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Imprint

CONTENT

Bridging the hiatus: Dramatic and poetic elements in Malalo's *kirari*

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Abstract:
The theme of this paper is *farautar jarumta* 'heroic hunting' in the north-western part of Nigeria. The paper pays particular attention to the *kirari* 'praise-epithets', also called *koɗa kai* 'adulation of the self', of the *mafarauta* 'hunters' as one of the cardinal features of this kind of hunting. It traces certain dramatic elements, such as stage/space, costume and props, dramatis personae, plot, impersonation, and the spectacle as well as the singing and drumming that are an important part of performance of *kirari*. It further examines poetic elements in Ummaru Usman Malalo's famous *kirari Saka-cira*; these elements are grouped into genealogy-based, action-based, and metaphorical *yabo* 'praise'. The paper shows that, although the delivery of *kirari* has, in some studies, been analysed as a song text, it requires performance along with the dramatic elements which belong in a performance. The analysis of *Saka-cira* – which has never previously been studied – shows that in their *kirari*, *mafarauta* utilise poetic devices to portray, embellish, and exaggerate events, comparing themselves with, or even declaring themselves to be an animal or a natural phenomenon. The analysis in the paper relies on the Hausa version of the *kirari*. It utilises a transcribed version of *Saka-cira*, interviews, observations, and secondary literature.

 Keywords: Hausa, heroic hunting, *kirari*, performance, drama, poetry

1 Introduction

In Northern Nigeria, *mafarauta* 'hunters', *'yantauri* 'performers with knife blades' and *'yandambe* 'traditional boxers' perform their *kirari* 'praise-epithets' when practising their profession. The professions of hunting and boxing are male dominated occupations in Northern Nigeria, though the women perform important roles such as fortifying their husband's bodies through the use of charm, herbs and con-

coctions, therefore guarding their *asiri* 'spiritual or magical powers', and sometimes by reciting their *take* 'introductory praises'. As an art form, *kirari* is also used to praise spirits in the context of the spirit cult *boori* (King 1967). These artists use the *kirari* medium to glorify their lineages and their own successes; thus their *kirari* are a form of self-praise, and contrast with oral praise songs in which griots apostrophise the objects of their praise through *wakokin yabo* (Bello & Baum 2020).

The aim of this article is to expand our knowledge of hunting and *kirari* among Hausa people through an examination of the nature of heroic hunting in the north-western part of Nigeria. Central to this attempt is the analysis of the *kirari* of the hunter Ummaru Usman Malalo, with the title *Saka-cira* 'the one that causes an involuntary action'. *Saka-cira* is a verbal compound that comprises of two words (*saka* 'to cause' and *cira* 'involuntary action'). In verbal compounds, two or more words are used as single domain in conveying a larger idea e.g. *hana-salla* 'to prevent prayer' or *shiga-da-alwalla* 'enter with ablution' (McIntyre 2006: 171). This form of expression is common in Hausa language.

Verbal compounds of this nature are normally used in *wakokin yabo* and in *kirari* to elicit an action. Hunters and other participants react unpreparedly by moving, running, shivering or responding to taunts when they see the sturdily built hunter-performer, especially when the taunts are spiced with a hunter-performer's *tsawa* 'thunderous scream'. In the Hausa language, this is referred to as *harzuƙawa* 'instigation'. *Saka cira* is deliberately deployed here as *kambamar zulaki* 'hyperbole' to overstate Malalo's capacity to cause furore. *Kirarin farauta* 'hunting praise-epithets' are riddled with this form of *yabo* 'praises' (this will be discussed in section 8). It can be realised from the foregoing that *Saka-cira*, which doubles as both action-based *yabo* and a metaphor, is in fact pregnant with layers of meanings, depending on how it is used in a context.

The aim of this paper is to examine the use of these kinds of poetic elements in *Saka-cira*, as well as the dramatic nature of the delivery of hunting *kirari* among the Hausa people of north-western Nigeria. The Hausa people live in the Sahel region of West Africa, with a significant number in the northern region of Nigeria. They have a long history in West Africa and their language is spoken by as many as 50 million people (Sabi'u et al. 2018). Most Hausa people are Muslims;

their religion, Islam, sustaining their connection with the Arab world (Gandu 2016). Hausa society is a melting pot of civilisations and commerce, with trading, agriculture, and small-scale businesses as the mainstay of the people (Olugunwa 2014).

Ahmed (1983) groups the performance types of the Hausa people into *wasannin al'umma* 'community dramas', *wasannin yara* 'dramas for young people', *wasannin lokaci-lokaci* 'occasional dramas', and *wasannin sana'o'i* 'occupational dramas'. Hunting *kirari* can thus be classified under *wasannin sana'o'i* 'occupational dramas', since hunting is considered as an occupation among Hausa people. The main concern of this paper is *kirari*, in particular *kirari* performed in *farautar jarumta* 'heroic hunting'.

Heroic hunting differs from conventional hunting, in which hunters simply hunt for food or sport. In *farautar jarumta*, the concern is more with the display of strength and invulnerability than with actual hunting. It is characterised by the settling of scores between competing hunters and may well involve the shedding of blood. It is in such a context that *kirari* are performed; they are sung by the hunters themselves, singing their own praises, but may also be sung on other occasions. The hunters in *farautar jarumta* mostly target dangerous animals such as *ɓauna* 'buffalo', *karkanda* 'black rhino', *zaki* 'lion', *damusa* 'leopard', *kura* 'hyena', *siyaki* 'striped hyena', and *giwa* 'elephant' to prove their mettle. Only experienced hunters can hunt this type of dangerous animals. However, other animals such as *zomo* 'rabbit', *barewa* 'antelope', *gafiya* 'grasscutter', *yanyawa* 'pale fox', and *gauraka* 'crane' were also hunted. It is important to note that *farautar jarumai* was mostly practiced by poor people of lower caste in the Hausa society (see section 6.1). Hunting, as an occupation, is however still practiced.

2 Data

The data on hunting and the culture of *kirari* was obtained through two years of fieldwork that included interviews, participant-observation as well as documentation and description. Four interviews with Malalo and three with the hunter Ahmadu Kwabre were held in 2012, and provided much insight into the practice of heroic hunting and the delivery of *kirari* in north-western Nigeria. From the 1960s to the 1990s these hunters were revered by other such hunters as well as by

praise singers; the information given by the latter confirm the interviews with Malalo and Kwabre. The *kirari* examined in this paper – *Saka-cira* – was sourced from one of the interviews with Malalo; the nature of its delivery was also observed. All such information is documented and described in this analysis. Some secondary literature also provides information on *kirari* and the hunting culture in this region.

3 Methodology

The paper offers a literary, text-based, and descriptive analysis of the dramatic and poetic elements of *kirari*. The procedural information on the practice of heroic hunting was sourced from the interviews with Malalo. The analysis of the nature of the performance of *kirari* was equally derived from the hunter's narration and performance at intervals thereby helping in bridging the gap between narration and performance. The interviews with the hunters provided information on what heroic hunting is, on the nature of a hunting party, on the roles of hunters and praise singers and their troupes, on the actual hunt and forest spaces in which it takes place, and on the bloodletting, which occurs due to either disputes over the game or the settling of scores. The knowledge gleaned in the interviews provides a background to the hunting tradition, showing how it is moulded by factors such as culture, geography, politics and history instead of objective reality (Lakoff 1987).

Aware that no individual is an ultimate repository of cultural values and that no single account makes up an oral tradition the interviews referred to above were supplemented with participant-observation between 2012 and 2014. On 16th June 2012, I witnessed a hunting expedition during which *kirari* were performed; however, it was not the type of hunting expedition described here because there was no evident bloodletting. There were also less deadly animals, compared to when these actual heroic hunts took place. On the eve of the Eid-ul-Kabir[1] festival in Katsina in 2013, I was able to witness the *kirari* of Malalo and Kwabre; in 2014 Malalo delivered the same *kirari* that is analysed here but with some variation. For its

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1 Eid-ul-Kabir is an annual Muslim day of sacrifice in commemoration of Prophet Ibrahim's willingness to sacrifice his son, Prophet Ismail, when he was commanded by Allah. During this ritual, animals such as *rago* 'ram, *'saniya* 'cattle,' and *rakumi* 'camel' are sacrificed in honour of his obedience.

poetic analysis, this paper relies on the *kirari* he delivered during one of the interviews in 2012. The interview was recorded using a digital voice recorder and transcribed by the research assistant Abdullatif Yusuf under the supervision of the researcher.

The citations of *kirari* made during the hunting and the festivals were recorded using a video camera and have been analysed by the researcher. The recording provided the data needed to appreciate and understand the effect of the performances. In order to augment the data, the researcher observed the *kirari* of *'yandambe* 'boxers' on 2nd and 10th February 2013 and of *'yantauri* 'hard men with knife blades' on 10th and 11th July 2013 during the annual Eid-ul-Kabir celebration. These performances – of *'yantauri* and *'yandambe* – were analysed in relation to *kirarin mafarauta* because these forms are not significantly different. Secondary sources on *kirari* and hunting in the northern region in particular, and their practice across different cultures were also examined (see section 5).

4 Ummaru Usman Malalo

Ummaru Usman Malalo (* 1931/2; † 2016) is a Hausa hunter-performer from the city of Katsina in Katsina State. He had two wives and eighteen children. Malalo hunted alongside renowned hunters like Kwabre, and was regarded as a great warrior during his hunting years. Malalo hailed from a very religious home where his father was an Islamic teacher. Nevertheless, he chose *farautar jarumta* 'heroic hunting' despite his family background. In our interview, he narrated how he was labelled the black sheep of the family. Furthermore, although Islam prohibits seeking protection from any other being or force apart from Allah, Malalo resorted to the use of charms as a means of protection against enemies or wild animals. He started hunting small animals at the age of sixteen under the guidance of his uncle, who was also a hunter. He recounts that at the age of 26, he ventured into the world of the supernatural equipped with the basic protection expected of hunters and in a few years carved a niche for himself as a fierce, daring, and bold hunter.

5 Related literature on *kirari*

Before proceeding to the analysis of Malalo's personal *kirari Saka-cira* some studies on Hausa praise poetry and *kirari* are reviewed here. These studies show that *kirari* is an oral art form found in various contexts. In a study on the *boori* cult possession practice in Katsina State, for example, King (1967) describes the use of *kirari* to praise the spirits as part of the cult ritual. The focus of the present article, however, is to show *kirari* as a poetic form that can only be fully realised through a dramatic display. This concern with poetics and performance can be seen in the works of Finnegan (1970) and Furniss (1997). While Finnegan (1970) sees *kirari* as a kind of praise poetry, Furniss (1997) views it as oral poetry that is not exclusively used as praise. Both scholars, however, argue that *kirari* exploits poetic and dramatic elements.

Finnegan (1970) identifies *kirari* as poetic devices used to praise a particular subject, but argues that *kirari* can only be fully realised with the aid of performers, singing, drumming and an audience. Furniss (1997) also sees *kirari* as a poetic device, arguing that it requires some form of dramatisation; he also contrasts *kirari* with *take*, which is an introductory phrase in praise of subject-performers (hunter, traditional boxer, or a *boori* cult member) sung by another artist or a performer. It usually precedes a *kirari* and serves as a way of inciting the person it is intended for to deliver his *kirari* or, in the case of hunting and boxing, to demonstrate his paranormal powers. In another important work, Akporobaro (2006) considers a *kirari* as an incantatory poetry which – with its dramatic features – oils the wheels of hunting culture, fuels gallant displays and enables hunter-performers to take on a larger-than-life image. Although Finnegan (1970), Furniss (1997) and Akporobaro (2006) locate the poetic and dramatic features in *kirari*, they fail to examine these elements using practical examples. Nor are they solely concerned with the Hausa hunting *kirari*.

In his study on Hausa hunting *kirari*, the present author (Bello 2013) examines how hunters use the form to recount their gallant deeds and assert their dominance in hunting circles; the article attempts to locate the importance of hunting and *kirari* in Hausa society and to describe how the culture is gradually disappearing. However, despite its insights into the nature of *kirari* it does not

examine the dramatic and poetic features of *kirari*. In another work by Oumarou (2018), Hausa *kirari* are examined as autobiographical conduit used by hunters and renowned bards such as Dr. Mamman Shata Katsina; the paper focuses on Ahmadu Kwabre's *kirari* and Shata's *Bakandimiya* as examples of the way an individual's life may be expressed and preserved in Hausa praise poetry. It does not assess the dramatic and poetic elements associated with *kirari*, either.

In a study on hunting and related practices among the Kushi people of north-eastern Nigeria, Batic (2019) describes the procedural stages in hunting and how the hunter performs as narrator, using storytelling to preserve hunting practices. Bello & Baum (2020) deal with Hausa hunting, particularly from north-western Nigeria, by examining the deployment of eulogies in the *kirari* of Kwabre. They examine how hunter-performers re-stage conquests, glory, and history. In the present article, however, the concern is with some of the dramatic elements in Hausa hunting *kirari*, which have as yet not been adequately described. Specifically, Malalo's *kirari* have not been previously studied.

6 Elements of drama in *kirari*

This section locates and analyses some of the features of drama that can be found in *kirari* such as stage/space, dramatis personae, props and costumes, audience, imitation, and songs. The interplay of these key elements leads to a full realisation of the *kirari*, with the hunter brandishing and using dangerous weapons (e.g. knife, axe and horn) on himself in an attempt to prove his mettle. In his *kirari* the hunter dramatises his conquests of animals and men in hunting and war in such a way that even hunters who were not present at the event can visualise his deeds for themselves. The staging includes the delivery of *kirari* and a display of supernatural powers (Akporobaro 2006; Bello 2013). As will be shown in the analysis of Malalo's *kirari* these subject-performers eulogise their feats in words and action. Furniss (1997: 73) calls this form 'combat literature', and recounts that it is practiced by hunters in Northern Nigeria and boxing and wrestling combatants across different cultures.

6.1   Stage/space

In Northern Nigeria, hunting *kirari* were normally staged in forests, unless they were performed on request on occasions such as the Eid-ul-Fitr,[2] Eid-ul-Kabir and turbaning[3] ceremonies. In the past, hunters staged the kirari in the region's dangerous forests, such as *kukar sani mege, mazakai, gemawa,* and *'yar-tsamiya.* These forests were home to different species of animals such as *kura* 'hyena', *zaki* 'lion', and various species of snakes such as *kububuwa* 'the puff adder'. Sadly, however, most of these wild animals are facing serious threats of extinction because of deforestation for agricultural purposes and as a consequence of the growth of towns and cities; thus many of them are only found in game reserves today.

The practice of *farautar jarumta* also faces serious setback due to the loss of forest spaces, extinction of game, and low demand for the meat. Bello (2013) reports that, the hunters have resorted to serving as night-watchmen at farms and in the towns. In the past, they were used to defend towns against external aggression; keeping watch in a town or in wealthy homes at night is therefore, to a certain extent, continuity. This community policing has become more prevalent in the past few years since the conventional policing system in the region has gradually become less effective, leading to a high rate of crime and banditry.

Although *farautar jarumta* is no longer practiced today due to the above factors, the art of *kirari* has survived. As mentioned above, kirari is still delivered on request on special occasions. Bello & Baum (2020) reveal that hunting *kirari* was common in the region during the pre-colonial inter-tribal and religious wars. Many heroic hunters fought in the unending conflicts, and given their importance as warriors, they were allowed to operate in the forests undisturbed. In the interviews, Malalo (2012) and Kwabre (2012) reveal that *farautar jarumta* lasted into the 1990s. Malalo recounts that courageous hunters received kola nuts when invited to the hunts in the forests listed above and that only gallant hunters participated in the expe-

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2   Eid-ul-Fitr is an annual Muslim festival of breaking fast. It marks the end of the Ramadan fasting period.

3   Also known as coronation, the word turbaning was derived from the root word 'turban'. It is a ceremony in Hausa-Fulani culture for the installation of someone in a position of traditional power (e.g. district head or emir).

ditions. Among the Hausa people, kola nuts is used as a token of invitation to ceremonies or is distributed as *shaida* 'witness' during weddings or naming ceremonies. Among the Fulani, a people closely connected with the Hausa, kola nuts is used as a way of promising support in order to cement new relationships. Among the Igbo people, it serves similar cultural functions, such as acceptance, solidarity, or cooperation (Unya 2021).

Hunters who accepted the invitation had to prove their mettle during these expeditions. The weak or unlucky ended up dead or injured by the animals or by other hunters. This hunting expedition opened with the recitation of the *take* of the participant-hunters and is followed by the *kirari* of hunter-performers, expressions of rivalry, and the actual hunt. During *farautar jarumta*, the hunter could only keep what he killed if he withstood the blows or challenges of other ferocious hunters (Kwabre 2012).

This phase of the expedition is known as a *kazar ƙarfi* 'dispute over the game', whereby the captured or dead animal serves as a trophy that must be earned during the exercise. In the Hausa society even a maiden that suitors haggle over can be regarded as *kazar ƙarfi* that only the lucky man can get. The worth of a hunter was determined at this stage. It also marred ill-prepared hunters. The second phase of the *kirari* took place at this point. It was the climax of the event, whereby only the brave could stand tall; scores were normally settled during the conflict and even fiercest hunters were challenged to a duel.

As stated above, hunters who managed to catch a wild animal had to declare this before their rivals. According to Malalo (2012) this is deadliest part of the hunt because it required a hunter to stand with the dead animal amidst the other hunters, to recite his *kirari*, and ultimately counter the vicious strikes and blows of the rivals. This defining moment determined the worth and status of the hunter in the group. Hunters such as Malalo and Kwabre hunted and delivered their *kirari* under such harsh condition. In these notorious forest spaces many a hunter's reputation was made or marred.

The defining modes of the *kirari* performance, both simulative and dramatic, transformed the forest into an arena for display and narration. These spaces were graced by great hunters, along with popular musicians and drummers. The displays that accompanied the delivery of *kirari* on this stage were dramatic manifestations of under-

lying potential; they were untamed, and yet allowed the performance to assume the character of a ritual – with a carnivalesque quality. As mentioned earlier, hunter-performers mostly used the forests for their *kirari*. There was enough space for other hunters to participate, leaving room for improvisation: they could join the fray, old grudges could be rekindled or new conflicts initiated. Despite the enormous vastness of the forests, however, the hunter-performers staged their *kirari* in compact spaces, therefore promoting the participation of actors and spectators – presence and participation being the essence of live performance.

6.2   Costumes and props

Costumes are among the most noticeable features of performance of *kirari*. They attract attention not because of their ornamental nature – such as those used during *durbar* festivals – but because they are made from the skins of wild animals such as *zaki* 'lion' and *kura* 'hyena'. They are trophies, representing the hunter's prowess in hunting. Hunters also use costumes and props of men they defeated, brandishing their weapons in order to instil fear. Some of the clothes used are in tatters, a sign of a hunter's supernatural powers. Hunters normally fortify their bodies through spiritual means; this involves the use of herbs or concoctions. This fortification makes it difficult to injure the hunter during displays or actual conflict.

As a result, but often unintentionally, anything the hunter touches, such as *makami* 'weapon', *ƙarfe* 'iron' or *kaya* 'clothes' get worn out more easily. Thus, the more shabby and damaged the clothes, the more fortified the body of the hunter is seen to be. Unlike in a *durbar,* where members of the corps unit wear *sulke* 'chain mail' and *lifidi* 'padded armour', hunters tend to use animal skins. Since the latter can be pierced by a sword these skins are – paradoxically – a mark of their invulnerability: the hunter's protection lies in his use of charms and concoctions that harden the skin, such that it cannot be injured. They also move more easily when they use clothes made from skins.

Charms are tied and hung around the waist, hands and/or leg. They protect the hunter against injury or other hazards associated with hunting and war. They also enable him to perform mysterious acts, including vanishing into thin air and withstanding the fierce blows and strikes of his enemies. The charms also protect against wild beasts. Charms are mostly prepared by men, but women also

prepare concoctions at home, sometimes under the guidance of men. Other props that are used by the hunters include weapons like *sayi* 'black iron', *saƙandimi* 'heavy metal axe', *mashi* 'spear' and *takobi* 'sword'. Without such weapons, they are vulnerable and prone to attack. Furthermore, they require the props and costumes in order to perform; *farautar jarumta* and the associated *kirari* are not complete without them.

6.3   Dramatis personae

Kirari requires a performance. As identified in section 1, only men participated in the hunt and the performance of *kirari*. In the Hausa society, heroism, as well as praise singing and drumming, were seen to be the preserve of men. During a delivery of *kirari,* the necessary dramatis personae are hunters as subject-performers and hunters as participants-cum-audiences. The latter watch as subject-performers demonstrate and recount their feats of valour. At the *kazar ƙarfi* stage, where the hunter defends his prey, as identified earlier, other hunters join the fray, chanting and staging their *kirari* in response to that of the principal subject-performer.

The other hunters often respond by brandishing their own weapons and making to cut or stab themselves in order to demonstrate their invulnerability; finally, they strike the subject-performer, leading to a heated verbal exchange in a high-pitched tone. It was at this stage in the proceedings that, on occasion, some hunters lost their lives or sustained injuries; the culprits usually went unpunished. Kwabre in an interview narrated that he was once reprimanded by the Sultan of Sokoto for killing a fellow hunter during hunting in one of the forests of Sokoto state; he was eventually sent into exile, but finally relocated to Katsina (Kwabre 2012). As stated earlier, these hunters were allowed to operate in forests unchecked due to their enormous contributions to general security in the region and during warfare.

As mentioned in section 6.1, the performance of *kirari* is typified by the participation of the principal actor and spectators. This level of engagement lends vigour to hunting *kirari*. This sort of participation can equally be seen in the *kirari* of *'yandambe* 'traditional boxers' in Northern Nigeria. In *kirarin mafarauta*, participation is organised in heroic-hierarchical mode, a structure involving rules of precedence and seniority. The participants are aware that only hunters at par with the principal subject-performer can pick up the challenge

by responding to his taunts and disputing the claims in his *kirari*. As the subject-performer recounts, re-enacts and simulates, the hunters participate in the combat and in enacted event; bloodshed ultimately proves the heroism of the hunter-participants.

Only hunters who receive kola nuts are invited and have access to the event; the properly invited participants help determine the full actualisation of the *kirari*. Apart from celebrated hunters, other dramatis personae include famous drummers and praise-singers who also receive kola nuts as an invitation. Finnegan (1970) maintains that the appropriate participants help to intensify the excitement.

6.4   Plot

When staging his *kirari*, the performer enacts a story using words and gestures. In the present case, the hunter narrates his exertions and expeditions and recounts the history of his family or of those he associates with. In *Saka-cira*, Malalo offers a chronicle of heroic hunting expeditions in the region through a nonlinear plotting style which defies any attempt at tracing a direct causality in the order of events. This kind of narrative technique can be found in the Indian epic *Mahabharata*, where the story within the story method was adopted (Thorat 2005). Despite Malalo's use of this nonlinear style, the following thematic emplotment can be realised in the *kirari*: the introduction of the hunter and his family background (line 1 to 13); delineation of his heroic attributes (line 15 to 19); the culture of violence associated with *farautar jarumta* (in lines 19, 20, 21, 22); the accounts of actual conflicts (line 30 to 34); and closure (line 39 to 42).[4]

Saka-cira opens, in the first part, with the introduction of the hunter as the subject of the *kirari* and performer, who gives a brief history of his family, tracing his roots through his ancestors. Malalo states at this point in the narration that although his father was an Islamic scholar he and his brother 'Yar-mada chose to be hunters, and thus sought protection through supernatural means. In the second part, he tries to paint his heroic features using some poetic devices in an attempt to create a larger-than-life image as well as to instil fear in the minds of other hunters and enemies. He views himself as *bakin*

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4   The line numbers refer to the lines in numbering the *kirari* text in the appendix.

dawa 'a deadly forest' with *baƙin kwalli* 'a black silver-lead'[5] (in line 1), as an animal like the *kura* 'hyena' or the *kunama* 'scorpion' (in lines 13 and 32), an object such as a *likkafani* 'shroud' or a *garhanga* 'the witch's perfume' (in lines 7 and 8), and, metaphorically, as a *mahaukaci* 'mad man'. This part ends referring to the actual heroism of the subject, stressing his ability to cause chaos and dominate the hunting grounds.

The third part of this *kirari* offers a good insight into the violent culture of hunting in the north-western region. In this part, Malalo states how drumming, *take*, and *kirari* often precede deadly conflict in line 20: *kasa kiɗin mahaukaci kaga aiki* 'play the music of the mad man and see valour'. He recounts how the conflicts led to the deaths or serious injuries of participant-hunters in line 19 *ni ne inda gawar talaka da ta gada take* 'I stand tall around the dead body of the poor man and the antelope'. And in the fourth part of the *kirari*, he takes us back to the actual conflicts he has been involved in. He narrates how he spent seven days striking the enemy (*kwana bakwai nike ana sara ta*) in line 30 and another seven days enduring retaliatory blows (*kwana bakwai nike ina sara wa*) in line 31.[6] He claims to have been part of numerous hazardous hunting expeditions and major conflicts and to have survived the worst. In an interview, Malalo confessed that he nearly met his waterloo during one of the hunts. He recalled that he was once nearly killed by a more prepared hunter during a hunting expedition and on his part fatally injured many hunters.

The heroic track record of Malalo is now established in the *kirari*, a reality the audience (such as hunter-participants, praise singers and their troupes) are expected to appreciate. He douses the heightened tension in the *kirari* towards the end with an account of his survival against tremendous odds. And finally, in the fifth part, he brings the curtain down with the prayer: *Allah kai mu inda ba'a rabawa* 'may Allah take us to where nobody interferes in a conflict' (in line 39), adding that *raban hwaɗa ka kawo raini* 'it is interference in a conflict that brings disrepute' (in line 40). Malalo in essence tries to warn against being invited to a hunting space where hunters will not be allowed to settle their gory scores.

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5 Black silver-lead (also called *galena*) is an eye make-up that is equally used as a blood tonic.

6 Exaggeration is a common feature of *kirari*: there is an element of exaggeration in the actual days (14 days) that the conflict ensued.

6.5 Impersonation and spectacle

Impersonation – or an act of imitation – as a dramatic technique is indispensable for any theatrical delivery or display; it is at the heart of any performance. In a conventional theatre, it is thought to be secular; in a ritual, it is felt to be sacred. Furthermore, in the latter – and in the present case – the performance is typically associated with some form of imitative magic, whereby the hunters simulate animals and objects. In a *kirari*, the subject-performer impersonates himself, other hunters, and animals by re-staging his adventures, victories, and his worst fears. In this way, he re-enacts the terror he wreaked on wild animals and adversaries. He goes so far as to imitate the sounds and faint movements of his human and animal victims as they gasped their last breath.

The hunter's conquest of men/animals is chanted and demonstrated simultaneously in the performance. Here, the hunter becomes a performer. His dramatic presence is of the essence: his role as the hunter-protagonist is vital to the realisation of the re-enacted event. In the case of Malalo, such performances magnified his power, and, with his short and sturdy physique, sent fear down the spines of the other participants. The dramatisation and narration of his epic feats drove the performance, inviting challenges from other participants, who in their turn, re-enacted and narrated their own deeds (Malalo 2012).

In the performance of Malalo that this researcher observed in 2013, he responded to the taunts of other performers by praising himself and re-enacting the epic events he had been involved in. He further consolidated his heroic claims by using a knife to strike himself. He went even further, associating himself with dangerous weapons like a *gatari* 'axe'. This performance – and others – revealed that there is no major difference between a staged and a real event. Malalo's delivery of the *kirari Saka-cira* bridged the gap between a performer and protagonist and between claim and reality.

6.6 Singing and drumming

The hunting *kirari* is usually accompanied by *kidi* 'drumming', some form of fluting using *alghaita* 'a wooden oboe-like instrument' and is introduced by the *take* of the principal performers. Though hunters in the north-east either hunt in large groups or pairs, as can be seen

among the Kushi hunters (Batic 2019), they are not usually escorted by praise poets, drummers and flutists. In the north-west, which is the context of this study, this kind of hunting must involve these players and musical accompaniments. Some famous musicians and praise poets are invited in order to take part in the events, and the performances are spiced with a fast, heavy, and loud tone, amplified by *busa ƙaho* 'horn-blowing'.

Renowned praise-singers from the northern region like Abubakar Kassu Zurmi and Muhammadu Gambu, along with their troupes, participated in such hunting expeditions and amplified the events – and the rival clashes – with their invigorating tempo and rhythm. Kassu and Gambu sang mostly for the famous *mafarauta*, *'yantauri*, and *ɓarayi* 'thieves'. The troupes form part of the overall performances, entertaining and singing the *take* of hunter-participants. Although a number of famous hunters participated in this dangerous hunting expedition, the troupes often paid most attention to the most legendary among them. Their *take* stimulate these hunters to perform their own *kirari*. These songs and sounds add to the drama, thus creating the necessary tension for the hunter-participants. No *kirari* can be fully realised without musical accompaniment; it is a vital element of a performance, heightening the rhythm of the poetic chants and provoking clashes between the rival hunters.

7   *Yabo* in Malalo's *Saka-cira*

Praise poetry generally eulogises the life, accomplishments and epic deeds of the persons praised. In the contexts of Hausa culture, the subject of praise, the *jarumi* 'hero', may be an important person like a religious, cultural, or political leader, or even an ordinary person whose endeavours have left an enduring mark in their chosen career or neighbourhood. There are also instances where women, and even children, are praised. In the present context, we find the *mafarauta* or *'yantauri*. Such praise is known as *yabo* and involves the praise of the character of a person or real event. While a *kirari* entails *yabo* – both involve praise and have a purposive nature – it differs from the latter since it implies *koɗa kai* 'adulation of the self' and necessitates the exaggeration of the person's physique or actions, or requires the metaphorical representation of the performer with other animate or inanimate objects.

In this paper, Malalo's *kirari* is considered as *koɗa kai* – also used by praise singers in their songs – in its most exaggerated form, using proverbial expressions, metaphors and simile. Self-praise is not, actually, peculiar to any one culture. *Ijala* poets (*Ijala* is a form of oral poetry among the Yoruba people) also use metaphor and simile, but extend it to include personification and hyperbole (Alabi 2007). The use of *yabo,* through these devices, in the *kirari* of Malalo will be examined in subsections 7.1–7.3. The first subsection treats the factual content of his life, his genealogy; the second treats the real feats of the hero, at times exaggerated; the third subsection treats how he portrays himself as an animal or as a dangerous person, place or thing.

7.1   Genealogy-based *yabo*

Genealogy-based *yabo* associates the *jarumi* 'hero' with people that are related to him such as *iyaye* 'parents', *'yan-uwa* 'relatives', *abokai* 'friends', and *iyali* 'spouses'. The hunter traces his genealogy using words like *ɗan* 'son of' and *jikan* 'grandson of'. Such terms are often intended to stress the greatness of his forebears. In genealogy-based yabo, words such as *na* '(person/thing) of', *uban/baban* 'father of', *ƙanen* 'a younger brother of', *mijin/angon* 'husband/bridegroom of', and *abokin* 'friend of' are used (Tsoho 2014). In *Saka-cira* the *jarumi*, Malalo, tries to establish his genealogy using genealogy-based *yabo* in three instances, two of which can be seen in examples (2) and (3).

(2)   *Ni ne ƙanen 'Yar-mada*
      I am 'Yar-mada's younger brother.

(3)   *Ni ɗan malan wanda bai halin malan ba*
      I am the cleric's son that does not follow in his footsteps.

Association with others is vital in heroic poetry. The above excerpts introduce us to Malalo's forebears. In line (2), he utilises genealogy-based *yabo* in *ƙanen* 'a younger brother of' to tease out the relevance of family bonding among the Hausa people. Family is important to the Hausa, allowing one to be considered as a community member on the – essential – basis of affiliation to a family. There is hardly a *kirari* or a *waƙar yabo* 'praise song' without reference to the ancestry or family ties of the subject. The family is the 'microcosm' of society and protector of its values; parents are expected to guide children so that they fit into the society, and those who fail often have to hang their heads in shame.

Line (3) of the *kirari* implies one such parental failure in that Malalo did not sustain his family's old tradition: not only does he ignore his Islamic upbringing and his father's pursuit of Islamic scholarship, he chooses a career which turns him towards the supernatural, violating a core tenet of Islamic teaching. It looks like Malalo is not ashamed of his choice; he seems to believe that there is nothing wrong with dissent and with an individual choice of career. Indeed, he seems proud to see himself as the polar opposite of his family.

7.2 Action-based *yabo*

Action-based *yabo* paints the epic deeds of a protagonist. Given that the concern of heroic poetry is bravery and victory, words are used poetically to recount the hero's military feats and his pre-eminence, and the narration is normally accompanied by various displays that confirm his claims. Thus, the hero enables those who have not witnessed the hunting spectacles referred to in the *kirari* to imagine what transpired. The following excerpts from *Saka-cira* reveal this.

(6) *Saka-cira…*
     The one that causes an involuntary action…

(16) *Da mu aka zuwa, da mu aka dawowa*
     It is with us they go, it is with us they return.

(17) *Da mu aka zuwa wurin gumurzu*
     It is with us they go to any fierce conflict.

(30) *Kwana bakwai nike ana sara ta*
     I endure enemy strikes for seven days.

(31) *Kwana bakwai nike ina sara wa*
     I spend seven days returning enemy strikes.

(33) *Mu ka saran ƙato*
     It is us that strike monstrous men.

(34) *Mu ka tsire hanjin ƙato*
     It is us that pierce the huge man's innards.

In the above excerpts, the subject-performer uses poetic language to eulogise his epic successes in hunting expedition and other conflicts. In line (6) he uses a verb-based compound *saka-cira* 'one that causes an involuntary action', to show his capacity to initiate furore. Usage

of these kinds of verbal compounds is common in the self-praise of the Hausa people. Artists compose them using the verb plus its noun direct object, as in *ci-gari* 'conqueror of towns', *ki-gudu* 'fearless' and *gagara-gasa* 'undisputed' (Tsoho 2014). *Mafarauta* 'hunters' carefully utilise compounding involving metaphor (metaphor + direct object, metaphor + metonymy, metaphor + verb) in *kirari,* as in *daki-bari* 'a strong/reliable thing', *ja-in-ja* 'argument', and *sha-kundun* 'overall' (McIntyre 2006).

