

## Chapter 35

# Clicks on the fringes of the Kalahari Basin Area

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How do we define the limits of a linguistic area? Typologically rare features may spill out beyond the bounds of an otherwise well-defined linguistic area. Rather than viewing the “fuzzy” boundary of a linguistic area as a problem, it can instead be seen to be an integral part of the structure of the linguistic area which may include a core, “depleted core”, fringe and even areas beyond the fringe. Clicks are a typical feature of the Kalahari Basin linguistic area, but their patterning on the fringes of this area is not so well-known. Clicks have been borrowed into Bantu languages spoken on the fringes of the area, but their functional load, as measured by the number of click phonemes and frequency of clicks in the lexicon, is lower than in the languages of the core of the area. Clicks have also been borrowed into Bantu languages spoken beyond the fringe of the area, but the functional load of clicks in these ultimate recipients is very low. Processes of click loss, both in Bantu languages and Khoisan languages on the fringe, show the same geographical patterning. The geographical distribution of clicks in southern Africa can be compared to the situation in eastern Africa, where there is evidence for an old linguistic area including Hadza and Sandawe in its core and Dahalo in its fringe.

## 1 Introduction

It is well known that linguistic features may cluster in particular geographic regions. We argue that the functional load of a linguistic feature may also exhibit geographical patterning. The traditional reliance on binary feature oppositions in



areal linguistics limits the amount of linguistic patterning that may be detected. By looking at functional load, as we do here, or at inter-speaker variability in the use of a feature (as done by Kulkarni-Joshi 2016), more information about the historical processes of linguistic convergence and divergence in a particular geographical region can be revealed.

Clicks are an oft-cited example of a cross-linguistically rare feature that is shared across multiple language families. Clicks are one characteristic feature of the Kalahari Basin Area (KBA) which has been established as a linguistic area on the basis of morphosyntactic as well as phonological features (Güldemann 1998; 2013; Naumann & Bibiko 2016). Clicks have also spread from the core of the KBA to certain languages spoken on the fringe of the area. We estimate the functional load of clicks in the phoneme inventory and in the lexicon of languages of the KBA core and fringe and show that functional loads are lower in the fringe than in the core. We look at newly attested cases of click loss, showing that there is a geographical patterning to this process as well. Finally, we discuss the functional load of clicks in East African languages, which can be interpreted as evidence for an old linguistic area, where continued contact with clickless languages has resulted in a reduction of the functional load of clicks. By focusing on the fringes of a linguistic area, we gain insight into the processes that may characterize the area over both space and time.

## **2 Comparison of functional load of clicks: Core vs. fringe**

The Kalahari Basin Area (KBA) includes languages from three different families, Kx'a, Tuu and Khoe (formerly referred to as "Khoisan"). Geographically speaking, the area of the KBA is also infiltrated by Bantu languages, as well as English and Afrikaans. None of these are part of the linguistic area; although the Bantu languages encroaching on the KBA share some of its features, the similarities are too small to consider them true members of the area (Güldemann & Fehn to appear: 18). The core of the KBA is situated in south-eastern Botswana and the adjacent area in Namibia. The fringe of the area can be roughly defined as the zone geographically adjacent to the core, which contains languages belonging to two or more families which participate in the linguistic area, as well as many Bantu languages. The fringe of the KBA encompasses most of southern Africa, excluding eastern Zimbabwe and Mozambique (see Figure 1). Clicks, as one of the features of the KBA, occur in certain Bantu languages on the fringes of the KBA. Two main clusters of Bantu click languages can be distinguished on the fringes of the KBA: the South-West Bantu (SWB) click languages, spoken on the south-

western edge of the Bantu-speaking area, and the South-East Bantu (SEB) click languages, spoken on the southeastern edge of the Bantu-speaking area (Pakendorf et al. 2017). The SWB languages are Fwe, Manyo, Mbukushu, Kwangali and Yeyi, spoken on the border of Botswana, Zambia, Namibia and Angola, which is the northern fringe of the KBA. The SEB languages include the Nguni languages Zulu, Xhosa, Swati, Ndebele and Phuthi, and the Sotho language Southern Sotho, and are spoken in South Africa, Swaziland, Lesotho and in western Zimbabwe, which is part of the southeastern fringe of the KBA. Certain Bantu languages are also spoken inside the core of the KBA, such as Tswana, Kgalagadi and Herero, though none of these make use of clicks as a regular phoneme.<sup>1</sup>

It has long been recognized that clicks in Bantu languages are the result of contact with Khoisan languages (Bleek 1862). For the SEB languages, the acquisition of clicks appears to be the result of contact with Khoekhoe mainly, but possibly also with one or more Tuu languages (Pakendorf et al. 2017). For the SWB languages, contact has mainly taken place with Ju varieties and with Khwe (Gunnink et al. 2015). There are different processes that have led to the incorporation of clicks: for the SEB languages, it has been argued that the borrowing of clicks was facilitated by the practice of *hlonipha*, a taboo for married women to pronounce words that resemble the names of their male in-laws (Herbert 1990). Among speakers of the SWB languages, however, the practice of *hlonipha* is unknown: for these languages, the incorporation of clicks may have been motivated by sound symbolism (Bostoen & Sands 2012). Language shift from Khoisan to Bantu has also played a role, specifically from Khoisan-speaking women marrying into Bantu society (Pakendorf et al. 2011), coupled with a certain prestige attached to language of the Khoisan speakers, and the use of clicks to flag a separate identity (Gunnink et al. 2015).

