a separate category. Since click inventories vary across languages and may change over time, it is important to note that the proposed typology can only be applied to one specific language at one point in time.

Table 1 below summarises the main properties associated with click consonants and the different subcategories thereof on the one hand and with non-consonantal clicks on the other.

⁷ Sandawe is often considered to be a potential higher-order relative of Khoe-Kwadi (Güldemann & Elderkin 2010).

⁸ Individual click-containing words have, however, been borrowed by a few non-CU languages through contact with CU languages. See discussion in Section 2.2.

Table 1. Typology of the use of clicks

Categories	Click consonants (mostly in CU languages)				Non-consonantal clicks (mostly in non-CU languages)
Subcategories of click phonemes	Regular (current)	Irregular			Not phonemes
		(1) Remnant (former)	(2) Borrowed (new)	(3) Special (for example, conventionalised mouthpiece)	
Part of “standard” phoneme inventories	Yes	No longer	Not yet	No	
Speech sound inventories	“Standard” phoneme inventories	“Extended” phoneme inventories ⁹			“Extended” speech sound inventories
Phonetic and articulatory properties	Complex speech sounds defined by click type (influx) & click accompaniment (formerly efflux); exceptions exist				Less complex speech sounds, occurring mostly as plain clicks with click accompaniments often not distinctive
Sentence grammar	Consonants in word formation				Not employed
Interactive grammar	Consonants in word formation, also as standalone or sequences of consonants				Employed mainly as standalone or sequences of non-consonantal clicks
Semantic domains, functions	All		Limited domains		Limited domains, limited functions

2.1 Regular click consonants

CU languages are identified by their use of click consonants. The significance of click phonemes, however, differs considerably among the approximately 30 CU languages. In determining the functional load of click consonants¹⁰ of a particular CU language, two parameters are commonly considered (Güldemann 2007; Sands & Gunnink 2019; Brenzinger & Shah forthcoming):

- the complexity of the click inventories, i.e., the number of distinct click consonants;
- the frequency of the occurrence of click consonants in the lexicon of the language.

Regarding the first parameter, numbers of distinct click consonants vary significantly among the CU languages: the Tuu language, Taa, with its 115 click consonants (Naumann 2016), has the largest click consonant inventory among the CU languages, while CU Bantu languages, with between 27 click phonemes in Botswanan Shiyeyi (Sommer 2003) and three in Sesotho (Doke & Mofokeng 1957), are at the lower end of this scale¹¹. Regarding the second parameter, the frequency of click consonants in the vocabularies of CU languages ranges from about 80% in Taa (i.e., eight out of ten words begin with click consonants) to below 1% in the Kavango Bantu languages (Brenzinger & Shah forthcoming).

⁹ The term “extended” phoneme inventory must be taken with some caution as non-regular click consonants might through their distinct properties form a sub-group of click consonants in the click consonant inventory of a language and as such not simply “extend” the “standard” phoneme inventory.

¹⁰ The term “functional load” in reference to click phonemes was introduced by Güldemann (2007).

¹¹ See Brenzinger and Shah (forthcoming) for a detailed discussion of the functional load of click phonemes in CU languages.

One distinct click type and one specific click accompaniment can commonly be identified with each click consonant. This binary assignment is also reflected in the written representation. For example, in the case of the voiced dental click consonant [ɮ], the dental click type is transcribed with the IPA click symbol [ɮ], which orthographies represent as either ⟨l⟩ or ⟨c⟩. The voicing accompaniment is commonly transcribed with [g] or [ᵑ] in IPA and with ⟨g⟩ or ⟨d⟩ in most orthographies.

Linguists commonly group click consonants according to their click type, assigning them to a bilabial, dental, palatal, etc., click series. At least in some CU languages, speakers also seem to arrange click consonants in this manner. For example, Taa speakers use verbs with the meaning ‘to produce a click consonant of the X click type’¹². There are no comparable verbs in Taa for referring to click consonants with the same click accompaniments, i.e., *‘to produce a click consonant with a nasal, delayed aspiration, etc.’. Nevertheless, in Taa, as well as in all other CU languages, click accompaniments are distinctive features and as important as click types in the production and perception of a particular click consonant.

In fact, in some of the CU languages, click consonants are primarily defined by their click accompaniment and not by their click type. In these languages, click accompaniments remain steady while click types are less salient; the latter are chosen indifferently among speakers but also by the same speaker. Maddieson (2003:37) observes, with regard to click consonants in some languages, a “lack of respect for place [of articulation] when few categorical contrasts exist” and states that “such context-free liberty to vary place of articulation is rarely encountered with other classes of consonants”. For this “lack of respect for place [of articulation]” with click consonants, he cites examples from Xinkuna (Xitsonga) (Baumbach 1974), Thimbukushu (Fisch 1977) and Rugciriku (Möhlig 1997).

In the Kavango languages Thimbukushu und Rumanyo (Rugciriku), click consonants are distinguished according to their accompaniments as “voiceless”, “voiced”, “voiceless nasalised”, “voiced nasalised”, and “prenasalised voiceless dental clicks with pharyngeal efflux” (Möhlig & Shiyaka-Mberema 2005:26). Möhlig (1997:219) notes for Rukwangali, another Kavango language, that “there are five distinctive clicks. Their places of articulation are almost all dental, however, with a broad individual variation ... they are rare phonemes, which is a system internal indication of their foreign origin.” Click consonants in the Kavango languages might never have been adopted in their entire complexity, i.e., click types might have been pronounced interchangeably already at the time when the borrowing from Khoe-Kwadi or Kx’a languages took place.