In lines (16) and (17), Malalo recounts his ability to survive fierce expeditions, which are later epitomised in lines (30) and (31) where he claims mysterious invulnerability, withstanding enemy strikes for seven days, and returning the blows for another seven days. He uses *kambamar zulaki* 'hyperbole' to exaggerate events. *Kambama* is used in Hausa poetry, especially in *kirari* and *wakar yabo*, to either stress a claim (*karfafa zance*) or to exaggerate.

The subject-performer's account of the strikes and retaliatory blows illustrates what normally ensued during heroic hunting expeditions. Hunters who manage to catch game must subject themselves to the blows of others, and survive them, in order to keep what they killed in the hunt. They also have the chance for *ramuwar gayya*, which is to appropriate 'a pound of flesh', when another hunter is subjected to the same ordeal. In 6.1 this was introduced as *kazar karfi* 'dispute over the game' stage. The height of this commotion is described in line (33) where the hunter wreaks havoc, and in line (34), where he conquers the unconquered.

7.3 Metaphorical *yabo*

Tamka 'metaphor' serves as associative reference. It is deployed in order to create a larger-than-life status. In the case of heroic praise poetry, *yabo* of associations and references are utilised to relate the subject with animate and inanimate objects like animals, plants, the natural world, as well as weapons. In Hausa *kirari*, hunters present themselves as animals, such as *kura* 'hyena', *zaki* 'lion', *kare* 'dog', *shaho* 'hawk', *giwa* 'elephant', or *kunama* 'scorpion'; as weapons like *kibiya* 'arrow', *gatari* 'axe', *kaho* 'horn', *karfe* 'metal', or *sakandimi* 'hefty metal axe'; as supernatural beings/things like *dodo* 'goblin'; or the natural world like *hadari* 'storm clouds', *fari* 'drought', and *tsawa* 'thunder'. Such metaphor helps them to impress and scare other hunters. In *Saka-cira,* Malalo deploys associative and descrip-

tive eulogies to emphasise his great strength and his unusual abilities, as can be seen below:

(1)   *Ni ne bakin dawa mai bakin kwalli*
       I am the dark forest with a black silver-lead.

(7)   *Garhanga nike, turaren maye*
       I am *garhanga*, the wizard's perfume.

(8)   *Likkafani nike wanda ba'a ciniki da farin rai*
       I am a shroud that never gets haggled over in a happy state.

(42) *Giwa nike mai halin ba'a juya ba*
       I am the elephant that never turns back.

Tamka is used considerably in the excerpts above, as can be seen in line (1), where the hero equates himself with *bakin dawa* 'a dark forest'. Equally, in line (7) he portrays himself as *garhanga*, a type of perfume that is used only when death occurs to stress an association with death as an inevitable reality for any hunter that engages him in a duel. In line (8) he goes as far as to suggest that he is a *likkafani* 'shroud', implying that anyone who challenges him to a fight will have to buy a shroud for himself. In line (42) he regards himself as *giwa* 'an elephant', one that does not back down, in order to suggest that he does not turn his back on the enemy. The *kirarin mafarauta* transcend metaphor because during performances they usually back their claims in such a way that most of what they relate can be seen as being within the realm of possibility.

Apart from these hunters directly declaring that they are something other than human beings (place, object, or animal), they also deploy some metaphors to paint a predilection (including temperament) or a physical trait. Some related examples are *babbakun ruwa* 'deadly water' and *daki-bari* 'undefeatable' (Bello & Baum 2020). The following excerpts from the *kirari* reveal this:

(13) *Ko kura tasan kada kwari yaka kwana*
       Even a hyena knows the crocodile sleeps in the valley.

(32) *Kowar raina gajere bai taka kunama ba*
       Whoever disrespects a dwarf haven't stepped on a scorpion.

In attempting to depict his temperament, the hero, in line (13), uses zoomorphism, which is a type of metaphor in which a human being

takes on the attributes of an animal – in the present case, assigning the nature of the crocodile to himself. He also suggests by that, like the crocodile that only sleeps in the valley, he only participates in dangerous expeditions. In describing his short staunch physique, he compares himself to the scorpion when stepped upon, implying that only the right response proves one's manliness.

8 Conclusion

This article discusses the nature of *farautar jarumai* in north-western Nigeria as a distinct form of hunting. It identifies *kirarin mafarauta* 'hunter's chants' as a manifest feature of this form of hunt, showing hat heroic hunting cannot be complete without it, and that a *kirari* must be performed in order for it to be fully realised. Many of the dramatic elements of *kirari* described above (in section 8) are rooted in descriptions of Western drama, but as seen in the analysis they are not the preserve of Western drama. Such features include (a) use of a stage, which in this case is the hunting ground or forests where *kirari* is performed; (b) the props, like weapons and amulets, as well the use of costumes (the latter are not purely ornamental or showy, but are made of skins of the beasts the hunter has killed); (c) dramatis personae, which include the principal hunter as well as participant hunters who perform in a heroic-hierarchical style; (d) a plot that opens with the introduction of the hero and his ancestors, paints his heroic attributes, offers an account of the violent nature of hunting, recount actual conflicts in which the hero was engaged, and then brings down the curtain with his triumph against all odds; (e) impersonation, in the way the *jarumi* 'hero' impersonates either himself while hunting, or other hunters and animals in an attempt to recount what transpired; and (f) singing and drumming that aid in proclaiming the *kirari.*

The paper also examines the poetic nature of the *kirari* through the analysis of *Saka-cira*, revealing the hunters' penchant for *koɗa kai* 'adulation of the self' which leads them to embellish and exaggerate events and compare and declare themselves to be both animate and inanimate objects. Using Malalo's *kirari* the paper has examined the kind of *yabo* found in *kirari*, and has shown that *kirarin farauta* are based on lineage, conquests, and self-praise. It reveals that, in *Saka-cira* the hunter deploys genealogy-based *yabo*, allowing him to trace

his roots with pride and to stress family and communal associations; action-based *yabo*, which using *kambamar zulaki* 'hyperbole' enables him to embellish his accounts of events and epic breakthroughs in hunting expeditions; and metaphorical *yabo* or *tamka* 'metaphor' to describe, to personify and to embellish. In conclusion, delivery or performance of *kirari* can be seen to belong in the realm of drama or theatre with metaphor as an essential mark of its poetic potential.

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Appendix

Saka-cira - **The one that causes an involuntary action**

1. *Ni ne bakin dawa mai bakin kwalli*
   I am the dark forest with a black silver-lead.

2. *Ni ne ƙanen 'Yar-mada*
   I am 'Yar-mada's younger brother.

3. *Ni ɗan malan wanda bai halin malan ba*
   I am the cleric's son that does not follow in his footsteps.

4. *Yaro baya rantsuwa da abunai*
   the boy cannot be sure of his possessions.

5. *In bai ci ba ubanai ya ci*
   If he does not use it his father will.

6. *Saka-cira, sa-cira*
   the one that causes an involuntary action.

7. *Garhanga nike, turaren maye*
   I am *garhanga*, the wizard's perfume.

8. *Likkafani nike wanda ba'a ciniki da farin rai*
   I am the shroud that never gets haggled over in a happy state.

9. *Mai saye da bakin rai*
   the buyer in a bad mood.

10. *Mai saidawa da bakar zuciya*
    the seller with dark intent.

11. *Nine radda jar gada taffaɗi*
    I outlive the antelope.

12. *Kaɗo nike baka abokin hira*
    I am *kaɗo* that doesn't befriend others.

13. *Ko kura tasan kada kwari yaka kwana*
    even a hyena knows the crocodile sleeps in the valley.

14. *Saka-cira, sa-cira*
    the one that causes an involuntary action.

15. *Muka zuwa*
    we are always ready to go.

16. *Da mu aka zuwa, da mu aka dawowa*
    it is with us they go, it is with us they return.

17. *Da mu aka zuwa wurin gumurzu*
    it is with us they go to any fierce conflict.

18. *Da mu aka zuwa, da mu aka dawowa*
    it is with us they go, it is with us they return.

19. *Ni ne inda gawar talaka da ta gada take*
    I stand tall around the dead body of the poor man and the antelope.

20. *Sannan kasa kiɗin mahaukaci kaga aiki*
    play the music of the mad man and witness valour.

21. *Innai gudu kace man shege*
    if I back down declare me a bastard.
22. *Inna waiwaya ubana goma*
    if I hesitate I am not born by one man.
23. *Saka-cira, sa-cira*
    the one that causes an involuntary action.
24. *Arna ko da mai sayen garhanga*
    is there any hero with the audacity to buy a garhanga.
25. *Arna ba'a saka ka sai an mutuwa*
    which is only used when there is death.
26. *Arna ƙarya suke manema suna*
    even heroes have failed to prove their mettle.
27. *Yaro ƙarya yake*
    you are just a pretender boy.
28. *Karya yake, wa'ar yaro*
    you are just a pretender who can't stand conflicts.
29. *Mai mutuwa ɗaya rana*
    you can't survive a day's furore.
30. *Kwana bakwai nike ana sara ta*
    I endure enemy strikes for seven days.
31. *Kwana bakwai nike ina sara wa*
    I spend seven days returning enemy strikes.
32. *Kowar raina gajere bai taka kunama ba*
    whoever disrespects a dwarf haven't stepped on a scorpion.
33. *Mu ka saran ƙato*
    it is us that strike monstrous men.
34. *Mu ka tsire hanjin ƙato*
    it is us that pierce the huge man's innards.
35. *Saka-cira, sa-cira*
    the one that causes an involuntary action.
36. *Arna ko da mai sayen garhanga*
    is there any hero with the audacity to buy a garhanga.
37. *Garhanga nike turaren maye*
    I am *garhanga*, the wizard's perfume.

38. *Arna ba'a saka ka sai an mutuwa*
    which is only used when there is death.
39. *Allah kai mu inda ba'a rabawa*
    may Allah take us to where nobody interferes in a conflict.
40. *Raban hwaɗa ka kawo raini*
    it is interference in a conflict that brings disrepute.
41. *Kowa yasan inda ya baro zomon sa*
    we all know where we belong.
42. *Giwa nike mai hali ba'a juya ba*
    I am the elephant that never turns back.

Retracing labial-velar consonants in Mbum (Adamawa): Between genetic transmission and language contact

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Abstract

Labial-velar consonants, which are typologically rather rare in the languages of the world, have been used for both genealogical and areal classification purposes. The claim that their occurrence mainly signals areal contact (e.g. Güldemann 2008), has been criticized by scholars (cf. Cahill 2017, Childs 2017) who point out a possible genealogical development in multiple language families of Africa. In this paper, we analyze contemporary and historical data on Mbum varieties from the Adamawa plateau in Cameroon and closely related languages of the Kebi-Benue family to approach the question whether labial-velars are transmitted merely through contact in these languages or warrant a genealogical explanation. The bottom-up approach leads to an interpretation of the current distribution of labial-velars that has both elements in it: There are arguments for reconstructing labial-velars for the Proto-Kebi-Benue level, but certain specifics of their geographical distribution also hint at a contact explanation.

Keywords: labial-velars, areal vs. genealogical distribution, Mbum, Kebi-Benue family

1 Introduction

Labial-velar consonants (LV hereafter) have attracted attention from Africanists for a long time. As such double articulated units are rare in phoneme systems on a global scale, their striking abundance in Sub-Saharan Africa has long been recognized. Their occurrence or absence has been used for both genealogical and areal classification purposes. The claim that they are a major diagnostic feature for areal contact on a large scale (Güldemann 2008, Clements & Rialland

2008) has recently been criticized by scholars who argue for their genealogical development in more than one of the major language families of the continent (Cahill 2017, Childs 2017) and thus taking up earlier hypotheses (Greenberg 1983, Manessy 1979). Using a very large database and generalized additive modelling, a strong counter-argument has been made by Idiatov and Van de Velde (2021), stating that LV are mostly a substrate feature and cannot be reconstructed for the languages that currently have them in their sound inventory.

In this paper we take a closer look at the distribution of labial-velar consonants on a micro level. By analysing contemporary and historical data on Mbum varieties from the Adamawa Plateau in Cameroon and closely related languages of the Kebi-Benue family, we look at possible ways to explain the current distribution of LV and take both genealogical and contact explanations into account. In the case of Mbum, the micro level approach entails a lexical data base extending over more than a century and allows to explore possibly related historical speech-group events that may have contributed to the spread of these phonemes.

To that end we start in section 2 with a brief account of labial-velar consonants in Africa and recall the theoretical positions taken to explain their occurrence in a wide variety of languages. In section 3, we present the data on LV occurrences in Mbum and related languages of the Kebi-Benue family that partly stem from older sources. In section 4, we try to make sense of the sometimes contradictory data in looking at historical accounts of the related speech groups. The findings of the paper are summarized in section 5, outlining the more general conclusions that can be drawn from our data.

2 Labial-velars as areal and genealogical features

Labial-velar consonants are characterized by a close to simultaneous double articulation on the velum and on the lips. Since the release at the velum is a few milliseconds earlier than at the lips (Cahill 2018: 152), a more appropriate label would be 'velar-labials'. They are considered a single phonetic unit and come in three different flavours: the voiced and unvoiced stops [g͡b] and [k͡p], as well as the nasal variant [ŋ͡m]. Besides, there are the closely related velar stops, where the labial component is analyzed as a secondary articulation. They are either noted as [kʷ/gʷ] or [kw/gw] and are often understood as

an intermediate developmental step between the double articulation and the plain stop.

The occurrence of LV as phonemes is often considered an African phenomenon with just a few exceptions in New Guinea (Maddieson 2013). Their frequent occurrence and distribution pattern across several language families in central Sub-Saharan Africa in combination with the supposed scarcity outside of Africa made LV a strong candidate for a diagnostic criterion concerning the contact-induced and geographically defined Macro-Sudan belt (MSB) (Güldemann 2008: 157) as well as the Sudanic belt (SB) (Clements & Rialland 2008).

This view of labial velars as a main phonological feature of linguistic areas and concomitant language contact has been challenged recently. Cahill (2017: 20) argues that labial-velars "in Africa arose from sound change in several dozen languages (or proto-languages), from language contact in several dozen cases, and from genetic inheritance in several hundred languages". In his private database Cahill (2017: 14–15) also finds a much wider distribution of the phonemes extending to Asia, South America and a few other places. Even though the overwhelming majority of languages displaying LV in his data still concentrate in the MSB-area, for him, the argument of an unusual feature that cannot be explained genetically or through internal development accordingly does not hold for LV. To be fair, it also has to be stated that later conceptualizations of linguistic areas in general and the MSB in particular, understand feature development as the result of 'multiple causation' where genetic inheritance and areal contact explanations combine (Güldemann 2018: 496–497). Cahill's (2017: 13) remark that proponents of areal explanations would assume that LV "are uncommon and largely arise through language contact" is thus invalidated.

Childs (2017: 294) supports Cahill's view in rejecting the "circumstantialist" approach to the definition of linguistic areas which does not "eliminate chance, universals, possible undetected genetic relationships, or internal developments/convergence as explanations". He promotes a 'socio-historic' approach that also considers the nature of the interaction between speakers of different languages which is often missing for areal explanations (Childs 2017: 294–295). Again, one has to add following Güldemann (2018: 497) that such a claim is at times unrealistic. An appropriate socio-historic scenario for feature transmission along both lines of explanations, i.e. con-

tact and genealogical inheritance, may be difficult to obtain. Given the scarcity of historical records and reliable sources for even quite recent times in Africa, such scenario reconstructions for an area like the MSB or a proposed genealogical unit like the Adamawa languages are just not feasible.

So a pertinent question is how these consonants behave in different families and groups in order to understand whether and how they lend themselves to a contact and/or genealogical explanation. Relying on a very large lexical data base, Idiatov and Van de Velde (2021) use advanced statistics and generalized additive modelling to understand the exact repartition and possible developments of LV in the languages of Northern Sub-Saharan Africa (NSSA). They establish that there is an expressive element to this phonological unit, as LV are more often found in expressive parts of the lexicon than anywhere else (Idiatov & Van de Velde 2021: 77–80). This adds to the main finding of their work, namely that LV are concentrated in three separated zones that can be equalized with retention zones for speakers of languages that came under external pressure in the more easily accessible parts of the NSSA spread zone (Idiatov & Van de Velde 2021: 94–96). Judging from the current repartition of language families and groups, Idiatov and Van de Velde (2021: 97, 103) infer that "chances are very high that LV stops [...] originated in a language family or families that have disappeared today", which also implies that LV stops were not part of the phoneme inventories of the proto-languages of the families currently attested in NSSA.

Mbum, the Adamawa language in the centre of this paper, is actually located in what is named the Cameroon Gap between the Lower Guinea hotbed and the Ubangi Basin hotbed of LV occurrence by Idiatov and Van de Velde (2021: 82). It is therefore particularly interesting to compare the findings from the micro level with their macro level approach.

3 Labial-velars in Mbum and related languages

Mbum is a language of the Kebi-Benue family within the Adamawa pool[1] of languages. In the following, we first present contemporary

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    1 In his comprehensive overview of languages and linguistics in Africa, Gülde-mann (2018: 200) refers to the Adamawa group as "a highly diverse genealogical pool of Niger-Congo languages". This nomenclature reflects the fact that such classi-

data on labial-velar consonants which comprise quite recent work but also take linguistic descriptions into account that date back to the 1970s. As Mbum-speaking people have been of interest to the German colonial administration there is also a wealth of language data dating back to the late 19th and early 20th century that we present subsequently. In order to also include at least some comparative data above the dialectal level, we also look at some of the closest relatives of Mbum in the Kebi-Benue family and the occurrence of LV there. An informed guess about the proto-status of LV in this family closes this section.

3.1 Labial-velars in contemporary Mbum

LV have been reported in several publications on Mbum. Hagège's (1970) study of the Mbum variety of Nganha (some 60 km northeast of Ngaoundéré, see Figure 1) lists the labial-velar stops /k͡p/, /g͡b/, and the prenasalised version /ng͡b/ as part of the regular consonant inventory.
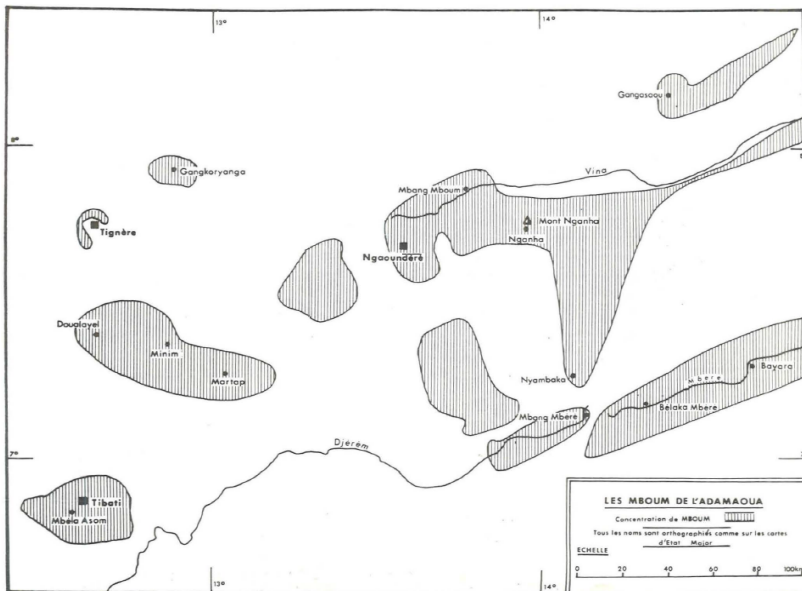
Figure 1. The Mbum varieties on the Adamawa plateau (Hagège 1970: n.p.)

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ficatory units are not well-established genealogical lineages or entities (Güldemann 2018: 82) like for instance the Kebi-Benue family within this pool. In the present paper, we adapt our nomenclature to Güldemann where appropriate.

In the extended word list *Français-Mbum* by Fløttum (1974) all three versions of LV can also be found; And in a more recent publication from Ngaoundéré by the *Association des Mboums autochtones du Cameroun* (Mamoudou et al. 2018), all three labial-velars also figure prominently. The following examples of LV in the three publications can be found among many others:

Table 1. Labial-velars in three published sources on Mbum

	Hagège (1970)	Fløttum (1974)	Mamoudou et al. (2018)
/k͡p/	k͡párá 'oyster' k͡pútúk 'over-weight'	k͡póŋà 'power' k͡pírìm 'intact'	k͡párká 'age' k͡pórò 'left'
/g͡b/	g͡békè 'demolition' g͡bárá 'needle'	g͡bónà 'bark' g͡bàkàr 'to camp'	g͡báí 'to hit' g͡bímí 'hippopot-amus'
/Ng͡b/²	ng͡bérè 'frog' ng͡bólòŋ 'ditch'	ŋg͡bàm 'to unnerve' ŋg͡bándá 'youth'	ŋg͡búrà 'to open' ŋg͡bór 'street, pas-sage'

While all three sources illustrated in Table 1 thus support the occurrence of LV stops in general, there are some differences. The prenasalised labial-velar stop figures as /**n**g͡b/ in Hagège's (1970: 30) phoneme inventory while in Fløttum (1974) the nasalisation is always rendered with the velar nasal /**ŋ**g͡b/. A transcription error may be excluded since Hagège (1970: 38) differentiates between the nasals /n/ and /ŋ/ in other lexemes, e.g. *ngàŋ* 'peau (skin)'. Due to the temporal proximity of the publications by Hagège (1970) and Fløttum (1974), one might therefore assume a dialectal or idiosyncratic variation. In the dictionary from Mamadou et al. (2018), the prenasalised LV is also written with a preceding velar nasal.

Additional contemporary material on Mbum comes from field data recorded in Ngaoundéré from 2018 to 2021 among young urban speakers of Mbum.[3] A comparison of the data from the literature with our field data is given in Table 2:

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2 /N/ denotes an unspecified nasal consonant.

3 The Mbum data stem from the first phase of the DFG-funded project "Language use and linguistic variation in urban multilingual professional networks in Ngaoundéré (northern Cameroon)". Most data were collected by Beyer during field trips from 2018 to 2020. With two of the six Mbum speakers Kunzmann has estab-

Table 2. Comparison of published and field data

	Hagège (1970)	Fløttum (1974)	Mamoudou et al. (2018)	field data (2018–2021)
/k͡p/				
'hoe'	k͡pà	k͡pâ	k͡pã̀	
'oyster'	k͡párá	k͡pârâ	k͡pãrã̀	
'power'		k͡pɔ́ŋà	k͡pɔ́nà	k͡pɔ́ŋà/pɔ́ŋà
'short, small'	k͡pérkém	k͡pútúrú	k͡pútúrú	nɟíkí
'yam'	k͡péî	k͡péî	k͡péí/k͡póî	
'elder'	k͡párká	k͡párká	k͡párká	párká
'left'		k͡pórò	k͡pórò	pòrò
'intact, pure'	k͡pírím	k͡pírìm	k͡pírìm	
/g͡b/				
'bark'		g͡bó	g͡bónà	g͡bó
'excrement'		ɓâr	ɓâr	g͡bárà/g͡bár
'camp'	g͡bákàr	g͡bakar		
'destroy'	g͡békè(r)	g͡bèkèr/ g͡bèsek	g͡bèkèr/g͡bèsek	
/ng͡b/				
'voice, tongue, language'	ng͡bôk	ŋg͡bôk	ŋg͡bôk	mbók
'take, catch'	ng͡bá/ɓaŋ	ŋg͡bá/ɓaŋ	ŋg͡bánà	ng͡bá(N)/ mbá

While the published sources clearly attest LV-occurrence in the respective varieties, the Mbum of young speakers in Ngaoundéré shows signs of attrition of this phoneme. Although only a few young urban Mbum have been analyzed according to their use of LV so far, we can already detect some general tendencies. The attrition of /k͡p/ to a mere unvoiced labial plosive is probably due to the fre-

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lished communication channels via internet, which we exploited during the pandemic as traveling to Cameroon was not possible for several months. On-site field research will be resumed with the start of phase II of the DFG-project.

quent perception of /k͡p/ as a /p/. On a historic level this is "largely responsible for the sound change *K͡P > P being much more common than *K͡P > K" (Cahill 2018: 153). The voiced onsets, however, display less clear cases of attrition. There seems to be some confusion with the implosive voiced bilabial /ɓ/[4] and the prenasalised bilabial (cp. Table 2, 'excrement', 'take, catch'). A case in point showing the general attrition tendency is the word for 'tree, wood' (see Table 3). While the written sources have /k͡p/ as onset, four speakers (here identified by their initials) of the young urban group reduce it to /p/ while one uses another lexeme, *di* from the Mbum Perre variety:

Table 3. Labial-velar attrition with young speakers in Ngaoundéré (cf. k͡pù in Hagège (1970), Fløttum (1974) and Mamoudou et al. (2018)

	YS	AO	SM	YM	HF
'tree, wood'	*pù*	*pù*	*di* (Mbum- Perre)	*pù*	*pù*

Another puzzle is that the data Mamoudou et al. (2018) compiled in Ngaoundéré displays nearly the same amount[5] and distribution of LV as the two publications from the 1970s. In other sources from Ngaoundéré (i.e. Boyd 1974 and our field data), LV are far less prominent. An explanation would be that two of the four authors of Mamoudou et al. (2018) grew up in Nganha and the other two in more southerly regions (from around Tibati) where LV are still pretty much alive (see also section 4 below). Contrary to that, the speakers from our ongoing research are connected to far more heterogeneous and multilingual social networks and therefore adapt to a more diffuse version of Mbum (Beyer 2022). Most of these young urbanites have also passed at least half their lives in Ngaoundéré and, consequently, have not been exposed to the possibly more conservative up-country varieties for very long. In addition, the difference in purpose between the two data sources is apparent: while our ongoing research aspires to detect phonological variation through empirically observed and meticulously transcribed language data, Mamoudou et al. (2018) are

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[4] A familiar phenomenon found in many other languages with LV (Cahill 2018: 151, 152).

[5] Hagège (1970: 47) gives an idea about the frequencies of these phonemes compared to simple labial and velar consonants: "[…] sur l'ensemble de monèmes à l'initiale bilabiale, vélaire et labio-vélaire […] en rencontre 15% de p, 18% de b, 16% de k, 16% de g, 18% de kp, 17% de gb".

more interested in language standardization and koineization, and possibly take the more prestigious version of Nganha as a blueprint.

However, that the voiceless /k͡p/ is articulated in today's Mbum of Ngaoundéré as a simple /p/ is also apparent in some entries in Mamoudou et al. (2018). Sometimes two versions for one and the same gloss are given: 'force' *k͡pónà ~ póŋà*, 'left side' *k͡póró ~ póró*, 'tree' *k͡pù ~ pù*. There is also one example where /k͡p/ varies with /k/: 'thirst' *k͡pók-mbì ~ kó mbì*.

3.2 Colonial sources

The picture gets even more complicated when one considers older sources, which is in fact possible in the case of Mbum. Together with other languages, Mbum received substantial attention from German colonial administration and early researchers (e.g. Heinrich Barth and Adolf Overweg, cited in Duisburg 1925: 133), so that we have sources on the language dating back into the 19th century. In Duisburg (1925: 159) we find the entries for the gloss 'Baum' ('tree'), as depicted in Table 4:

Table 4. The entries for 'tree' in several varieties a) and sources b) of the late 19th and early 20th century (Duisburg 1925)

a)

Mbum-Perre	Mbere	Mbum
dị	*dị*	*pụ*

b)

Thiel (unpubl.)	Dühring (unpubl.)	Strümpell	Overweg
mbu	*pu*	*pĕgi*	*pū*

Duisburg adds unpublished sources of his time where the entries for 'tree' do not show the LV-onset either. Unfortunately, the exact locations and varieties referred to in these sources are unclear. As a matter of fact, in Duisburg's (1925) own data no LV are listed at all! The same observation holds for the even older compilation of Adamawa languages from 1910, in which Strümpell lists the entries for 'tree' (cp. Table 5) for some Kebi-Benue languages (as far as we could identify them comparing it with Boyd's classification (Boyd 1974, 1989)):

Table 5. Lexemes designating 'tree' in various languages of the Kebi-Benue family according to Strümpell (1910)

Jassing (Ngoum?)	Mangbai	Dama	Lakka	Mbere	Mbum
pu	*bēga*	*pĕgi*	*pū*	*di*	*pû*

One could multiply such entries where the older sources do not display LV while the younger authors list them (cp. Table 6):

Table 6. Older sources without labial-velars where modern authors have them

	Strümpell (1910)	Duisburg (1925)	Fløttum (1974)	Mamoudou et al. (2018)
'buffalo (Büffel)'	*pĕrrĕ*	*pérę̆*	*k͡péré*	*k͡péré*
'hippopotamus'		*bĭmĭ/bĕmę*	*g͡bémé*	*g͡bímí*
'needle'	*ssānă*	*sānā*	*g͡bara*	*g͡bárá*
'left'		*poro*	*k͡pórò*	*k͡pórò*
'passage'		*boro*	*ng͡bóró*	*ŋg͡bór*
'catch, take'		*mbā*	*ng͡bá*	*ŋg͡bánà*

From such a comparison one might infer that either some hundred twenty years ago LV were not present at all in Mbum and its close relatives, or that the authors just did not hear the double articulation because they were not sensitive to this kind of complex consonants from their own linguistic backgrounds.

On the other hand, when one looks at the comments and the generally fine-grained phonetic transcriptions employed by the authors, it is hard to believe that they missed labial-velar sounds all together. For instance, Duisburg (1925: 134) and Tessmann (1930: 55) cite Westermann (1911, 1927) as reference for transcription and analysis of language data, which may be considered the "gold standard" of that time.[6]

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6 Duisburg (1925: 133–134) also reflects on some onset variation in the language name of the most southern language variety and states that he explicitly tried to figure out whether there is a [ke] or even a [te/i] in the onset (as some other sources state). It is finally transcribed as Pɛ́rɪ by him, whereas it is referred to as Kpere [sic] in Boyd (1989). This seems to indicate his phonetic awareness and skill for fine-grained transcription.

3.3   Labial-velars in Kebi-Benue

The Kebi-Benue family within the Adamawa-pool is the classificatory home of the Mbum language. Elders (2006: 48) states that the LV stops /k͡p/, /g͡b/ and the prenasalised /ng͡b/ (but not the labial-velar nasal /ŋm/) are frequent in all languages of the family – except for Tupuri – and thus also in Mbum. However, while the authors from the influential book on the linguistic geography of Africa (Heine & Nurse 2008) acclaim LV as a strong diagnostic feature for areal contact, Elders is not taking this view explicitly. Cahill (2018: 156) considers the Adamawa-Ubangi family as "promising for reconstruction" of LV in showing that only one sub-branch of Adamawa and one of Ubangi lack these phonological units in most of their languages. Thus, chances are high that genetic inheritance of labial-velars also plays a role in Kebi-Benue and its sub-groups (Northern, Central, Southern).

For a well-founded assessment of the historical development of LV in Mbum we thus need to evaluate the possibility of genealogical inheritance of labial-velars in Mbum and related languages. To that end, we first consult Boyd's (1974) comparative study of the Lakka-languages that were later called Mbum group (Boyd 1989) and are nowadays known as the Kebi-Benue group (Elders 2006) or family (Güldemann 2018: 209) of the Adamawa pool. As far as we know, Boyd (1974) was the first attempt to reconstruct a proto-system for one of the Adamawa language families (see Figure 2). The specific family of our interest is number *6. Mbum* below, where the numbers of the sub-groups refer to the classification of Greenberg (1963). Extract (2) in Figure 2 displays the internal grouping where the eponymous Mbum-language and its closest varieties are placed in the Southern branch.

(1) Classification of Adamawa-Ubangi (Boyd 1989a)

(2) Mbum group (Boyd 1989a)

Unclassified languages: Pondo, Gonge, Tali, Dek
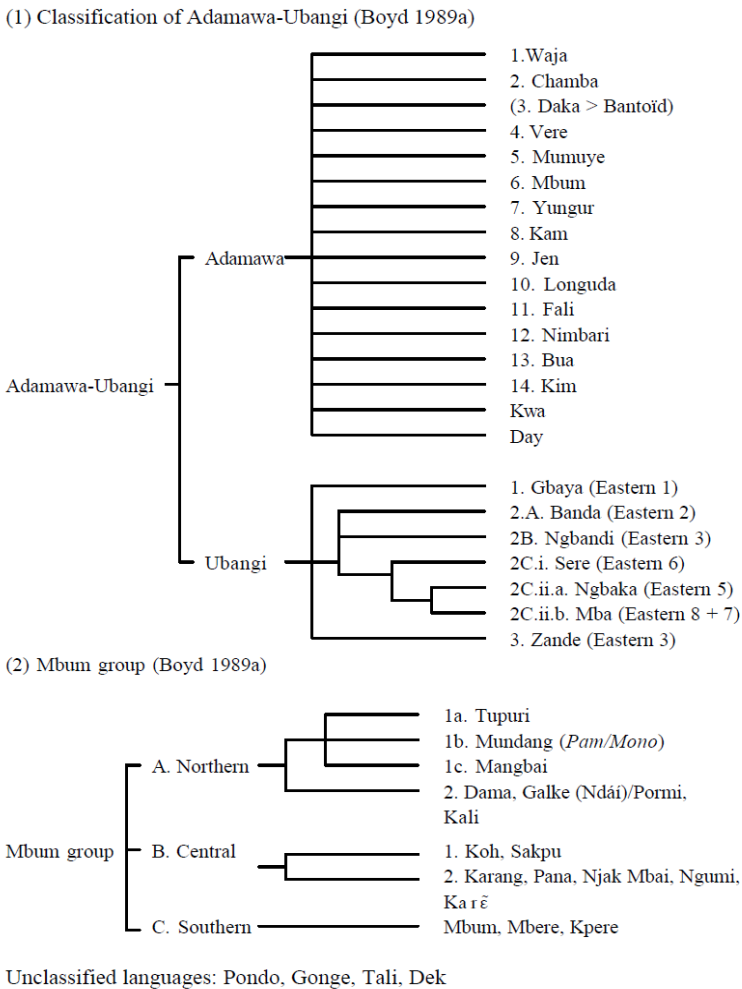
Figure 2. Classification of Adamawa-Ubangi (1) and internal classification of the Mbum group (2) (Boyd 1989 as cited in Elders 2006: 40)

In Boyd's (1974: 18) comparative study, the Kebi-Benue family is treated under the label "lakka", a somewhat diffuse exonym that Fula-Speakers used for some ethnic groups in the region of Rey Bouba (~200 km northeast of Ngaoundéré close to the border with Chad, see Figure 3).
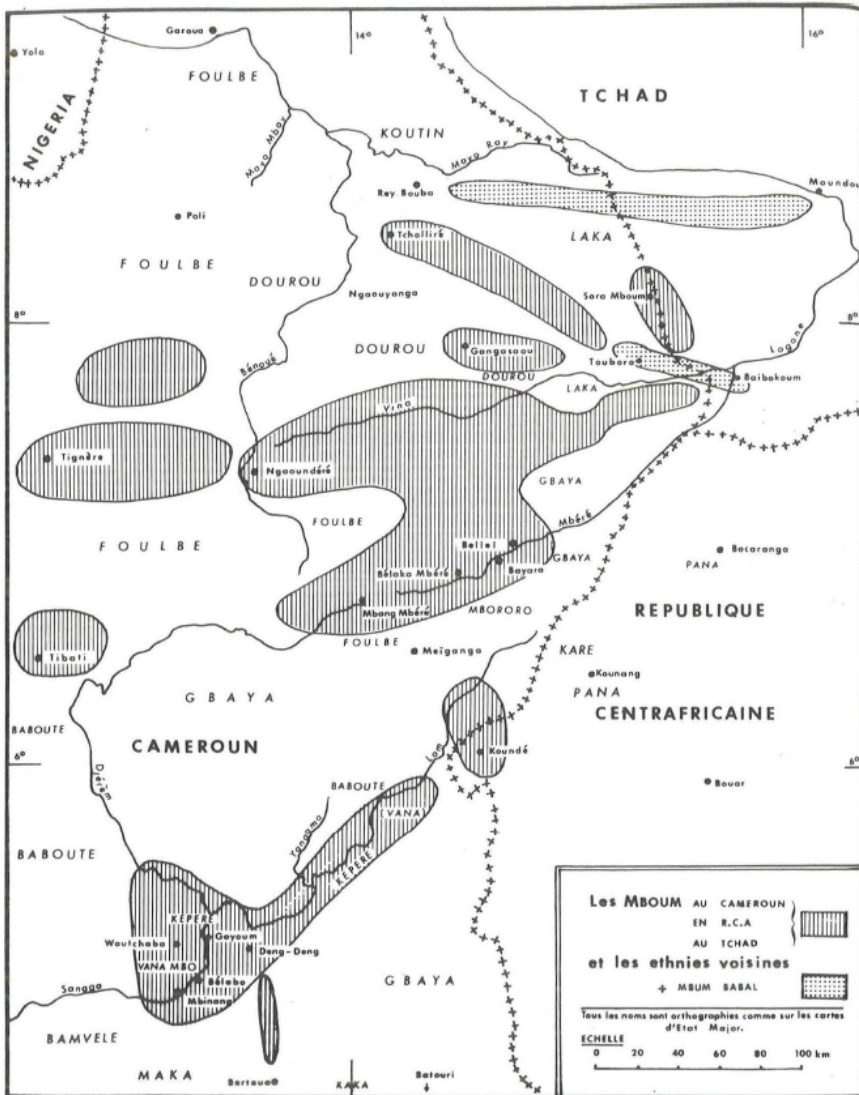
Figure 3. The southern Kebi-Benue languages (Hagège 1970: n.p.)