That the functional load of clicks in the phonemic inventory and in the lexicon of different click languages varies widely across languages has been previously noted (Güldemann & Stoneking 2008). Naumann & Bibiko (2016) show that the presence of clicks, and of an inventory of more than three basic click types is characteristic of the KBA. We use different metrics to measure functional load and how it varies between languages of the core vs. those of the fringe of the Kalahari Basin Area, as described below.

Languages of the core of the KBA typically use at least four different click types, i.e. dental, alveolar, palatal and lateral. Some also use a fifth click type,

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<sup>1</sup>For Kgalagadi, marginal clicks have been reported (Dickens 1987: 298, Lukusa & Monaka 2008: 10), as well as for the Ngwato dialect of Tswana (Tale 2005: 209-210). It is possible that these languages used to have more substantial click inventories in the past, but more research is needed to verify this possibility (Pakendorf et al. 2017).

the bilabial. This contrasts sharply with the fringe languages, many of which only use one click type, most commonly the dental; other fringe languages use two or three contrastive click types. Botswana Yeyi is the fringe language that is geographically closest to the core of the KBA and also the only fringe language to use four contrastive click types. (See Table 1 for an overview.)

The number of click consonants in a language depends on the contrasts made involving click types with various click accompaniments, i.e. particular laryngeal, nasal and dorsal release features). We follow a unitary analysis of clicks whereby, /l, lq, lq<sup>h</sup>/, for example, are considered to be three distinct consonants, rather than a cluster analysis which would see these as a single click (/l/) which may occur in clusters with obstruents /q/ and /q<sup>h</sup>/. See Bradfield (2014) for a discussion of unitary vs. cluster analyses.

In core languages we see as many as 75–80 click phonemes (#Hoan and !Xoon, respectively). Within the core languages, there are differences in the size of the click inventories of different languages: Kua and Shua, spoken on the eastern edge of the core area, use between 20 and 30 click phonemes, and Khoekhoe, spoken on the western edge of the core area, uses only 20 click phonemes. Despite these differences within the core area, click inventories of fringe languages are significantly smaller. Many fringe languages use fewer than 10 click phonemes; between 10 and 20 click phonemes are found in Namibian Yeyi and the Nguni languages. Southern Sotho only has three click phonemes, which may be related to the hypothesis that Southern Sotho did not acquire clicks directly from Khoisan languages, but as a result of contact with Nguni languages, as many Southern Sotho click words are shared with Nguni (Bourquin 1951; Doke & Mofokeng 1957: 23).<sup>2</sup> The largest click inventory is found in Botswana Yeyi, which uses 22 contrastive clicks. It should be noted, however, that Botswana Yeyi is a moribund language displaying some phonetic irregularity, and firm evidence for the phonemic status of all 22 clicks cannot be given (Fulop et al. 2003). The differences in the size of the click inventory between core and fringe languages listed in Table 1 is illustrated in Figure 1.

Another parameter by which the functional load of clicks can be measured, the occurrence in the lexicon, also yields different results for core and fringe languages. In Bantu fringe languages, the percentage of the lexicon in which clicks occur ranges from 1 to 17%. In all the core languages, more than 50% of

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<sup>2</sup>Sotho-Tswana peoples are believed to have migrated to southern Africa more recently than Nguni-speaking populations (Pakendorf et al. 2017: 31) and thus would have had a shorter period of contact with speakers of click languages, perhaps accounting for the smaller functional load of clicks in Sotho-Tswana languages than Nguni, despite their relative proximity to the KBA.

Table 1: The functional load of clicks in core and fringe languages. Numbers are rounded to the nearest integer.