The fading distinctiveness between click types can also be observed in isiNdebele, formerly known as Southern Transvaal Ndebele. Schulz et al. (2019:251) observe that dental clicks prevail in this language, noting that these dental clicks may be pronounced as postalveolar clicks. This “lack of respect for the place [of articulation]” might be the result of either click loss or click replacement. More recently, these processes seem to have come to a halt in isiNdebele; in fact, they might even be reversed as a result of contact with isiXhosa speakers and through writing isiXhosa at school. Due to exposure to a language with a more “complete”

¹² *Ohũ-Ohũ & Onũ-Onũ* ‘make the sound of the bilabial click [ɔ]’ (Traill 1994:50, 51); *lhẽ-lhẽ & l’ã-l’ã* ‘make the sound of the dental click’ (Traill 1994:66, 71); *!hẽ-!hẽ* ‘make the sound of the [!] click’ (Traill 1994:90); *lnà-lnà & l’ã-l’ã* ‘make the sound of the lateral click [l]’ (Traill 1994:122, 128); *thẽ-thẽ & t’è-t’è* ‘make the sound of the [ʈ] click’ (Traill 1994:144, 150).

Nguni click consonant inventory, especially younger isiNdebele speakers are increasingly pronouncing click consonants with their “correct, original” click types and accompaniments (Schulz et al. 2019:253).

2.2 Remnant and borrowed click consonants

In CU languages – as well as in some non-CU Bantu languages which are in contact with CU Bantu languages – click consonants may appear in the lexicon despite the fact that they are not part of the “standard” phoneme inventory. These *other* click consonants may have been regular click phonemes in the past and are now relic, remnant click consonants, i.e., first subcategory of non-regular click consonants (see Table 1 above). They may, however, also be new click consonants which have been borrowed in loanwords, i.e., second subcategory.

In the case of remnant click consonants, some click-containing words may have preserved click consonants which are no longer in use in the language otherwise. In Sindebele, formerly known as Northern Transvaal Ndebele, all click consonants have disappeared over the last 100 years or so; hence, this language is no longer listed among the CU languages. The last click consonants in Sindebele – then already remnant click consonants – seem to have been used in plant names. Ziervogel (1959:33) reports for the mid-1950s:

My old informants remember former times when the old people actually used clicks in their speech. Actually, some plant names are still known by names with click sounds, [...]

In the case of borrowed click consonants, additional click consonants that are not otherwise used in the language may enter a CU language with loanwords. SiSwati, for example, has borrowed click-containing isiZulu words and maintained their “original” pronunciation, even with words which contain click consonants that are not part of the siSwati phoneme inventory. The borrowed verb *kúnconcótsa* ‘to pound, hammer, ram’, which derives from the borrowed click-containing ideophone *ncó*¹³, is such an example. While rendered ⟨nc⟩, i.e., using the common representation for a nasal dental click consonant in the Nguni writing convention, both the ideophone and the derived verb are, according to Rycroft (1982:67), pronounced with a “prenasalized postalveolar click”; they should therefore be written as *kúnqonqótsa* and *nqó*, respectively. Click consonants of the postalveolar click type are not part of the “standard” phoneme inventory of siSwati, but through borrowing became new click consonants of the language.

When non-CU languages borrow click-containing words, these click consonants become part of an “extended” phoneme inventory, even if these click-containing words are interjections. For example, in Setswana and Northern Sotho, languages which do not employ click consonants otherwise, “clicks are used emotionally, for example in interjections” (Herbert 2002:307). No examples are provided by Herbert, and these click interjections might therefore be non-consonantal clicks like in other non-CU languages. However, if the click-containing interjections have been borrowed from neighbouring CU languages, the click speech sounds would be borrowed click consonants.

¹³ *ncó* ‘1. Ideophone of knocking [...]. 2. of being erect, upright, vertical. 3. of sloping upwards steeply’ (Rycroft 1982:67).

While the borrowing of click consonants by non-CU languages in southern Africa is quite common, it seems to occur only rarely in eastern Africa. One of the few examples of the latter is found at the Kenyan coast, where a “complex click” in an interjection has been documented in dialects of Digo, one of the Mijikenda languages. Walsh (2006:159) mentions this click, which he sets apart from other “simple unelaborated clicks [which] do occur in Digo interjections”. He notes that a “voiced velar nasal” dental click consonant followed by the vowel “a” – in his transcription /^hla/ – functions as an interjection which expresses “(perhaps rudely) driving someone away” (Walsh 2006:116). Dahalo, a Cushitic language that most likely borrowed click-containing words from CU languages which no longer exist, is spoken in the vicinity of Digo (Brenzinger & Shah forthcoming). One may assume a similar origin for /^hla/ in Digo, namely a borrowing of an interjection which consists of a click consonant with an accompanying vowel.

If non-CU languages borrow click-containing words in large numbers, the status of these languages might be reconsidered. For example, Xitsonga and Cicopi are often regarded as CU languages due to extensive borrowing of click-containing isiZulu words (Brenzinger & Shah forthcoming). Accordingly, the borrowed click consonants – even though limited to loans – become part of the “extended” phoneme inventories of these formerly non-CU languages.

The origin of non-regular click phonemes is not always transparent, as seen in the following examples from Ts’ixa and Namibian Shiyeyi. For Ts’ixa, a Kalahari Khoe language, Andrason, Fehn and Phiri (2020) and Fehn and Ketapilwe (2021) provide examples of words with both remnant and borrowed click consonants, see Table 2.