In this study, Boyd (1974: 27) uses the name for the whole family and tries to reconstruct what he calls a "'lakka' commun" (abbreviated "lc"). The comparative series comprises data for most of the languages from his later Mbum group (cp. Figure 2), except for Tupuri from the Northern branch and Kpere from the Southern branch. In addition, he collects data from the Vere group (called Dourou within

Adamawa by Greenberg (1963)) to provide higher order comparison and sets out to reconstruct a "langue-mère du 'lakka' commun et du dourou" (Boyd 1974: 27) (abbreviated "L$_2$").

The language data Boyd presents were mainly collected by himself within the project "Linguistic inventory of Cameroon" at the University of Yaoundé in the years 1973 and 1974, by using a word list of 220 glosses, each accompanied by a phrase for contextualization (Boyd 1974: 15).

Apparently, his comparative word lists were already partly finished when he added the data from 1974. This explains the somehow confusing presentation of his data, where the representatives of his supposed sub-group Lakka and data from parallel groupings are mixed up while important languages for the reconstruction (Mundang, Mbum) only figure below the hypothetic proto-phonemes and sometimes do not seem to corroborate them (Boyd 1974: 63ff.; also compare the critique in Güldemann 2018: 202).

His main locations for data collection on the Mbum language were the cities of Ngaoundéré and Tcholliré, and – for the Mbere-variety – along the upper parts of the river Mbéré, some 100 km southeast of Ngaoundéré (Boyd 1974: 18; see Map 1). With regard to the appearance and possible reconstruction of labial-velar consonants from his data, we can state the following: the comparative series 150–156a (Boyd 1974: 82–83) provides evidence for the postulation of initial labial-velar consonants in both 'lakka' commun and the hypothetical higher order proto-language L$_2$ (Boyd 1974: 33, 38). While the voiced and unvoiced versions are well supported by the data, the prenasalised /ng͡b/ is only substantiated with a relatively weak comparative series (156 and 156a). *ng͡b is therefore only postulated for symmetry reasons in lc (Boyd 1974: 32) and considered a free variation in L$_2$ (Boyd 1974: 37).

The overall picture emerging from Boyd's data thus hints to labial-velar consonants being part of the proto-Kebi-Benue phoneme inventory, a claim that is also supported by Elders (2006: 48). The additional Dourou data in Boyd (1974) clearly do not provide enough evidence for reconstructions on the proto-level of the whole Adamawa pool or even some intermediary grouping.

Looking at Boyd's (1974) comparative series more closely we find that none of his entries for the Southern languages Mbum ~ Mbere show any labial-velars at all (Boyd 1974: 82–83). This is all the more

astonishing as the other sources from that period (i.e. Hagège 1970 and Fløttum 1974) display LV where Boyd does not have them. In Table 7 we reproduce all entries for the southern Kebi-Benue languages from Boyd's comparative series and contrast them with the data from the other two sources of that time. Because in Boyd's compilation data for the third language in the southern branch, namely Kpere (aka Gbete), are missing, we also add entries for this relying on Duisburg (1925), who has mainly collected his data from this most southern language of the Kebi-Benue group. The last column displays Boyd's (1974) reconstructions of his "'lakka' commun". Concerning these reconstructions, one must keep in mind that they reflect all languages of the Kebi-Benue group whereas in Table 7 we only reproduce Boyd's data for the Southern branch. That is to say that data from the Central and Northern branch are mainly responsible for Boyd's starred forms. At least for the unvoiced LV, the data from Hagège (1970) and Fløttum (1974) support Boyd's reconstruction of *kp* where his own data do not.

How, then, can we explain the mismatch concerning the /$\widehat{kp}$/- sound between the authors who collected the data at around the same time and in places commonly considered to be part of Mbum's core-area? This stretches roughly from Tibati[7] (Fløttum 1974) via Ngaoundéré (Boyd 1974) through Nganha (Hagège 1970) to the north-easterly regions of Tchollire (Boyd 1974). Duisburg's data (1925) from the southwest, although collected some 50 years earlier, generally support Boyd.

We also see that despite the relatively numerous instances of /$\widehat{gb}$/ in Hagège (17% of all labial, velar and labial-velars, cp. footnote 2) and Fløttum there are no matches with Boyd's comparative series for the reconstruction of *$\widehat{gb}$. It seems as if the Mbum varieties of Tibati and Nganha reflected in Hagège (1970), Fløttum (1974) and Mamoudou et al. (2018) stick to the Kebi-Benue proto-system in the

Table 7: Comparative series in Boyd (1974: 82–83) contrasted with other authors

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7 Sverre Fløttum also published a Mbum-English vocabulary in 1960. An earlier version of this had already been published in 1957 by the "Mission protestante norvégienne" in Tibati some 200 km southwest of Ngaoundéré (cited in Barreteau et al. 1993: 69). This leads us to infer that Fløttum has mainly worked on this southwestern variety of Mbum. Unfortunately, we do not have access (yet) to neither the 1960 nor the 1957 publication.

comp. series: glosses	Hagège (1970): Mbum (Nganha)	Fløttum (1974): Mbum (Tibati)	Boyd (1974): Mbum (Tcholliré, Ngaoundéré) Mbere (upper Mbéré river)	Duisburg (1925): Kpere = Pễrễ (Yoko, Dengdeng)	reconstruction in Boyd (1974): 'lakka' commun
150: 'left hand'	-	k͡pórò	póro	(ndǒk) pǫró	*k͡p/g͡b(ng͡b)(ɛ, ɔ)-t
151: 'tree, wood'	k͡pù	k͡pù	pù	di/pù	*k͡pà (-k)
152: 'elder person'	k͡párká	k͡párká	parka/pok-ri	párka	*k͡p/g͡bɔk
153: 'to beat'	-	ndǎk	ʋa	vǎ	*g͡ba(l)
154: 'to throw'	vi	hvú	ʋu	-	*g͡bu
155: 'ten, twenty'	ɓôn	ɓǒ	bǒ/bòn	bō; bō ndǒa	-
155a: 'path'	-	mǎǎfíl	-	mǎfụl; mbụ̃ro	-
156: 'to scratch'	ngúá	-	mbana	-	*k͡p/g͡b/ng͡ban
156a: 'big, large'	-	hụ̃ndǎké	-	hụn	*ngo

case of /k͡p/-onsets. As for /g͡b/ and /ng͡b/, these Mbum-varieties seem to have reinvented the /g͡b/-phoneme and employ lexemes that show this onset where others do not.

A short comparison of the /g͡b/-varieties with data from the older sources confirms this (Table 8). As further lexical sources of that time other than Boyd are scarce, we return to the colonial authors who unfortunately do not have many cognates for the relevant lexemes. However, even the short list in Table 8 shows that /g͡b/ and /ng͡b/ are much more prominent there than in all other Mbum varieties:

Table 8. The two /g͡b/-varieties contrasted with colonial sources on Mbum

	Hagège (1970) Nganha	Fløttum (1974) Tibati	Mamoudou et al. (2018) Nganha & Tibati	Duisburg (1925) Strümpell (1910)* Tessmann (1930)**
'take, catch'	*ng͡bá/ɓaŋ*	*ŋg͡bá/ɓaŋ*	*ŋg͡bánà*	*baŋ* *băn/ng͡bà***
'dig (open)'		*ŋg͡búnàké*	*g͡búrà*	*daŋ*
'open'	*ng͡bùr*	*ŋg͡bù*	*g͡békà*	*tŭr***
'sing'		*g͡bó siŋ*	*g͡bónà siŋ*	*dina schin(g)* *dí si̱ṉ***
'surprise'	*g͡bór(ók)*	*ŋg͡bá*	*g͡bórók* ('suddenly')	-

4 Labial-velars in Mbum reconsidered

The above described state of affairs leads to several interrelated questions:

a. Given the possibility of LV being part of the proto-inventory of Kebi-Benue, what happened to them in the southern sub-branch of this family?
b. What would be a probable socio-historical scenario that accounts for the uneven distribution of LV in this branch and among the different Mbum varieties?
c. What does this tell us about the diagnostic value of LV in general?

Starting from the assumption that LV existed in the ancestor language of the Kebi-Benue family, the early sources without LV would be either marked as unreliable in this respect or one would assume some specific internal attrition process in at least some varieties of the southern branch. Even if we would assume that the early German authors had difficulties to identify these complex phonemes, this would not explain their absence in Boyd's data and the fact that the voiced LV data from Tibati and Nganha do not match at all with the rest. Additionally, the discrepancy observed between the contemporary literature on Mbum of the last 50 years (except Boyd 1974) and the current young speakers' version of it in Ngaoundéré would nourish a contact explanation due to the special sociolinguistic situation of the urban speakers.

Another possible answer to a) would take the authors from the beginning of the 20th century (Strümpell 1910, Duisburg 1925) seriously and neglect LV as a part of the proto-inventory of the southern Kebi-Benue group all together, thereby also accounting for Boyd's (1974) data. However, that would warrant a different explanation for their existence in the Nganha and Tibati varieties.

Moreover, the even more specific puzzle of the /g͡b/-varieties strongly hints to a contact scenario in which these varieties kept or reinvented labial-velar sounds that have long been lost in other varieties. While /k͡p/ in these regional dialects may well be a retention from Proto-Kebi-Benue, the /g͡b/-onsets mostly cannot be explained with a preservation of the proto-system in this respect. It seems like the speakers of the /g͡b/-varieties use different lexemes with this specific onset that are not so common in the rest of the Mbum-continuum.

Given the strange pattern, with Tibati and Nganha holding on to a group of phonemes that do not figure in the other varieties and languages of the southern branch, a probable socio-historical context may be found in a specific regional pattern of socio-political domination. Such a context is related to the Fulani intrusion in the Adamawa plateau from the beginning of the 19th century onwards (Mohammadou 1978).[8] Fulani first migrated into the region to pasture their cattle on the rich soil of the plateau and lived alongside

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8 In how far the German (1884–1919) and French (1919–1960) colonial occupation had an impact on such dialectal variation is difficult to fathom, but an informed guess would be that it was less operative on the phonological level of the indigenous languages and varieties.

the Mbum. The latter were present in the area at least since the 17th century and had formed a vast kingdom with a federal structure. The local *Belaka* (head of a Mbum fraction) allowed the arriving Fulani to settle down and they founded the city of Ngaoundéré. As time passed, more Fulani arrived, and the socio-political climate changed. The emerging conflict led to a battle between Mbum and Fulani at Ngau Kor in 1830, in which the Mbum were defeated by the Fulani army of Ardo Njobdi (the first Fulani ruler of Ngaoundéré) and two allies. However, after this defeat, the Mbum in and around Ngaoundéré came to an understanding with the newly installed Fulani rulers who agreed to always intermarry with at least one autochthonous woman (Markgraf 2017: 94–95).

So while Ngaoundéré and the surrounding region came to some sort of cohabitation and understanding with the Fulani, Nganha kept its status as cultural centre of all Mbum. Until today, it is considered a stronghold of Mbum culture and language, generally less influenced by the Fulani domination. One could thus explain the extended /k͡p/ use in the Nganha-variety as some kind of identity preserving linguistic marker that was not given up easily. The voiced /g͡b/ seems to have been reintroduced via loans from the central and northern Kebi-Benue groups.

Tibati was also under the domination of Fulani rulers.[9] But contrary to the understanding reached in Ngaoundéré, the Mbum of Tibati were never integrated into the Fulani ruling system. So they, just like the speakers from Nganha, may have expressed their challenged ethnic identity through the LV as identity marker, a phoneme not known to Fula-speakers at all. As conjectural as this speculation might be, it seems a possibility to explain why and how these two dialects of all Mbum varieties have kept LV in their phonological system, while all other varieties including that of Ngaoundéré did not hold on to them.

Turning to question c) on the diagnostic value of labial-velars for areal contact, the answer is two-sided. According to our findings, the feature cannot be solely attributed to contact. The evidence strongly hints to a genetically transmitted feature that was present in Proto-Kebi-Benue. But as the case of the Nganha- and Tibati-varieties stands, LV phonemes may also be prone to social identity and status

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9 One of the allies in the battle of Ngau Kor was the Fulani ruler of Tibati, Ardo Hama Sambo.

marking and thus may have been preserved or even reinvented. The possibility of a socially motivated reintroduction of the voiced /g͡b/ onsets from sources outside Southern-Kebi-Benue still fosters the areal contact explanation.

So the micro-approach to the current distribution of labial-velars in the Mbum area suggests multiple causation driven by socio-historic speech-group events some two hundred years ago in combination with genealogical inheritance of this linguistic feature.

5 Preliminary Conclusion

The micro-perspective on labial-velar onsets in the varieties and lowest level relatives of Mbum reveals a much more heterogeneous picture than one would assume by just looking at general overviews and large-scale comparisons. For the Kebi-Benue family it seems safe to say that LV can be established for the proto-system. Whether this holds for even deeper layers of reconstructed proto-systems – maybe even for the Adamawa pool in general as suggested by Cahill (2017: 22–23) – has yet to be shown.

However, the closer look at LV in Mbum-varieties and Kebi-Benue languages also exemplifies how these phonemes are prone to socially induced manipulation. The proposed scenario of identity-marking with LV yields a plausible explanation for their distribution in contemporary languages and varieties which dates back some two hundred years or so. This also leads to the assumption that, in principle, any social circumstances may have led to a transfer of LV between (proto-) languages and varieties 2000 years ago. The problem is that the further back in time we go, the blurrier gets the picture we can paint of suitable sociolinguistic scenarios to support a contact or genealogical thesis.

For the question at hand, whether the Adamawa pool as a whole or some lower-level parts of it acquired LV via contact within the Macro-Sudan belt, a well-founded answer is quite difficult to give with certainty. The statistic modelling presented by Idiatov and Van de Velde (2021) provides us with some more clues. Their analysis of the frequencies of labial-velar consonants adds some detail to the already known presence of LV in the MSB and in NSSA in general. The Kebi-Benue family of languages is situated at the most western fringe of what they call Ubangi Basin hotbed, where the frequen-

cies of LV trickle out to nearly zero (Idiatov & Van de Velde 2021: 81–82). Their historical interpretation of these facts sees originally Savannah-based populations push south along ecological pathways that matched their former habitat. The low frequencies of LV in the languages of these zones are understood as substrate effects due to borrowing and contact with languages that had them but that only survived in the retention zones of the hotbeds (Idiatov & Van de Velde 2021: 95–97)

In the Cameroon Gap, the latest of such proposed movements of Savannah populations is represented by the southward Fulani expansion. But it is by no means excluded that others came before them who at one point in time added LV to their phoneme inventory. It is also quite natural to think of some proto language that acquired these phonemes and then continued its genealogical development passing on these sounds to their daughter languages.

We think that chances are high that LV in the Kebi-Benue family are a genetic feature handed down to the current languages. They may have been acquired through contact from "Primary LV Populations" (Idiatov & Van de Velde 2021: 96) and later, in the case of the Tibati and Nganha varieties even reached the status of identity marking features. Such a chain of events is hard to prove but highly probable and fits a multivariate understanding of linguistic areas in general (Güldemann 2018: 496).

Clearly, the chances of finding suitable speech-group scenarios and concomitant sociolinguistic contexts decrease the deeper we delve into the past, and with it evidence supporting the view of multiple causation for any given feature. But our micro level case study, which examines a rather short period of time, may be in principle extrapolated to recurring situations in the deep history of language families and linguistic areas.

Diacritics (as found in the early sources)

¯	long vowel
.	tensed vowel
V̲	open vowel
k̲	barely audible [k]
ṅ	velar nasal [ŋ]
v̂	bilabial vibrant (or labio-dental) (Boyd 1974: 22)
å̇	significance unclear (Boyd 1974)

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Moraic mismatches in Somali phonology: coda consonants reconsidered[1]

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Abstract:
This paper reconsiders the moraic status of coda consonants in Somali. It is argued that Somali joins a growing list of languages presenting a challenge to the Moraic Uniqueness Hypothesis. Several phenomena are explored that suggest that Somali exhibits moraic mismatches whereby moras associated with segments of different types contribute to, or "count" differently for particular phonological processes. Evidence in support of this proposal is drawn from the literature on tonology and poetic metrics, but also from word shape and minimality requirements, and from the distribution of syllable shapes of different types in Somali words. It is argued that an approach to Somali phonology that permits reference to moras associated with different segment types offers a unified and more transparent account of the language's segmental and tonal phenomena. Notably, such an approach precludes the assumption of "early" coda consonant moraicity followed by a global dissociation of consonantal moras by rule before high tone assignment, as argued for in earlier work. The findings presented here illustrate that standing points of view on the role of the mora in Somali phonology must be reconfigured.

Keywords: moraic phonology, tonology, gemination, Cushitic, Somali

1 Introduction

That the mora plays a role in Somali phonology is well-established, at least to the extent that the mora governs the location of high tone assignment in lexical items like nouns and verbs. High tone is assigned to the final or penultimate mora of these and other lex-

ical bases (Banti 1988a; Hyman 1981) though its distribution is less straightforward for multimorphemic words (Green & Morrison 2016, 2018) and in instances of subject marking. So, too, has the mora been invoked in motivating the distribution of syllables with short vs. long vowels in the templatic structure of different poetic genres. Establishment of mora-sized units as the key functional units of Somali poetry is attributed to Maxamed Xaashi Dhamac and Cabdullaahi Diiriye Guuleed, with notable linguistic studies on Somali poetic metrics referencing the mora including Andrzejewski (1982) on *gabay*, Andrzejewski & Lewis (1964) on *masafo*, Orwin (2001) and Orwin & Maxamed Xaashi Dhamac (2010) on *jiifto*, and Banti & Giannattasio (1996), which analyzes several poetic genres. See also discussion in Johnson (1979, 1984).

While Somalists agree that vocalic moras "count" in the phenomena mentioned above, the role of consonantal moras in the language's phonology remains a matter of uncertainty, or better yet, apparent inconsistency. This inconsistency is clearly explicated in a series of insightful works by Orwin and colleagues that seek to explain how and why consonants in syllable codas seem to contribute to syllable weight in the language's reduplicative phenomena (Orwin 1996) and to preclude closed syllable shapes from appearing in certain line positions in poetic metrics (Orwin 2001; Orwin & Maxamed Xaashi Dhamac 2010), all the while playing no apparent role in the calculation of the location of tone assignment.

The current paper contributes to this dialogue by discussing word shape and minimality requirements, as well as the distribution of open vs. closed syllables of different types within Somali words of a variety of shapes, all of which will be argued to implicate coda moraicity. The findings presented, taken together, strongly suggest that Saeed's (1999: 19) blanket claim that "only vowel melodies are relevant for counting" in Somali must be rejected in favor of a more nuanced treatment of the language's moraic phonology. In support of this proposition, it is argued that Somali is a member of a growing list of languages like those discussed in works by Crowhurst (1991), Gordon (2004), Hyman (1992), and Steriade (1990) whose behavior presents a challenge to the Moraic Uniqueness Hypothesis (MUH) (Hyman 1992). The MUH states that "at any given stage in derivation, there is only one moraic projection" (Hyman 1992: 255). Put another way, a segment that contributes a mora (i.e., is weightful) for

one process in a language should do so for all processes. Likewise, if a given segment fails to contribute weight for one process, it should fail to do so for all processes. The expectations of the MUH differ notably from so-called context-dependent weight phenomena (e.g., Hayes 1994; Rosenthall & Van der Hulst 1999) where the ability of a segment to license a mora depends on its position in a word. For example, according to Hayes (1995), closed syllables in Pacific Yupik Chugach pattern as heavy for the purpose of stress assignment only when they are word-initial. When non-word-initial, however, they pattern as if light in that they do not attract stress. Thus, one way to view this is that coda consonants are moraic only in word-initial syllables and non-moraic in others.

   Outcomes such as these highlight the complexity of accounting for the behavior of consonants and their moraicity in the world's languages overall. A central question in theories of moraic phonology concerns which segments are underlyingly associated with a mora, with particular concern having been paid to the moraicity of consonants, as their contribution to syllable weight is well known to vary parametrically from language to language. The moraicity of vowels is far less variable, though there are notable instances reported in the literature where vowels of certain types or qualities behave as if non-moraic (see, e.g., Cohn 1989 on the behavior of schwa in Indonesian). Hyman (1985) proposes that all segments, including consonants, are underlyingly associated with a mora but may lose their mora by rule. This depends in part on which position in a syllable they are parsed; the assumption in this particular theory is that onset consonants are never weightful and therefore always lose their mora. Codas, however, may or may not retain their mora, which is determined by whether and how they contribute to outcomes pertaining to stress and tone assignment, among others, in the language. Hayes (1989) instead proposes that it is only vowels that are underlyingly moraic and that consonants, if they contribute to weight in a given language, are assigned a mora by rule. Both theories reasonably accommodate the fact that coda consonants may or may not be moraic, but they differ in whether they are assumed to be moraic in the first place. The position taken in this paper follows Orwin (1994, 1996) and, accordingly, Hyman (1985) in assuming that coda consonants in Somali are underlyingly moraic. Unlike Orwin (1996), however, it is proposed here that the vast majority of coda consonants

retain their moras, rather than losing them by rule prior to high tone assignment.

As will be shown, languages like Somali exhibit what have come to be called "moraic mismatches" (Hyman 1992), and, as such, they contradict the MUH. In these languages, moras of different types – vocalic vs. consonantal – either count, or fail to do so, in the calculation of conditions necessary to trigger altogether different phonological processes. Rather than counting, or not, for the same process depending on their word position, like in Pacific Yupik Chugach stress, a language exhibiting moraic mismatches might, for example, ignore consonantal moras for tonal alternations but count them for other processes. In the case of Somali, it will be shown that it is only vocalic moras that count for calculating the location of tone assignment, while both vocalic and consonant moras count for a variety of segmental or prosodic phenomena. The process-based behavior exhibited by Somali closely correlates with cross-linguistic tendencies reported in Gordon's (2004) survey of syllable weight phenomena. That is, vocalic moras (and, as we shall see, others associated with high sonority segments) more reliably count toward tonal processes, while moras associated with a wider variety of segments tend more often to contribute to segmental or metrical processes.

The remainder of this paper is organized as follows. Section 2 briefly reviews patterns of Somali high tone assignment, as well as patterns of partial prefixing reduplication of adjectives and other attributive elements known by various names, among them "derived adjectives" (Saeed 1999: 147) and "adjectival participles" (Green 2021: 158). It is shown, following work by Orwin, that the latter can scarcely be motivated without reference to moraic consonants in syllable codas. Section 3 turns to a survey of word shape and size requirements before turning to detailed discussion concerning the distribution of particular word-internal vs. word-final syllable shapes in the Somali lexicon. It is shown that Somali exhibits a stringent phonotactic restriction against word-internal singleton syllable codas, despite the fact that geminate consonants are accommodated in the same distribution. Descriptive and theoretical implications of this typologically unusual finding are discussed. The paper closes in section 4 with brief discussion and concluding remarks.

2 Background on moras in Somali

As introduced above, there are several references to the mora in the Somali literature. The longstanding perspective expressed in Saeed's (1999) reference grammar is that only vocalic moras play any substantive role in the language's phonology.[2] Even before this, in the mid-1990s, however, Orwin had already begun to present evidence that consonantal moras have a function in the language, particularly in patterns of partial prefixing reduplication. Later work by Orwin and colleagues suggested that reference to coda consonants may also help to explain the distribution of closed syllables in certain metrical scansion patterns. This section provides a brief overview of work referencing the mora in Somali, beginning with the role that it plays in tone assignment and thereafter in intensive/pluractional/evaluative partial prefixing reduplication. In the interest of space, the reader is directed to works cited above for more detail on the role of the mora in the language's poetic metrics.[3]

2.1   High tone assignment

Saeed's proposition about the role of vocalic moras generally holds in the realm of tone assignment. As has been long established in seminal works on Somali phonology like Hyman (1981) and Banti (1988a), the examples in (1) show that lexical stems exhibit a single high (H) tone on either their penultimate or final vocalic mora. These simple examples illustrate tone distribution in stems of different shapes from both the language's grammatical gender series. Examples are provided in the standard Somali orthography and supplemented with tone marking. H tone is indicated by an acute diacritic over a given vowel. Vowels unmarked by such a diacritic are considered phonologically toneless, though they are realized phonetically low. Note that Somali has two harmonic series of vowels, the distinction between which is typically described as a contrast in ATR (advanced tongue

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2 Saeed's (1993) pedagogical grammar, including the 2nd edition released in 2002, maintains that "tone is a feature of syllables" (Saeed 1993: 29; 2002: 23), though the discussion that follows this claim makes implicit reference to tone's association to vocalic moras.

3 Note that while the behavior of moras in Somali poetic metrics presents another example of process-based weight, precisely where in a given scansion consonants contribute weight is also context-dependent.

root), as indicated in works such as Saeed (1999: 15), Green (2021: 53), and Mohamoud (2013), and implicit in several others. These distinctions are not relevant to the phenomenon under consideration in this paper and are therefore not encoded in the provided examples.

(1)   **k-series 'masculine'**   **t-series 'feminine'**

a.	*sán* 'nose'		b.	*bán* 'diarrhea'
c.	*búug* 'book'		d.	*qoór* 'neck'
e.	*qáwl* 'pledge'		f.	*haýb* 'genealogy'
g.	*nácas* 'fool'		h.	*galáb* 'afternoon'
i.	*gantáal* 'arrow'		j.	*mindí* 'knife'
k.	*ciídan* 'army'		l.	*Soomaalí* 'Somalis'

Words like those in (1) illustrate long-noted correlations between H tone location and grammatical gender in noun stems, with H being associated with the penultimate vocalic mora in masculine or 'k-series' grammatical gender stems and instead with the final vocalic mora in feminine or 't-series' gender stems.[4] K-series and T-series here refers to patterns of grammatical gender agreement realized on modifiers and, in some instances, on verbs. For example, the k-series noun *nácas* 'fool' is *nácaska* 'the fool' with a definite determiner, while the t-series noun *qoór* 'neck' would instead be *qoórta* 'the neck' in the same context. The precise surface realization of these agreement affixes varies according to the surrounding consonantal and vocalic context; for details, see Saeed (1999: 28–49) and Green (2021: 65–78).

The penultimate vs. final H tone pattern in nouns is seen most clearly by comparing (1c, g) to (1d, h), though it is neutralized in monosyllabic words like (1a, b) where H is found on the stem's only vocalic mora in both gender series. Words like (1k) are especially telling of the overall pattern in that their H tone is found on the second

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4 There are several competing analyses seeking to explain these correlations between tone assignment and grammatical gender. For Hyman (1981), declension class, and accordingly, grammatical gender dictates the location of tone assignment, but Nilsson (2018) argues that tone assignment is independent of grammatical gender and is instead predictably distributed according to stem shape. Godon (1998), Lampitelli (2011, 2013), and Le Gac (1997) have similarly posited predictability according to stem shape, arguing that "feminine" stems have an empty catalectic slot at their right edge that is counted in tone assignment. Their analyses collectively propose that H tone is always assigned to the penultimate mora of the stem.

mora of a long vowel in the word's penultimate syllable. By comparison, it is reasonable to assume that orthographic glides in words like (1e, f) function as tone bearing units, though whether or not these should be treated as vowels or semi-vowels is an open question. Monosyllabic t-series CVGC words like (1f) realize a rising contour with H tone on the glide, suggesting that the glide is a tone bearing unit.[5] By extension, one can assert that glides in k-series CVGC words have the same prosodic status, though H tone is realized as expected on the penultimate mora, namely on the stem vowel. If coda consonants projected moras that were counted in H tone assignment, one would be hard-pressed to explain even the simplest outcomes like (1a) vs. (1b), as it might be expected that (1b) would instead surface *bań. Likewise, other outcomes would have to stipulate that larger k-series stems have H on their antepenultimate mora while t-series stems instead sometimes have H on their penultimate mora and other times on the final mora. Referring solely to vocalic moras offers a simpler and more transparent analysis.

A complication to this relatively simple pattern is presented by stems with word-final orthographic glides. Whereas glides in words in (1) arguably function as tone bearing units, the word-final glides in (2) do not appear to function in this way in all instances. In disyllabic k-series nouns like (2a, c, e), H appears on the first syllable's vowel, seeming to skip over the glide in calculating the location of tone association. The same can be said of the disyllabic t-series noun in (2d). The monosyllabic noun in (2b) and others like it differ, however, in that the word-final glide counts toward the calculation of H tone assignment, but apparently only when there are fewer than two other vocalic moras in the stem.

(2) **k-series 'masculine'**   **t-series 'feminine'**

a.   *árdey* 'student'   b.   *eý* 'dogs'

c.   *íley* 'one-eyed man'   d.   *badów*[6] 'inhabitants'

e.   *híley* 'strap'

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5 Here and elsewhere, V stands for vowel, C for consonant, and G for a glide (semi-vowel).

6 A reviewer suggests an alternative gloss for this noun: 'uncivilized or rustic person.' The translation given here stems from Orwin (1996); the noun also appears in Hashi (1995: 38).

Words in (2), and perhaps (1e, f), reveal subtle preferences concerning tone assignment and also suggest that orthographic glides may best analyzed as semi-vowels; their behavior, at least word-finally, differs from that of vowels. As such, one could argue that tone assignment in Somali based on vocalic moras is ideal, but semi-vowels can function as tone bearing units under some conditions. Outcomes like these suggest that even when it comes to tone assignment, there is some, albeit limited, flexibility within the grammar concerning the types of moras that "count." That is, both vocalic and semi-vocalic moras can count, at least under some circumstances, in calculating the location of H tone assignment. As a natural class of segments, Somali tone bearing units could perhaps be defined in terms of their high sonority relative to other segments, or with reference to a feature like [-consonantal].

2.2   Partial prefixing reduplication

A second process in which the mora is said to play a role is in intensive/pluractional/evaluative partial prefixing reduplication of adjective and adjectival participle bases. This phenomenon has been discussed in detail by Andrzejewski (1969), Banti (1988b), Lampitelli (2014), and Saeed (1999), but the importance of the mora in the process is explored only in Orwin (1996).

The summary of patterns in (3) is adapted from Orwin (1996) and illustrates attested reduplicated forms, the bases from which they are derived, and also, in some instances, one or more related but unattested outcomes for comparison. A hyphen is included in examples to facilitate identification of the boundary between reduplicant and base, though it does not appear orthographically. Another minor but important deviation from the standard orthography is the inclusion of an apostrophe to indicate a phonetic glottal stop [ʔ] pronounced in vowel-initial words like (3c). The examples are sub-divided into patterns based on the surface structure of the reduplicant. (3a, b) have a CVV reduplicant where the vowel(s) of the reduplicant differ from the base. (3c–e) have a CVC reduplicant, while the reduplicant in (3f–g) is CVVC. The reduplicants in (3h–j) are unique in that they involve consonant alternation (3h, i) or are somehow subminimal compared to others (3j). Several interrelated factors help to explain how these patterns arise.