Language	click types	click phonemes	percentage of lexicon	percentage of basic lexicon
<b>Core</b>				
†Hoan	5	75	64%	52%
Jul'hoan	4	47	69%	68%
Khoekhoe	4	20	72%	66%
Naro	4	28	64%	62%
N uu	5	45	86%	77%
!Xoon	5	80	73%	82%
G ui	4	52	71%	56%
Kua	4	26	58%	55%
Shua	4	29	<i>a</i>	33%
Tsua	4	34	56%	37%
<b>Southern fringe (SEB)</b>				
Zulu	3	15	14%	7%
Xhosa	3	18	17%	10%
Southern Ndebele	2	8	7%	5%
Zimbabwean Ndebele	3	15	8%	6%
Swati	1	4	12%	5%
Phuti	3	12	8%	8%
Southern Sotho	1	3	3-5%	0%
<b>Northern fringe (SWB)</b>				
Namibian Yeyi	2	12	10%	6%
Botswana Yeyi	4	22	15%	8%
Manyo	1	5	1%	1%
Kwangali	1	5	2%	0%
Mbukushu	1	4	<1%	0%
Fwe	1	4	<1%	1%

Sources: SEB and SWB languages: Pakendorf et al. (2017), and sources cited therein. †Hoan: Collins & Gruber (2014), Gruber (1975). Jul'hoan: Dickens (1994), Miller-Ockhuizen (2003). Khoekhoe: Brugman (2009: 47), Haacke & Eiseb (2002). Naro: Visser (2001; 2013). N|uu: Miller (2014), Miller et al. (2009), Miller et al. (2007). !Xoon: Traill (1985; 1994). G|ui: Nakagawa (1996; 2013). Kua: Chebanne & Collins (2014). Tsua: Mathes (2016), Chebanne & Mathes (2013). Shua: Fehn, personal communication, Vossen (2013).

<sup>a</sup>As no full lexicon for Shua is available, the percentage of clicks in the lexicon cannot be given.

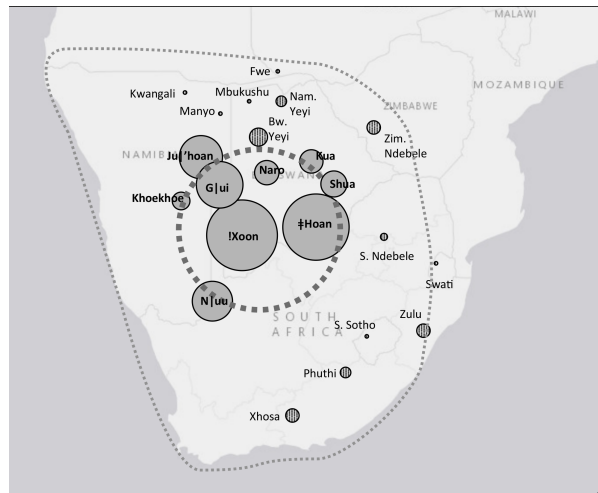


Figure 1: Map showing the relative sizes of click inventories of languages of the core and fringe of the Kalahari Basin Area (based on data in Table 1). (The sizes of filled circles are proportional to the number of click phonemes in each language. The fringe is enclosed by a dotted line, the core by a thicker dashed line. Bantu languages are shown with striped circles; other languages are shown with solid circles.)

the lexicon contains a click. This difference is illustrated in Figure 2. The functional load of clicks may also be estimated, as Idiatov & Van de Velde (2016) do for labial-velar stops. They compare the expected occurrence of each consonant with the actual occurrence, presupposing that each C phoneme occurs with equal frequency. This measure tends to heighten differences between the core and the fringe, e.g. 63% of Nluu consonants are clicks but they occur in 86% of the lexicon; while 29% of Zulu consonants are clicks, they occur in only 14% of the lexicon.

The percentage of clicks in the basic lexicon also differs between core and fringe languages, as shown in Figure 3. Using a version of the Swadesh-100 list of basic vocabulary (Holman et al. 2008), we counted a much higher percentage of click words in basic vocabulary in core languages than in fringe languages. Furthermore, in the core languages, the percentage of clicks in the overall lexicon and the percentage of clicks in basic vocabulary does not differ significantly, whereas in some of the fringe languages, i.e. Zulu, Xhosa and Botswana Yeyi, the percentage of click words in the basic vocabulary is significantly lower than in the overall lexicon. This is probably the result of lexical borrowing, which is less likely to affect basic vocabulary. In the SWB languages, borrowings from Khoisan languages are mainly found in restricted, specialized semantic domains related to the natural environment and a foraging lifestyle (Gunnink et al. 2015).

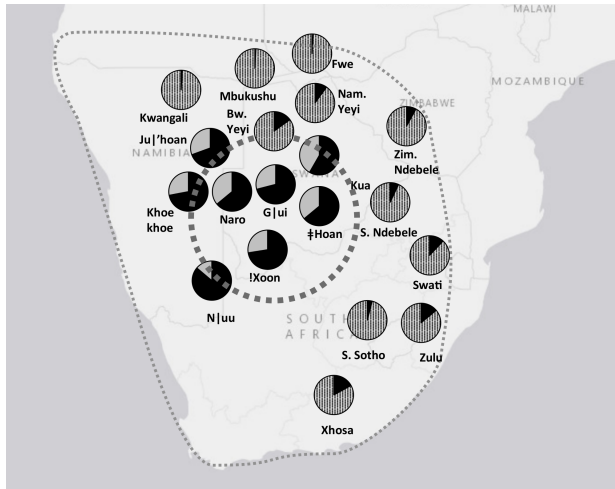


Figure 2: Map with pie charts showing the functional load of clicks in the lexicon in languages of the core of the KBA and on its fringe. The percentage of clicks is shown by the solid dark color. Circles representing Bantu languages have a stippled pattern.