Table 2. Non-regular click consonants in Ts’ixa ideophones

	Click consonant		Ideophone	Gloss	Source
(1)	!x’	Alveolar affricate ejective click consonant	!x’ua	Sound made by a large stone falling into the water	Andrason, Fehn & Phiri (2020:311, fn. 25)
(2)	!k’	Palatal voiceless ejective click consonant	!k’up!k’upi	Sound of leaking rainwater	Fehn & Ketapilwe (2021:72)
(3)	!h	Dental click with delayed aspiration	!hup	Sound with which a tuber is pulled out	Fehn & Ketapilwe (2021:70)

While the three click consonants in Table 2 are not part of the Ts’ixa phoneme inventory, they are regular click consonants in neighbouring languages. Fehn (p.c. 2021) suggests different scenarios for these non-regular click phonemes in Ts’ixa: limited retention of the click consonants [!x’] (1) and [!k’] (2), i.e., they formerly existed as regular click consonants which were replaced by non-click speech sounds elsewhere in the lexicon, and introduction of a new click consonant by means of borrowing in the case of [!h] (3).

A non-regular click consonant also exists in Namibian Shiyeyi, a CU Bantu language spoken in the Zambezi region of the country. Even though Shiyeyi has no lateral click consonants in its phoneme inventory, Donnelly (1990:14) describes an “alveo-lateral ... [l]” click consonant in an “interjection expressing disapproval”. He also notes a verb which is derived from this interjection, namely *kùnql’ápìzá* meaning ‘to indicate disapproval by making the interjection [l]’. Seidel (2008:43) later describes the click as “voiceless pre-nasal lateral” and he also notes a derived verb *kùnqxàpìzá* [kuñlapiza] ‘disapprove by making a lateral click’. For the time being,

the question remains open as to whether the lateral click existed in Namibian Shiyeyi in the past, thus making it a remnant click consonant, or whether this lateral click consonant entered the language through borrowing of this interjection from another CU language, thus making it a borrowed and therefore new click consonant.

2.3 Special click consonants

In addition to remnant and borrowed click consonants, there are other non-regular click phonemes which can be subsumed under the label “special click consonants”. In this discussion, we focus on and introduce one special click consonant, namely the “conventionalised mouthpiece click consonant”¹⁴. Conventionalised mouthpiece click consonants are click speech sounds which are produced by speakers who serve as mouthpiece by speaking on behalf of a particular animal or another non-human entity; thus, storytellers are not imitating the non-humans but make their presumably genuine voices speaking the human language heard.

Such special click phonemes have been described in the animal speeches of Damin, a ritual register used by Lardil-speaking males on the Mornington Islands in Australia. In the 1970s, Ken Hale documented this register with the last proficient speaker. Damin used to be taught to male initiates and had many speech sounds which occur rarely or not at all in the languages of the world. Claimed to be produced by “an ancestor known as Kaltharr (Yellow Trevally Fish), [Damin] has a rich inventory of sounds, some echoing what ‘fish talk’ would sound like” (Evans 2010:201). Among these sounds are also “Khoisan-style clicks” (Evans 2010:246), such as a “nasalized bilabial click” in the word *m!ii* [ŋ̃oi:] which corresponds to a proto-Tangkic word **miyi* ‘vegetable food’, the latter being without the click (Evans 2010:201). It seems that Damin – and for that reason also the use of these special click consonants – was limited to certain ceremonial contexts.

Conventionalised mouthpiece click consonants were already described in the 1870s by Wilhelm Bleek and Lucy Lloyd when they recorded stories in |Xam, a Tuu language once spoken by hunter-gatherers, which became extinct in the late 1920s. When animals or the moon appear in these stories and speak |Xam, the storytellers become their mouthpiece. The narrators pronounce |Xam in the way in which they anticipate the words would sound like if uttered by these animals or the moon. While non-click consonants in Damin are replaced by click consonants and other speech sounds when imagining how “‘fish talk’ would sound like”, |Xam speakers replace click consonants from the “standard” |Xam click phoneme inventory with special click consonants from an “extended” |Xam click phoneme inventory. Bleek (1875:6) notes:

A most curious feature in Bushman folklore is formed by the speeches of various animals, recited in modes of pronouncing Bushman [|Xam], said to be peculiar to the animals in whose mouth they are placed. It is a remarkable attempt to imitate the shape or position of the mouth of the kind of animal to be represented. Among the sounds which are hereby affected, and often entirely commuted, are principally the clicks.

¹⁴ The term “conventionalised mouthpiece click consonant” is a newly coined label, which has been suggested by Bernhard Weiss (p.c. 2022).

Although !Xam speakers were already using 37 regular click consonants (Güldemann 2013:82), Bleek (1875:6) noticed that the moon, the anteater, and the hare employ “a most unpronounceable click” which is otherwise not used in the language. When the moon talks !Xam, Bleek observed that the regular click consonants are substituted with those from the “moon click series” with the exception of the bilabial click consonants which are retained.

In !Xam, the special click consonants in the speeches of animals and non-human entities are conventionalised in that they are defined by specific click types. These non-regular click types are joined by the regular click accompaniments of the “standard” !Xam click series. Bleek represents the additional click types with distinct click symbols and employs the established writing conventions for the representation of the click accompaniments. !Xam children most likely acquired these conventionalised mouthpiece click consonants naturally, just like any other click consonants of their language. In contrast to the click consonants in Damin which were used by males in specific contexts only, the conventionalised mouthpiece click consonants in !Xam seem to have been part of an “extended” click phoneme inventory and were employed by all !Xam speakers when speaking on behalf of the moon, hare and anteater.

The existence of these additional click types in !Xam led Bleek (1875:6) to suggest that:

The presence of these abnormal clicks in the different kinds of speech, points to the possibility, nay, even to the probability, of the former presence of many more clicks in the Bushman language than the five [click types] which are now to be found there.

Bleek’s assertion that !Xam might have had an even richer click phoneme inventory in the past does not, however, necessarily imply that the animal and moon click consonants were once click phonemes of the “standard” phoneme inventory of !Xam as spoken by humans.