(3) a. *dhaa-dheer*   *dheer*   'long'   **dheer-dheer,⁷*
                                                     **dhee-dheer,*
                                                     *dhaar-dhaar

     b. *waa-weyn*   *weyn*   'big'   **weyn-weyn,*
                                                     **wee-weyn,*
                                                     *wayn-wayn

     c. *'ad-'adag*   *'adag*   'hard'
     d. *xir-xiran*   *xiran*   'tied up'   *xirx-xiran
     e. *dil-dillaacsan* *dillaacsan* 'burst open' *dill-dillaacsan
     f. *taag-taagan*   *taagan*   'standing'   *taa-taagan
     g. *qayb-qaybsan*   *qaybsan*   'divided'   *qay-qaybsan
     h. *gug-guban*   *guban*   'burnt'   *gub-guban
     i. *duud-duuban*   *duuban*   'rolled up' **duu-duban,*
                                                     *duub-duuban

     j. *ja-jaban*   *jaban*   'broken'   **jab-jaban,*
                                                     **jaj-jaban,*
                                                     *jaa-jaban

Orwin (1996: 67) proposes that "the prosodic constituent that makes up the prefixal reduplicative affix is a syllable node which is satisfied to the fullest extent." In further defining how the template is formed and satisfied, Orwin follows argumentation in McCarthy & Prince (1986) concerning cross-linguistic patterns of reduplication and proposes that melodic units (i.e., segments) comprising the reduplicant must be countable prosodic units and therefore moras. His conclusion is that consonants must be moraic at the point in word formation in which reduplication occurs, but because consonants do not count in the calculation of H tone assignment, their moras are later vacated. In support of his analysis, Orwin provides a detailed derivation of just one sub-type of reduplication (specifically, the word given here in 3f), with certain other details set aside (namely vocalic alternations) or attributed to phonotactics. Orwin's analysis unfortunately does not explicitly address forms like those in (3c–e), stating only that they are assumed to behave like other forms with a consonant-final redu-

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7 A reviewer kindly points out that *dheer-dheer* is attested in some sources; Saeed (1999: 49) lists it as an alternative pronunciation to *dhaa-dheer*, while Zorc & Osman (1993: 167, 185) list both *dheer-dheer* and *dhaa-dheer* as independent entries. The generalizations below remain the same.

plicant. It is on this point that Orwin's analysis and that proposed in the current paper diverge to some extent.

While the patterns discussed below in section 3 are in partial support of Orwin's analysis, and specifically in the proposition that consonants are underlyingly moraic, the assumption that consonantal moras are vacated globally at some point in word formation before tone assignment is challenging to substantiate. Given compelling cross-linguistic support for an approach to moraic phonology that accommodates moraic mismatches, as argued for in works cited above in section 1, an analysis grounded in process-based weight would arguably preclude a global operation of consonantal demorafication. Though a global operation may not be justified, patterns of syllable shape distribution in the language suggest that there may be some evidence of mora vacation, akin to that proposed by Orwin. This would be limited to very specific instances, however, as in cases of prefixal reduplication like that in (3f) and others like it (e.g., 3g and 3i). That demorafication occurs more broadly, such as in cases of prefixal reduplication like (3c–e, 3h), would be more difficult to support.

3 Behavior of coda consonants in other outcomes

It was shown in section 2 that the mora has a role to play in Somali in calculating both patterns of tone assignment and the template for prefixal reduplication. The current section considers other outcomes in the language on which moras appear to bear, beginning with word shape and minimality requirements. Discussion then turns to a survey of syllable shape distribution in different word positions. Based on what is presented about these phenomena, the section closes by returning to the matter of prefixal reduplication and revisiting the question raised above concerning whether and which coda consonants in the language vacate their moras following the process.

3.1   Minimal word size and shape

In viewing a Somali corpus, one might have the impression that Somali words are quite large. This is misleading, however, due in part to the synthetic nature of the language's lexicon, particularly its verbs, but also because the orthography treats oftentimes complex phrases as single written words (Green & Morrison 2018). Upon

closer inspection, one finds an abundance of smaller words, with a robust minimality requirement on word size, as illustrated below. The examples in (4) show that, with very few notable exceptions, the smallest content words in the language are primarily of the shapes VC, CVC, VG, and CVG. Some have described VG sequences as diphthongs (Green 2021; Orwin 1996; Saeed 1999), of which there are five attested and represented here.[8]

(4) a. *nín*   'man'   b. *áf*   'tongue, language'
    c. *káb*   'shoe'   d. *búd*   'tomb'
    e. *éy*   'dog'   f. *áw*   'purpose'
    g. *yéy*   'wolf'   h. *hóy*   'home, dwelling'
    i. *gów*   'part, section'   j. *jáy*   'type of gravel'
    k. *dáw*   'road'

There are a few possible exceptions, including the CV-shaped nouns *sí* 'way, manner' and *hú* 'clothing.' Curiously, the latter varies with *húb* (Zorc & Osman 1993: 313); a reviewer points out that it is related to the verb stem *huw-*, which is phonologically /huww-/. Another exceptional noun is *cí* 'cry, scream, roar', which is derived from the verb stem *cí* 'scream, bray (of an animal)'.

There are fairly few monosyllabic content words of the shape CVV, such as *wáa* 'time' and *hoó* 'offering', the latter being derived from the verb *hoy-* 'to take', but open syllable shapes like this, and also VV and CVG, are mostly found in function words and interjections. A representative group of examples is provided in (5), with their function or a reasonable translation provided for each.

(5) a. *ee/oo* subordinators   b. *soo* ventive deictic
                                              particle
    c. *sii*   itive deictic particle   d. *baa* focus marker
    e. *waa*   declarative marker   f. *haa* 'yes'
    g. *saa*   'thus, like that'   h. *naa* 'hey!'
    i. *see*   'how?'

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8 In addition, the Somali orthography includes words with "long" diphthongs, i.e., VVG sequences, but these are not contrastive (Armstrong 1934; Orwin 1994; Green 2021) and will not be discussed. As these sources point out, they occur only in borrowings, morphologically-complex words, or as variants of short VG sequences.

As seen in both (4) and (5), most monosyllabic content words and indeed most function words minimally contain a branching rhyme, or, if lacking a coda consonant, their nucleus contains a long vowel. The skewed distribution whereby there are remarkably few CVV content words may suggest a phonotactic preference for falling sonority rhymes. With the possible exceptions of *sí*, *hú*, and *cí* mentioned above, other CV shaped items are function words and clitics, with a fairly exhaustive list of such items given in (6).

(6) a. *ma*   question marker   b. *ka/ta*   definite determiners

c. *na*   1PL object pronoun   d. *na*   clausal conjunction

e. *ba*   intensifier   f. *má*   clausal negative marker

g. *se*   clausal disjunction   h. *ú*   'to, for, towards, etc.'

i. *kú*   'at, in, on, with (instrumental), etc.'   j. *ká*   'from, about, out of, etc.'

k. *lá*   'about, with (comitive)'   l. *la*   'one' (pronoun)

m. *i*   1SG object pronoun   n. *ku*   1SG object pronoun

This distribution and the characteristics of these monosyllabic items is highly suggestive of a minimal word requirement. One possibility is that a well-formed, independent phonological word (PWd) in Somali must contain a branching rhyme. This might explain the preponderance of monosyllabic CVC words, but it would entail that nuclei in (C)VV syllables, in particular, be considered branching. Another possibility, however, would be to posit that Somali has a bimoraic minimality requirement. Because, for example, CVV and CVC words pattern similarly, and assuming uncontroversially that CVV syllables are bimoraic, it would appear that coda consonants count in satisfying this minimality condition, and therefore that they behave as if moraic.

There are also many other monosyllabic content words in Somali of the shapes VVC, CVVC, and CVGC, as seen in the representative examples in (7). While such words present no challenge to the propo-

sition of a bimoraic minimal word requirement, they do raise a question as to the moraic status of their final consonant.[9]

(7)   a.   *daáb*   'handle'   b.   *kuúl*   'eye makeup'

       c.   *nóoc*   'type, sort'   d.   *réer*   'household'

       e.   *áar*   'revenge'   f.   *uúb*   'afterbirth'

       g.   *eéd*   'accusation'   h.   *íib*   'item for sale'

       i.   *cáwd*   'hot, stuffy place'   j.   *qáwl*   'pledge'

       k.   *cáysh*   'nourishment'   l.   *héyl*   'cardamom'

Words like those in (7) would satisfy the language's minimal word requirement solely by virtue of their heavy nuclei, but the moraic status of their final consonant is unclear. One possibility is that these consonants, like others that we have seen thus far, are moraic and, therefore, that these words are composed of a single superheavy syllable. While superheavy syllables are not unattested in the world's languages, their distribution cross-linguistically is extremely limited. Another possibility might be that the consonants are moraic but that their mora is extrametrical or extrasyllabic. Broselow (1992) and Watson (2007) entertain these and other possibilities to explain the variable patterning of consonants in similarly-shaped words in varieties of Arabic, which, as an Afroasiatic language, is related, albeit distantly, to Somali. Yet another possibility is that the consonants lose their mora altogether, along the lines of what is proposed by Orwin (1996). While it is clear that syllables of this shape are readily permitted word-finally, it is necessary to look at similarly-shaped syllables elsewhere in the language in order to arrive at a better understanding of the moraicity of their coda consonants.

3.2   Syllable shape distribution

It is shown in this section that there are tight restrictions on the types of syllable shapes that can appear word-internally within a stem. Both CVC and CVV syllables readily occur in this distribution, as seen in (8), where syllable boundaries are indicated here and else-

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    9   Green (2021: 88–89) provides an overview of Somali phonotactics suggesting that any vowel can appear in a CVVC or VVC word. The distribution of semi-vowels in CVGC words, however, is not equivalent – CV[w]C words are far fewer in number than CV[y]C. There are also restrictions on the types of consonants that appear word-finally after a diphthong. Another detailed study of Somali phonotactics can be found in Barillot (2002).

where by a period for ease of presentation. For CVC syllables in particular there are no unusual restrictions on the types of consonants that can occupy these codas, as both stops and sonorants are readily attested. As is well established, Somali does not allow complex syllable margins, thereby precluding syllables with branching onsets or codas (Saeed 1999: 16; Green 2021: 85).[10]

(8) a. *kúm.bis*   'meat in ghee'   b. *hán.qal*   'chest (body)'
    c. *fán.to*   smallpox   d. *wal.qál*   'naming cere-
                                                    mony'
    e. *búr.cad*   'butter'   f. *ráb.shi*   'guano'
    g. *dub.lád*   'funnel'   h. *kab.xán*   'type of tree'
    i. *baá.rax*   'open space'   j. *feé.tin*   'stake'
    k. *ruú.mi*   'wool'   l. *tii.gaál* 'distant place'

Because the concern here is the moraic status of coda consonants, words such as these present no conclusive evidence. However, CVV syllables, being uncontroversially bimoraic, are seen to be accommodated word-internally before another onset, and their distribution parallels that of CVC syllables.

CVGm syllables are also found word-internally within a stem. Here, Gm indicates a geminate consonant; Somali has both contrastive geminate stops and sonorants in its inventory (see Green 2021; Saeed 1999). The examples in (9) contain word-internal syllables with a geminate coda, where the geminate is presumed to be moraic. This in line with standard views of gemination (e.g., Davis 2011; Hayes 1989), as is the fact that word-internal geminates are parsed ambisyllabically.

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10 A reviewer points out that (8j) *feétin* varies with *feýtin* and, furthermore, that some have analyzed intervocalic voiceless stops in words like this as underlying "virtual" geminates (Barillot 2002; Barillot & Ségéral 2005; Orwin & Maxamed Xaashi Dhamac 2010; Ségéral & Scheer 2001); some arguments against this view are suggested by Green (2021: 52). Because the current paper is concerned with analyzing patterns of surface syllable shape distribution, little can be gained here from taking a stance, one way or another, on the status of these abstract phones. Because other geminates readily appear word-internally in Somali (see below), the inability for the voiceless "virtual" geminates to surface is already exceptional.

(9) a. *gáb.bal*   'daylight'   b. *múd.dac* 'argument'
     c. *óg.gol*   'approval'   d. *dum.mád* 'cat'
     e. *gal.lád*   'gratitude'   f. *hol.lób* 'scaly skin'

The ambisyllabic nature of these intervocalic geminates is also implicit in other work on Somali (Bendjaballah & Le Gac 2019; Le Gac & Bendjaballah 2020; Saeed 1999). Assuming this is correct, it reinforces the statement above that bimoraic syllables appear to be readily permitted in such a word-internal distribution. Here, CVC syllables can be seen as patterning with another type of bimoraic syllable.

While CVC and CVGm syllables pattern together in (8) and (9), similarly shaped syllables with long vowels – CVVC and CVVGm – behave strikingly different from one another in this position. Most remarkable is that word-internal CVVC syllables are absent altogether from the Somali lexicon. To be clear, this refers to stems, rather than to morphologically complex words, borrowings, or compounds, where phonotactic requirements are quite different from that of stems. What is more puzzling, however, is that CVVGm syllables are readily accommodated in the same distribution, as seen in the examples in (10). Alternations such as vowel lengthening before intervocalic geminates are not reported in such words (Bendjaballah & Le Gac 2019).

(10) a. *aám.mus* 'silence'   b. *beéd.dal* 'type of female
                                                   horse'
      c. *cood.dí* 'meat, flesh'   d. *dhood.dí* 'land with hard
                                                   soil'
      e. *geéd.di* 'traveler'   f. *quúl.le*   'wild berry'
      g. *saáb.bir* 'poor person'   h. *daál.lin* 'felon'
      i. *doób.bi* 'laundry'

Given the parallel distribution above for CVC and CVGm syllables, but the divergent behavior here of CVVC vs. CVVGm syllables, one must ask what conditions this difference and also what underlies it. One possible explanation may lie in constraints on segmental structure such that Somali might disprefer stem-internal syllables with a complex nucleus and a branching rhyme. This, however, would not answer why CVVC are absent while CVVGm remain, as both are structurally similar to one another. A related appeal to a "coda con-

dition" on geminates would also fail, as no such condition is observed elsewhere, such as in words in (8) and others like them, where both word-internal CVC and CVGm are attested.

Another possible explanation might pertain to constraints on syllable weight. To explore such a possibility, however, would require one to entertain different assumptions regarding coda consonant moraicity. If one starts with the standard assumption that geminates are moraic (see Davis 2011) and were to begin by assuming that coda consonants are not so in the language, the Somali outcome could be seen as unintuitive. This is because one would need to explain why syllables with inherently moraic geminates are accommodated stem-internally while those with non-moraic coda consonants are not. Even if one were to assume instead that coda consonants and geminates are both moraic, a puzzle would still remain. It would still be unclear why CVVC is selected against while CVVGm is not. Because neither structure nor moraicity alone appear to offer a simple solution to this distribution, one must consider another possibility, namely that both moraicity and structure bear on the outcome.

Though at first puzzling, Somali's behavior is reminiscent of what is reported by Baker (2008) for Ngalakgan, a now extinct language of Australia. In Ngalakgan, syllables ending in a geminate maintain their length but pattern as if light (i.e., they fail to attract stress) even though other closed syllables pattern as heavy. Proposals are offered by Baker (2008) and Davis (2011) for how to analyze these outcomes. One possibility raised is that moraic elements in Ngalakgan must have their own place features, rather than place features shared with an adjacent onset. Thus, singleton coda consonants would have their own place features and accordingly be moraic and attract stress. Geminates, however, would share place features with a following onset and therefore be unable to license a mora and to attract stress. Another possibility calls into question foundational assumptions of different theories of gemination. For example, Hayes (1989) assumes that geminates are underlyingly moraic and that the distinction between singleton and geminate consonants rests in that the latter is underlyingly associated with a mora while the former is not. Other approaches (Leben 1980, among others) propose that the distinction rests instead in length, or association to timing slots. Under such a view, geminates are associated with two timing slots, while singletons are associated with just one.

Davis (2011) suggests that the behavior of geminates in Ngalakgan, among other languages, points toward a reconfigured view of geminate structure that incorporates elements of both earlier theories. He illustrates that, in various ways, languages may require reference to different elements of geminate structure – or different tiers – such as a timing tier (length), a gesture tier (segment or melody), but also a quantity tier (weight). For example, Davis & Torretta (1998) show that in Trukese, an Austronesian language of Micronesia, geminates pattern as heavy but may or may not surface occupying two timing slots. Ringen & Vago (2011) argue that geminates in Hungarian must occupy two skeletal (timing) slots given their susceptibility to interruption by an epenthetic vowel; the geminates are still associated to a single melody (gestural) slot, and whether or not they contribute to syllable weight is dependent on other factors. For Ngalakgan, Baker (2008) argues that geminate behavior crucially makes reference to the gestural tier, despite them not contributing to weight.

With these various outcomes in mind, and in arguing for universal geminate moraicity, Davis (2011) raises the possibility of a "composite" model of geminate structure. In this model, underlying geminate moraicity is assumed, though whether or not the mora is maintained or contributes weight is based on language-specific factors or a ranking of optimality-theoretic constraints. Davis (2011: 858) states the following concerning the composite model: "a geminate is represented on both a timing (length) tier and a gestural tier. It is viewed as having a moraic representation if it functions as heavy." Under this model, and as entertained in Baker (2009), Ngalakgan geminates could be seen as underlyingly moraic, though they would lose the ability to license their mora by virtue of being associated to a single gesture (as opposed to $CVC_\alpha.C_\beta V$ sequences where the coda and following onset are associated with different gestures), while still maintaining their length.

While it is beyond the scope of this paper to fully entertain the applicability of the "composite" model to all geminate phenomena, the structure proposed in the model offers some insight into a possible explanation for the divergent distribution of word-internal CVVC vs. CVVGm syllables in Somali. As introduced above, an explanation for the absence of CVVC but the maintenance of CVVGm is challenging to motivate based on structure or weight alone. An alternative explored here takes both into consideration, as the outcomes might be seen as

illustrating two structurally-mediated responses to a conspiracy to avoid word-internal superheavy (i.e., trimoraic) syllables.

Beginning with attested CVVGm syllables, one could argue that their behavior and their ability to surface aligns in some ways with what is seen in Ngalakgan. That is, although geminates may be underlyingly moraic, and although they may surface maintaining their length, they would appear not to contribute to syllable weight. As such, they might be seen as vacating their mora word-internally, perhaps to avoid the creation of a trimoraic syllable. That they are able to surface, however, may be possible because the geminate is syllabified in two adjacent syllables. Moreover, the ability to maintain their length could be due to their association to two slots on the timing tier.

Such a possibility is schematized in the "composite" structure in (11), composed of separate tiers for weight, gesture, and timing. This structure illustrates a surface representation in which word-internal geminates have vacated their mora, yet are able to be maintained due to their ambisyllabicity; independent association to the timing tier accordingly allows them to maintain their length.

(11) Surface representation of Somali geminates
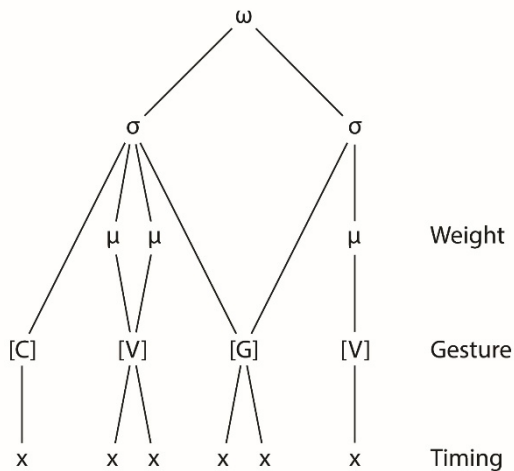
The corresponding structure in (12) illustrates a hypothetical representation with a word-internal CVVC syllable; the first syllable contains a moraic singleton consonant parsed into its coda rather than being shared between syllables. Such a structure cannot be accom-

modated in Somali, of course, due to a ban on trimoraic syllables, and must somehow be repaired. As I have suggested, due to a 'one-to-one' relationship between mora, gesture, and segment in Somali, a requirement for weightful coda consonants, and the coda consonant being parsed in one syllable, repair via mora loss would entail loss of the segment itself.

(12) Hypothetical representation with word-internal CVVC
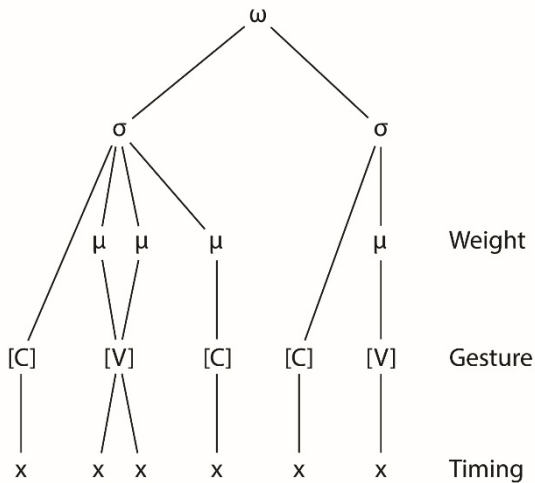
In partial support of such an approach, Bendjaballah & Le Gac (2019) argue for an analysis of Somali geminates based on timing slots, though they do not explore moraicity. They contend that an appeal to timing slots is necessary to explain the sensitivity of consonants of different types to lenition. For the speakers with whom they have worked, phonological geminates are realized as stops while singleton consonants are realized as spirants. The distinction, they propose, is encoded in gestural association to two timing slots for the former and to just a single timing slot for the latter. Thus, Bendjaballah & Le Gac treat the phonological contrast in terms of the number of timing slots, though the phonetic implementation of this distinction neutralizes the length distinction in favor of a manner distinction. As Green (2021) reports, however, not all Somali speakers realize such a neutralization; some speakers maintain a length distinction between

singleton and geminate consonants.[11] Though somewhat peripheral to the main point of this paper, if the perspective on Somali geminates proposed here and in Bendjaballah & Le Gac (2019) is correct, it would offer support for the "composite" model of geminate structure. That is, Somali could be seen as requiring reference to both the moraic and timing tiers of the model.

Setting this aside for now, a comparison to CVVC syllables presents a greater challenge owing to the fact that their properties must be motivated primarily by their absence, at least word-internally. CVVC syllables do appear word-finally, as seen above in (7), but this may be because they can be accommodated due to extrametricality, or a related mechanism, along the lines of those discussed by Broselow (1992) and Watson (2007). Extrametricality would not be an option word-internally. Rather, based on direct comparison to the patterning of word-internal CVVGm syllables, as well as to comparable CVC and CVGm syllables, the absence of CVVC syllables in the same distribution might once again imply the avoidance of violating a constraint against word-internal superheavy syllables. In this instance, however, unlike CVVGm syllables, whose codas may ultimately surface due to a combination of mora vacation and ambisyllabic licensing, CVVC syllables are avoided altogether. In order to surface, singleton codas in such syllables would somehow need to vacate their moras, but unlike geminates, they could not be "saved" by being structurally resident in two syllables. Operations that might accommodate such a sequence, such as mora sharing between the nucleus and coda (Broselow 1992; Watson 2007), appear not to be an available option in the language.

These various possibilities make it clear that the behavior of word-internal codas, at least in syllables with complex nuclei, is a matter that deserves further attention. Despite this, the observed distribution of these syllables finds a fairly transparent explanation under an approach that permits reference to moraic codas. It has been shown that a structural explanation without reference to moras encounters certain problems in motivating the distribution of word-internal CVVC vs. CVVGm syllables. The ability to "count" consonantal moras in explaining this distribution would also be in line with what appears necessary for other segmental phenomena in

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11 It is worthwhile to note that geminates never occur word-finally in Somali; when they might appear, they are degeminated.

Somali, including those discussed here and elsewhere in the literature. Consonantal moras, as shown above and elsewhere, appear not to have a substantive role to play in the language's tonology.

3.3   Prefixal reduplication revisited

It has been argued in the preceding sections that consonantal moras appear to "count" in the calculation of minimality and word shape requirements in Somali. They have also been argued previously to do so for prefixal reduplication patterns. Taken together, these outcomes strongly suggest a revision is necessary to longstanding viewpoints about the role played by moras in the language's phonology. Vocalic moras are not the only moras that count.

A question left outstanding above in section 2.2 concerns the early vs. late moraicity of coda consonants in prefixal reduplication. This can now be revisited in light of what has been discussed in section 3. Recall that Orwin (1994, 1996) assumed underlying moraicity of coda consonants, but also suggested that these consonants globally vacate their moras prior to H tone assignment. At issue is, in part, whether there is any evidence that some, none, or all consonants exhibit such behavior. Another matter is accounting for why reduplicated forms like *taag-taagan* 'standing', with what would appear to be a word-internal CVVC syllable, are permitted, given that such syllables do not surface elsewhere in the language in this distribution. The first of these questions might be moot under a process-based theory of moraic phonology that recognizes and permits moraic mismatches. Under such a theory, one need not assume that the coda of the reduplicant in outcomes like *xir-xiran* 'tied up', nor other moras in CVC syllables, lose their mora. They might simply not enter into the calculation of H tone assignment which, as discussed above, is a key factor motivating the analysis in Orwin (1996). Forms where alternation leads to an apparent word-internal geminate, such as *duud-duuban* 'rolled up', however, might perhaps provide better evidence for vacation of a consonantal mora, in line with what is proposed in section 3.2 for word-internal CVVGm syllables elsewhere in the language. Still, there is some reason to question this given that in prefixal reduplication results in both CVVGm syllables (*duud-duuban* 'rolled up') and CVVC syllables (as in *taag-taagtan* 'standing') are permitted in the same distribution. One could argue that their now parallel distribution suggests that there may be something struc-

turally unique about these words formed by reduplication, compared to lexical bases.

One possibility to account for this outcome would be to appeal to the shape and characteristics of the reduplicant itself. Earlier works cited above have posited that the reduplicant is a single syllable that is satisfied to the fullest extent allowed by the language's phonotactics. This could be adjusted slightly to stipulate that the reduplicant fills a bimoraic template – $CV_\mu X_\mu(X)$ – where some final consonant X may be included in the reduplicant, but only if permitted by the language's phonotactics, though it does not otherwise have a role to play in the reduplication process. That is, this final consonant would behave as if extrametrical. Such an adjustment is attractive in that it parallels what is observed for word shape/size requirements, as discussed in section 3.1. The shape/size requirements of the reduplicant would appear to be the exact same as those for minimal word shape. Another way to think of this would be that the reduplicant in prefixal reduplication is, at most, the very size of a prosodic word. This would arguably also help to explain why CVVC is accommodated as a reduplicant, as the right edge of the reduplicant's syllable would also coincide with the right edge of a word. If this is correct, then one could argue that there is no evidence that mora vacation applies in prefixal reduplication, but rather, it is a case of extrametricality. As such, it would appear that the strongest case to be made for mora vacation in the language word be in word-internal CVVGm syllables within a stem. In this way, the vacation of consonantal moras might be seen as a last resort in a conflict between syllable markedness and stem faithfulness, rather than an operation triggered across the board.

4 Summary and concluding remarks

The modest goal of this paper has been to explore the behavior of coda consonants in Somali in order to determine whether and how they participate in tonal and segmental phenomena. The paper has taken as its premise, based on earlier studies, that both vocalic moras and consonantal moras have a role to play in the language's phonology. What has yet to be explored until now, however, is the extent to which consonantal moras, in particular, function more broadly in the language outside of prefixal reduplication and poetic metrics, and whether there is any clear indication that a given consonant's

status alternates from moraic to non-moraic at some point in the derivation of a word.

In exploring these matters, this paper has considered the shape and size of monosyllabic words, as well as the distribution patterns of syllable shapes of various types within stems. It is argued that the patterns observed strongly suggest that coda consonants function as moraic. The implication thereby is that the moraicity of consonants, as proposed by Orwin, et al. in prefixal reduplication, as well as what is known about the behavior of consonants in poetic metrics, are not "one off" outcomes. Rather, it would appear that, more often than not, consonants do count in Somali, contrary to what is assumed elsewhere in the literature. That is, although consonantal moras play no role in the language's tonal phenomena, they regularly, and in remarkably similar ways, play a role in segmental processes and alternations. Typology also supports the proposal argued for here. More specifically, the correlation between moras associated with more highly sonorous elements being implicated in tonal phenomena and those associated with less sonorous elements "counting" more often for segmental phenomena is in line with cross-linguistic patterns of process-based weight phenomena reported by Gordon (2004). This analysis of Somali also informs moraic theory in presenting further evidence that the Moraic Uniqueness Hypothesis cannot be upheld, while simultaneously opening the door for further inquiry into evidence that Somali's behavior might provide for the "composite" model of geminates. From a descriptive standpoint, this is also the first invocation, to my knowledge, of moraic mismatches in a Cushitic language. Future research, therefore, would benefit from inquiry into whether and how similar processes, among others, reference moras of different types across the family. For Somali specifically, these outcomes ultimately suggest that a reconfiguration or at least a more nuanced restatement concerning the role of the mora in the language is needed. Lastly, while the analysis in this paper is largely aligned with earlier work on Somali moraic phonology, it improves upon this earlier work by introducing an analytical alternative that need not globally assume the loss of consonantal moras, while also illustrating that some limited instances of such an alternation may still be justified.

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A phonological description of Naba

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Abstract

Naba, also known as Bilala, is a Nilo-Saharan (Sara-Bagirmi) language of Chad with about 410,000 speakers from three ethnic groups. This paper gives a basic description of the Naba phonological system, using segmental phonology and lexical phonology approaches. Topics covered include the phonemic inventory, syllable structure and phonotactic restrictions, the tone system and its interaction with other phonological processes, and the main lexical and post-lexical processes. A special focus is given to the important role of sonority hierarchy in Naba phonological structure and processes. This hierarchy groups affricates and non-sibilant fricatives with stops in a single obstruent category, while nasals, liquids, and approximants comprise the sonorant category. The distinction is key for syllable structure, phonotactic restrictions, tone sandhi, and a number of both lexical and post-lexical processes. It is proposed that the two sibilant fricatives /s/ and /z/ exist as a separate sonority level in between obstruent and sonorant, and evidence is given as to why they cannot be classed with either group.

Keywords: Naba, Bilala, Nilo-Saharan, phonological description, sonority, sonority hierarchy, lexical phonology

1 Introduction

1.1 The Naba-Speaking Community

The Naba, or Melbene, language is spoken in the Batha-Est region in central Chad by about 410,000 people according to Eberhard et al. (2022). Naba is part of the Nilo-Saharan family, more specifically a Bongo-Bagirmi language of the Central Sudanic branch. Closely related languages with previous documentation include Kenga, Bagirmi, and Sar.

The majority of Naba speakers live in the East Batha and Bahr-el-Gazel regions of Chad, but many speakers are also found in the Guéra and Hadjer-Lamis regions as well.

There are three ethnic groups who speak Naba as their first language, the Bilala, Kuka, and Medogo. Each ethnic group has its own dialect typically referred to with the same name as the group (Bilala, Kuka, and Medogo), but the Bilala dialect appears to have at least four sub-dialects as well.[1] Members of the ethnic groups themselves and sociolinguistic research affirm that Naba is a single language (Maass 2001: 5). Among these ethnic groups, the Bilala are the majority, and for this reason the language is often referred to as "Bilala" rather than as "Naba". More recently, representatives of the Naba-speaking community as a whole have proposed the term "Melbene" to refer to the language, because it is seen as more neutral and inclusive, whereas "Naba" has come to imply speakers who are not ethnically Bilala. Since the language is officially known at the international level in publications such as Eberhard et al. (2022) as Naba, I will restrict myself to the name "Naba" and not make reference to other names unless dialectal differences are being considered.

1.2   Data collection methods

This description of the phonology of Naba is based on data from speakers who participated in a series of language development workshops led by the Federation of Associations for the Promotion of National Languages (FAPLN), a Chadian literacy organization. I worked as a consulting linguist with FAPLN during these workshops from late 2018 to early 2021 as an orthography and literacy materials were developed. The speakers, mostly of the Bilala ethnic group, came from the three largest Bilala towns, Yao, Ambasettna, and Am-Djaména-Bilala, as well as one speaker of Kuka origin and one speaker of mixed Bilala-Medogo heritage. The work of these speakers was the basis for Naba literacy materials, but the data used in this paper either originated from or was confirmed by a speaker from Yao currently living in the town of Bitkine in the Guéra region of central Chad, Mr. Abderhaman Daoud. Since the dialect of Bilala spoken in Yao has been selected by the language community as the basis

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1 These subdialects have not been confirmed by sociolinguistic research but are acknowledged by Bilala speakers, who refer to them by the names of the four major Bilala towns, Yao, Ambassatna, Amjamena-bilala, and Moeto.

for language development and as the majority of data comes from speaker of this sub-dialect, this article will be describing Yao pronunciation unless otherwise indicated.

I would like to acknowledge here the members of the Naba-speaking community with whom I have worked: Abderhaman Daoud from Yao, my main language informant; and the members of the FAPLN Naba literacy initiative: Hawa Agid Mahamat, Fatime Sabur Beglar Beshar, Adoum Abakar Mahamat, Goni Mahamat, Halime Mahamat Hassan, Hassaballah Yermie, Hissein Sali Ngale, and Mahamat Abdel Kerim. Informed consent was obtained with an audio recording from Abderhaman Daoud with the understanding that data could be used for academic research as well as for Naba language development. Oral consent was also given by Hissein Sali Ngale on behalf of the Naba literacy initiative.

The data set includes over 4500 recordings of individual lexical items and short phrases, 1,200 recordings of specific grammatical constructions, ten natural recorded texts (three procedural, one hortative, and six narrative), 16 recorded descriptive texts prompted by images, and seven written texts created for the literacy program. The total time of the recordings is approximately 17 hours.

My work with the Naba community began as involvement in their literacy project. Because our initial goal was to create a writing system, and the representatives of the Naba community were insistent on not using tone marking, earlier data was unmarked for tone. Later as I began researching the tone system independently of the literacy project, tone marking was used. The result is that my data is not marked consistently. When writing this paper, phonological issues that involved tone necessarily drew upon data marked for tone, but in parts of the analysis in which tone does not appear to play a role, I made use of unmarked data. The overall tone system of Naba is still being researched as I continue work on the grammar; since grammatical tone is still being analyzed, the presentation of tone in this paper is incomplete.

1.3 Literature Review

A study of the phonology of Naba, specifically focused on the Bilala dialect, was previously written by missionaries Paul and Amy Schultz (Schultz & Schultz 2001). This was followed by a grammatical description (Schultz & Schultz 2003). These studies covered the

basics but were not geared towards an academic audience and seem to focus on comparing Bilala with English in order to assist foreigners attempting to learn the language. Their studies were also almost exclusively based on data from three Bilala men living in the Chadian capital city far from the Bilala territory (Schultz & Schultz 2001: 2) and this fact is reflected in the high level of borrowing from Chadian Arabic present in the data. For this reason, I have not incorporated the Schultz's research into the current analysis.