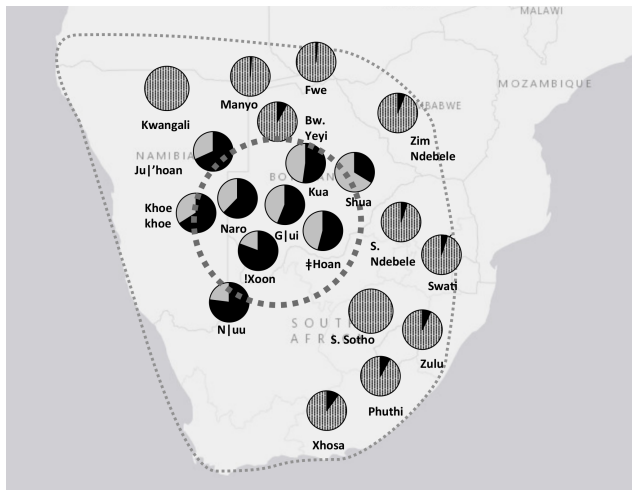


Figure 3: Map with pie charts showing the functional load of clicks in the basic vocabulary of languages of the core of the KBA and on its fringe. The percentage of clicks is shown by the solid dark color. Circles representing Bantu languages have a stippled pattern.

The relative functional load of a feature can be a strong indicator of the source language(s) of the feature. The functional load of clicks in Bantu languages is much lower than it is in Khoe, Kx'a and Tuu languages. The average percentage of words with clicks is more than 8 times as high in the lexicons of core KBA languages (68%) as it is in the languages of the fringe (8%) listed in Table 1. Differences in percentages of clicks in lexicons of core KBA language families are relatively minimal, i.e. Kx'a (67%), Tuu (80%) and Khoe (64%). Another example of features borrowed across language families are labial-velar stops, e.g. from Ubangian into Bantu. These phonemes also have a higher functional load in the source languages than in the recipient languages: the percentage of words with labial-velar stops twice as high in the lexicons of Ubangian languages Ngbaka (18%) and Ngbandi (17%) as it is in the neighboring Bantu language Lingombe (9%) (Bostoen & Donzo 2013).

### 3 Click loss in fringe languages

The functional load of clicks not only differs from one language to the next, but variation can also occur across dialects of a single language. We now discuss a number of cases of Bantu languages on the fringe of the KBA where one of their varieties has undergone click loss, leading either to the complete loss of the feature of clicks or to a reduction in its functional load.

Fwe is one of the SWB click languages spoken on the northern fringe of the KBA. Clicks in Fwe have a low functional load; only four click phonemes are distinguished, and clicks have so far been found in about 80 vocabulary items, none of which are basic vocabulary. Fwe has a northern variety, spoken in the Sinjembela area of Zambia, and a southern variety, spoken in the Zambezi region (formerly known as Caprivi strip) in Namibia. Clicks only occur in the southern variety of Fwe. The northern variety does not use clicks, but uses a velar consonant where the southern variety uses a click.<sup>3</sup>

- (1) kù-ʘ|ânk-à Southern Fwe  
kù-ŋânk-à Northern Fwe  
'to shell groundnuts'
- (2) rù-|ɔ́ mà Southern Fwe  
rù-kómà Northern Fwe  
'papyrus'

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<sup>3</sup>Many Bantu languages do not use IPA symbols in their official orthographies, but transcribe clicks with the letters <c>, <q> and <x>. Throughout this paper, we transcribe all clicks using the IPA symbols, even where this deviates from the source or the official orthography of the language.



The correspondences in (1-2) could be explained as either click loss in the northern variety or as click insertion in the southern variety. Gunnink (to appear) argues that click loss is the more likely explanation, as can be seen from the form of lexemes that use a click in Southern Fwe, but have a Bantu reconstruction without a click. The original consonant has been replaced by a click at some point in the history of Fwe, such as the southern Fwe word -*ŋùm-ùn-à* ‘to pull out, uproot’. This word is of Bantu origin, as attested by the reconstruction *\*-túmɔd-* ‘take firewood from fire, tear asunder’ (Bastin et al. 2002), and reflexes in Bantu languages related to Fwe such as Tonga *-fum-un-a* ‘pull out as grass from thatch’ (Torrend 1931: 117). The expected reflex in Fwe would be *-sùm-ùn-à*, as Proto-Bantu *\*t* followed by a high back vowel regularly changes to /s/ in Fwe (Bostoen 2009: 118). In northern Fwe, however, this word is realized as *-ŋùm-ùn-à*. The use of /ŋ/ rather than /s/ in the northern Fwe form can only be explained as a change from the nasal click. This shows that northern Fwe, too, must have used clicks in the past, but lost them later, probably as the result of the lack of contact with speakers of other click languages. Northern Fwe is in extensive contact with Lozi, a clickless Bantu language, as well as Kwamashi and Shanjo, also Bantu languages that do not use clicks. Southern Fwe, however, is in contact with Yeyi, a Bantu language in which clicks have a higher functional load than in Fwe, and also with the Khoe-Kwadi language (Caprivi-)Khwe. The continued contact between southern Fwe and languages in which clicks have a high functional load has helped this variety to maintain its clicks.