2.4 An “impossible” speech sound used as a click consonant?

In this section, we introduce a click from Taa which at first sight appears to be another special click consonant, however, as demonstrated by its phonetic description, it is not. As in many other languages, Taa derives bird names from the songs of these birds. Tuhuse and Traill (1999:1041) devoted a short paper to the names of the Desert cisticola (*Cisticola aridula*), a pale brown small bird, which is called *hán-hánsè*, with a regular aspirated palatal click consonant. The authors call this “the ‘tame’ version of the sound symbolic form [of the bird name] since it involves a mapping of salient acoustic features of the bird’s call onto conventional phonological segments and prosody of the [Taa] language”. In addition, there is also “a ‘wild’, or direct imitation of the birdsong, [which] involves a wholly unusual sound in the place of the conventional click” (Tuhuse & Traill 1999:1041):

This sound is also an acute, impulse-like click with the identical double articulation and suction cavity found with the palatal click, but [...] it is produced when the dorsal closure is released while maintaining the anterior (coronal) closure. [...] the articulation is probably best known as the non-linguistic gesture used by some people to scratch an itchy velum!

This speech sound seems in some respect to resemble the “click-like articulation” described by Lionnet (2020) for several West African languages, e.g., the anterior closure is not released. Tuhuse and Traill (1999:1041) provide convincing arguments which show that this “dorsally released click” [ɖ̥] “is not a possible speech sound” and therefore does “not exist in any language”. Having stated that, they nevertheless provide a “semi-wild” version of this bird name [ɖ̥*ɦɖ̥*nsè], which uses this “impossible” speech sound “in a conventional phonetic and prosodic context” (Tuhuse & Traill 1999:1041). According to its description, [ɖ̥] is not a possible speech sound, but at the same time it appears as a click consonant in a bird’s name. Our typology of the use of clicks does not accommodate for non-speech sounds which at the same time can be employed as click consonants.

2.5 Non-consonantal clicks in non-CU languages

Following our discussion on the use of various sub-categories of click consonants by CU languages, we now turn to the use of non-consonantal clicks. Non-consonantal clicks almost exclusively occur in non-CU languages and our discussion in this section therefore focuses on this set of languages only (for a discussion on the use of non-consonantal clicks in CU languages, see Section 3).

All click speech sounds in non-CU languages are non-consonantal clicks which therefore cannot join with phonemes to form words in the sentence grammar. Non-consonantal clicks only appear in or as interactives and have been observed widely in non-CU languages (see Gil 2013 for examples). Already some 150 years ago, voiceless dental non-consonantal clicks were noticed by Charles Darwin (1872:286), who mentioned that Australians and Europeans “express gentle surprise by a little clicking noise”. Traill (1978:138), among many others, points out that a sequence of “lateral clicks” is used in English to encourage horses to trot. Non-consonantal clicks are commonly singletons or sequences of click-only utterances and seem to be mainly voiceless.

As claimed by Bradfield (2014:3), all five click types represented in the International Phonetic Alphabet, i.e., bilabial, dental, lateral (alveolar), alveolar and palatal, also occur as non-consonantal clicks in non-CU languages. Click interjections in non-CU languages which convey particular emotional states or attitudinal stances seem to be click type sensitive. In contrast, click discourse markers of different functions¹⁵, at least in non-CU languages such as English and Spanish, seem to employ click types interchangeably (Wright 2011; Pinto & Vigil 2018).

Non-consonantal clicks might take on a range of different functions within the interactive grammar. The tongue pop used by drag queens in various Englishes, but also in Hebrew and Thai, is used as an interjection, a discourse marker and an intensifier (Pratchett 2021). Pratchett (2021) describes the tongue pop as follows: a “single ingressive ‘click’ consonant: appears to be plain, laminally produced post-alveolar-to-palatal click, i.e., not a proto-typical palatal click (ɖ̥)”. The tongue pop is a recent innovation and has appeared without contact to CU languages.

¹⁵ Non-consonantal clicks in English serve, for example, as discourse markers which “demarcate the onset of new and disjunctive sequences” (Wright 2011:224).

3. Clicks in interactives in CU languages

CU languages in contrast to non-CU languages employ click consonants not only in the sentence grammar but also in the interactive grammar, mainly in ideophones, as discourse markers and in primary as well as secondary interjections.

Non-consonantal clicks seem to be absent in ideophones¹⁶ in both non-CU languages and CU languages. However, click consonants are quite often employed in ideophones by CU languages, such as Ts'ixa (Fehn & Ketapilwe 2021), siSwati (Rycroft 1982) and !Xóõ (Taa) (Traill 1994).

Clicks as discourse markers have not yet been systematically studied in CU languages. However, Christian Rapold, in a personal communication with Bonny Sands in 2013, mentions that a “voiceless palatal click occurs as a marker of the start of a turn in the speech of some Khoekhoe women” (Sands 2020:45). Further research would be needed to confirm if other click-containing discourse markers in CU languages, assuming that they exist, also use click consonants, or if non-consonantal clicks can be identified in this function.

Click consonants occur regularly in interjections. Among the 343 interjections documented in isiXhosa by Andrason and Dlaki (2020), 40 interjections contain click consonants. By far most of these click-containing interjections are made up of click consonants which are joined by vowels, such as in *camagu* ‘interjection of apologizing’ (177)¹⁷, *gcadinja* ‘interjection of annoyance’ (172) and *qash-qash* ‘interjection of surprise’ (172). There are also click-only interjections such as *nc-nc-nc-nc-nc* ‘interjection of denying, rejecting, disagreeing’ (176, 185, 187) and *x* ‘interjections of disappointment, contempt, impatience’ (172). While these singletons – also when repeated in a sequence – violate phonotactic constraints of the word formation in the sentence grammar of isiXhosa, they continue to be click consonants of the established phoneme inventory of this language.