In 2002, Olsen and Schultz presented a brief paper on the morpho-phonological behaviour of Naba's third person singular object marker ɲa (Olson & Schultz 2002). Using a geometry feature tree approach, they suggested that the way in which this suffix assimilates to a previous segment (discussed below in section 5.3) gives evidence for the spreading of the feature [sonorant].

This article is meant to serve as a technical description of the phonology of Naba with special focus on the role of the sonority hierarchy in many of Naba's phonological processes. The sonority status of sibilants is of particular interest. It has been adapted from my previous phonological sketch, written in French as a basis for the development of the Naba orthography (Scherrer 2020; 2021a). This article will cover the segmental phonology with special attention to sonority groupings, phonological structure (syllable types and phonotactics), the tone system and its interaction with syllable structure and sonority-based restrictions, and finally an overview of phonological processes. Since I have used the theory of Lexical Phonology extensively in development of the Naba orthography (Scherrer 2021b), these processes will be presented in the categories of lexical and post-lexical phonological processes.

1.4   Notes on Naba Grammar

The basic word order of Naba is SVO. The noun phrase consists of the noun followed by a number of modifiers. Clitics on the noun phrase level indicate plurality, definiteness, and connection to certain non-verbal elements.

The Naba verb takes subject and object morphology as well as a number of affixes and auxiliaries that indicate aspect. Verbs can be nominalized, and most adjectives and adverbs are derived from stative verbs. It is often with syntax alone that derived nouns and adjectives/adverbs can be distinguished from verbs. In this paper glosses

will reflect the syntactic category of the word in a given context, while isolation forms will generally be glossed as the root verb.

Independent pronouns in Naba are optional, and while there are object affixes for each person and number, subject marking on the verb is less distinct. For vowel-initial verbs, prefixes mark the first person singular and plural, and suffixes mark the second and third person plural for any kind of verb. However second and third person singular subjects are not marked on the verb, and the subject prefixes for first person singular and plural are not evident on consonant-initial words. The reader should thus be aware that glossing of pronominal verb subjects is context-dependent. Also, some of the data will have independent subject pronouns (used normally for emphasis or contrast in Naba discourse), while others will not. For purposes of simplicity, I have only used verbs with ambiguous subject marking when I know them to refer to third person singular; thus, any apparently 'unmarked' verb is translated with the English subject 'he/she'.

2 Segmental Phonology

Naba has 25 consonant and five vowel phonemes. The consonants fall into four main places of articulation, labial, alveo-dental, palatal, and velar. The consonants can be divided into categories of sonorant and obstruent, with sibilants having characteristics of both. The vowel system is a symmetrical five-vowel system with contrast between single and double vowels.

2.1 Consonants

The following Table 1 shows the consonant phonemes of Naba, including simple, prenasalised, and implosive obstruents; sibilants, nasals, liquids, and approximants.

The main places of articulation are labial, alveolar, palatal, and velar, with one glottal /h/. There is some question as to the status of /h/ as a phoneme, discussed in section 5.6, and it would also be possible to include it with the velars as a single category.

The category "alveolar" could also be labelled "alveo-dental" because there is variation in the pronunciation of obstruents at this place of articulation. Stops are usually pronounced in a dental manner, particularly in the Yao sub-dialect, while the sibilants show more variation between alveolar and dental place of articulation.

Table 1. Consonants

	Labial	Alveolar	Palatal	Velar	Glottal
Obstruent	f b	t d	tʃ dʒ	k g	h
Prenasalised	mb	nd	ndʒ	ng	
Implosive	ɓ	ɗ			
Sibilant		s z			
Nasal	m	n	ɲ	ŋ	
Liquid		l r/ɹ			
Approximant	w		j		

2.1.1   Notes on obstruent consonants

As /b/ is the only stop without a voiceless correspondent, and /f/ has no voiced correspondent, these phonemes are presented as corresponding labial obstruents. As we will see in more detail as the different phonological processes of Naba are presented, grouping /f/ and /h/ as well as the two affricates /tʃ/ and /dʒ/ together with the stops in a single obstruent category explains the overall phonological system better than maintaining separate fricative and affricate categories. This is especially noticeable in the behaviour of these phonemes compared to the sibilant fricatives /s/ and /z/, which I do maintain as a separate category.

The fricative /f/ may also be pronounced as the voiceless labial stop [p] in initial position. This is a case of free variation, although in certain words [p] is pronounced more often, particularly in loan words. /f/ is proposed as the underlying phoneme because [p] may only occur in initial position, as shown in (1a) whereas [f] occurs in initial position, intervocalic position, and between a consonant and a vowel, as shown in (1a–c):

(1)   a.   *fene* 'one'   >   [*fene*]   or   [*pene*]
      b.   *naafe* 'moon'   >   [*naafe*] not *[*naape*]
      c.   *terfe* 'shoulder blade' >   [*tɛrfe*] not *[*terpe*]

Additionally, in Kuka and Medogo wordlists [p] does not occur at all (Maass 2001, Laya 2003), suggesting that this alternation is restricted to the Bilala dialect.

There are two implosives in Naba, /ɓ/ and /ɗ/, with /ɗ/ being much more frequent. /ɓ/ is not attested in medial position except in

the word *eɓe* 'heal'. In several other Sara-Bagirmi languages there is also a palatal implosive, but we do not see this in Naba.

The prenasalised stops are analysed as single phonemes rather than as consonant sequences in this paper, although there is some evidence to suggest that underlyingly they are nasal-stop sequences. This analysis is explained further in section (6.6).

The affricate /tʃ/ is pronounced as [ʃ] intervocalically. The sound [ʃ] is also found initially in many loan words from Arabic and there is ongoing debate as to whether it should be considered a separate phoneme and written as a digraph <ch>, as distinct from <c> which represents the phoneme /tʃ/[2]. Although the <ch> and <c> both currently exist in the orthography, it is fairly clear that in non-loans, [ʃ] only exists as an allophone of /tʃ/. This description will thus not consider a separate phoneme /ʃ/.

The affricates /tʃ/ and /dʒ/ become /c/ and /ɟ/ when followed by a consonant as discussed in section (6.3). The main reason for proposing the affricates rather than the palatal stops as the underlying phonemes is their wider distribution. The affricates are found word-initially, and between a consonant and a following vowel. Intervocallicaly, /dʒ/ is pronounced as [dʒ] while /tʃ/ changes to /ʃ/. The palatal stops /c/ and /ɟ/ are restricted to pre-consonantal position, and this process of fortition before a consonant corresponds to the fortition of /f/ to [p] and /h/ to [k]. Examples are shown in Table 2 below.

Table 2. Palatal obstruent distribution

Position	Voiceless Palatal	Voiced Palatal
Word-initial	*tʃorlo* 'giraffe'	*dʒere* 'short'
Post-Consonantal	*kurtʃu* 'cucumber'	*kendʒe* 'fish'
Intervocalic	*itʃi* [iʃi] 'defecate'	*tedʒe* 'bee'
Pre-Consonantal	/reece-ɲa/ [rec-tʃa] break-3SG.OBJ 'he/she breaks it'	/miidʒe=ge/ [miɟge] addax=PL 'addaxes'

Native speaker intuition also contributes to this analysis. During the development of the Naba orthography, Naba speakers were clearly

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2 In both Arabic and French, the languages of wider communication in Chad, <ch> is used to represent the phoneme /ʃ/, rather than <sh> as is typical in languages with an English influence. Because the <ch> represents /ʃ/, <c> is used in many Chadian languages to represent /tʃ/.

aware of the phonemes [tʃ] and [dʒ] and were able to identify them in various positions. However, the speakers were not aware that [c] and [ɟ] existed in their language until the pronunciation in pre-consonantal position was pointed out to them.

2.1.2 Notes on Sonorant Consonants

The phoneme /r/ is generally pronounced as an alveolar trill, but is pronounced more like a retroflex approximant [ɻ] in fast speech, particularly in intervocalic position (2a); it is difficult to confirm which is the underlying form. It also may be pronounced as the uvular trill [R] when adjacent to a back vowel (2b). While it seems that the trill is the underlying phoneme, since it patterns with the liquid /l/ in Naba, I consider it as belonging to the liquid class and not to a separate class of trills. /r/ also is often pronounced as [dr] or [dR] in phrase-initial position in the Yao sub-dialect (2c).

(2)   a.   *dʒiriri* 'gills' [*dʒiɻiɻi*]   *gere* 'fart'   [*geɻe*]

  b.   *uuru* 'sew'   [*uuRu*]   *kurtʃu* 'cucumber' [*kʊRtʃu*]

  c.   *raaga* 'mat'   [*draaga*]   *ruunu* 'hip'   [*dRuunu*]

The two liquid consonants /r/ and /l/ are occasionally interchanged in fast speech when in word-medial position, but there are a number of minimal pairs that make it evident that they are two separate phonemes, several of which are given in (3):

(3)   a.   *iiri* 'name'   *iili* 'be black'

  b.   *ndere* 'comb'   *ndele* 'become'

  c.   *kerhe* 'mucus'   *kelhe* 'alone'

The approximants /w/ and /j/ show the same behaviour of being interchangeable in fast speech word-medially.

2.1.3 Notes on sibilant consonants

The two Naba sibilants /s/ and /z/ do not fall neatly into either the obstruent or sonorant category. The unique behaviour of the sibilants will be noted throughout this analysis, and a summary is given in section 7.

/s/ is much more frequent in Naba than /z/, with the lexicon showing 292 examples of /s/ and only 97 instances of /z/, a good portion of which are found in Chadian Arabic loan words, particularly when /z/ is in word-initial position. While it is possible that

word-initial /z/ derives from Arabic, there are many instances of /z/ in medial position in non-loans that show clear contrast with /s/, as in example (4) below:

(4) a. *ozo* 'slip'   *oso* 'eat'
     b. *keeze* 'hatred'   *keese* 'cough'
     c. *kaza* 'horn'   *kasa* 'lure'

Table 3 shows the distribution of the consonants. There are only few examples of final consonants, which reflects the fact that in Naba nearly all words are underlyingly vowel-final, excluding a handful of ideophones and grammatical function words. See sections 3.2 and 5.1.

Table 3. Consonant distribution

Conso-nant	Initial position	Medial position	Final position
/b/	*biisi* 'dog'	*raaba* 'to roast'	-
/ɓ/	*ɓormo* 'thigh'	*eɓe* 'heal'	-
/d/	*daana* 'nice'	*dede* 'feather'	-
/ɗ/	*ɗoho* 'woman'	*tʃoodo* 'whip'	-
/f/	*fiili* 'kitchen'	*gufufu* 'viper'	-
/t/	*terle* 'jackal'	*nduutu* 'dry'	-
/dʒ/	*dʒaŋala* 'clay jar'	*eedʒe* 'birth'	-
/tʃ/, [ʃ]	*tʃuuru* 'sesame'	*gumaʃe* 'heart'	-
/g/	*gundʒu* 'camel'	*aaga* 'to crawl'	*derg* 'under'
/k/	*kaawa* 'long'	*lohoko* 'chameleon'	*tak* 'all'
/h/	*hilek* 'throat'	*oho* 'have'	-
/s/	*sinde* 'horse'	*keese* 'to cough'	-
/z/	*zuriye* 'clan'	*gaaza* 'confuse'	-
/mb/	*mbala* 'choose'	-[3]	-
/nd/	*ndufo* 'duck'	-	-
/ng/	*ngaala* 'belly'	-	-

---

3 Nasal-stop sequences do occur word-medially, but are analysed as being two separate phonemes belonging to different syllables rather than as prenasalised stops in this environment. See sections 3.3.2 and 6.6.

/ndʒ/	*ndʒa* 'leg'	-	-
/m/	*mahala* 'slow'	*noomo* 'enter'	*kam* 'TAM marker'
/n/	*naafe* 'moon'	*uunu* 'take'	*an* 'possessive marker'
/ŋ/	-	*naaŋa* 'ground'	-
/ɲ/	-	*aɲa* 'to run'	-
/l/	*laaba* 'grandfather'	*eele* 'say'	*kal* 'TAM marker'
/r/	*roɲo* 'to want'	*gara* 'thing'	*kar* 'plus'
/w/	*waaye* 'spear'	*gowa* 'snail'	-
/j/	*jiimi* 'grasshopper'	*kaje* 'see'	-

For reference, Table 4 shows the proposed sonority hierarchy of Naba consonants; the first row indicates the overall hierarchy, with the second showing the proposed hierarchy among the obstruents:

Table 4. Naba Sonority Hierarchy

Obstruent	Sibilant	Nasal	Liquid	Approximant

Stop		Implosive	Affricate/Fricative

2.2 Vowels

Naba has five vowel phonemes, shown below in Table 5:

Table 5. Vowels

	Front	Central	Back
Close	i		u
Mid-close	e		o
Open		a	

All five vowels show contrast between a single phoneme and a doubled sequence (V vs. VV). Our analysis is that a long vowel is a sequence of two identical vowels (VV) rather than a single separate vowel phoneme (V:). One reason for this is that each vowel acts as a separate mora and can thus be a tone-bearing unit. Diphthongs and sequences of two non-identical vowels are not permitted. There are

many contrasts between single and double vowels in the lexicon, as in the following examples in (5):

(5) V *naŋa* 'children'   VV *naaŋa* 'ground'
      V *tele* 'to cultivate'   VV *teele* 'to kill'
      V *iri* 'root'   VV *iiri* 'hibiscus'
      V *kolo* 'rope'   VV *koolo* 'pot'
      V *ulu* 'to swallow'   VV *uulu* 'to braid (a rope)'

2.2.1   Vowel harmony

Example (5) above shows the strong tendency in Naba for complete vowel harmony at the word level. A significant portion of the lexicon retains identical vowels throughout the word, especially in verbs. For words without complete vowel harmony, there are restrictions on which vowels can appear in what order. /a/ may appear in any position, but for the other vowel phonemes two rules apply:

- If the word contains either two front vowels or two back vowels, the close vowel must precede the mid-close vowel (/u/ before /o/ and /i/ before /e/); see examples (6a–d).
- If the word contains two vowels with the same level of openness, the back vowel must precede the front vowel (/u/ before /i/ and /o/ before /e/); see examples (6e–h).

(6) a. *tugo* 'wash'   e. *guwi* 'calf'
      b. *rulo* 'shadow'   f. *wurli* 'peanuts'
      c. *miidʒe* 'addax'   g. *oɗe* 'to vomit'
      d. *inde* 'give'   h. *yolhe* 'goods'

The vast majority of trisyllabic words show complete vowel harmony, so there is not enough data to show whether the same rules of vowel ordering apply. Several examples of complete trisyllabic vowel harmony are given in (7a–d) with incomplete harmony in (7e–g), and (7h) showing three completely different vowels:

(7) a. *bataŋa* 'bushbaby sp.'   e. *berije* 'porridge'
      b. *bedede* 'spark'   f. *gedʒafa* 'tree sp.'
      c. *tʃoroŋo* 'thorn'   g. *maruwa* 'grass sp.'
      d. *titiri* 'ant sp.'   h. *tubijo* 'lion'

Trisyllabic words usually display at least two of the three syllables with harmony as in (7e–g), but examples such as (7h) show that all three vowels may differ in a handful of cases.

2.2.2   Other vowel phones

There are other vowel phones in Naba to consider. All of the vowel phonemes with the exception of /a/ have open allophones that appear in (C)VC syllables. In this environment (i, u, e, and o) become (ɪ, ʊ, ɛ, and ɔ). The central vowel phone [ə] also occurs in fast speech and in vowel epenthesis.

The vowels (ɪ, ʊ, ɛ, and ɔ) function as allophones of the phonemic vowels (i, u, e, and o) in closed syllables.

The vowels [ɪ] and [ʊ] occur only in this particular environment of the closed syllable. Example (8) shows the vowel alternation:

(8)   */mindi/* 'river'   >   [*mɪndi*]

　　　/dirli/ 'tear'   >   [*dɪrli*]

　　　/urde/ 'granary'   >   [*ʊrde*]

　　　/gundʒu/ 'camel'   >   [*gʊndʒu*]

The open-mid vowels [ɔ] and [ɛ] occur both as allophones of /o/ and /e/ in closed syllables, and as free variants of these phonemes in open syllables. This free variation generally occurs only in non-final syllables, though there are a handful of exceptions. The open-mid allophones [ɔ] and [ɛ] may also be doubled, which is not permitted for the allophones [ɪ] and [ʊ]. Example (9) shows the open-mid allophones [ɔ] and [ɛ] in closed syllables, while Example (10) shows them in open syllables:

(9)   */kergese/* 'quiver'   >   [*kɛrgese*]

　　　/nderŋe/ 'cane'   >   [*ndɛrŋe*]

　　　/mborɲo/ 'beard'   >   [*mbɔrɲo*]

　　　/korondʒo/ 'chicken'   >   [*korɔndʒo*]

(10) */keere/* 'elephant'   >   [*keere*] or [*kɛɛrɛ*]

　　　/neere/ 'be wet'   >   [*neere*] or [*nɛɛrɛ*]

　　　/joje/ 'be heavy'   >   [*joje*] or [*jɔje*]

　　　/booɗo/ 'warthog'   >   [*booɗo*] or [*bɔɔɗɔ*]

Some Naba speakers, particularly those of the Yao sub-dialect, do hear a distinction between [o]/[ɔ] and [e]/[ɛ], but many others

cannot tell the difference unless it is pointed out to them. Certain words have a clear tendency to be pronounced with open-mid allophones even in final position, as in example (11).

(11) /oŋo/ 'be hot, heat'   >   [ɔŋɔ], not [oŋo]
      /eere/ 'ripen'   >   [ɛɛrɛ], not [eere]

In other Sara-Bagirmi languages, such as Kenga (Neukom 1993: 26), Gor (Kosmadji & Roberts 2009: 3), and Na (Keegan 2015: v), ɛ and ɔ exist as distinct phonemes, and it seems quite possible that Naba originally had a similar seven-vowel system that has been partially retained in the Yao sub-dialect. However, there are several reasons to conclude that these sounds are not phonemic in the current system:

- There are very few examples of minimal pairs for [e]/[ɛ] or [o]/[ɔ] and these can also be distinguished by tone melody
- Words with stable pronunciation of [ɛ] and [ɔ] in open consonants are restricted to a certain sub-dialect.
- The same speaker may show free variation in pronunciation of these allophones in identical contexts.

The central vowel [ə] is found in Naba but is not involved in any kind of alternation. It is used in epenthesis to break up 3-consonant clusters, and in rapid speech. The process of epenthesis is discussed in section.

3 Phonological structure

In this section we treat the phonological structure of Naba, including the form of the syllable and its basic types, restrictions on syllable position, and phonotactic rules for both vowel and consonants.

3.1   Syllable types

Example (12) is a list of all syllable types found in Naba; the first four are open syllables and the last two are closed:[4]

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4   A reviewer suggested that because liquid consonants may be part of the syllable nucleus rather than a coda, the analysis of closed syllable structure does not follow a priori. However, as non-liquid consonants may also appear in this final syllable position, the existence of closed syllables seems the simplest explanation of the data.

(12)   V   *i.ri* 'root'   CV   *mbu* 'grass'
             e.he 'climb'   *ɓa.da* 'tomb'
       VV   *ii.li* 'black'   CVV   *maa.re* 'crocodile'
             uu 'pull'   *ndii* 'scatter'
       VC   *ar.ge* 'search'   CVC   *ter.dʒe* 'insult'
             ul.ɓe 'tree sp.'   *len.dʒe* 'friend'

Ideophones, which are common in Naba, often do not follow structural rules, and one lexicalized ideophone exists with the syllable type CVCC, the preposition *derg* 'under'. There is also a process of final vowel deletion that creates (C)VCC sequences not found in underlying word forms, which I discuss in section 5.1. Leaving these cases aside, Naba has a symmetrical system of syllable types, shown in the following Table 6:

Table 6. Syllable types

	With onset	Without onset
Open Single	CV	V
Open Double	CVV	VV
Closed	CVC	VC

These syllable types can also be categorized as light (V, CV) and heavy (VC, VV, CVV, and CVC); a double vowel or a consonant add a second mora to the syllable. This distinction between light and heavy is significant for the realization of tone melodies, as the mora, rather than the syllable, is the tone-bearing unit in Naba.

3.2   Syllable restrictions

Certain restrictions apply in Naba as to the order of syllables within a word. First, for monomorphemic words that are not ideophones, the final syllable must be open. Closed syllables are only permitted in initial or medial position, with the exception of lexicalized ideophones such as *derg* 'under' and *tak* 'all', and of grammatical function morphemes such as *in* (possessive marker), *kar* (used to join count numbers)[5], *kal* (inceptive aspect marker), and *nen* (proximal demon-

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    5   *kar* plays the same role as the hyphen in English count numbers and can be translated as 'and' (but it cannot be used in any other context besides that of count numbers). For example *twenty-two* in English becomes *si rujo kar rujo* 'ten two [twenty] and two' in Naba.

strative pronoun). These grammatical function morphemes may in fact have final vowels in their underlying form; however since they must always appear in context before another word, the supposed final vowel may undergo final vowel drop, discussed in 5.1. Because of their nature, it is difficult to elicit such words in isolation, but at least one speaker has verified that *kar*, used to join numbers, is underlyingly *kara*.

Double vowels are not permitted in word-final position in polysyllabic words; thus the general rule is that final syllables (excepting those of monosyllabic words) must be both open and light.

The syllables V and VV exist in several monomorphemic words, but in polymorphemic words they are restricted to word-initial position. VV appears often in verbs, but rarely in nouns (the corpus contains six nouns with a VV syllable, but 51 verbs).

The final vowel of a word is often deleted before another morpheme (full word or suffix). Closing the syllable with a consonant reduces a double vowel to a single one. Thus in context consonant-final words do occur, with syllables such as (C)VC (from underlying …(V)V.CV#) as in (13a) and (C)VCC (from underlying …VC.CV#) as in (13b):

(13)	a.	***ruu.nu* 'hip'**	CVV.CV
		[*ruŋna*]	CVC.CV
	→	*run* + *-ɲa*	CVC + CV
		hip -3SG.POSS	
		'his/her hip'	

	b.	***ar.ge* 'search'**	VC.CV
		[*arg lo*]	VCC CV
	→	*arg* + *lo*	VCC + CV
		search firewood	
		'he/she searches for firewood'	

Table 7 shows examples of all attested syllable combinations in the Naba lexicon.

Table 7. Syllable combinations

Syllables	Examples	Glosses
V	*u*	'ostrich'
VV	*uu*	'pull'

CV	*jo*	'hear'
CVV	*mbaa*	'breast
V.CV	*i.tʃi*	'pull out'
CV.CV	*ndu.jo*	'weak'
VV.CV	*oo.bo*	'refuse'
VC.CV	*ur.de*	'granary'
CVV.CV	*boo.ɗo*	'warthog'
CVC.CV	*kor.ho*	'scratch'
V.CV.CV	*a.ri.di*	'demon'
CV.CV.CV	*be.ri.je*	'porridge'
VC.CV.CV	*or.lo.ho*	'throat'
CVC.CV.CV	*bar.ta.la*	'flat basket'
CV.CVC.CV	*ko.ron.dʒo*	'chicken'
CVC.CVC.CV	*gor.dʒon.ko*	'wrinkle'
V.CV.CV.CV	*i.bi.ri.ti*	'traditional clay jar'
CV.CV.CV.CV	*ku.gu.ɗu.mu*	'hyena'
V.CVC.CV.CV	*o.nan.gi.da*	'moringa tree'
CV.CVC.CV.CV	*bo.hol.ko.lo*	'rooster'
CVC.CV.CV.CV	*bar.da.wi.ja*	'type of drum'
V.CV.CVC.CV	*e.le.mar.ja*	'vulture'

Of all structures, the two-syllable word is by far the most frequent, followed by trisyllabic, then monosyllabic words. There are some four-syllable words that appear to be single morphemes, but anything over four syllables is either a reduplication serving as an ideophone or a compound word.

3.3   Phonotactics

Both within syllables and at syllable boundaries there exist rules concerning which phonemes can occur in what sequence. Phonotactic rules are either based on the level of sonority of the phonemes in question or on syllable weight.

3.3.1   Vowel phonotactics

Long vowels are analysed as sequences of two identical vowel phonemes which are pronounced as a single unit. Naba contains no

sequences of non-identical vowels, neither as diphthongs nor as two distinct syllables. There are occasions in fast speech when diphthong-like sounds are pronounced, but in slow speech it is clear that an approximant /w/ or /j/ actually exists between the two vowel sounds. The deletion of the final vowel before a following morpheme (the deletion of the final vowel is discussed in section 5.1) creates the diphthong sound. This can be seen in examples of fast speech in (14):

(14)   a.   */ɓa.wo/* 'to go'

         ja   [ɓa̰o̰]   *ndʒerhe = n*   *taaga*
         3SG.SBJ   go   field = CN   yesterday
         'he/she went to the field yesterday'

     b.   */ko.je/* 'owl'

         [ko̰ḛ]   *il = ge*
         owl   black = PL
         'black owls'

     c.   */no.je/* 'blacksmith'

         man   *ngeere*   [no̰ḭ]   *bobo-ma*
         1SG.SBJ   know   blacksmith   father-1SG.POSS
         'I know my father's blacksmith'

3.3.2   Consonant Phonotactics

As noted above, CC sequences in a single syllable are not found in monomorphemic words pronounced in isolation. However, CC sequences are found across syllable boundaries, in cases where the final consonant of one syllable is followed by the onset of the next syllable.

    The type of consonant permitted at the end of the first syllable is restricted, while the second syllable can take any consonant as its onset. The rule is that in a $C_1.C_2$ sequence, C_1 must be a sonorant consonant, most frequently a nasal or a liquid, as we see in Example (15):

(15)   *on.do* 'put'   *ter.fe* 'shoulder-blade'
       ram.ba.ja 'type of basket'   *tʃul.mo* 'ulcer'

In discussing CC sequences across syllable boundaries, it is necessary to explain why a CVNCV structure is to be analysed as CVN.

CV rather than CV.nCV, as prenasalised stops are phonemic in Naba. Many words in Naba have the CVNCV... structure, with pronunciation affected by nasal assimilation (treated in section 6.4). Example (16) shows a number of such structures:

(16) a. /sinde/   [sɪnde]   'horse'
      b. /lendʒe/   [lɛndʒe]   'friend'
      c. /bongoro/   [bɔŋgoro]   'scythe'
      d. /tʃanga/   [tʃaŋga]   'pen'
      e. /bambara/   [bambara]   'stool'
      f. /tʃimba/   [tʃɪmba]   'tree stump'

From these examples, there is a clear possibility of analysing the sequences as CV.ⁿCV..., with the syllable boundary consisting of an open syllable followed by a prenasalised onset. The idea is supported by the fact that all of the NC sequences take identical place of articulation, just as the prenasalised obstruent phonemes. The analysis of these examples as (16a) *si.nde*, (16b) *le.ndʒe*, (16c) *bo.ngo.ro*, (16d) *tʃa.nga*, (16e) *ba.mba.ra*, and (16f) *tʃi.mba* would use known Naba phonemes and would not create any new syllable types.

However, there are three reasons to posit that the prenasalised stops occur only at the beginning of the word and not medially:

- The pronunciation of examples (16a–f) in slow speech always results in separation into distinct syllables CVN and CV, never CV and ⁿCV. It is possible that a prenasalised onset adds a mora to a syllable, and that a final ⁿCV syllable would counter the restriction against heavy final syllables.
- CVN.CV corresponds well with the rule that allows liquid and approximant classes, also sonorants, to be in the final position at a syllable boundary, while non-sonorant consonants are typically excluded from this position.
- Not all word-medial NC sequences match the components of prenasalised stops as shown in example (17)[6]:

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6 The examples here all involve the nasal /m/, as other nasals will always assimilate to the place of articulation of the following consonant, making it impossible to tell if the underlying nasal is different.

(17)   */namse/* 'taste'
       /ŋgulʊmka/[7] 'hum'
       /amraje/ 'antelope sp.'
       /tɔmɓo/ 'diarrhea'
       /samdʒaj/ 'make similar'

Approximants are the most sonorant of the consonants, but they are rarely found in underlying CC sequences, with /w/ not occurring at all in this position within the available data. The reason for this may simply be that approximants occur less frequently than other sonorants in general. There are, however, certainly a few examples of /j/ occurring as C_1 in a consonant sequence, as shown in (18):

(18)   *al.raj.ta* 'type of flute'
       su.buj.buj 'skeleton'
       goj.bo 'bell'
       lej.te 'bird sp.'

An exception to the sonorant-only rule for final consonant at a syllable boundary is the existence of /s/ in this position in certain words. Many, if not all, of these words are Arabic in origin, but as the sibilants in Naba have a tendency to shift between properties of sonorants and obstruents, it is possible that for this particular situation /s/ is classified as a sonorant. /z/ is only found once in C_1 position in the corpus, but it is a rare phoneme both in Naba and in Arabic. In $C_1.C_2$ sequences, /s/ is always followed by /k/ as the C_2. The suffixation of -*ka* to an Arabic root produces Naba verbs, and most cases of … Vs.kV# are in these types of verbs; however there are several words in which an Arabic origin is unclear. Some examples are shown in Table (8).

Table 8. Words with syllable-final sibilants

Lexeme	Gloss	Origin
keske	'quickly'	Naba (may be ideophone)
aske	'divorce'	unknown
bandaska	'dwarf'	possibly from Arabic *anduuru* 'dwarf'

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   7   */ŋgulʊmka/* is one of a class of words whose roots are borrowed from Arabic and to which -*ka* is added to form a Naba verb, discussed just below.

waraska	'inherit'	from Arabic *waras* 'to inherit'
gawaska	'weigh'	from Arabic *wazzan* 'to measure'
mizge	'corpse'	unknown, not standard Bilala dialect

Whether the occurrence of /s/ in C_1 position can be dismissed as limited to loan words or whether we propose that for this phonotactic restriction the sibilants are categorized as sonorants, the rule barring obstruents from the syllable-final position at a word-internal syllable boundary stands.

4 Tone

Naba is a tonal language, with three level tones, High (H), Mid (M) and Low (L). The majority of words, especially nouns and verbs, have an underlying tone melody which consists either of one level tone or a sequence of levels. However, a good number of grammatical function morphemes, such as clitics, particles, and verbal affixes, are underlyingly toneless. The analysis of Naba's tonal system is ongoing, so this section will be only a brief overview of what has been discovered so far.

4.1   Tone-bearing units

Many words are distinguished solely by tone melody as in the examples presented in (19):

(19)   a.   *ūlū* 'to swallow'   c.   *éèrè* 'ripen'
            ùlù 'raise (a child, animal)'   *ēéré* 'urinate'

       b.   *tʃē* 'rib, side'   d.   *móòŋò* 'to howl (dog)'
            tʃé 'mother'   *mōōŋò* 'to quarrel'

From the examples in the right column it is shown that in Naba tone attaches to moras rather than to syllables. VV sequences that form a single syllable can carry two different tones. In these examples each vowel represents a single mora, so a word such as *eere* has two syllables, but because it has three vowel phonemes it has three moras and can take three tones. However, the underlying tone melody is not restricted by the number of moras; if there are fewer moras than tones for a given word, the final tone may be deleted, may fully spread onto a following toneless morpheme, may move back onto a sonorant consonant or into a contour tone (see 4.4.1). Above we see

the monosyllabic *tʃē* (19c) and *tʃé* (19d) in isolation and may conclude them to have underlying melodies M and H. But if we attach the plural-marking clitic =*ge*, a toneless morpheme (see 4.3), we see that the melodies are in fact ML and HL. For nouns, comparing the form in isolation with the plural form gives a better idea of the underlying melody, as in (20):

(20) /*tʃē*/   [*tʃē*]   'rib'   (ML)
          →   [*tʃēgè*]   'ribs'

      /*tʃé*/   [*tʃé*]   'mother'   (HL)
          →   [*tʃégè*]   'mothers'

      /*dū*/   [*dū*]   'sore'   (M)
          →   [*dūgē*]   'sores'

      /*sā*/   [*sā*]   'cow'   (ML)
          →   [*sāgè*]   'cows'

      /*máāme*/   [*máāmē*]   'python'   (HM)
          →   [*mámgē*]   'pythons'

      /*jòró*/   [*jòró*]   'teak'   (LH)
          →   [*jòrgé*]   'teaks'

      /*jòrò*/   [*jòrò*]   'saliva'   (L)
          →   [*jòrgè*]   'salivas'

4.2 Tone melodies

Naba has nine attested tone melodies, with two (MH and LHL) being rare enough to question their validity. The melodies manifest themselves differently depending on the number of moras in the word to which they apply. Table 9 shows melodies that have been confirmed in the corpus with examples presented both according to number of syllables and number of moras. With some examples of nouns lacking enough moras in isolated form, the clitic =*ge* has been added to show the full underlying melody.