Another example of click loss is seen in Yeyi, a Bantu click language spoken on the northern fringe of the KBA. Like Fwe, Yeyi has two varieties, a Namibian variety spoken in the Zambezi region (former Caprivi strip), and a Botswana variety spoken in Ngamiland. Although both varieties use clicks, the functional load of clicks in Botswana Yeyi is higher than in Namibian Yeyi (Table 2).

Table 2: Functional load of clicks in Yeyi

	# of click types	# of click phonemes	% of clicks in vocabulary	% of clicks in basic vocabulary
Botswana Yeyi	4	22	15%	10.4%
Namibian Yeyi	2	12	10%	5.6%

As Namibian Yeyi has fewer click types than Botswana Yeyi, it has merged certain click types: examples (3–4) show that both palatal and dental clicks in Botswana Yeyi correspond to dental clicks in Namibian Yeyi.

- (3) *kù-/hàkà* Botswana Yeyi  
*kù-/hàkà* Namibian Yeyi  
'to chop' (Lukusa 2009: 10; Seidel 2008: 41)
- (4) *kù-í-#hòà* Botswana Yeyi  
*ku-i-/hoa* Namibian Yeyi  
'to slap' (Seidel 2008: 41; Sommer & Voßen 1992: 34)

Click loss, where clicks in Botswana Yeyi correspond to non-clicks in Namibian Yeyi, is also attested, as shown in example (5), which shows that a click in Botswana Yeyi can correspond to a non-click velar in Namibian Yeyi.

- (5) *kù-ì-g'ámàni* Botswana Yeyi  
*kù-ì-khyàmínà* Namibian Yeyi  
'to throw' (Seidel 2008: 43; Sommer & Voßen 1992: 32)

Botswana Yeyi is spoken much closer to the core of the Kalahari basin area than Namibian Yeyi, and as such is in contact with languages where clicks have a high functional load; this may have helped the language maintain its click inventory. Namibian Yeyi, on the other hand, is mainly in contact with Bantu languages with fewer clicks, such as Fwe and Mbukushu, or no clicks, such as Lozi, Subiya and Totela. This contact situation may have prompted Namibian Yeyi to simplify its click inventory.

Click loss also occurs in Bantu click languages spoken on the southeastern fringe of the KBA. The Nguni language Ndebele has three varieties: southern Ndebele, spoken in the Mpumalanga province of South Africa, Zimbabwean Ndebele, spoken in eastern Zimbabwe, and northern Ndebele, spoken in the Limpopo province of South Africa. Southern and Zimbabwean Ndebele use clicks, but clicks have been lost in northern Ndebele, where they have been replaced by velar non-click consonants. This click loss must have taken place recently: at the time of Ziervogel's (1959) research, some speakers of northern Ndebele still used clicks in certain plant names, but a later study (Skhosana 2009) found that these too had been replaced by velar non-clicks. Recently, however, northern Ndebele appears to have reborrowed clicks, probably as a result of contact with Zulu (Schulz & Laine 2016).

Another case where contact did not lead to the loss of clicks, but to a decrease in their functional load, is seen in the variety of Zulu spoken in Soweto. Soweto is an urban area south of Johannesburg where extensive language contact, especially between Zulu and Sotho, has led to the creation of an urban register that deviates in certain aspects from the standard language. One of these deviations is

the simplification of its click inventory, specifically the loss of contrast between dental and postalveolar clicks. These click types are contrastive in standard Zulu, but are used as free allophones in Sowetan Zulu. For example, the word *-ela* ‘request’, which has a dental click in standard Zulu, can be realized as either *lela* or *-lela* in Sowetan Zulu; similarly, the word *-lala* ‘start’, which has a postalveolar click in standard Zulu, can be realized as either *-lala* or *-lala* in Sowetan Zulu (Gunnink 2014: 164-165). This merger is likely to be motivated by contact with Sotho, which has only one click type, the postalveolar click. Contact with other, clickless Bantu languages may also have played a role, such as Pedi and Tswana. Sowetan Zulu is widely spoken as a second language by migrants with very diverse linguistic backgrounds, including many languages with no or fewer click contrasts than standard Zulu, which may also have played a role in the reduction of the functional load of its click inventory.