With regard to interjections, scholars commonly distinguish between primary and secondary interjections (Bloomfield 1914; Ameka 1992; Heine 2023). Primary interjections, such as “oops!”, “wow” and “hmm” in English, are utterances which occur exclusively in the interactive grammar, i.e., they carry no meaning in the sentence grammar. In contrast, secondary interjections, such as “shit!”, “Jesus!”, “help!” or “yes!”, are interjections which derive from homophonous nouns, verbs or other word-classes; thus, these interjections have their origin in the sentence grammar. While all (click) speech sounds in secondary interjections are consonants of the phoneme inventory of the language, also primary interjections, such as *nc-nc-nc-nc-nc* and *x* mentioned above for isiXhosa, use regular (click) phonemes of the languages in question.

In non-CU languages, there are no click-containing words from which click-containing secondary interjections can be derived; thus, all click-containing interjections in these languages are primary interjections. CU languages, by contrast, employ click consonants in both primary and secondary interjections. For example, !Xun, a Kx'a language spoken predominantly in Namibia, uses the interjections *!áin* ‘(a) thank you!:(b) goodbye!’ and *!àn hǎ*

¹⁶ “An ideophone is an interactive used for a vivid depiction of sensory imagery of a state, event, object, or quality” (Heine 2023:148).

¹⁷ Page numbers in Andrason and Dlaki (2020).

‘wait and see!’ (König & Heine 2008:80–81). The utterance *!áin* exists in the sentence grammar as a verb ‘to thank’ and *!àn hǎ* employs the two verbs ‘to wait’ and ‘to see’. For the !Xun interjection *lxàá* ‘oh!, exclamation of surprise’ (König & Heine 2008:101), no source lexeme has been identified yet; it might therefore be either a primary interjection or a secondary interjection.

With click-only interjections, i.e., utterances which consist of standalone click consonants, distinguishing between primary and secondary interjections is challenging. For example, the voiceless lateral click consonant *X*¹⁸, in the meaning ‘of disappointment, impatience, etc. leave me!’ in isiXhosa, might derive from another more complex secondary interjection *Xá* ‘Stop!’ (Kropf & Godfrey 1915:464). This would make the standalone click consonant *X* a secondary interjection derived from another secondary interjection *Xá*¹⁹. However, an alternative interpretation of this example would be that the click consonant *X* is a primary interjection which constituted the basis from which the more complex secondary interjection *Xá* has been derived. If no source lexeme has (yet) been identified, it seems impossible to determine whether an interjection in a CU language is a primary or secondary interjection.

The only example of a non-consonantal click in a CU language which is known to us has been noted for siSwati by Rycroft (1982:8). He describes an “atypical dental click” that is not part of the siSwati phoneme inventory and is not employed in the lexicon otherwise. This non-consonantal click is among several click-only interjections, with all other interjections employing click consonants from the “standard” and “extended” phoneme inventories of siSwati, see Table 3²⁰.

Table 3. Click-only interjections in siSwati (Rycroft 1982)

Example	Click-only interjections	Meaning of interjection	Page
(1)	<i>c</i>	‘of indifference or disgust (often made with tongue-tip against an eye-tooth, rather than centrally as for the normal C click).’	8
(2a)	<i>c c c</i>	‘of regret: What a shame!’	9
(2b)	<i>c c c</i>	‘of annoyance or impatience: What a nuisance!’	9
(3)	<i>c c</i>	‘interj. of delight. (Usually a post-alveolar click, as Zulu Q. ...)’	9
(4a)	<i>c</i>	‘of annoyance (usually a lateral + velar click is used, like Zulu X). ...’	8
(4b)	<i>nx</i>	‘(nasalised lateral click ...) of annoyance or disgust’	75

While example (1) is a non-consonantal click, all other interjections in Table 3 employ either regular or borrowed click consonants. For the two interjections (2a) and (2b) rendered ⟨*c c c*⟩, no information on the actual pronunciation has been provided by Rycroft (1982:9). Based on their spelling, one may assume that these sequences are three regular voiceless dental click consonants, and even though they cannot in their current form be joined with non-click

¹⁸ In the original source, the two interjections appear as “*X!*” and “*Xá!*”. The exclamation marks have been removed in the text to avoid confusion with the (post)alveolar click consonant.

¹⁹ A verb “*ukuti-Xá* ... to pause, wait a little, to stop (at a place)” (Kropf & Godfrey 1915:464) has been derived from this interjection.

²⁰ Note that the orthographic representations by Rycroft do not adequately capture the actual pronunciation of the click speech sounds.

phonemes to form words, voiceless dental click consonants are part of the phoneme inventory and are therefore regular click consonants in siSwati.

The interjection (3) ⟨c c⟩ in the meaning ‘of delight’ is pronounced as a “post-alveolar click” repeated twice (Rycroft 1982:9). In the Nguni writing convention, these click consonants would be represented as ⟨q q⟩ and in IPA as [! !]. Post-alveolar click consonants occur in siSwati as (new) click phonemes in loanwords only. A verb (*kú*)-*ncáncata*, which expresses delight by repeating a post-alveolar click (Rycroft 1982:66), has been derived from this click-only interjection in which the voiceless postalveolar click consonants have received nasal accompaniments.