Table 9. Tone melodies

Melody	Monosyllable	Disyllable	Trisyllable
H	1 μ: *ú* 'ostrich' 2 μ: *tʃíí* 'saw'	2 μ: *tádé* 'sauce' 3 μ: *ndírgí* 'accept'	3 μ: *fítírí* 'lake' 4 μ: *bámbárá* 'stool'

M	1 μ: *bī* 'hair' 2 μ: *mbāā* 'breast'	2 μ: *bānā* 'yellow' 3 μ: *tʃōōdō* 'whip'	3 μ: *tōrōŋō* 'ant' 4 μ: *tʃōrōŋdʒō* 'porcupine'
L	1 μ: *jò* 'hear' 2 μ: *nòò* 'paternal aunt'	2 μ: *dòŋò* 'answer' 3 μ: *mòrŋò* 'bull'	3 μ: *gùlùlù* 'centipede' 4 μ: -
HM	1 μ: - 2 μ: -	2 μ: *óŋō* 'find' 3 μ: *dáānā* 'forehead'	3 μ: *dʒáŋālā* 'clay jar' 4 μ: *tíhīrdī* 'gecko'
HL	1 μ: *bégè* 'houses' 2 μ: *sî* 'milk'	2 μ: *éfè* 'fishing net' 3 μ: *kéèlè* 'wrap'	3 μ: *kólìjò* 'tree sp.' 4 μ: *kárkàbà* 'chicken tick'
ML	1 μ: *tʃēgè* 'ribs' 2 μ: -	2 μ: *tēlè* 'cultivate' 3 μ: *kāàrà* 'chest'	3 μ: *mēlèlè* 'goiter' 4 μ: -
MH (rare)	1 μ: - 2 μ: -	2 μ: *ōdó* 'to reap' 3 μ: *ndīírí* 'cricket'	3 μ: *gāláŋá* 'shield' 4 μ: *bāndáská* 'dwarf'
LH	1 μ: - 2 μ: -	2 μ: *fèné* 'one' 3 μ: *dààná* 'accompany'	3 μ: *bàrúwá* 'morning' 4 μ: *kùndúlú* 'gizzard'
LHL[8]	1 μ: - 2 μ: -	2 μ: - 3 μ: -	3 μ: *dʒàrájè* 'hoe' 4 μ: *ràmbájà* 'basket type'

Among level tone melodies, M is the most common, with HL being by far the most common melody overall, particularly among verbs. Tones will attach to vowels, unless there are more tones in the melody than there are vowels in the word; in such cases a sonorant consonant may become a tone-bearing unit. Since sonorant consonants do not carry tone in underlying forms, attachment of tone to sonorants is caused by processes such as final vowel drop (section 5.2). In example (21) we see five disyllabic words which lose their

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8 LHL is almost exclusively found in Chadian Arabic loan words, reflecting the stress system of that language.

final vowel before another morpheme. The tone from the deleted vowel moves leftwards and attaches to the sonorant consonant.[9]

(21)   a.   */ɓárà/* 'year'   (HL)
      →   [*ɓár̀*   *fāsā*]
           year   good
           'a good year'

      b.   */tēlè/* 'cultivate'   (ML)
      →   [*tēl̀-ɲá*]
           cultivate-3SG.OBJ
           'he/she cultivates it'

      c.   */jéēlē/* 'bird'   (HM)
      →   [*jél̄*   *sí*]
           bird   ten
           'ten birds'

      d.   */síjè/* 'scatter'   (HL)
      →   [*sî̯-ɲá*]
           scatter-3SG.OBJ
           'he/she scatters it'

      e.   */dàwá/* 'pen (animals)'   (LH)
      →   [*dàẃ*   *fāsā*]
           pen   good
           'a good pen'

4.3   Toneless morphemes

A handful of Naba morphemes do not appear to have any underlying tone melody. These include the nominal clitics *=ge*, *=ne*, and *=n*, and possibly the locative particle *ti*. Many of the pronominal affixes also show behaviour that indicates tonelessness, but as we currently

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9 As discussed in 4.4.1, it is the following morpheme's tone melody that "blocks" spread and provokes this leftward movement. If the next morpheme is toneless, the attachment to a sonorant consonant will not occur.

have more data on the tonal behaviour of noun phrases than of verb phrases, we will here focus on the nominal clitics.

If a Naba speaker is prompted to pronounce one of the clitics in isolation (which is difficult to accomplish because the clitics have no meaning in themselves), the perceived tone level is mid. However, this does not necessarily mean that the the tone of these morphemes is mid, as we note that M may be a kind of default tone in (section 4.4.1). Further, if these clitics were underlyingly mid, they would display the same kind of behaviour as other mid-toned morphemes. In example (22a) we see the mid-toned word following a low-toned word, and in (22b) the clitic =*ge* following the same word. Then we see another comparison following a LH word in (22c) and (22d):

(22) a. */jòrò   fāsā/* →   [*jòr fāsā*]
          saliva   good
          'good saliva'

      b. */jòrò=ge/*   →   [*jòrgè*]
          saliva=PL
          'salivas [spits]'

      c. */dàwá   fāsā/* →   [*dàẃ fāsā*]
          pen   good
          'good pen'

      d. */dàwá=ge/*   →   [*dàẃgé*]
          pen=PL
          'pens'

The underlyingly M word *fasa* is not changed significantly by either the L tone of *joro* in (22a) or the LH of *dawa* in (22c) (although downstep may slightly alter the pronunciation after L, see 4.4.2). However, the L in (22b) and the H in (22d) are spread completely to =*ge*, which is pronounced with a low tone and a high tone respectively.

However, it could be argued that clitics are different in their tonal behavior from separate words, and that they naturally take the tone of the word they attach to because they do not have a word boundary marking tone spread. To determine if this is the case, we must com-

pare the nominal clitics with examples of other bound morphemes that do have underlying tone. One such morpheme is the third person singular suffix *-ɲá*, which marks the object when attached to a verb or the possessive when attached to a noun (see 5.2). *-ɲá* is underlyingly H, whereas the clitics =*ge* (plural marker) and =*ne* (definite marker) we suppose to be toneless. Example (23) shows L, M, and HL nouns followed by the plural and definite clitics and by *-ɲá*.

(23) a. */jòrò=ge/*   [*jòrgè*]
          saliva=PL
          'salivas [spits]'

          /jòrò=ne/   [*jòrnè*]
          saliva=DEF
          'the saliva'

          /jòrò-ɲá/   [*jòrɲá*]
          saliva-3SG.POSS
          'his/her saliva'

  b. */tʃēlē=ge/*   [*tʃēlēgē*]
          bed=PL
          'beds'

          /tʃēlē=ne/   [*tʃēlēnē*]
          bed=DEF
          'the bed'

          /tʃēlē-ɲá/   [*tʃēlēɲá*]
          bed-3SG.POSS
          'his/her bed'

  c. */rámè=ge/*   [*rámgè*]
          squirrel=PL
          'squirrels'

/rámè=ne/   [rámnè]
 squirrel=DEF
 'the squirrel'

/rámè-ɲá/   [rámɲā]
 squirrel-3SG.POSS
 'his/her squirrel'

In (23a) and (23b) we see a clear difference in tonal behavior; in both cases =ge and the =ne take the tone melody of the noun while ɲá retains its underlying H tone. In (23c) the tone of -ɲá is M rather than H, which occurs because of the limitation on HH sequences (treated in 4.4.3). These examples support the premise of toneless morphemes, although a broader study of the tonal behavior of clitics, affixes, and particles is needed (the behavior of the connective clitic =n is treated in 5.4).

4.4   Tone processes

An in-depth analysis of tone processes in Naba is beyond the scope of this paper, but three phenomena will be briefly addressed: tone spread, downstep, and restriction of HH sequences.

4.4.1   Tone Spreading

In Naba, a word's tone melody spreads across the word and to a tone-less segment that directly follows (such as certain clitics and affixes). The melody will only spread to one further syllable, not across whole strings of toneless segments. It is important for the tonal analysis of Naba to note that the mid tone functions as a "default" tone; that is, if toneless morphemes are not assigned tone as a result of spreading, they will be pronounced with a mid-tone by default. It is thus difficult to determine whether M actually spreads in the same manner as H or L tone, because M on a toneless unit after a melody ending in M can be interpreted either as a result of M spreading or as a result of default tone assignment.

In trimoraic words with underlying melodies of only one tone, that tone will be realized on all three moras (24a–c); with two-tone melodies, the first tone will attach to the first mora, with the final two moras taking the second tone (24d–g). However, with the MH melody, the M usually is assigned to the first two syllables, with H

only on the last syllable, as in (24h) and (24i). The reason for this is yet to be determined, though it should be mentioned that MH is the rarest tonal melody attested in Naba.

(24) a. */bédédé/* 'spark'   (H)
      b. */lōhōkō/* 'chameleon'   (M)
      c. */gùlùlù/* 'centipede'   (L)
      d. */mélèsè/* 'to stammer'   (HL)
      e. */bàrúwá/* 'early morning'   (LH)
      f. */áālā/* 'let go'   (HM)
      g. */rūùnù/* 'hip'   (ML)
      h. */māgāná/* 'sorghum sp.'   (MH)
      i. */mūgūlú/* 'pestle'   (MH)

Leftward tone movement occurs when a tone melody is blocked from spreading rightwards by the presence of another tone melody, as seen in 24b–f. In those examples, however, the spread is facilitated by a sonorant consonant. An obstruent consonant in the same position blocks leftward movement. Tone may spread rightwards across a stop, but may not be "pushed" leftwards, as we see in (25). The clitic =*ge* appears to be toneless (discussed in section 4.3) and because tone can spread rightwards across an obstruent it takes the L tone of *seede* (25a). But when *seede* is followed by the word *si* which carries its own H tone, the L of *seede* can neither spread rightwards to replace the tone *si* nor be preserved by moving leftwards (25b). This is because an obstruent cannot take tone.

(25) a. */sēèdè=ge/*   [*sēdgè*] (ML-∅)
          wild.animal=PL
          'wild animals'

      b. */sēèdè   sí/*   [*sēd sí*] (ML H)
          wild.animal   ten
          'ten wild animals'

Sibilant fricatives have variation in this environment, giving strength to the argument that they have their own special sonority category. Sibilants may not take tone themselves, but a tone attaching to an underlying vowel may move leftwards across a sibilant when the

vowel is dropped, creating a contour tone on the preceding vowel, as seen in (26):

(26)   a.   */másà/*   [*másà*]   (HL)
              'tamarind'

              /másà=ge/   [*mázgè*]   (HL=∅)
              tamarind=PL
              'tamarinds'

              /másà   sí/   [*mâs sí*]   (HL H)
              tamarind   ten
              'ten tamarinds'

              /másà   bò/   [*mâz bò*]   (HL L)
              tamarind   big
              'a big tamarind'

        b.   */ōòsò/*   [*ōòsò*]   (ML)
              'pierce'

              /já   ōòsò-rege/   [*já ōsrēgē*] (ML-∅)
              3SG.SBJ pierce-3PL.OBJ
              'it pierces them'

4.4.2 *Downstep*

A L tone at the end of one morpheme may downstep a H or M tone at the beginning of the following morpheme. This automatic downstep does not create a complete lowering; H is not downstepped to M nor is M downstepped to L, but a slight lowering can be perceived. For the current research I rely on listener perception, but an acoustic analysis would enable a better understanding of downstep in Naba's tone system.

(27)   a.   */sūlō-ɲá/*   [*sūlōɲá*]   (M-H)
             gather-3SG.OBJ
             'he/she gathers him/her/it'

b.   /kélè-ɲá/   [kélèɲ⁺á]   (HL-H)
     love-3SG.OBJ
     'he/she loves him/her/it'

In (27), both verbs *sulo* and *kele* retain their final vowel, have /l/ as their final consonant, and take the H suffix *-ɲa*. But in listening to recordings, the *-ɲá* attached to *kele* (27b) is slightly lower in quality than that of *sulo* (27a), although not low enough to be equivalent to a mid-tone. This type of automatic downstep occurs throughout the language, but is most obvious in polymorphemic words and may be more difficult to perceive across word boundaries.

    Non-automatic downstep, caused by floating L tone, is not attested in Naba, although further study of the interaction of tone in the grammatical system is required before ruling it out entirely.

4.4.3   Restriction on HH sequences
Naba discourages two adjacent H surface tones, particularly if they are part of two different underlying melodies. The H melody may spread to a second mora on a single morpheme, as in (28a), although the third mora of an H melody word generally lowers to M (28b). However, if one H-melody morpheme follows another, the first instance of H on the second morpheme will have a lower pronunciation regardless of how many moras the first H has manifested on (28c, d).

(28) a.   H   *búgí* 'grandmother'

      b.   H   /bédédé/ 'spark'   →   [bédédē]

      c.   H H   /ndérlé   sílí/   →   [ndérə́l sīlí]
                  turn   pile
                  'turn a pile'

      d.   LH H   /tìwí-ɲá/   →   [tìwíɲā]
                  unroll-3SG.OBJ
                  'he/she unrolls it'

5 Lexical Phonological Processes

Lexical phonological processes are those that occur at the word level, whereas post-lexical processes occur beyond word boundaries. We will summarize in this section those lexical processes that are most significant in the analysis of Naba phonology.

5.1   Final vowel drop

Nearly all words in Naba end in a final vowel when pronounced in isolation or in the final position of a phrase ("prepausal" position). However, in non-final position, the majority of Naba words (about 70 percent), drop the final vowel, and this process provokes a change to the word's syllabic structure.

   Before treating the process of final vowel drop, we must establish that the underlying form of words undergoing this process are indeed vowel-final. Another possible analysis is that some words are underlyingly C-final, and that they take a final vowel in pre-pausal position. This is a valid argument, but the following evidence supports the case for the V-final analysis:

1. Variation in final vowels. If C-final words have a final vowel added in prepausal position, one would expect some regularity as to the quality of this vowel. We would expect either a single vowel sound to apply in all such cases, or a vowel that in some way regularly 'matched' the quality of vowels in the word root. As discussed in section (2.2.1), the tendency in Naba is for complete vowel harmony, but there are many exceptions. None of the words in (29) have final vowels pronounced before another morpheme. (29a–b) are identical except for the final vowel, and (29c–d) show analogous environments.

(29)   a.   *oɗe* 'vomit'
            [*ot   kolo*]
            vomit   much
            'he/she vomits a lot'

    b.   *odo* 'reap'

        [*ot*   *kolo*]

        reap   much

        'he/she reaps a lot'

    c.   *ngaala* 'stomach'

        [*ŋgal*   *bo*]

        stomach big

        'a big stomach'

    d.   *ngaare* 'sultan'

        [*ŋgar*   *bo*]

        sultan   big

        'a big sultan'

If these words have underlying C-final structure, there is no explanation as to why the final vowel should differ between (29a) and (29b) or between (29c) and (29d). If the final vowel is inserted by a phonological process, the environment should dictate a specific vowel quality.

2. Behavior of Arabic loan words. Chadian Arabic has both V-final and C-final words, but when they enter Naba, a final vowel is always added. This would be expected for pre-pausal forms in either analysis. What is more relevant is that when positioned before another morpheme, Arabic loans separate into the same two categories as Naba, those that have a final vowel and those that do not. Yet there is no predictability linking this behavior in Naba to the syllabic structure of the Arabic source. The comparison is shown in Table 10:

Table 10. Chadian loans

	Naba lexeme	**Chadian Arabic lexeme**	**Naba lexeme in context**
a.	*/faharka/* 'think'	*fakkar* (C-final)	[*faharka* *koolo*] think much 'he/she thinks a lot'

b.	/abatʃe/ 'ant sp.'	abu'aache (V-final)	[abaʃe si] ant (sp.) ten 'ten ants'
c.	/katʃatʃa/ 'rake'	tchakarkara (V-final)	[kaʃac ʃasa] rake good 'a good rake'
d.	/tʃoloho/ 'sparrow'	abuntchulukh (C-final)	[tʃolɔg an bob-ma] sparrow POSS father-1SG.POSS 'my father's sparrow'

The Chadian Arabic source words in (a) and (d) are both consonant-final words that had vowels inserted finally as they were absorbed into the Naba language. However, (a) keeps that final vowel before another morpheme while (d) does not. (b) and (c) show loans derived from vowel-final Arabic words, but they show the same variance. While this is not definitive evidence, we can at least say that the apparent randomness of loan word behavior concerning the final vowel does not support an underlying distinction between V-final and C-final words.

3. Related languages. The analysis of final vowel drop as described here has been attested in varying degrees for two closely related languages, Kenga (Nekukom 1993: 40) and Bagirmi (Djibrine & Keegan 2016: xi), as well as in some other languages of the Sara-Bagirmi group, like Bongo (Kilpatrick 1985), and Baka (Parker 1985). In his work on the historical reconstruction of Sara-Bagirmi, Boyeldieu suggests a historic *CVCV pattern that has eroded to CVC in some languages (Yulu, Fer, Gula, and the Central Sara languages) and which has retained the final underlying vowel in others (Modo, Baka, Na, Kulfa, Bagiro, and possibly Ndoka) (Boyeldieu 2000: 55).

It is not clear why final vowel drop occurs in the majority of words but not in all. There is no clear correspondence between underlying syllabic structure or phoneme quality and the division of words into these two categories, although it is possible that tone melodies play a role. In the study of noun and verb tone melodies, there is a strong correspondence between the M tone melody and the retention of the final vowel; there are only a handful of cases of M tone verbs or nouns with final vowel drop. However, there are many words that retain

the final vowel that are not M tone. A good number of HL words keep the final vowel, and about half of all LH words keep the final vowel. H, L, and ML words nearly always drop the final vowel, and there are no cases of LM, MH or HM retaining the final vowel. Thus, while there is no hard rule linking tone melody to final vowel retention or deletion, there are certainly tendencies, particularly with M tone.

There is also a tendency for words with (C)VC.CV structure to retain the final vowel in context, although, again, this is just a tendency and not a rule. However, since there is also a strong correlation between this syllabic pattern and M tone, it could be that the tone melody alone is really in question.

The final vowel is always retained in monosyllabic words, although non-final position shortens a double vowel in such words, as in (30). This is further discussed in the following section (5.2):

(30)   a.   /lii=ge/   →   [lige]
            snake=PL
            'snakes'

       b.   /ndii/ 'sow'
       →   [ja   ndi   ŋgal   kala=ǹ   ti]
            3SG.SBJ   sow   in   bush=CIRC   LOC
            'he/she sows in the bush'

When the final vowel of a polysyllabic word drops, a new structure emerges because the last consonant of the word, underlyingly the onset of the final open syllable, now closes the previous syllable. This causes the morpheme to end in a closed syllable, which is not acceptable in underlying forms. As shown in (31), restructuring occurs both with the attachment of a clitic or suffix, or simply in context before another word.

(31)   a.   V.CV → VC
            /umu/ 'nose'
            →   [ʋm=ge]
                   nose=PL
                   'noses'

b.   CV.CV → CVC
     /golo/ 'trick'
     →   [*gol-ɲa*]
             trick-3SG.OBJ
             'he/she tricks him/her'

c.   CV.CV → CVC
     /domo/ 'palm leaf'
     →   [*kaj*   **dɔm**   *an*   *bɔb-ma*]
             see   palm_leaf   POSS   father-1SG.POSS
             'he/she sees my father's palm leaf'

d.   V.CV → VC
     /eje/ 'die'
     →   [*ja*   **ɛc**   *taaga*]
             3SG.SBJ   die   yesterday
             'he/she died yesterday'

e.   VC.CV → VCC
     /arge/ 'search'
     →   [*ja*   **arg**   *askari=ne*]
             3SG.SBJ   search   soldier=DEF
             'he/she searches for the soldier'

In (31a–d) above, we see words with the structure (C)V.CV, sequences of two open vowels; these syllabic structures lead to simple VC or CVC syllables after final vowel drop, syllables that are normally permitted in Naba. With the structure VC.CV in (31e), the closed syllable followed by an open syllable leads to a VCC syllable which is not part of the underlying syllable inventory of Naba.

When final vowel drop occurs in a word that contains a double vowel in the penultimate syllable, that vowel is shortened. Syllable weight is restricted in Naba to two moras, and final vowel drop creates a new consonant-final syllable. If the double vowel is retained in the new structure, it would create a three-mora ultra-heavy syllable, (C)VVC, so the vowel must be shortened, as in (32).

(32) a. CVV.CV → CVC
          /baaga/ 'turn over'
          → [ja   **bag**   koolo＝ne]
             3SG.SBJ   turn_over   pot＝DEF
             'he/she turns the pot over'

      b. CVV.CV → CVC
          /ruuzu/ 'flour'
          → [**ruz**   an   tʃe-ma]
             flour   POSS   mother-1SG.POSS
             'my mother's flour'

      c. VV.CV → VC
          /aaja/ 'drink'
          → [ja   **aj**   berije]
             3SG.SBJ   drink   porridge
             'he/she drinks the porridge'

The process of vowel shortening only occurs in the specific environment of final-vowel drop after a syllable containing a double vowel. Words that do not undergo final vowel drop retain their double vowels in any environment, as in (33):

(33) a. VV.CV
          /aafa/ 'leave'
          → [*aafa-k*]
             leave-2.PL.SBJ
             'you (pl.) leave'

          → [*aafa   saba*]
             leave   tomorrow
             'he/she leaves tomorrow'

      b. CVV.CV
          /boono/ 'robe'

→   [*boono = ge*]
      robe = PL
      'robes'

→   [*boono   fasa*]
      robe   good
      'a good robe'

5.2   Pronunciation of *-ɲa* '3SG.OBJ/POSS'

Naba has a series of pronominal suffixes that indicate the object of a verb, and a series of suffixes indicating the possessor of a noun. These suffixes are identical for the first, second, and third person singular while the possessive markers for plural person differ slightly from their object-marking counterparts. The difference is due to the incorporation of the clitic =*ge* into the plural object markers. All the suffixes are shown in Table (11) below.

Table 11. Possessive and object suffixes

	Possessive (on Noun)	Object (on Verb)
1 SG	-*ma*	-*ma*
2 SG	-*i*	-*i*
3 SG	-*ɲa*	-*ɲa*
1 PL[10]	-*ze*	-*zege*
2 PL	-*se*	-*sege*
3 PL	-*re*	-*rege*

Possessive marking on nouns often co-occurs with use of the definite clitic =*ne*; with the 1st person or 3rd person singular possessive markers, the nasal element is elided and only the vowel quality changes, as we see in (34):

(34)   a.   */kore-ma/*   →   [*kɔrma*]
         worm-1SG.POSS
         'my worm'

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10 Naba does have an inclusive/exclusive distinction in the 1st person plural, but it is not widely in use anymore and is only evident in subject marking; for possessive and object marking *-ze/-zege* is used for both.

/kore-ma＝ne/   →   [kɔrme]
worm-1SG.POSS＝DEF
'the worm of mine'

b. /bi-ɲa/   →   [biɲa]
hair-3SG.POSS
'his/her hair'

/bi-ɲa＝ne/   →   [biɲe]
hair-3SG.POSS＝DEF
'the hair of his/hers'

The /ɲ/ of the *-ɲa* '3SG.OBJ/POSS' suffix, whether marking possession or verbal object, undergoes an entire system of surface pronunciation allophony based on the sonority level of the preceding phoneme. This is considered a lexical process, as it is quite specific to this one affix and does not occur in general with either palatal or nasal consonants.

The suffix *-ɲa* behaves differently depending on the previous sound. When affixed to a final vowel (as is the case with words that do not undergo final vowel drop), *-ɲa* does not itself undergo any change, but fronts the preceding vowel if it is a back vowel. So /o/ is pronounced as [e] (35a), while /u/ is pronounced as [i] (35b). /a/ is not affected by the affixation of *-ɲa* (35c).

(35) a.   /ja   tʃoso-ɲa/   →   [ja tʃoseɲa]
3SG.SBJ   shell-3SG.OBJ
'he/she shells it'

b.   /ja   ulu-ɲa/   →   [ja uliɲa]
3SG.SBJ   swallow-3SG.OBJ
'he/she swallows it'

c.   /ndaafa-ɲa/   →   [ndaafaɲa]
fan-3SG.POSS
'his/her fan'

After a sonorant consonant (nasal, liquid, or approximant), *-ɲa* does not change its pronunciation as in (36), but may provoke assimilation of the first nasal to the palatal nasal (36d, e).

(36)   a.   */ŋgeere-ɲa/*   →   [ŋgɛr**ɲa**]
            'he/she knows it'

       b.   */baala-ɲa/*   →   [bal**ɲa**]
            'his/her ram'

       c.   */omo-ɲa/*   →   [ɔm**ɲa**]
            'he/she pours it'

       d.   */aana-ɲa/*   →   [an**ɲa**], [aɲ**ɲa**]
            'he spreads it (fire)'

       e.   */raaŋa-ɲa/*   →   [raŋ**ɲa**], [raɲ**ɲa**]
            'his/her tree (sp.)'

       f.   */toɲo-ɲa/*   →   [tɔɲ**ɲa**]
            'his/her millet'

       g.   */sowa-ɲa/*   →   [sɔw**ɲa**]
            'he/she digs it up'

       h.   */aaje-ɲa/*   →   [aj**ɲa**], [aj**ja**]
            'he/she drinks it'

In (36h), we see variation in the pronunciation of *-ɲa* after the approximant /j/. The distinction between the two palatals is difficult to maintain, and unless the speaker is enunciating slowly, the tendency is for /ɲ/ to assimilate to /j/. We will see a similar process with the sibilants.

   Non-sibilant obstruents include the regular, prenasalised, and implosive stops, the fricatives /f/ and /h/, and the affricates. When following an obstruent, the consonant of *-ɲa* loses its sonority by assimilating to a voiceless or voiced palatal obstruent [tʃ] or [dʒ]. The following pronunciations (37d–f) also show the post-lexical pro-

cess of fortition of the consonant before *-ɲa*, a process which will be discussed below in section (6.3).

(37) a. */baga-ɲa/*   →   [bag**dʒa**]
          'he/she closes it'

      b. */nduutu-ɲa/*   →   [ndʊtˀ**tʃa**]
          'he/she dries it'

      c. */ɗaba-ɲa/*   →   [ɗab**dʒa**]
          'he/she sells it'

      d. */oɗe-ɲa/*   →   [ɔd**dʒa**]
          'he/she vomits it'

      e. */reetʃe-ɲa/*   →   [rɛcˀ**tʃa**]
          'he/she breaks it'

      f. */uufu-ɲa/*   →   [ʊpˀ**tʃa**]
          'he/she blows it'

With sibilant consonants, the *-ɲa* suffix also loses its sonority, but instead of assimilating to a full obstruent, it becomes a palatal sibilant. This is another indicator that sibilants in Naba have their own level of sonority somewhere in between that of obstruent and sonorant. The similarity of the palatal sibilant to the alveolar sibilant preceding it provokes a total assimilation like that seen with *-ɲa* preceded by /j/ (36h). This total assimilation is shown for /s/ in (38a) and for /z/ in (38b).

(38) a. */ɗeese-ɲa/*   →   [ɗɛ**ʃʃa**]
          'he/she fills it'

      b. */ozo-ɲa/*   →   [ɔ**ʒʒa**]
          'he/she milks it'

5.3   Pronunciation of the connective marker $=n$ and circumstantial $=\grave{n}$

The connective marker (CN) is a single nasal segment $=n$ that attaches to the end of a noun phrase in order to link the NP to a certain stative and descriptive elements, such as adjectival and positional verbs, adverbials, and quantifier predicates. The connective marker appears in many contexts, and the analysis of its syntactic role is beyond the scope of this paper. The term 'connective' is taken from the Neukom's analysis of Kenga, in which a syllabic nasal clitic plays a similar role (Neukom 1993: 55). Like Kenga, Naba also has a "pronominal circumstantial" marker $=\grave{n}$ (CIRC) that attaches to the end of a word to indicate a following locative phrase (Neukom 1993: 113). The circumstantial can attach to a verb with a non-obligatory locative complement, or to a noun phrase that is the subject of a non-verbal predicate. The circumstantial may also appear *within* a locative phrase to attach a nominal element to the locative particle *ti*[11]. The circumstantial has an underlying low tone, as opposed to the connective $=n$, which is underlyingly toneless. However, outside of tone both connective and circumstantial display the same phonological behavior.

$=n$ and $=\grave{n}$ are pronounced syllabically in certain contexts. When attached to a morpheme that retains its final vowel, they are pronounced as the end of the final syllable (39a–b), but when attached after final vowel drop, these markers are pronounced as a syllabic nasal. The nasal assimilates to the place of articulation of the preceding consonant if the consonant is obstruent (39d–e). If the preceding consonant is a non-nasal sonorant, the clitic may assimilate to a following obstruent consonant (39c).

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11 It appears that the circumstantial marker in all three of these contexts is non-obligatory, with the same speaker either using it or not using it in identical environments. The post-verbal context is the least observed, which is reflected in the examples

(39)   a.   [elɛ**n** tə ɗe ti]
        /ele=ǹ   tè   ɗe   ti/[12]
        tail=CIRC   DAT DIST   LOC
        'a tail is there'

     b.   [bɪs fasa**n** tə nan ti]
        /biisi fasa=ǹ   tè   nani   ti/
        dog   good=CIRC   DAT PROX   LOC
        'a good dog is here'

     c.   [bal**ŋ** koolo]
        /baala=n   koolo/
        ram=CN   many
        '[there are] many rams'

     d.   [kab**m** fasa]
        /kaabe=n   fasa/
        egg=CN   be.good
        'the egg is good'

     e.   [ngab**m** kaawa]
        /ngaaba=ǹ kaawa/
        man=CIRC   long
        'a man is far'

If the final consonant of the NP (after final vowel drop) is also a nasal, the nasal clitic assimilates to it completely and is not pronounced syllabically, as in (40a). However, when the final consonant is the labial nasal *m*, an epenthetic vowel *ə* is inserted finally as in (40b). This insertion after the nasal clitic only occurs with *m*.

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12 In locative non-verbal predicates, the dative marker *tè* nearly always appears before a demonstrative pronoun. The dative marker is obligatory before demonstratives *ɗe* and *nani*, but optional before other locative elements such as prepositions.

(40)   a.   [*madan tə ɗe ti*]
             /*madana=ǹ   tè   ɗe   ti*/
             island=CIRC   DAT   DIST   LOC
             'an island is there'

       b.   [*jimə tɛn gooro*]
             /*jiimi=ǹ   tè   ngooro*/
             cricket=CIRC   DAT   near
             'a cricket is near'

The connective marker takes last position in the NP, including in noun phrases with multiple clitics (41a–b), while the circumstantial can attach either to the end of the NP subject of a locative predicate (41c) or as the final element of a verb connected to a locative complement (41d).

(41)   a.   [*bi rab nɛŋ koolo*]
             /*bi   raafa=ne=n   koolo*/
             hair   white=DEF=CN   many
             '(there are) many of the white hairs'

       b.   [*marəb bobogenɛn maʃa*]
             /*marba   bobo=ge=ne=n   matʃa*/
             Patas.monkey   big=PL=DEF=CN   six
             '[there are] six of the big Patas monkeys'

       c.   [*ŋgar dʒammɛn tə jaw ti*]
             /*ngaare   dʒaama=ne=n   tè   jawo   ti*/
             sultan   old=DEF=CIRC   DAT   Yao   LOC
             'the old sultan is at Yao'

       d.   [*ŋgabge utʊn taara*]
             /*ŋgaaba=ge   utu=ǹ   taara*/
             man=PL   exist=CIRC   above
             'the men are above'

As with the other NP clitics, =*ge* and =*ne*, the connective marker =*n* appears to be underlyingly toneless (section 4.3) and is pronounced according to the spread of the melody of the preceding morpheme as in (42).

(42) a. [*gùrń kóòlò*]
          /*gùrú=n   kóòlò*/
          basket=CN   many
          '(there are) many baskets'

      b. [*sīndē tə̀ mbúrgɛ̄n sìlí*]
          /*sīndē   tè   mbúūrū=ge=n   sìlí*/
          horse   DAT   donkey=PL=CN   seven
          '(there are) seven horses and donkeys'

5.4 /k/ in medial position

In certain dialects, particularly in the subdialect of Yao Bilala, the phoneme /k/ is pronounced as a fricative [x] in pre-vocalic, non-initial position. The [x] varies in quality and is often perceived as [h], leading to questions about the phonemic status of /h/, which mainly occurs in the same medial position. (43) shows some clear examples of the /k/ becoming [x], which are easier to identify because they have correspondences in the Medogo dialect, which sometimes retains the underlying /k/ in surface pronunciation:

(43) /*daa.ka*/ 'sow'   →   [*daa.**x**a*] in Bilala, [*daa.**k**a*] in Medogo
      /*tu.ku*/ 'hit'   →   [*tu.**x**u*] in Bilala, [*tu.**k**u*] in Medogo

However, there are many words in the Bilala dialect that retain the pronunciation [k] intervocalically. Since all of these are of at least three syllables, in most cases with the [k] being the consonant onset of the final syllable, it could be that another phonological process prevents /k/ from changing in this particular position, as shown in (44):

(44) a. /*ma.da.ka*/   [*ma.da.**k**a*] 'border of mat'
      b. /*lo.ho.ko*/ or /*lo.ko.ko*/?   [*lo.**h**o.**k**o*] 'chameleon'
      c. /*fa.ka.ha*/ or /*fa.ka.ka*/?   [*fa.**k**a.**h**a*] 'fishing stick'

With (44b) and (44c) it is difficult to determine if there are two underlying /k/ phonemes or if these show actual /h/ and /k/ phonemes in the same word. As no words in the Bilala dialect contain either two surface [k]s or two surface [h]s simultaneously, a possible interpretation is that /k/ becomes [h] intervocalically but may only do so once in a single morpheme.

It is fairly clear that /k/ always becomes a fricative in the position of final syllable onset following a penultimate closed syllable in the Yao sub-dialect. The fricative in such cases is [x], with less variation in pronunciation. In corresponding words from the Kuka and Medogo dialects, the /k/ is often retained in the surface pronunciation, as seen in example (45):

(45)   */bur.ku/* 'ashes'   [*bʊr.xu*] in Bilala, [*bʊr.ku*] in Medogo
       /kor.ko/ 'to scratch'   [*kɔr.xo*] in Bilala, [*kɔr.ko*] in Kuka

It is interesting to note that the fricativization of /k/ is the only phonological process that causes a phoneme to become more sonorous rather than less sonorous. In a sonorant environment (between two vowels or between a sonorant consonant and a vowel), a fully occlusive obstruent becomes a fricative obstruent. Why this only happens with the stop /k/ is not evident, but it is comparable to similar processes in related languages, as in Kenga, where /h/ does not exist and [x] only exists as an allophone of /k/ in this position (Weiss 2000: 3; 6).

5.5   The phonemic status of /h/

Previous work on the Bilala dialect by Schultz (2001: 5) suggests that /h/ does not exist as a phoneme outside of Chadian Arabic loan words. He states that we hear it only as an allophone of /k/, as discussed above. It is a possible interpretation, and one that adds to the symmetry of Naba's phonemic inventory, which otherwise has voiced/voiceless correspondents for obstruents at each other place of articulation. However, this interpretation necessitates that we focus solely on the Bilala dialect of Naba and that we conclude that [x] and [h] are both allophones of /k/ in the same positions. But in looking at all three main dialects of Naba, I find it harder to eliminate a phonemic /h/. One reason is the number of words (albeit small) in all three dialects with a clearly pronounced initial /h/ that have no evident link to Arabic; some of these are shown in example (46):

(46)   Medogo: *haku* 'falcon'   *halgom* 'goiter'

       Bilala: *hormo* 'foam'   *hoɲo* 'body'

       Kuka: *hala* 'abort, refuse' *hatedʒi* 'stallion'

In fact, Kuka has many words beginning in /h/ that have vowel-initial correspondents in Bilala (Laya 2003). The examples in Table (12) suggest a development in which the /h/ (or perhaps initially a /k/) in Kuka was eventually dropped at the beginning of certain words:

Table 12. /h/ in initial position in Kuka

Bilala	Kuka	Gloss
ele	*hele*	'tail'
ere	*here*	'urine'
arle	*hɛrlɛ*	'twist'

We can dismiss the idea that Kuka adds an [h] to the beginning of vowel-initial words, because Kuka also has correspondent words beginning with vowels, as shown in Table (13):

Table 13. Comparison of word-initial vowels in Bilala and Kuka

Bilala	Kuka	Gloss
ooɲo	*ɔɲ*	'wound'
aza	*azi*	'brother-in-law'

As for /h/ in non-initial position, there are perceivable differences between [h] and [x] that suggest the possibility of both /k/ and /h/ occurring intervocalically; this is however, difficult to prove since one could argue that [h] and [x] represent a range of variant pronunciations of /k/. (47) shows a few examples where a consistent difference is heard:

(47)   a.   [*roho*] 'attach'   [*roxo*] 'fall'

       b.   [*tehe*] 'be full'   [*exe*] 'climb'

A possible interpretation of the status of *h* is that it originally was not a phoneme but that over the period of Naba's interaction with Arabic, it became phonemic, to varying degrees in the different dialects. Cross-linguistic studies in the Sara-Bagirmi family show that /h/ is often infrequent or restricted to certain positions. /h/ does not exist as a phoneme in Kenga (Neukom 1993: 19), which is closely related to Naba. According to Keegan's cross-linguistic research, /h/ is very rare in Central Sara and Western Sara languages (Keegan 2014a: 16)

but somewhat common in Eastern Sara languages (Keegan 2014b: 17).