Although click loss may occur as the result of regular sound change, as is attested in for instance the loss of a contrastive retroflex click type in northern and southern Ju languages (cf. Sands 2010), language contact seems to play the crucial role in these Bantu languages. Just as Bantu languages have acquired clicks through contact with languages in which clicks have a higher functional load, in the same way, they appear to reduce or lose their click inventories when they come in contact with languages in which clicks have a lower functional load, or are absent altogether. In addition to contact, however, prestige also plays a role: clicks may be discarded in areas where these sounds are associated with Khoisan speakers, who generally have a much lower social position than Bantu speakers (Wilmsen & Vossen 1990).

#### 4 Clicks beyond the fringe of the Kalahari Basin Area

Clicks have not only spread from the core of the KBA to its fringe, but from the fringe to languages yet more geographically removed from the KBA, as shown in Figure 4. The functional load of clicks in Bantu languages of eastern Zimbabwe, Mozambique and Malawi is low. They occur mainly in borrowings and ideophones. The Changana variety of Tsonga has three click phonemes and 142 words with clicks (Siteo 1996). Other lects seem to have fewer click words. Certain varieties of Karanga, spoken in the Midlands of Zimbabwe, are reported to have a small number click words, such as *mù/irò* ‘whip’, *-ùḅà* ‘rinse mouth’ and *mà-ìmbí* ‘edible caterpillars’ (Pongweni 1990), but the total number of words in the lexicon with clicks is unknown.

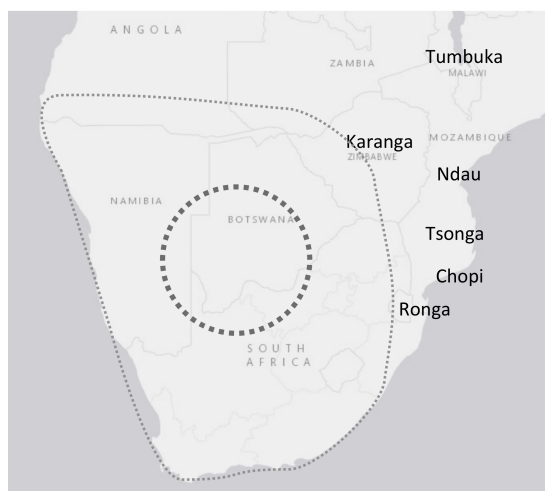


Figure 4: Map showing Bantu languages immediately outside of the Kalahari Basin Area fringe in which clicks occur as (marginal) phonemes

In the Mzimba variety of Tumbuka, spoken in Malawi, clicks occur in certain place names. These clicks correspond to alveolar ejectives in the Nkhamanga variety of Tumbuka, which lacks clicks: the Mzimba place name *!aba* is known as *t'afa* in Nkhamanga, and the Mzimba name *Engu/wini* as *Ngut'wini* in Nkhamanga (Moyo 1995).

In Ndaou as described by Borland (1970), certain words with clicks can be found, most of which are traceable to Zulu, such as *ku-g!oka* 'wear clothes' (Borland 1970: 32), from Zulu *-g!oka* 'wear, put on' (Doke et al. 1958: 85). There is some instability in the pronunciation of clicks in Ndaou: lateral clicks alternate with dental and alveolar clicks, i.e. *chi-!embo* ~ *chi-lembo* 'spoon', or *n!wadi* ~ *n/wadi* 'book'. Clicks also alternate with velar non-clicks, i.e. *chi-g!ogo* ~ *chi-gogo* 'hat' (Borland 1970: 30). Other descriptions of Ndaou, such as Doke (1931), do not mention clicks, suggesting either that they are recently acquired or only found in specific dialects.

Clicks in these Bantu languages beyond the fringe of the KBA are not the result of direct contact with core languages, but of contact with fringe languages. The functional load of clicks in Bantu languages beyond the fringe is even lower than in fringe languages, showing that with each transmission, the functional load of clicks was reduced. In many languages, the relatively high prestige of the donor language may have facilitated the adoption of clicks.

The donor languages are likely to be Nguni languages: many click words have Nguni etymologies, and contact is either ongoing or historically attested. In the case of Nda, Tsonga, Chopi and Ronga, the likely donor language appears to be Zulu, a language with more than 10 million native speakers and an equal number of second language speakers, and a relatively high prestige. This prestige may have facilitated the introduction of clicks in certain languages. In the case of Karanga, clicks are likely to be the result of contact with Zimbabwean Ndebele, the main language of western Zimbabwe. For Tumbuka, the use of clicks appears to be the result of contact with Ngoni, the language of the former ruling class of the Tumbuka. Ngoni was a Nguni language spoken by a group of migrants that fled South Africa in the nineteenth century as a result of the political upheaval of the Mfecane. They ultimately settled in eastern Africa, where they came into contact with Tumbuka speakers. Although the Ngoni language is no longer spoken in Malawi today, its influence on some varieties of Tumbuka is still seen in the use of clicks, as well as other phonological features (Moyo 1995).