Examples (4a) ⟨c⟩ and (4b) ⟨nx⟩ ‘of annoyance or disgust’ (Rycroft 1982:75) are click consonants which seem to be – even with nasalisation lacking in (4a) – different spellings of the same interjection with a “nasalised lateral click”. The primary interjection ⟨nx⟩ in siSwati employs a new click consonant which has been borrowed from Zunda Nguni languages (see, for example, Andrason and Dlali 2020:172, who document ⟨nx⟩ as a primary interjection of anger, displeasure, and impatience in isiXhosa). Although lateral click consonants are not part of the siSwati “standard” phoneme inventory, a verb (*kú*)-*ncapha*, expressing ‘annoyance or impatience by uttering the lateral click’ has nevertheless either been derived from this interjection (4a) or been borrowed from neighbouring languages (4b).

It is highly unlikely that the “atypical dental click” (1) described for siSwati is the only non-consonantal click used by a CU language. More attention needs to be given to the actual pronunciation of click speech sounds in interactives of CU languages in order to identify possible non-consonantal clicks in these languages.

Click-like speech sounds employed exclusively in the interactive grammar by CU languages, might, however, as with the examples discussed for non-CU West African languages in Section 1 above, also be “non-phonemic click-like articulations” (Lionnet 2020:422). In their study of onomatopoeias in Tjwao, a moribund Eastern Kalahari Khoe language, Andrason, Fehn and Phiri (2020:301) record tokens which mainly consist of regular phonemes, among them also click consonants. One of the exceptions is a potential candidate for a non-consonantal click, i.e., a sequence of three “bilabial clicks” ⟨*mbh-mbh-mbh*⟩ as an animal call addressed to cattle (Andrason, Fehn & Phiri 2020:311)²¹. The authors state that this “non-speech sound” is “similar to a lip-smacking sound produced in English when mimicking a fish” (Andrason, Fehn & Phiri 2020:311, fn. 25). An acoustic analysis of this speech sound by expert linguists does not yet exist to our knowledge. Based on the description provided by the authors, there seems to be no release of a back closure, and even more importantly, no tongue movement seems to be involved in the sound production. Both are essential in the production of click consonants and one may therefore refrain from referring to this lip-smacking sound as a bilabial (non-consonantal) click. Together with whistles²², the bilabial “lip-smacking sound” belongs to an “extended” speech sound inventory of the language which appears in the interactive grammar only. While we can assume that non-phonemic click-like speech sounds also exist in interactives of CU languages, they have not yet been mentioned for these languages.

²¹ While bilabial click phonemes are regular consonants in Taa, N!uu, †Amkoe, and non-regular click consonants in Hadza, Tjwao does not have bilabial click consonants in its phoneme inventory.

²² Whistling seems to be widely employed in interactives, for example by fans in soccer stadiums to demonstrate support or express disappointment or by humans to convey various orders when communicating with animals.

4. Summary

Click speech sounds are widely employed as non-consonantal clicks in interjections and as discourse markers of the interactive grammar in the languages of the world. Click consonants, by contrast, are phonemes in only a few languages, all of which are spoken on the African continent. Depending on the phoneme inventory, the same click speech sound can be a click consonant in one language and a non-consonantal click in another. For example, the two voiceless dental clicks <tsk-tsk> [l |] expressing disapproval are non-consonantal clicks in English, while the same click speech sound repeated three times <c c c> [l | |] conveying annoyance are regular click consonants in siSwati (see Table 3).

The proposed typology presented in this paper aims at accommodating the different uses of clicks and may be applied to specific languages, with most categories of the typology being relevant for the 30 or so CU languages only. In the typology, click consonants and non-consonantal clicks are first distinguished, with the former consisting of regular and non-regular click consonants. Non-regular click phonemes can be further subcategorised into remnant click consonants on the one hand and new click consonants which enter the language through borrowing on the other. Special click consonants are additional non-regular click phonemes, such as the conventionalised mouthpiece animal and moon click consonants of !Xam. The click consonants of these three non-regular click phoneme subcategories are members of an “extended” phoneme inventory. The discussion of an “impossible” click-like speech sound used as a click consonant demonstrates the limitations of the proposed typology. All clicks in non-CU languages are non-consonantal clicks, as they are not part of the phoneme inventories of the respective languages; they occur in interactives only. Non-consonantal clicks are conventionalised and belong to established “extended” speech sound inventories.

While CU languages seem to utilise their often rich click consonant inventory also in interactives, non-consonantal clicks have, with one exception, not yet been mentioned in these languages. This might partly be because non-consonantal clicks have to date received little scholarly attention in studies of CU languages. Further research by phoneticians specialised in CU languages is required to determine if the click speech sounds in click-only utterances are the regular click consonants of the respective CU languages, or if they are additional non-consonantal clicks. While there is no denying that non-consonantal clicks are common in the world’s languages, this does not seem to be the case with CU languages; whether non-consonantal clicks are universal or not therefore remains an open question.

Acknowledgements

Lenore Grenoble asked many years ago if speakers of CU languages also use clicks in verbal gestures, and this paper started off as an attempt to address her question. We are extremely grateful to Alexander Andrason, Anne-Maria Fehn, Bernd Heine and Pippa Skotnes for inspiring discussions on the topic and valuable feedback on previous versions of this paper. We would also like to thank colleagues at the International Symposium on Kalahari Basin Area Languages and Cultures in Riezlern, Austria (17th – 21st July 2022) for their constructive comments on our typology. Thanks to Bernhard Weiss for suggesting the term “conventionalised mouthpiece click consonant”. Many thanks also to the anonymous reviewers for their helpful suggestions and to the editors, Ian Bekker and Theresa Biberauer, for their professional support.