6 Post-lexical phonological processes

Post-lexical processes are those that occur after morpheme-specific processes have applied. They are not restricted to certain types of morphemes and occur within words, across morpheme boundaries in the same word, and across word boundaries. Unlike most lexical processes in Naba, which need to be ordered in their application, post-lexical processes in Naba are not generally ordered amongst themselves, with the possible exception described in 6.1. They must be applied after all relevant lexical processes have first applied.

6.1 Unreleased Voiceless Stops

Voiceless stops are pronounced without release when they occur before another consonant. Since surface voiceless stops may be created by the voicing assimilation (48a, b) and/or fortition processes (48c), it does appear that the unreleasing process is ordered to apply after assimilation and fortition.

(48) a. */tada/* 'chase'

/ja	*tada*	*kere/*	→	[*ja tat̚ kere*]
3SG.SBJ	chase	elephant		

'he/she chases an elephant'

b. */booɗo/* 'warthog'

/kaje	*booɗo*	*kaawo/*	→	[*kaj bɔt̚ kaawo*]
see	warthog	long		

'he/she sees a long warthog'

c. */reetʃe/* 'break'

/ja	*reetʃe*	*kudʒu=ne/*	→	[*ja rɛc̚ kudʒune*]
3SG.SBJ	break	knee=DEF		

'he/she breaks the knee'

Voiced stops are always pronounced as released in Naba. Sometimes a slight epenthetic vowel may even be heard after a voiced stop followed by a consonant in order for the release to be distinct.

6.2 Voicing Assimilation

In Naba, all obstruent consonants undergo the process of assimilation in voicing to a following consonant. This process occurs most frequently with morphemes that first undergo final vowel drop, leaving a final consonant before another morpheme that may begin with a consonant. Assimilation to the voiced /g/ occurs with nouns that drop their final vowel before being pluralized by the clitic =*ge*, as in (49):

(49)   /*gete*/ 'winnowing basket' + =*ge* → [*gɛdge*] 'winnowing baskets'

       /*lohoko*/ 'chameleon' + =*ge*   → [*lohogge*] 'chameleons'

       /*naafe*/ 'moon' + =*ge*   → [*nabge*] 'moons'

       /*tʃaatʃa*/ 'turban' + =*ge*   → [*tʃaɟge*] 'turbans'

Devoicing occurs with the suffix marking a second person plural subject on verbs, -*ki*, as in (50):

(50)   a.   /*uudu*/ 'grind'

          /*uudu-ki*   *toŋo*/   → [*ʊtˀki toŋo*]

          grind-2PL.SBJ   millet

          'you(pl.) grind millet'

     b.   /*ɗeebe*/ 'store'

          /*ɗeebe-ki*   *mondʒo*/ → [*ɗɛpˀki mɔndʒo*]

          store-2PL.SBJ   beans

          'you(pl.) store beans'

Assimilation occurs across word boundaries as well, with both voicing (51a–b) and devoicing (51c–d):

(51)   a.   /*tatʃa*/ 'track'

          /*ja*   *tatʃa*   *booɗo*/   → [*ja taɟ booɗo*]

          3SG.SBJ   track   warthog

          'he/she tracks a warthog'

b.   /gerfe/ 'cloud'
     /kaye   gerfe   bo/   →   [kaj gɛrəb bo]
     see   cloud   big
     'he/she sees a large cloud'

c.   /bobo/ 'father'
     /bobo   tʃorlo/   →   [bɔp˺ tʃorlo]
     father   giraffe
     'giraffe's father'

d.   /aaga/ 'crawl'
     /ja   aaga   koolo/   →   [ja ak˺ koolo]
     3SG.SBJ   crawl   much
     'he/she crawls a lot'

The implosive consonants /ɓ/ and /ɗ/ do not have voiceless corre-
spondents in Naba, but as fortition changes them to non-implosive
stops before a consonant as seen below in example (55) in section
(6.3), they simply follow the voicing assimilation patterns of /d/ and
/b/.

   Sibilants do not consistently undergo voicing assimilation, this is
another instance of these consonants resting somewhere in between
obstruents and sonorants. Voicing assimilation of sibilants is a matter
of free variation, as shown in (52), although it does seem to occur
more regularly with verbs than with nouns.

(52) a.   /masa/ 'tamarind'
           /masa=ge/   →   [masge] or [mazge]
           tamarind=PL
           'tamarinds'

      b.   /biisi/ 'dog'
           /biisi=ge/   →   [bɪsge] or [bɪzge]
           dog=PL
           'dogs'

   c.   */usu/* 'wear'

       [*mʊs bɔn fasane*] or [*mʊz bɔn fasane*]

/m-usu	*boono*	*fasa=ne/*
1SG.SBJ-wear	garment	good=DEF

       'I wear the nice garment'

   d.   */ɗeese/* 'fill up'

       [*ja ɗɛs dude*] or [*ja ɗɛz dude*]

/ja	*ɗeese*	*dude/*
3SG.SBJ	fill.up	water.jar

       'he/she fills up the water jar'

6.3   Fortition

The non-occlusive members of the obstruent class – implosives /ɗ/ and /ɓ/, the affricates /tʃ/ and /dʒ/ and the fricatives /f/ and /h/ – undergo a fortition process before another consonant. The sibilant fricatives do not fortify at all except for in the specific lexical process of the suffixation of *-ɲa*, discussed above. This suggests that fortition is a post-lexical process acting on the obstruent class, which does not include sibilants in this case.

    All non-occlusive obstruents in Naba become stops when they immediately precede another consonant, whether the following segment is an affix, clitic, or separate word. As we will explore below, the implosives, which are technically occlusive, also change sonority quality by becoming egressive stops. The following consonant can be of any quality, sonorant or obstruent.

    The affricates affected by fortition become palatal stops, which are not part of the Naba phonemic inventory. /dʒ/ becomes [ɟ] and /tʃ/ becomes [c]. (For more on the palatal obstruents see 2.1.1) Voicing assimilation applies to the fortified consonant simultaneously. The palatal quality spreads if the following consonant is a nasal (53a, c):

(53) a. */miidʒe/* 'addax'

       /miidʒe=ne/   →   [*mɯɟɲe*]

       addax=DEF

       'the addax'

b. */reetʃe/* 'break'
/reetʃe-sege/   →   [*rɛcʔsege*]
break-2PL.OBJ
'he/she breaks you(pl)'

c. */gumatʃe/* 'heart'
/gumatʃe=ne/   →   [*gumaɟɲe*]
heart=DEF
'the heart'

The phonemes /f/ and /h/ are fortified to [b]/[p] (54a–b) and [g]/ [k] (54c–d) according to the voicing of the following consonant. There is some uncertainty as to the status of /h/, as it frequently occurs as an allophone of /k/ intervocalically (see section 5.6). The following examples of fortition involving /h/ (54c–d) are those that I have transcribed with an underlying /h/, but it is possible that the isolation forms contain the allophone of /k/ whereas the "fortified" forms actually show the underlying consonant.

(54)   a. */naafe/* 'moon'
/naafe=ge/   →   [*nabge*]
moon=PL
'moons'

/naafe   fasa=ge/   →   [*napʔ fasage*]
moon   good=PL
'good moons'

b. */uufu/* 'blow'
/ja   uufu   koolo/ →   [*ja ʊpʔ koolo*]
3SG.SBJ   blow   much
'he/she blows a lot'

/ja   uufu-ma/   →   [*ja ʊbma*]
3.SG.SBJ   blow-1SG.OBJ
'he/she blows on me'

c. */booho/* 'depot'
    /booho=ge/   →   [*bɔ**gg**e*]
    depot=PL
    'depots'

d. */naha/* 'touch'
    /naha   kinzir/   →   [*na**k**ˀ kinzir*]
    touch   pig
    'he/she touches a pig'

Implosive stops become non-implosive before another consonant, as shown in (55), suggesting that in Naba implosives may have a higher level of sonority than egressive stops. As /ɓ/ occurs rarely in non-initial position, there are only examples for the fortition of /ɗ/:

(55) a. */kaɗe/* 'gourd'
          /uunu   kaɗe   fene/   →   [*ʊn ka**t**ˀ fene*]
          take   gourd   one
          'take one gourd'

          /kaɗe=ge/   →   [*ka**dg**e*]
          gourd=PL
          'gourds'

      b. */oɗe/* 'vomit'
          /m-oɗe   koolo/ →   [*mɔ**t**ˀ koolo*]
          1SG.SBJ-vomit   much
          'I vomit a lot'

          /oɗe-rege/   →   [*ɔ**dr**ege*]
          vomit-3PL.OBJ
          'he/she vomits them'

6.4 Nasal Assimilation

The alveolar nasal /n/ assimilates to the point of articulation of either a preceding or following obstruent consonant, no matter what

the manner of articulation of this consonant. Nasal assimilation of
/n/ occurs morpheme-internally and across morpheme boundaries,
as shown in (56), although there is some variation in the level of
assimilation across word boundaries (56f). In careful speech, nasal
assimilation at the word boundary may not occur at all, particularly
if the assimilation is to the labial place.

(56)　a.　*/andʒe/* 'light'　→　　[*aɲdʒe*]

　　　b.　*/tʃanga/* 'pen'　→　　[*tʃaŋa*]

　　　c.　*/ngaaba/* 'man'
　　　　　/ŋgaaba=ǹ　　te　　de　　ti/　→　[*ŋgabm tə de ti*]
　　　　　man = CIRC　　DAT　DIST　LOC
　　　　　'that man is there'

　　　d.　*/kudʒu/* 'knee'
　　　　　/reetʃe　　kudʒu-ɲa/　　　　　→　[*rʊc kuɟɲe*]
　　　　　break　　knee-3SG.POSS
　　　　　'he/she broke their knee'

　　　e.　*/doogo/* 'buffalo'
　　　　　/doogo=ǹ　　te　　nani　　ti/　→　[*dogŋ tə nan ti*]
　　　　　buffalo = CIRC　DAT　PROX　LOC
　　　　　'this buffalo is here'

　　　f.　*/muuno/* 'child'
　　　　　/muuno　　bo/　　　　　→　[*mum bo*] or [*mʊn bo*]
　　　　　child　　large
　　　　　'a large child'

　　　g.　*/tʃono/* 'be old'
　　　　　/sige　　tʃono-ki/　　→　[*sɪg tʃɔŋki*]
　　　　　2PL.SBJ　be.old-2PL.SBJ
　　　　　'you (pl.) are old'

Only /n/ submits to this post-lexical process of nasal assimilation. The other nasal phonemes /m/ (57a), /ŋ/ (57b), and /ɲ/ (57c–d) retain their places of articulation:

(57) a. */maame/* 'boa'
          /maame   si/   →   [*mam si*], not
          boa   ten   *[*man si*]
          'ten boas'

      b. */naŋe/* 'children'
          /naŋe   dʒere-ni/   →   [*naŋ dʒereni*], not
          children be.short-3PL.SBJ   *[*nan dʒereni*]
          'children are short'

      c. */iɲi/* 'scorpion'
          /iɲi=ge/   →   [*ɪɲge*], not *[*ɪŋge*]
          scorpion=PL
          'scorpions'

      d. */roɲo/* 'want'
          /sige   roɲo-ki/   →   [*sɪg rɔɲki*], not *[*sɪg
          2PL.SBJ   want-2PL.SBJ   rɔŋki*]
          'you (pl.) want'

The connective marker =*n* discussed above can be pronounced syllabically, leading to an environment where a nasal is directly in between two consonants, which may have different places of articulation. In such a situation, the nasal assimilates to the preceding consonant, not the following, as in (58):

(58) a. [*nʊbm tə nan ti*]
          /nuubu=ǹ   te   nan   ti/
          blind.person=CIRC   DAT   PROX   LOC
          'the blind person is here'

b.   /waaje=n   koolo/   →   [wajɲ koolo]
     spear = CN   many
     'there are many spears'

6.5   Vowel Epenthesis

Sequences of three consonants are prohibited in Naba, so in such cases a vowel is inserted to break up the cluster. Because of the nature of syllabic structure, such clusters only occur at morpheme boundaries following the lexical process of final vowel deletion. The schwa [ə] is normally inserted between the first and second consonants to modify syllable structure, although the epenthetic vowel may assimilate to the vowel of the first morpheme in rapid speech, particularly in the case of high vowels (59b, 60b).

(59) a.   /mar.ba/ 'Patas monkey' $CVC_1.C_2V$

          /marba=ge/ $CVC_1C_2V = C_3V$

          Patas.monkey = PL

          'Patas monkeys'

                   →   [ma.rəb.ge] $CVC_1C_2.C_3V$

      b.   /girli/ 'mahogany' $CVC_1.C_2V$

          /girli   bo/ $CVC_1C_2V \ C_3V$

           mahogany   big

           'a big mahogany'

                   →   [gi.rɪl bo] $CVC_1C_2 \ C_3V$

While the norm is for the epenthetic vowel to be inserted between the first and second consonants of a sequence, it may be inserted between C_2 and C_3, particularly if C_3 is a sonorant consonant:

(60) a.   /mar.ba/ 'Patas monkey' $CVC_1.C_2V$

          /marba=ne/ $CVC_1C_2V = C_3V$

          Patas.monkey = DEF

          'the Patas monkey'

                   →   [mar.bə.ne] $CVC_1C_2.C_3V$

b.   */girli/* 'mahogany' $CVC_1.C_2V$

      /girli-ma/ $CVC_1C_2V\text{ -}C_3V$

      mahogany-1SG.POSS

      'my mahogany'

         →   [*gir.lə.ma*] $CVC_1C_2C_3V$

6.6   Resyllabification of prenasalised Stops

In non-initial position in a phrase, the nasal element of a prenasalised stop may move to the end of the previous word or be deleted entirely. The sonority level of the previous sound determines how the prenasalised stop is structured. Prenasalised stops exist in many of the Sara-Bagirmi languages, but little research has been done into their behaviour and underlying status. The resyllabification of prenasalised stops as discussed here has been observed in at least one other Central Sudanic language, Bongo (Kilpatrick 1985: 29), but most phonological treatments list the prenasalised stops as phonemes without giving additional evidence for their status. An exception to this is in the analysis of Gor, in which Kosmadji and Roberts treat the prenasalised stops as homorganic consonant sequences (Kosmadji & Roberts 2009: 6).

The resyllabification process suggests that prenasalised stops may be underlyingly nasal-stop sequences, but as there are no other consonant sequences permitted in the underlying structure of the Naba syllable, particularly in initial position, the analysis of these sounds as single phonemes seems more congruous with the overall phonological system. For this analysis I adopt the position that prenasalised stops are underlyingly single phonemes, although further research may indicated nasal-stop sequences.

The nasal element of a prenasalised stop detaches from the stop and closes the final syllable of a previous vowel-final word, as in (61):

(61)   a.   [*o.sɔ**n** **d**ar sa*]

        /oso   ndaara   sa/

        eat   skin   cow

        'he/she eats the cow skin'

b. [ɗɔg nɛn u.gʊm **bi**ɲɛn ti]
/ɗoho   nen   ugu   mbi-ɲa = ǹ   ti/
woman   PROX   hit   ear-3SG.POSS = CIRC   LOC
'this woman hits herself on her ear'

If the previous word undergoes final vowel drop, resulting in a final nasal or liquid consonant, the nasal element of the prenasalised stop will be deleted altogether. In careful speech, however, the nasal element may be retained after a liquid (62c):

(62) a. [nɔ**m** **g**al ɓene]
/noomo   ngaala   ɓe = ne/
enter   in   house = DEF
'he/she enters the house'

b. [ɓaw kalan ta**r** **d**ɛrle]
/ɓawo   kala = ǹ   tara   nderle/
go   bush = CIRC   do   turn
'he/she got lost in the bush'

c. [nda**r** **nd**ufo]
/ndaara   ndufo/
skin   duck
'duck skin' (slow speech)

Unlike the other sonorants, approximants do not provoke a deletion of the nasal element. Rather, the nasal element is pronounced syllabically after /j/ (63a) or /w/ (63b):

(63) a. /kaje   ngerse/   →   [kaj.**ŋ̩** **g**ɛrse]
see   louse
'he/she sees a louse'

b. /suwa mboje/   →   [sʊw.**m̩** **b**oje]
Arab   wash.self
'an Arab washes himself'

Non-occlusive obstruents also provoke the syllabification of the nasal element of the prenasalised stop, as in (64). In this case, sibilants group with the other fricatives and with affricates (64c):

(64) a.   [ŋgɔmne ʊf.ɲ **dʒ**an ti bo]
           /ngomo = ne   uufu   ndʒa = ǹ   ti   bo/
           hernia = DEF swell   leg = CIRC LOC be.big
           'the hernia that swells the leg is big'

      b.   [mɪɟ.**ŋ g**oxo]
           /miidʒi   ngoko/
           addax   be.bent
           'the addax is bent'

      c.   [ja ɔz.**ŋ̍ g**al ɓene]
           /ja   oozo   ŋgaala   ɓe = ne/
           3SG.SBJ sweep   in   house = DEF
           'he/she sweeps the house'

If the final consonant of the preceding word is a stop, the prenasal-
ised stop is not restructured at all, as in (65):

(65) a.   /gooto   ndame/   →   [gɔt **nd**ame]
           place   dance
           'place for dancing'

      b.   /rige   ndooro-ni   koolo/ →   [rɪg **nd**orɔn koolo]
           3PL.SBJ fight-3PL.SBJ much
           'they fight a lot'

7 Conclusion

In this article I have presented an overview of the segmental pho-
nology, syllable structure, tonal system, and lexical and post-lex-
ical processes of Naba. We have seen that the distinction between
sonorant and obstruent consonants plays a major role in all aspects
of the phonological system. I have also shown that sibilants in Naba
have a special sonority status placing them in between obstruents
and sonorants. Table 14 is a summary of the patterning of sibilants
for different phonological processes:

Table 14. Sonority behaviour of sibilants

Property	Sonorant-like	Obstruent-like	Comment
Can occur as syllable-final in underlying structure	no	yes	Occurs in a few words with sk sequence but is not normally allowed
Can be a TBU	no	yes	
Blocks leftward tone movement	yes	no	
Provokes -ɲa sonority assimilation	yes	yes	-ɲa assimilates, but to palatal sibilant, not to an affricate
Assimilates in voicing	no	no	voice assimilation is optional
Undergoes fortition	yes	no	
Provokes following syllabic nasal	no	yes	

Table 14 shows that sibilants pattern consistently with neither sonorants nor obstruents, and sometimes exhibit their own specific behaviour.

In addition to the particular status of sibilants, this current research has shown correspondence between tone behaviour and the sonority hierarchy; further research will show how tightly the two factors are interwoven.

I have intended this description to be a preliminary investigation into the phonology of Naba, and hope that it will be beneficial to those studying related languages and doing cross-linguistic typology, particularly in the domains of sonority hierarchy and tone systems.

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Did Proto-Chadic have velar nasals and prenasalised obstruents*?*

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Abstract

Ever since the Afroasiatic affiliation of Chadic as a whole was suggested by Joseph H. Greenberg (1950, 1963) in his seminal re-classification of African languages and has been generally accepted, i.e. encompassing both 'Chado-Hamitic' and 'Chadic' languages of influential pre-Greenbergian genetic classifications, the issue of whether Proto-Chadic possessed prenasalised obstruents and velar nasals has been repeatedly raised and debated in the literature, yet without final consent. Most of the 196 presently known Chadic languages would appear to possess these consonants in their synchronic phonemic inventories. The present article reviews the debate in view of recently available new insights on the historical phonology and lexical reconstruction based on data from 66 of the 79 known Central Chadic languages, i.e. the most numerous and most diverse branch of Chadic. According to these recent comparative studies of Central Chadic that allow to reconstruct Proto-Central Chadic phonology and lexicon, there is massive evidence to show that both velar nasals and prenasalised obstruents emerged as results of natural phonological processes probably already on the proto-language level, but need not be reconstructed for the proto-language's phonemic inventory. And if Proto-Central Chadic did not have these consonants as inherited phonemes, then this would also be true for its predecessor, Proto-Chadic. The major processes leading to the emergence of velar nasals and prenasalised obstruents were segmental fusion and the emergence of prenasalisation prosody that arose from the de-segmentalisation and prosodification of reconstructed nasals. The article summarises the evidence and gives illustrative examples for the reconstructed phonological processes, which created segmental fusions that eventually became phonologised yielding synchronic phonemes in the modern Central Chadic languages.

Keywords: Afroasiatic, Chadic, historical phonology, prosodification, segmental fusion

1 Introduction

Expert wisdom on the inventory of consonants in Proto-Chadic (PC) is divided, both in general terms and particularly with regard to velar nasals and prenasalised obstruents. Recent surveys (for instance, Meyer & Wolff 2019: 271; Frajyzngier & Shay 2012: 249) offer no new insights and refer the reader back to Newman (1977: 9), which still remains the authoritative view on matters. The analysis and description of co-articulated consonants in Chadic links up with a more general problem in linguistics, namely the impact of theoretical inclinations and methodological preferences of the individual linguist on the description of a language system.

> The existence of underlying segments with double articulation, such as pre-nasalized stops (frequent in Chadic), labial-velar and palatalized consonants, is to a certain degree dependent on the theoretical assumptions and the methods of phonological analysis, in particular on the way a given researcher discovers a distinction between consonant clusters and single phonemes. (Frajzyngier 2012: 508)

The present paper addresses exactly this issue against the backdrop of very recent studies on the historical phonology and lexical reconstruction in Central Chadic (see Wolff 2022; Wolff in press). Central Chadic (CC), with 79 known languages (Eberhard et al. 2021) is perceived to be not only the most numerous branch of the Chadic language family by number of known languages, but also the internally most diverse (at least by expert intuition). The aim of the paper is to throw light from the author's most recent comparative research on Central Chadic on the hitherto open question of whether PC had prenasalised obstruents, and also whether it had velar nasals.

In historical-comparative works on Chadic languages, there is little agreement among authors on how many and which consonants or consonantal series in terms of manner and place of articulation to reconstruct for the common proto-language. Stolbova (2016) reconstructs neither velar nasals nor prenasalised obstruents for PC. Schuh (2017: 22), on the other hand, lists a velar nasal ŋ (but no labialised ŋʷ) and a prenasalized series mb, nd, nz, nj, ŋg in his "schematic table of consonants widely found in Chadic lan-

guages".[1] Schuh remains vague regarding the central questions of this paper, namely whether ŋ, mb, nd, nz, nj, ŋg can or should be reconstructed for PC. Two earlier and influential publications on Proto-Chadic reconstructions again differ in their research findings and conclusions. Jungraithmayr & Shimizu (1981: 19–20) present a rather rich "Table of Proto-Chadic consonants", which contains a prenasalised series ᵐb, ⁿd, (ⁿj), ⁿg, but no velar nasal ŋ. Finally, Newman (1977: 9) provides a list of consonants under the heading "Proto-Chadic Phonemic Inventory", in which we find neither prenasalised obstruents nor a velar nasal. Newman (1977: 11), however, explicitly addresses "[t]he problem of prenasals" and does so in a broader Afroasiatic context. His treatment can be regarded as authoritative and valid until this day and, therefore, deserves to be quoted in full. It should be pointed out that the problem of whether or not to reconstruct prenasalised obstruents for PC was already discussed at length and insightful in the earlier paper by Newman & Ma (1966: 223–225), and their answer at the time was negative. Also, Newman & Ma did not reconstruct a velar nasal.

> The reconstructed consonantal inventory presented above still does not include prenasalized consonants (mb, nd, nj, ŋg, etc.) and the problem of the origin of prenasals in Chadic remains unsolved. Greenberg (1958) had postulated their existence – mb specifically – not only for Proto-Chadic but for all of Afroasiatic. Recognizing that the original evidence was thin, Greenberg subsequently reaffirmed his position on prenasals and offered a list of nineteen etymologies as evidence "tending towards the establishment of an original [Afroasiatic] *mb" (1965: 89). Of these nineteen etymologies, fourteen drew on evidence from Chadic languages (mainly Hausa); and of these fourteen, only one is reconstructable for PC and this not necessarily with a prenasal (see word list no. 97 'place'). Thus as far as Chadic is concerned, Greenberg still hasn't begun to prove his hypothesis. Similarly, the eight Chadic etymologies with *mb proposed by Illic-Svityc (1966) are much too weak to provide any real support for the idea of prenasals in PC.
>
> The issue of prenasals is complicated because there are in fact two problems to solve: (i) did PC have prenasalized consonants and if so

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1 Schuh (2017: 22) remarks on his table of consonants that "[m]any, but by no means all, are reconstructable for Proto-Chadic. No Chadic language has all these consonants, but every language has a large subset of these."

what subsequently happened to them in Chadic linguistic history? and (ii) what is the origin of the prenasals one now finds so widespread in the Chadic family? These may turn out to be the same or related questions but not necessarily so. They may be entirely independent questions and the failure to recognize this may partially account for our inability to make any progress towards solving the problem. In the comparative word list presented here, there is one item (no. 45) where an mb in WST [West Chadic] corresponds to an mb in BM [Biu-Mandara = Central Chadic] and a few others where b in WST corresponds to m or mb in BM. What the significance of these scattered examples is I cannot say. (Newman 1977: 11)

A major and pioneer-type contribution to comparative Chadic linguistics with a focus on Central Chadic is Gravina (2014), where he gives a table entitled "Proto-Central Chadic consonants". The table contains a "pre-nasalized" series: ^{m}b, ^{n}d, ^{n}dz, (^{ŋ}g), (^{ŋ}g^{w}). On the phonological status of the members of this series, he states:

The phonemes in parentheses are those which are innovations in Central Chadic, but where it is not clear whether they originated in Proto-Central Chadic or shortly afterwards. [...]

There were only two nasals in Proto-Central Chadic, *m and *n. Indeed, in the majority of the present-day languages, there are only these two nasals. In a number of cases /ŋ/ has been added, and in some of these languages there is also the labialized equivalent /ŋ^{w}/. [...]

For the pre-nasalized consonants, *^{m}b and *^{n}d are well-attested. The phoneme *^{n}dz is present in only one root – *ndzah 'to sit' – though the root is extremely well-attested. The other two potential pre-nasalized consonants *^{ŋ}g and *^{ŋ}g^{w} are difficult to establish for Proto-Central Chadic, and may or may not have existed as phonemes. They are included in the table within parentheses. (Gravina 2014: 231–232.)

To the best of the author's knowledge, there has been no more recent study that would throw conclusive light on this issue of PC phonological and lexical reconstruction.

2 Evidence from Proto-Central Chadic lexical reconstructions

Very recently, the present author has finalised two book-length studies on the historical phonology of Central Chadic (Wolff 2022) and Central Chadic lexical reconstructions (Wolff in press). These studies address the issue of proto-language reconstruction of vowel and consonant inventories, with data from up to 66 of the 79 languages of the Central Chadic branch. At variance with the study by Gravina (2014) addressing the same issues, our present insights reveal – based on massive comparative evidence – that at least Proto-Central Chadic (PCC) should not be reconstructed with either prenasalised obstruents nor with any velar nasal. Clearly, when modern Central Chadic languages that frequently show prenasalised obstruents and velar nasals in their synchronic phonetic surface representations of reconstructable words did not retain these from PCC – how much less could they have retained these from PCC's predecessor Proto-Chadic? If PCC did not possess these consonants, then PC cannot have possessed them either. (To assume the reverse process would be more than counter-intuitive and highly improbable: Why should PCC dissolve prenasalised obstruents inherited from PC, only to allow its offspring languages to re-invent these again in individual language histories?)

How, then, can we explain the massive occurrence of prenasalised obstruents and velar nasals in modern Central Chadic languages – if not by heritage? Our recent reconstruction of PCC phonology and a lexicon of some 220 words suggests the following historical developments.

Velar nasals owe their synchronic existence in modern Central Chadic languages to possibly three distinct phonological processes:

- Homorganic assimilation of *m or *n to an abutting velar consonant.
- Very frequently occurring at the right margin of words, velar nasals mostly develop from fusion of a nasal and an abutting velar consonant. The abutting velar consonant is quite often the initial consonant of a reconstructable petrified suffix *{kʷ(a)}. When the initial consonant of the suffix undergoes de-labialisation, which is frequently the case, the resulting surface velar nasal is plain [ŋ]. When, however, the labialising co-articula-

tion is maintained, the resulting velar nasal also shows labialisation and surfaces synchronically as [ŋʷ]. Both plain and labialised velar nasals occur in modern Central Chadic languages and there can be considered synchronic phonemes.

- A rather doubtful rule that changes nasals to velar nasals spontaneously in right-margin position of words.

Accidental /ŋw/ clusters occur and are synchronically interpreted as labialised velar /ŋʷ/ and are transcribed as such in the database (Gravina 2015) on which our recent studies rest.

Prenasalised obstruents, which very frequently occur at the left margin of words, owe their phonetic surface emergence to four quite different phonological processes.

1. Mostly we are dealing with diachronic nasal + obstruent clusters in word-initial position, which in the database are interpreted as synchronic prenasalisation ᴺC of the word-initial consonant;

2. Quite often we deal with cases of N-prosody, by which a partially or completely de-segmentalised and prosodised petrified prefix containing a nasal consonant spreads its nasal feature across the morpheme boundary and prenasalises a root-initial or root-medial obstruent;

3. Rather rarely we see dissimilation and hardening of *m → b /m(X)_ , i.e. when *m follows another *m within the same word; subsequently [b] would undergo N-prosody to yield [ᵐb];

4. Even more rarely we may be dealing with spontaneous prenasalisation *b → ᵐb under still unidentified conditions, possibly and on occasion triggered by language contact.

In the following sections 3 and 4 of this paper, these diachronic processes will be presented in some detail and illustrated by examples from Central Chadic languages of the currently accepted 18 language groups as referred to in the most recent comparative works on Central Chadic languages (Gravina 2014; Wolff 2022; Wolff in press).

The examples underpin the plausibility of the emergence of velar nasals from conditioned allophones and fusions of nasals with velar obstruents, and of prenasalised obstruents from nasal + obstruent clusters and N-prosody affecting 'plain' oral obstruents. This makes it unnecessary to reconstruct velar nasals and prenasalised obstruents as single phonemes for Proto-Central Chadic, and thereby also for

Proto-Chadic. Post-PCC diachronic developments would account for their becoming phonologised in the modern Chadic languages, where they widely occur as synchronic phonemes.

The evidence on which we base our conclusive negative answer to the question raised in the title of this paper comes from rich Central Chadic data, which were provided in a digital database by the linguist Richard Gravina and which are freely available on the internet (Gravina 2015). The data quoted in this paper stem exclusively from that database. The database contains Gravina's own Central Chadic lexical reconstructions based on a valuable compilation of data from 66 languages and language varieties including both published and massively also unpublished sources. The sources for the individual languages and language varieties are listed in Gravina (2014, 2015).

The following conventions are observed in this paper.

1. The data from the original sources as compiled in the database (Gravina 2015) are always given in *italics*.
2. Our own reconstructions of PCC simple roots are always given in **bold**.
3. All cited languages will be identified by the language group that they are considered to be affiliated to; the language group is always given in SMALL CAPITALS.
4. All reconstructions are preceded by '*'.
5. Deletion/historical loss of segments is made explicit by the symbol 'Ø'.
6. The characteristic prosodies that we need to identify in Central Chadic languages are indicated by superscript $^{?}$, ^{n}, ^{y}, ^{w}, both for sources and targets of glottalisation, prenasalisation, palatalisation, and labialisation.[2] These prosody effects may also be indicated by using the notations $+N$, $+Y$, $+W$, and $+?$.

In order to make data analysis and reconstructions transparent, the following features of Central Chadic languages and PCC reconstructions need to be taken into account.

1. Both PCC reconstructions and their synchronic reflexes in modern CC languages mirror an underlying 'minimal vowel system' based on one phonemic vowel /a/ plus non-phonemic [ə]. In this system,

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2   Note that superscript ^{w} is also used to indicate labialised co-articulation of both reconstructed velars and synchronic phonemic consonants.

the high vowels [i, u] represent conditioned distributional allophones of /y/ and /w/ in syllable-nucleus positions. Phonetic mid and occasional long vowels in surface realisations can also be accounted for by rules of allophony and prosodic 'colouring'.

2. At the PCC level, we often do not deal with simple roots, but with augmented roots, which carry petrified morphological material, both prefixal and suffixal, from the proto-language's grammatical system.

3. PCC roots may occur in the shapes of different 'root types' depending on presence and distribution of */a/ in root-medial interconsonantal slots; this is indicated by conflated symbolisations of roots that would contain *(a) in parentheses.

The data and diachronic processes to be discussed will be presented in the following tabular format:

(n) Language (LANGUAGE GROUP) 'gloss' (PCC *ROOT)
PCC input: *root (simple or augmented)

Phonological processes	Phonological processes	Output (underlying)

Under 'Output', we will give both the data as transcribed in the database (given in *italics*) and a more abstract underlying form (given in parentheses), in which insertions of epenthetic schwa are shown (this also allows to read the form under the option that schwa was phonemic, as some authors claim for some synchronic CC languages). The examples will be followed by notes, in which we will also give a reconstructed phonemic proto-form for the individual language, in which (a) non-phonemic schwa is not indicated, and (b) the presence (or absence) of prosodies is made explicit: *^{y}/.../ for Y-prosody (palatalisation), *^{w}/.../ for W-prosody (labialisation), *^{n}/.../ for N-prosody (prenasalisation), and /.../ for absence of any prosody. Different prosodies may co-occur in one and the same word, they may even combine, like Y- and W-prosodies, to affect the same segment. Note that prosodies may affect any segment in the morpheme or word: Consonants by all four prosodies, and vowels by only Y- and W-prosodies.