## 5 Clicks in Khoisan fringe languages

Up to now, we have emphasized the relatively low functional load of clicks in Bantu languages as compared to languages of the core of the Kalahari Basin Area. In this section, we show cases of click loss in non-Bantu languages. Click loss has been documented primarily on the fringes of the KBA, but has affected each of the three families which participate in the linguistic area (Khoe-Kwadi, Tuu, Kx'a), as shown in Figure 5. We are primarily concerned here with the loss of contrastive click types, as this determines the number of click types and click phonemes in each language. Because the lexical documentation of these languages is very uneven, we will not attempt a comparison of the functional load of clicks in their lexicons.

Many Khoe-Kwadi languages have been affected by click loss (Traill & Vossen 1997). Kwadi, just beyond the fringe of the KBA,<sup>4</sup> has lost all Proto-Khoe-Kwadi click types but the dental (Fehn to appear[a]). East Kalahari Khoe languages such as Tshwao and Shua have lost both palatal and alveolar click types, while Khwe has lost only alveolar clicks (Fehn to appear[a]). Tsua has full sets of accompaniments for dental and lateral clicks (11 phonemes per click type) but only 5 alveolar and 7 palatal click phonemes (Mathes 2016). In contrast, G|ui and Naro in the core of the KBA have retained all Proto-Khoe click types, and all click types

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<sup>4</sup>We have placed Kwadi just outside the fringe because it is geographically further from the other languages and also because the functional load of clicks is comparatively low.

occur with the same set of accompaniments. Click loss is sporadic but affects all click types in Sesfontein Damara (Job 2014), a dialect of Khoekhoe. Interestingly, click loss was previously reported to occur in Sesfontein in an undocumented San language known as Kubun (||Ukun) (van Warmelo 1951: 45).

Click loss in the Kx'a languages Jul'hoan and †Hoan is much less extensive than than seen in Mupa !Xuun. Proto-Kx'a is reconstructed with a contrastive retroflex click \*! which has been lost in all daughter languages apart from Central Ju lects (Heine & Honken 2010; Sands 2010). In addition to the loss of \*!, Mupa !Xuun is in the process of losing most palatal and alveolar clicks (with the exception of those with nasalized, glottalized, delayed aspirated accompaniments which are generally retained) (Fehn to appear[b]). Palatal clicks and alveolar clicks are replaced by alveolar and velar non-clicks, respectively (Fehn to appear[b]). Click loss in the speech of young people speaking varieties of !Xuun in southern Angola appears to go back some generations (Bleek 1928; Traill & Vossen 1997).

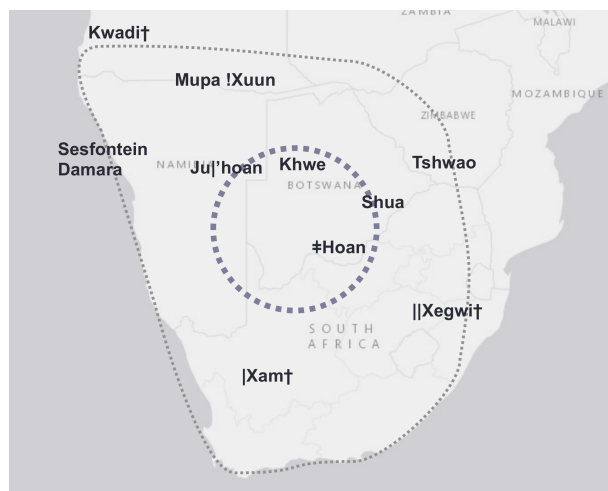


Figure 5: Map showing Non-Bantu languages which have lost click contrasts: Kwadi, Sesfontein Damara, Khwe, Shua, Tshwao (Khoe-Kwadi); Mupa !Xuun, Jul'hoan, †Hoan (Kx'a); !Xam, ||Xegwi (Tuu)

In the southern fringe of the KBA, some Tuu languages of the !Ui subgroup show signs of click loss. ||Xegwi lost Proto-!Ui palatal and alveolar clicks, but reborrowed the latter from Swati (Sands 2014; Traill & Vossen 1997). !Xam merged some or all Proto-!Ui palatal clicks with alveolars, but reborrowed palatal clicks from Khoe (Sands 2014).

In these non-Bantu languages, loss of clicks generally increases with distance from the core of the KBA, suggesting the process may be accelerated by contact with non-KBA languages. Languages in the north came into contact with Bantu languages earlier than those to the south, and we see a higher rate of click loss in the north as compared to the south. Click loss need not be indicative of divergence from the KBA; the loss of retroflex clicks in core languages Jul'hoan and †Hoan may be considered a convergence toward the KBA, since Khoe and Tuu languages do not have retroflex clicks. Different types of click loss must be attributed to different historical contact patterns.