References

- Ameka, Felix. 1992. Interjections: The universal yet neglected part of speech. *Journal of Pragmatics* 18(2–3): 101–118. [https://doi.org/10.1016/0378-2166\(92\)90048-G](https://doi.org/10.1016/0378-2166(92)90048-G)
- Andrason, Alexander & Mawande Dlali. 2020. The (crucial yet neglected) category of interjections in Xhosa. *STUF – Language Typology and Universals* 73(2): 159–217. <https://doi.org/10.1017/S0041977X20002608>
- Andrason, Alexander, Anne-Maria Fehn & Admire Phiri. 2020. Interjections in Tjwao. *Bulletin of the School of Oriental and African Studies* 83(2): 293–319. <https://doi.org/10.1515/stuf-2020-2001>
- Ballu, Victor Narcisse. 1868. Essai d’alphabet universel. Unpublished manuscript, 26 pages, cited after Halvet 1875.
- Baumbach, Erdmann (Ernst) Julius M. 1974. *Introduction to the Speech Sounds and Speech Sound Changes of Tsonga*. Pretoria: Van Schaik.
- Bleek, Wilhelm Heinrich Immanuel. 1875. *A Brief Account of Bushman Folklore and Other Texts*. London: Trübner & Co.
- Bloomfield, Leonard. 1914. *An Introduction to the Study of Language*. New York: Holt.
- Bradfield, Julian. 2014. Clicks, concurrency and Khoisan. *Phonology* 31(1): 1–49. <https://doi.org/10.1017/S0952675714000025>
- Brenzinger, Matthias & Sheena Shah. Forthcoming. *Writing Clicks*. London: EL Publishing.
- Darwin, Charles Robert. 1872. *The Expression of the Emotions in Man and Animals*. London: John Murray. <https://doi.org/10.1037/10001-000>
- Doke, Clement Martyn & Sophonia Machabe Mofokeng. 1957. *Textbook of Southern Sotho Grammar*. Cape Town: Longmans.
- Donnelly, Simon Scurr. 1990. Phonology and morphology of the noun in Yeeyi. Unpublished BA thesis, University of Cape Town, South Africa.
- Eberhard, David M., Gary F. Simons, & Charles D. Fennig (eds.). 2022. *Ethnologue: Languages of the World*. 25th edition. Dallas, Texas: SIL International. Online: <http://www.ethnologue.com> (Accessed 15 September 2022).
- Evans, Nicholas. 2010. *Dying Words: Endangered Languages and What They Have to Tell Us*. Malden, MA: Wiley-Blackwell. <https://doi.org/10.1002/9781444310450>
- Fehn, Anne-Maria & Arnold Ketapilwe. 2021. A dictionary of Ts’ixa, a Khoe language of northern Botswana. Unpublished manuscript.

- Fisch, Maria. 1977. *Einführung in die Sprache der Mbukushu, Ost-Kavango, Namibia*. Windhoek: S.W.A. Wissenschaftliche Gesellschaft.
- Gil, David. 2013. Para-linguistic usages of clicks. In Matthew S. Dryer & Martin Haspelmath (eds.). *The World Atlas of Language Structures Online*. Leipzig: Max Planck Institute for Evolutionary Anthropology. Online: <https://wals.info/chapter/142> (Accessed 14 April 2022).
- Grenoble, Lenore A., Martina Martinović & Rebekah Baglini. 2015. Verbal gestures in Wolof. In Ruth Kramer, Elizabeth C. Zsiga & One Tlale Boyer (eds.). *Selected Proceedings of the 44th Annual Conference on African Linguistics*, 110–121. Somerville, MA: Cascadilla.
- Güldemann, Tom. 2007. Clicks, genetics and “proto-world” from a linguistic perspective. *University of Leipzig Papers on Africa, Languages and Literatures* 29: 1–35.
- Güldemann, Tom. 2013. Southern Khoesan (Tuu). In Rainer Vossen (ed.). *The Khoesan Languages*, 75–83. London: Routledge.
- Güldemann, Tom. 2014. ‘Khoisan’ linguistic classification today. In Tom Güldemann & Anne-Maria Fehn (eds.). *Beyond ‘Khoisan’: Historical Relations in the Kalahari Basin*, 1–41. Amsterdam: John Benjamins. <https://doi.org/10.1075/cilt.330.01gul>
- Güldemann, Tom & Edward Derek Elderkin. 2010. On external genealogical relationships of the Khoe family. In Matthias Brenzinger & Christa König (eds.). *Khoisan Languages and Linguistics: Proceedings of the 1st International Symposium, January 4–8, 2003, Riezlern/Kleinwalsertal* (Research in Khoisan Studies 24), 15–52. Cologne: Rüdiger Köppe.
- Güldemann, Tom & Hiroshi Nakagawa. 2018. Anthony Traill and the holistic approach to Kalahari Basin sound design. *Africana Linguistica* 24: 45–73.
- Hammarström, Harald. 2016. Linguistic diversity and language evolution. *Journal of Language Evolution* 1(1): 19–29. <https://doi.org/10.1093/jole/lzw002>
- Hammarström, Harald, Robert Forkel, Martin Haspelmath & Sebastian Bank. 2022. *Glottolog 4.6*. Leipzig: Max Planck Institute for Evolutionary Anthropology. Online: <http://glottolog.org>, (Accessed 15 September 2022).
- Heine, Bernd. 2023. *The Grammar of Interactives*. Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780192871497.001.0001>
- Herbert, Robert Kevin. 2002. The sociohistory of clicks in Southern Bantu. In Rajend Mesthrie (ed.). *Language in South Africa*, 297–315. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511486692.016>
- Herbert, Thomas. 1638. *Some Yeares Travels into Divers Parts of Asia and Afrique*. ... London: I. Blome & R. Bishop.
- König, Christa & Bernd Heine. 2008. *A Concise Dictionary of Northwestern !Xun* (Research in Khoisan Studies 21). Cologne: Rüdiger Köppe.

- Kropf, Albert & Robert Godfrey. 1915. *A Kafir-English Dictionary*. 2nd edition. South Africa: Lovedale Mission.
- Lionnet, Florian. 2020. Paralinguistic use of clicks in Chad. In Bonny Sands (ed.). *Click Consonants* (Empirical Approaches to Linguistic Theory 15), 422–437. Leiden, Boston: Brill. https://doi.org/10.1163/9789004424357_015
- Maddieson, Ian. 2003. The sounds of the Bantu languages. In Derek Nurse & Gérard Philippson (eds.). *The Bantu Languages*, 15–41. 1st edition. London: Routledge.
- Miller, Amanda. 2011. The representation of clicks. In Marc van Oostendorp, Colin J. Ewen, Elizabeth Hume & Keren Rice (eds.). *The Blackwell Companion to Phonology*, Volume 1, 416–439. Malden, MA: Wiley-Blackwell.
- Möhlig, Wilhelm J.G. 1997. A dialectometrical analysis of the main Kavango languages: Kwangali, Gciriku and Mbukushu. In Wilfrid Heinrich Gerhard Haacke & Edward Derek (eds.). *Namibian Languages: Reports and Papers* (Namibian African Studies 4), 211–234. Cologne: Rüdiger Köppe.
- Möhlig, Wilhelm J.G. & Karl Peter Shiyaka-Mberema. 2005. *A Dictionary of the Rumanyo Language* (Southern African Languages and Cultures 2). Cologne: Rüdiger Köppe.
- Naumann, Christfried. 2016. The phoneme inventory of Taa (West !Xoon dialect). In Rainer Vossen & Wilfrid Heinrich Gerhard Haacke (eds.), *Lone Tree: Scholarship in the Service of the Koon. Essays in Memory of Anthony Traill*, 311–351. Cologne: Rüdiger Köppe.
- Pillion, Betsy, Lenore A. Grenoble, Emmanuel Ngué Um & Sarah Kopper. 2019. Verbal gestures in Cameroon. In Emily Clem, Peter Jenks & Hannah Sande (eds.). *Theory and Description in African Linguistics: Selected Papers from the 47th Annual Conference on African Linguistics*, 303–322. Berlin: Language Science Press.
- Pinto, Derrin & Donny Vigil. 2018. Clicks as discourse markers in Peninsular Spanish. *Spanish in Context* 15(3): 441–464. <https://doi.org/10.1075/sic.00022.pin>
- Pratchett, Lee J. 2021. The queerest click: A lesson in linguistic marginalia by Drag Queens. Paper presented at the 27th Lavender Languages & Linguistics Conference, California. Online: <https://doi.org/10.5281/zenodo.5119340> (Accessed 15 July 2022).
- Proctor, Michael, Yingua Zhu, Adam Lammert, Asterios Toutios, Bonny Sands & Shrikanth Narayanan. 2020. Studying clicks using real-time MRI. In Bonny Sands (ed.). *Click Consonants* (Empirical Approaches to Linguistic Theory 15), 210–240. Leiden, Boston: Brill. https://doi.org/10.1163/9789004424357_007
- Rycroft, David K. 1982. *Concise SiSwati Dictionary: SiSwati-English / English-SiSwati*. Pretoria: Van Schaik.

Sands, Bonny. 2020. Click consonants: An introduction. In Bonny Sands (ed.). *Click Consonants* (Empirical Approaches to Linguistic Theory 15), 1–73. Leiden, Boston: Brill. https://doi.org/10.1163/9789004424357_002

Sands, Bonny & Hilde Gunnink. 2019. Clicks on the fringes of the Kalahari Basin Area. In Emily Clem, Peter Jenks & Hannah Sande (eds.). *Theory and Description in African Linguistics: Selected Papers from the 47th Annual Conference on African Linguistics*, 703–724. Berlin: Language Science Press.

Schulz, Stephan, Antti Olavi Laine, Lotta Aunio & Nailya Philippova. 2019. Click variation and reacquisition in two South African Ndebele varieties. *Studia Orientalia* 120: 213–282.

Seidel, Frank. 2008. *A Grammar of Yeyi: A Bantu Language of Southern Africa* (Grammatical Analyses of African Languages 33). Cologne: Rüdiger Köppe.

Sommer, Gabriele. 2003. Western Savanna. In Derek Nurse & Gérard Philippson (eds.). *The Bantu Languages*, 566–580. 1st edition. London: Routledge.

Trails, Anthony. 1978. The languages of the Bushmen. In Phillip V. Tobias (ed.). *The Bushmen: San Hunters and Herders of Southern Africa*, 137–147. Cape Town, Pretoria: Human & Rousseau.

Trails, Anthony. 1994. *A !Xóǀ Dictionary* (Research in Khoisan Studies 9). Cologne: Rüdiger Köppe.

Tuhuse, Bolo ||Xao & Anthony Trails. 1999. #Hán-#hansè, the Desert Cisticola, implements an acoustic target. In John J. Ohala, Yoko Hasegawa, Manjari Ohala, Daniel Granville & Ashlee C. Bailey (eds.). *Proceedings of the 14th International Congress of Phonetic Science, San Francisco, 1–7 August 1999*, 1041–1042. Berkeley: University of California.

Walsh, Martin T. 2006. A click in Digo and its historical interpretation. *Azania Archaeological Research in Africa* 41(1): 158–166. <https://doi.org/10.1080/00672700609480440>

Wright, Melissa. 2011. On clicks in English talk-in-interaction. *Journal of the International Phonetic Association* 41(2): 207–229. <https://doi.org/10.1017/S0025100311000144>

Ziervogel, Dirk. 1959. *A Grammar of Northern Transvaal Ndebele*. Pretoria: Van Schaik.