The presence of clicks outside of the KBA in the non-Bantu languages raises the likelihood that the geographical extent of the KBA was once greater than it is today. We distinguish the former presence of a larger linguistic area outside of the present-day core and label it a depleted core. In the case of Bantu languages on the fringe of the KBA, the presence of clicks appears to be a feature which has bled out from the core. With the depleted core languages, clicks have shown signs of fading away with greater distance from the core, particularly to the north of the present-day core. Thus, a geographical fringe may be comprised of both a depleted region and an overlapping region into which a feature has spread.

## 6 Clicks in East Africa

There are three click languages in East Africa, as shown in Figure 6: Hadza (isolate), Dahalo (Cushitic) and Sandawe (which has a tentative link to Khoe-Kwadi, Güldemann & Elderkin 2010). We look at the functional load of clicks in these languages and compare them to the languages of the Kalahari Basin.

With three contrastive click types, Hadza and Sandawe are similar to KBA fringe languages Zulu and Xhosa; Dahalo has only one contrastive click type, similar to fringe languages such as Fwe. The number of click phonemes in these languages is also comparable to those of the KBA fringe, ranging from 4 phonemes (/ǀ, ǁ, ǁ<sup>w</sup>, ǁ<sup>w</sup>/) in Dahalo (Maddieson et al. 1993), to 12 in Hadza (Miller et al. 2012) and 15 in Sandawe (Elderkin 2013; Hunziker et al. 2008).

The frequency of clicks in the lexicon is similar in Sandawe (21%) and Hadza (18%), but much lower in Dahalo (3%) (based on hand counts of words in Miller et al. 2012, Ten Raa 2012, Tosco 1991). These frequencies are similar to frequencies seen in the fringe of the KBA. Rates of clicks in basic vocabulary are shown in Figure 6. The functional load of clicks in the basic vocabulary of Sandawe (37%) and Hadza (16%) however, is higher than that seen in any Bantu language.

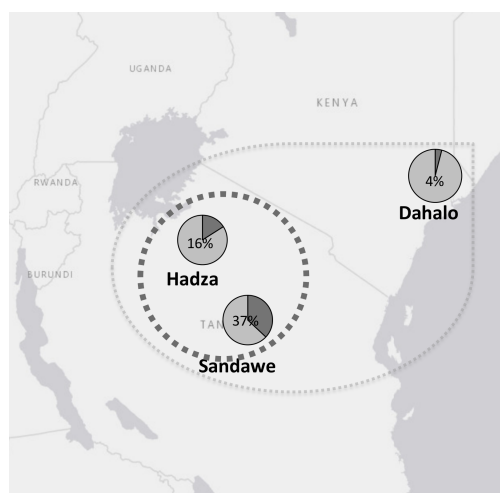


Figure 6: Map of East African click languages showing the percentage of clicks in basic vocabulary. The proposed (depleted) core is enclosed by a heavy dashed line, the fringe by a dotted line.

Unlike most languages of the KBA fringe, populations speaking these languages have been isolated from speakers of other click languages for multiple generations, as shown by genetic evidence (cf. Schlegel et al. 2012, Soi 2015). It seems likely that clicks in all of these languages once had a higher functional load than they do at present, and that continued contact with clickless languages has reduced their functional load, similar to what is seen in southern Africa. If East African click languages once formed a linguistic area, the functional load of clicks suggests that Hadza and Sandawe are part of a depleted core and Dahalo is part of its fringe.

## 7 Conclusion

In this paper, we have examined the distribution of clicks, one of the features of the Kalahari Basin linguistic area, on the fringes of the area. By considering the functional load of this feature, rather than merely its presence or absence, we have been able to reveal considerable substructuring of the linguistic area, distinguishing a core of the area, a depleted core, and a fringe. Weak signals of the area can even be detected beyond the fringe. The functional load of the feature of clicks diminishes with distance from the core of the area, and appears to diminish with each transmission.



We have discussed cases where clicks are used in a specific variety of a language, but are absent in others, or where different varieties differ in the functional load of clicks. Clicks can be acquired through contact with languages where clicks have a higher functional load, but clicks can also be lost through contact with languages where clicks are absent or have a lower functional load. Furthermore, the differences in click inventory between closely-related varieties of the same languages underscore the need for dialect studies, which may elucidate the processes by which these features are acquired and lost.

Finally, we have suggested that differences in the functional load of a linguistic feature may be useful in identifying old linguistic areas. Outside of the Kalahari Basin Area, we have seen that the functional load of clicks is relatively higher in Hadza and Sandawe than it is in Dahalo, a pattern that is reminiscent of the relative functional load of clicks in the core vs. the fringe of the Kalahari Basin Area.

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