For the author's view on the theoretical and methodological fundamentals of Central Chadic historical phonology and reconstructions, see Wolff (2022; Wolff in press).

3 The emergence of velar nasals in Central Chadic languages

In the following subsections, we trace the historical emergence of velar nasals in PCC both 'plain' [ŋ] and labialised [ŋʷ], from segmental fusion of any nasal consonant with an abutting velar consonant. If the velar consonant is a 'plain' /C/ or a 'de-labialised' /Cʷ/, the result will be 'plain' [ŋ]. If the velar consonant is a labialised /Cʷ/, the resulting velar nasal will also be labialised: [ŋʷ]. In post-PCC periods, these fused pseudo-phonemes undergo phonologisation and become phonemes in the modern CC languages.

3.1   The emergence of plain /ŋ/

We discuss the emergence of plain /ŋ/ in modern CC languages in terms of three diachronic scenarios: I. Trivial homorganic assimilation of a nasal *N to an abutting velar consonant; II. Assimilation and subsequent fusion of a nasal *N with an abutting velar consonant; III. A somewhat doubtful rule of pre-pausal velarisation *N → [ŋ]/_##.

I. A natural and unspectacular process to create phonetic velar nasals in surface representations is homorganic assimilation to an abutting velar consonant. We are dealing with conditioned allophones of reconstructed */m/ and */n/. The phonetic presence of such allophonic [ŋ] may have supported the independent diachronic phonologisation of velar nasals towards synchronic phonemes in the modern languages. These processes and developments are illustrated in examples (1)–(6b).

*/n/ → [ŋ]/_k,g

(1) Jimi (Bata) 'beer' (PCC ***vxʷa**)
PCC input: *na-kʷa-vxʷa-n

De-labialisation	Homorg. assim.	Output (Underlying)
*kʷ → k	*n → ŋ/_k; voicing k → g; prosodification *xʷ → Øʷ	ə-epenthesis; + W əʷ → u
*nØ-ka-vxʷØ-n >	*ŋ-gØ-vØʷ-n >	ᵑgəvun (ŋgəvəʷn)

Note: The input is a quadri-morphemic word. The phonetic output given in the database is transcribed with a prenasalised obstruent /ⁿg/. Diachronic analysis, however, identifies this as a nasal + obstruent cluster [ŋg], in which original *n assimilates homorganically to abutting *k (= de-labialised *kʷ → k) under parallel assimilation of voice: *kʷ → k → g/ŋ_. The Proto-Jimi form can be given as *ʷ/ŋgvn/.

*/m/ → [ŋ] /_g

(2) Mbudum (DABA) 'to belch' (PCC ***gʷʤa**)
PCC input: *ma-gʷʤa

*gʷ → g	Homorg. assim.	Output (Underlying)
*ɗ → r	*m → ŋ/_g	ə-epenthesis
*mØ-grʤØ >	*ŋ-grʤ >	*ŋgərʤ* (ŋgərʤ)

Note: The input is a bi-morphemic word. The phonetic output given in the database is transcribed as a nasal + obstruent cluster. This is supported by diachronic analysis. Prefixal original *m assimilates homorganically to abutting *g (= de-labialised *gʷ → g). In a parallel fashion, the word undergoes epenthetic insertion of [ə] after medial *ɗ has weakened to /r/. There are no prosody effects. The Proto-Mbudum form can be given as *ʷ/ŋgrʤ/.

II. Velar nasals frequently occur at the right margin of words, where they owe their phonetic surface emergence to assimilation plus fusion of a nasal and an abutting velar consonant. The abutting velar consonant is quite often the initial consonant of a reconstructable petrified suffix *{-kʷ(a)}. When the initial consonant of the suffix has undergone de-labialisation, which is frequently the case, the resulting surface velar nasal is plain [ŋ].

*/kn/ → [ŋ]

(3) Ouldeme (MOFU) 'to boil' (PCC ***kʷaɗaxa**)
PCC input: *kʷaɗaxa-y-kʷ-n

Suffixal *kʷ → k	Homorg. assim. & fusion *kn → ŋ; prosodification *y → Øʸ	Output (Underlying) + Y *aʸ → e
*kʷaɗaxa-y-k-n >	*kʷaɗaxa-Øʸ-ŋ >	*kʷaɗeheŋ* (kʷaɗaʸxaʸŋ)

Note: The input is a quadri-morphemic word. The labialised suffix-initial *kʷ is de-labialised and fuses with adjacent *n: *kn → [ŋ]. Y-prosody changes *a → [e] in the ultimate and penultimate syllables. The Proto-Ouldeme form can be given as *ʸ/kʷaɗaxaŋ/.

(4) Matal (MANDARA) 'bird' (PCC ***ɗyakʷa**)
PCC input: *ɗyakʷa-n

Delabialisation	Homorganic assimilation	Output
*kʷ → k	& fusion *kn → ŋ	ə-epenthesis
*ɗyakØ-n >	*ɗyaŋ >	*dəyaŋ*

Note: The input is a bi-morphemic word. The labialised root-final *kʷ is de-labialised and fuses with adjacent suffixal *n: *kn → [ŋ]. There are no prosody effects. The Proto-Matal form can be given as */ɗyaŋ/.

/mg/ → [ŋ]

(5) Hdi (LAMANG) 'to belch' (PCC ***gʷʤa**)
PCC input: *ma-gʷʤa

Re-segmentalisation	Assim. & fusion	Output (Underlying)
*gʷ → g + w	mg → ŋ;	ə-epenthesis;
	metathesis	w → u
	wʤ → ʤw	
*mØ-gwØʤa >	*ŋʤw >	*ŋəʤu* (ŋəʤw)

Note: The input is a bi-morphemic word. The prefix-initial *m fuses with adjacent *g (after re-segmentalisation of *gʷ → g + w) → [ŋ]. The (re-segmentalised) approximant *w ends up in syllable-nucleus position where it automatically syllabifies to yield [u]. There are no prosody effects. The Proto-Hdi form can be given as */ŋʤw/.

III. There may still be a somewhat doubtful rule of final-nasal velarisation *N → [ŋ]/_## that changes a nasal to become a velar nasal in right-margin position of words and where this is not triggered by an abutting velar. Such a rule is known to operate in several Chadic languages, for instance, in West Chadic Hausa. However, there is no robust evidence for such a rule on the PCC level because we only have one doubtful example so far. The example may be analysed as a parallel case to the examples above, namely one of homorganic assimilation plus fusion:

(6a) Kamwe-Futu (HIGI) 'crocodile' (PCC/Loan *kdma~*kʷrma)[3]
PCC/Loan input: *kdma-kʷ-n

*d/r → l;	Homorg. assim.	Output (Underlying)
*kʷ → k;	& voicing	ə-epenthesis
metathesis	*nk → ŋg	
*kn → nk		

*klmØ-n-k >   *klm-ŋg >   kələma�docᵍ (kələməŋg)

Note: The input is a tri- or bi-morphemic word. There is comparative evidence for a petrified suffix *{n} also in other Central Chadic languages, but not for *{-kʷ}, i.e. postulating suffixal *kʷ to explain the velarisation of *n by assimilation and fusion would be ad hoc.

On the other hand, we may indeed deal with a rare case of spontaneous velarisation of a final nasal if we consider the actual transcription 'ⁿg' to indicate the presence of a final velar [ŋ]); see the alternative analysis of the same example:

(6b) Kamwe-Futu (HIGI) 'crocodile' (PCC/Loan *kdma~*kʷrma)
PCC/Loan input: *kdma-n

*kʷ → k;	N → ŋ/_##	Output (Underlying)
*d/r → l		ə-epenthesis

*klmØ-n >   *klm-ŋ >   kələmaᵍ (kələmən)

Note: Here we assume the input to be a bi-morphemic word. There are no prosody effects. The Proto-Kamwe-Futu form of this loan can be given as */klmŋ/ or */klmŋg/ depending on our interpretation of transcribed 'ⁿg'.

The *N → ŋ/_## rule, however, would not account (a) for the transcription /ŋg/ indicating a final velar consonant in the example above, and (b) for word-final [ŋʷ] where it occurs. This makes the rule more than doubtful for PCC.

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3 This root for 'crocodile' has a complex history of being borrowed and re-borrowed among Nilo-Saharan Kanuri and (Central-)Chadic languages. In the light of Kanuri *karam*, one wonders about the direction of probably very early borrowing, whether from Nilo-Saharan into Chadic or vice versa, and whether this happened once or several times, in the latter case reflecting different shapes of the original root, such as possibly *kʷ(a)r(a)ma and *k(a)d(a)ma, which may have co-existed in the area. While *k(a)d(a)ma would be close to the original Chadic root (see PC *kədam, Newman 1977), it was likely borrowed into Kanuri as *karam*, and has been re-imported into Central Chadic languages as 'Pseudo'-PCC root in the shape of *kʷ(a)r(a)ma.

3.2   The emergence of labialised /ŋʷ/

We discuss the emergence of labialised /ŋʷ/ in modern CC languages in terms of two diachronic scenarios: I. Assimilation plus fusion of a nasal *N and an abutting labialised velar consonant (plus occasional subsequent de-segmentalisation and prosodification); II. Reinterpretation of a nasal + obstruent cluster as prenasalisation of the obstruent.

I. The following examples (7) and (8) display different scenarios involving root-internal and root-augmental segments in the process of creating intermediate-level phonemic /ŋʷ/ that feeds re-segmentalisation and prosodification /ŋʷ/ → ŋ + ʷ.

*/gʷn/ → /ŋʷ/ → /ŋ + ʷ/

(7) Giziga-Muturwa (Maroua) 'child' (PCC *zgʷna)
PCC input: *zgʷna

	Fusion *gʷn → ŋʷ; re-segmentalisation & prosodification ŋʷ → ŋ + ʷ	Output (Underlying) ə-epenthesis; +W əʷ → u
*zgʷnØ >	*zŋʷ > *zŋ + ʷ	*zuŋ* (zəʷŋ)

Note: The input is a mono-morphemic word. The Proto-Giziga-Muturwa form can be given as *ʷ/zŋ/.

*/kʷn/ → /ŋʷ/ → /ŋ + ʷ/

(8) Lamang (Lamang) 'hat' (PCC *dzakʷa)
PCC input: *dzakʷa-na

	Fusion *kʷn → ŋʷ; re-segmentalisation & prosodification ŋʷ → ŋ + ʷ	Output (Underlying) +W *aʷ → o
*dzakʷØ-na >	*dzaŋʷa > *dzaŋ + ʷa >	*dzoŋo* (dzaʷŋaʷ)

Note: The input is a bi-morphemic word. The Proto-Lamang form can be given as *ʷ/dzaŋa/.

II. In the following example (9), fusion creates a velar nasal, which then becomes abutting to w, which was weakened from underlying *kʷ:

*/ŋw/ cluster

(9) Malgwa (MANDARA) 'fly' (n.) PCC (***dzkʷɗa**)
PCC input: *ma-dzkʷɗa-kʷ-n

Radical *kʷ → w;	Assimilation	Output (Underlying)
suffixal *kʷ → k;	*m → n/_dz;	ə-epenthesis;
*ɗ → y	fusion *kn → ŋ;	+ Y *dzʸ → ʤ
	metathesis	
	wyŋ → ŋwy;	
	prosodification	
	*y → Øʸ	

*mØ-dzwya-k-n >   *n-dzwya-ŋ >
                    *n-dzŋwØʸa >   ⁿʤəŋʷa (ndzʸəŋwa)

Note: The input is a quadri-morphemic word. The transcription in the database indicates a labialised velar nasal, which our historical analysis does not confirm. Rather, we suggest a nasal + obstruent cluster in which [ŋ] results from suffixal *kn and medial /w/ has come about by weakening of root-medial */kʷ/. The Proto-Malgwa form can be given as *ʸ/ndzŋwa/.

4 The emergence of prenasalised obstruents in Central Chadic

Given the overall prosodising typology of CC languages (Wolff 2022; Wolff in press), one can derive both suspicious nasal + obstruent clusters and prenasalised obstruents in modern CC languages from the reconstruction of a prefixal root augment *{ma-} of old Afroasiatic heritage (or any other prefixal root augment that contained a nasal consonant, such as *{na-}). We will restrict the discussion in this paper to *{ma-}, which is the most frequent nasal-initial root augment to be considered; our discussion would by analogy also apply to other nasal prefixes, wherever they may have played a comparable role.

Note that not all postulated *{ma} prefixes actually prosodise. We observe three stages of prosodification and desegmentalisation, see Table 1.

Table 1. Prosodification and desegmentalisation of *{ma-}

Retention	Prosodification	Partial desegmentalisation	Complete desegmentalisation
*{ma-}	→ *mⁿa-	→ *mⁿØ-, *Øⁿa-	→ *Øⁿ-

It remains a continuous challenge for the synchronic description of languages to distinguish nasal + obstruent clusters from prenasalisation of obstruents. Available transcriptions by field linguists are not necessarily consistent and do not always reflect thorough phonological not to speak of phonetic analysis. Usually, and also in the case of Central Chadic languages, comparative analysis throws light on the issue as far as it suggests a nasal + obstruent cluster analysis where we have reason to assume that we are dealing with historically underlying multimorphemic structures, in which a – usually homorganic – nasal belongs to one morpheme, for instance a prefix, and the abutting obstruent to another morpheme, for instance the root. In cases where we have no evidence from such morphological analysis, it remains for the descriptive linguist to decide whether to treat the suspicious cases as nasal + obstruent clusters or as prenasalised obstruents, depending on whether or not prenasalised obstruents are considered to belong to the synchronic inventory of the language's sound system. If so, we could still be dealing with synchronic phonologisation towards prenasalised obstruents that, nonetheless and historically, derive from nasal + obstruent clusters.

4.1   Nasal + obstruent clusters

The reconstruction of a prefix *{ma-} allows us to describe the synchronic emergence of nasal + obstruent clusters. Under such analysis, we assume *{ma-} to delete its vowel */a/ → *mØ- and be retained as plain bilabial nasal consonant */m/. This nasal consonant then forms a nasal + obstruent cluster, occasionally by undergoing homorganic assimilation to the immediately following root-initial consonant. Often competing analyses are feasible whether we are dealing with a nasal + obstruent cluster or with a case of prenasalisation (see below). It is not always clear from the available transcriptions of data what process we are actually dealing with in a given example.

*m + *b → /mb/

For the lexical item 'horn', the data contain four roots of different areal distribution. Three of the roots appear to be augmented by a

prefixal element *{ma-}. One of these roots is analysed here (see ex. 10a–d below); it occurs in seven languages belonging to four different groups and shows root-initial */b/, which theoretically could end up in a nasal + obstruent cluster /mb/. Note, however, that in Vulum (Musgum) *amok* (underlying amaᵂk) the initial /b/ has been deleted. In Vame (Hurza) *ɓaŋʷam* (underlying ɓaⁿgʷam) and in Moloko (Mofu) *moⁿgom* (underlying maʷⁿgʷaʷm), the prefix *{ma-} prosodises and affects C$_2$ */kʷ/ by N-prosody to yield surface [ŋgʷ]. In the remaining four languages, we find an initial nasal + obstruent cluster /mb/ in three (ex. 10a–c), but genuine prenasalisation by N-prosody in one language, namely Ouldeme (Mofu), see ex. (10d).

(10a) Ga'anda (Tera) 'horn' (Areal root *__bakʷama__)
Areal root input: *ma-bakʷama-ɗa

*kʷ→ʔʷ	Prosodification	Output (Underlying)
	*m → mⁿ;	+ N *ɗ → ⁿd;
	re-segmentalisation	+ W *aʷ → o
	ʔʷ → ʔ + ʷ	

*mØ-baʔʷamØ-ɗa >	*mⁿ-baʔ + ʷam-ɗa >	ᵐbo'omⁿda
		(mbaʷʔaʷmⁿda)

Note: On this tri-morphemic input, both potentially possible processes operate. In initial position, the loss of the prefix-vowel */a/ yields a nasal + obstruent cluster /mb/. The partial desegmentalisation and prosodification of the prefix-consonant */m/ → mⁿ affects the final consonant of the word: *ɗ → ⁿd. (Note that N-prosody automatically de-glottalises *ɗ → d.) Root-medial *kʷ changed to ʔʷ, which becomes re-segmentalised and prosodised ʔʷ → ʔ + ʷ. The Proto-Ga'anda form can be given as *ⁿʷ/baʔamda/.

(10b) Zulgo (Mofu) 'horn' (Areal root *__bkʷma__)
Areal root input: *ma-bkʷma

	Prosodification & re-segmentalisation kʷ → k + ʷ	Output (Underlying) ə-epenthesis; + W əʷ → u
*mØ-bkʷmØ >	*m-bk + ʷm >	ᵐbukum (mbəʷkʷəʷm)

Note: The input is a bi-morphemic word. Root-medial *kʷ undergoes re-segmentalisation and prosodification. The Proto-Zulgo form can be given as *ʷ/mbkm/.

(10c) Gemzek (MOFU) 'horn' (Areal root *$\mathbf{bk^wama}$)
Areal root input: *ma-bk^{w}ama

	Prosodification & re-segmentalisation $k^w \rightarrow k + {}^w$	Output (Underlying) ə-epenthesis; $+ W\ ə^w \rightarrow u$; *$a^w \rightarrow o$
*mØ-bk^{w}amØ >	*m-bk + ^{w}am >	^{m}*bukom* (mbə^{w}k^{w}a^{w}m)

Note: The input is a bi-morphemic word. Root-medial *k^w undergoes re-segmentalisation and prosodification. The Proto-Gemzek form can be given as *^{w}/mbkam/.

In the Ouldeme language, we find a different process of desegmentalisation and prosodification of the prefix *{ma-}. Here, the initial prefix-consonant desegmentalises completely and prosodises to Ø^n, while the prefix-vowel */a/ is retained. N-prosody affects the root-initial */b/ $\rightarrow$ [^{m}b].

(10d) Ouldeme (MOFU) 'horn' (Areal root *$\mathbf{bk^wama}$)
Areal root input: *ma-bk^{w}ama

*$k^w \rightarrow k$	Prosodification *ma $\rightarrow$ Ø^{n}a	Output (Underlying) ə-epenthesis; $+ N\ b \rightarrow {}^mb$
*ma-bkamØ >	*Ø^{n}a-bkam >	a^m*bəkam* (a^{m}bəkam)

Note: The input is a bi-morphemic word. The Proto-Ouldeme form can be given as *^{n}/abkam/.

*$\mathbf{m + p \rightarrow /mp/}$

Next, let's look at the case of Mbudum (DABA) *pumpa* 'armpit'. The transcription in the database reflects an analysis in terms of nasal + obstruent cluster /mp/. All other examples from several language groups, i.e. a total of 16 languages, however, suggest by their database transcriptions that synchronically we are dealing with cases of prenasalisation by N-prosody. Given the historically grounded adjacency of the nasal (originating from a postulated PCC prefix *{ma} and occasionally involving reduplication), we reanalyse the Mbudum example indeed as a case of nasal + obstruent cluster.

(11) Mbudum (DABA) 'armpit' (PCC ***xbwa**)
PCC input: *RED + ma-xbwa

*b → p; reduplication	Prosodification *w → Ø^w	Output (Underlying) ə-epenthesis; + W ə^w → u
*mp + mØ-Øpwa >	*Øp + mpØ^{w}a >	*pumpa* (pə^{w}mpa)

Note: Somewhat exceptionally (but see also ex. 18 below), the redu-
plication treats the petrified prefix *{ma-} as part of the root. The
prefix became compensatory part of the simple root after the loss of
the initial root consonant */x/, i.e. the original *ma-xbwa was turned
into a pseudo-root *mpwa. This pseudo-root underwent reduplica-
tion *mp + mpwa with subsequent loss of the initial *m: *p + mpwa.
This form of the word then underwent prosodification of *w → Ø^w
and epenthetic vowel insertion. The Proto-Mbudum form can be
given as *^{w}/pmpa/.

*$**n**$ + *$**w**$ → /$**ŋw**$/

In the following example from Malgwa (MANDARA), the issue
remains hidden by the transcription found in the database. Here, too,
we are dealing with a nasal + obstruent cluster stemming from the
postulated PCC prefix *{ma-} > *{na-}.[4] The prefix undergoes vowel
deletion to *{nØ-}, and the initial prefix consonant */n/ homorgan-
ically assimilates to following /w/ (←*ɣ^w), which in turn syllabifies
to [u] in syllable-nucleus position.

(12) Malgwa (MANDARA) 'blind' PCC (*$**ɣ**^w**$**rpa**)
PCC input: *na-ɣ^{w}rpa-y

*ɣ^w → w; *r → l; *p → f	Homorg. assim.; prosodification *y → Ø^y	Output (Underlying) *w → u, + Y *a^y → e
*nØ-wlfa-y >	*ŋ-wlfa-Ø^y >	*ŋulfe* (ŋwlfa^y)

Note: The input is a tri-morphemic word. The Proto-Malgwa form
can be given as *^{y}/ŋwlfa/.

   Often, such nasal + obstruent cluster analysis is corroborated by
comparative evidence, like in the above case by two languages of
the KOTOKO-CENTRAL group, which are expected to use the original

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   4 In MANDARA group languages, the inherited form of the prefix *{ma-} is
innovated to take the shape *{na-}.

prefix shape *{ma-}: Lagwan *nxufi* (nxʷəʷfy), Mser *ngʷafɨ* (ngʷafəʸ). In Lagwan, the transcription *nxufi* already suggests a nasal + obstruent cluster with only partial assimilation of *m → n/_x, likewise the transcription *ngʷafɨ* in Mser suggests a nasal + obstruent cluster with only partial assimilation of *m → n/_gʷ.

*m + *t → nd

In many examples, a majority of the CC languages suggests a transparent multimorphemic origin involving the PCC prefix *{ma-}. However, some descriptive linguists for some languages describe the resulting synchronic structures as showing prenasalised obstruents, because (a) the former presence of *{ma-} is not evident from the synchronic form, and (b) the phonological system of the language is perceived to allow prenasalised obstruents. Such is the case, for instance, for Dghwed̶e *ⁿdała* 'to be cold'. The transcription indicates synchronic analysis as prenasalisation, while comparative evidence favours the analysis of non-prosodising PCC prefix *{ma-}, see *mə-tała* in almost neigbouring Podoko of the same MANDARA group and in many other languages. Therefore, we analyse the Dghwed̶e examples as homorganic assimilation of *m → n before abutting */t/ → d:

(13) Dghwed̶e (MANDARA) 'cold' (PCC ***tała**)
PCC input: *ma-tała

*t → d/m_	Homorg. assim.	Output (Underlying)
	*m → n/_d	
*mØ-dała >	*n-dała >	*ⁿdała* (ndała)

Note: The input is a bi-morphemic word. There are no prosodic effects. The Proto-Dghwed̶e form can be given as */ndała/.

4.2   N-prosody

Quite often, the available sources and their transcriptions suggest cases of N-prosody, by which a partially or completely de-segmentalised and prosodised petrified prefix containing a nasal consonant spreads its nasal feature across a morpheme or word and prenasalises a word-medial obstruent. For the verb 'to get well, cure, take care', comparative evidence suggests a simple PCC root ***b(a)ra**, which again tends to associate with the PCC prefix *{ma-} > *{mØ}. The simplest analysis would indeed be to analyse ***m-b(a)ra** > *mbara as containing a nasal + obstruent cluster resulting from an under-

lying bi-morphemic structure. Yet, with the exception of one source (LAMANG group Hdi *mba*), the sources in the database for all other CC languages transcribe the synchronic root with a prenasalised bilabial in initial position, e.g. Gude (BATA) *ᵐbii*, Gavar (DABA) *ᵐbəl*, Mbuko (DABA) *ᵐbar*, Giziga-Muturwa (MAROUA) *ᵐbul*, Gidar (GIDAR) *iᵐbəla*.

Occasionally, the two theoretically possible competing analyses can be found reflected in the database transcriptions for closely related languages of same groups. For 'hair', for instance, in the MAROUA group both descriptions co-occur. In Giziga-Muturwa, the lexeme is described in terms of a nasal + obstruent cluster (ex. 14a), while in Mbazla the lexeme is transcribed with a prenasalised obstruent in initial position (ex. 14b). Both analyses, i.e. nasal + obstruent clustering and N-prosody, are feasible and would have some historical justification. Nonetheless, we prefer to derive both synchronic forms as historically stemming from a nasal + obstruent cluster.

(14a) Giziga-Muturwa (MAROUA) 'hair' (PCC *g^wtsa**)
PCC input: *ma-g^wtsa-y

	Partial assimilation	Output (Underlying)
	*m → n/_g^w;	ə-epenthesis;
	prosodification	+ Y əʸ → i;
	*y → yʸ	ts → tʃ;
		*y → i
*mØ-g^wtsØ-y >	*n-g^wts-yʸ >	*ng^w itʃi* (ng^w əʸtsʸy)

Note: The input is a tri-morphemic word. The Proto-Giziga-Muturwa form can be given as *ʸ/ng^w tsy/.

(14b) Mbazla (MAROUA) 'hair' (PCC *g^wtsa**)
PCC input: *ma-g^wtsa-k^w

*ts → z;	Homorg. assim.	Output (Underlying)
*k^w → ʔ^w	*m → ŋ/_g^w;	ə-epenthesis;
	re-segmentalisation	+ W ə^w → u;
	ʔ^w → ʔ + ^w	*a^w → o
*mØ-g^wza-ʔ^w >	*ŋ-g^wza-ʔ + ^w >	*ŋguzo'* (ŋg^w ə^w za^w ʔ)

Note: The input is a tri-morphemic word. The Proto-Mbazla form can be given as *^w/ŋg^w zaʔ/.

A sharp distinction between nasal + obstruent cluster and prenasalisation (N-prosody) may serve purposes of historical analysis, but

it says nothing about the synchronic situation in individual modern CC languages.

Clear cases of N-prosody are such as illustrated by the following examples.

*b → ᵐb

(15) Margi (MARGI) 'armpit' (PCC ***xbwa**)
PCC input: *ma-xbwa

	Prosodification	Output (Underlying)
	*m- → Øⁿ-;	ə-epenthesis;
	prosodification	+W əʷ → u;
	*w → wʷ	+N *b → ᵐb;
		*w → u
*mØ-xbwØ >	*Øⁿ-xbwʷ >	*huᵐbu* (xəʷᵐbw)

Note: The input is a bi-morphemic word. The Proto-Margi form can be given as *ⁿʷ/xbw/.

*ɗ → ⁿd

(16) Mbazla (MAROUA) 'five' (PCC ***ɬɗama**)
PCC input: *ma-ɬɗama-y

*ɬ → ʒ	Prosodification	Output (Underlying)
	*m- → Øⁿ-;	ə-epenthesis;
	prosodification	+N *ɗ → ⁿd;
	*y → Øʸ	+Y əʸ → i
*mØ-ʒɗamØ-y >	*Øⁿ-ʒɗam-Øʸ >	*ʒiⁿdam* (ʒəʸⁿdam)

Note: The input is a tri-morphemic word. The Proto-Mbazla form can be given as *ⁿʸ/ʒɗam/. (Note that N-prosody automatically de-glottalises /ɗ/ → d.)

*g → ᵑg

(17) Mada (MOFU) 'to belch' (PCC ***gʷdʒa**)
PCC input: *ma-gʷdʒa-a-ya

*gʷ → g	Prosodification	Output (Underlying)
	*ma- → mⁿa-;	+N *g → ᵑg;
	prosodification	+Y *aʸ → e
	*y → Øʸ	
*ma-gØʒa-ya >	*mⁿa-gʒa-Øʸa >	*meᵑgʒea* (maʸⁿgʒaʸa)

Note: The input is a quadri-morphemic word. The Proto-Mada form can be given as $*^{ny}$/magɮaa/.

$*z \rightarrow {}^{n}z$

(18) Vame (HURZA) 'blood' (PCC $*\mathbf{x^{w}bza}$)
PCC input: $*$RED-ma-x^{w}bza-y

	Prosodification	Output (Underlying)
	$*$m- $\rightarrow \emptyset^{n}$;	ə-epenthesis;
	prosodification	$+$N $*z \rightarrow {}^{n}z$;
	$*x^{w} \rightarrow \emptyset^{w}$;	$+$W $ə^{w} \rightarrow u$;
	prosodification	$+$Y $*z \rightarrow ʒ$;
	$*y \rightarrow \emptyset^{y}$	$*a^{y} \rightarrow e$

$*$RED-m$^{n}\emptyset$-x$^{w}\emptyset$za-y $>$ $*$m-$\emptyset^{n}$-$\emptyset^{w}$za-$\emptyset^{y}$ $>$ *munʒe* (m^{w}ə^{wn}z^{y}a^{y})

Note: The input is a quadri-morphemic word involving reduplication (RED). At variance with the transcription in the database, comparative data support the analysis of N-prosody /^{n}z/ rather than nasal $+$ obstruent cluster /nz/. The Proto-Vame form can be given as $*^{nwy}$/mza/.

$*ts \rightarrow {}^{n}dz$

(19) Zulgo (MOFU) 'chicken' (PCC $*\mathbf{g^{w}tsk^{w}ra}$)
PCC input: $*$ma-g^{w}tsk^{w}ra-y

	Prosodification	Output (Underlying)
	$*$ma- $\rightarrow$ m^{n}a-;	ə-epenthesis;
	Prosodification	$+$N ts $\rightarrow {}^{n}$dz;
	$*y \rightarrow \emptyset^{y}$	$+$Y $*a^{y} \rightarrow e$, $ə^{y} \rightarrow i$

$*$ma-$\emptyset$tsk^{w}r$\emptyset$-y $>$ $*$m^{n}a-tsk^{w}r-$\emptyset^{y}$ $>$ *me^{n}dzik^{w}ir* (ma^{yn}dzə^{y}k^{w}ə^{y}r)

Note: The input is a tri-morphemic word. Both the prefix and the suffix undergo prosodification. The Proto-Zulgo form can be given as $*^{ny}$/matsk^{w}r/. (Note that N-prosody automatically voices $*ts \rightarrow dz$.)

*y → ⁿy

(20) Malgbe (Kotoko-North) 'to cut' (PCC *ɬa)
PCC input: *ma-ɬa-y-kʷ-n

*ɬ → s; re-segmentalisation *kʷ → ʔ+w	Prosodification *m → Øⁿ; prosodification *y → yʸ; prosodification ʔ → Øʔ; prosodification w → wʷ	Output (Underlying) ə-epenthesis; +N *y → ⁿy; +Y əʸ → ɨ; +ʔ *s → sʔ; +W əʷ → u

*mØ-sa-y-ʔw-n >	*Øⁿ-sa-yʸ-Øʔwʷ-n >	*s'inyawun* (sʔəʸⁿyawəʷn)

Note: The input is a penta-morphemic word. A suffix consonant undergoes change and re-segmentalisation *kʷ → ʔ+wʷ, and both the prefix and a suffix undergo instances of prosodification. The Proto-Malgbe form can be given as *ʔⁿwy/syawn/.

4.3 N-prosody after dissimilation and hardening

*m → b → ᵐb

The corpus of available data contains a small set of lexical items where dissimilation and consonant fortition *m → b would provide a plausible explanation. We will discuss the examples in sub-sets.
In the first subset, three languages from two groups are involved. Here, a labial nasal within a prefix co-occurs with another labial nasal within the root; the root nasal hardens (*m → b) and subsequently undergoes N-prosody by effect from the prefix nasal.

(21) Mafa (Mafa) 'ear, name' (PCC *ɬma)
PCC input: *ma-ɬma-ɗ

*ɬ → ʐ; dissimilation & fortition *m → b/*m(X)__	(i) prosodification *m- → Øⁿ- (ii) prosodification *m- → mⁿ-; homorg. assim. *m → n/__ʐ	Output (Underlying) ə-epenthesis; +N b → ᵐb

*mØ-ʐba-ɗ >	(i) *Øⁿ-ʐba-ɗ >	(i) *ʐəᵐbaɗ* 'ear'
*mØ-ʐba-ɗ >	(ii) *nⁿ-ʐba-ɗ >	(ii) *nʐəᵐbaɗ* 'name'

Note: The input is a tri-morphemic word. The prefix-initial nasal undergoes prosodification and complete de-segmentalisation for the meaning 'ear'. The prefix nasal undergoes only partial de-segmentalisation under retention of the *N segment (which homorganically assimilates to the following consonant) for the meaning 'name'. The Proto-Mafa forms can be given as *ⁿ/ɮbaɗ/ for 'ear', and *ⁿ/nɮbaɗ/ for 'name'.

(22a) Jimi (BATA) 'wind' (PCC ***smɗa***)
PCC input: *ma-smɗa-y-n

Dissimilation & fortition of radical *m → b/*m(a)_;	Prosodification *y → Øʸ; (ii) prosodification prefixal *m → Øⁿ	Output (Underlying) ə-epenthesis; + Y əʸ → i
*mØ-Øbɗa-y-n >	(i) *m-bɗa-Øʸ-n >	ᵐbidən (mbəʸɗən)
*mØ-Øbɗa-y-n >	(ii) *Øⁿ-bɗa-Øʸ-n >	ᵐbidən (ᵐbəʸɗən)

Note: The input is a quadri-morphemic word. Alternative analyses are feasible: (i) The surface prenasalised obstruent [ᵐb] could be analysed as underlying nasal + obstruent cluster /mb/, or (ii) be analysed as resulting from N-prosody. The Proto-Jimi form can be given as either (i) *ʸ/mbɗn/ or (ii) *ⁿʸ/bɗn/.

(22b) Margi-South (MARGI) 'wind' (PCC ***smaɗa***)
PCC input: *ma-smaɗa-kʷ

*s → y; dissimilation & fortition radical *m → b/m(X)_; *kʷ → w	Prosodification *m → Øⁿ	Output (Underlying) ə-epenthesis; w → u; + N b → ᵐb
*mØ-ybaɗØ-w >	*Øⁿ-ybaɗ-w >	yəᵐbadu (yəᵐbaɗw)

Note: The input is a tri-morphemic word. The Proto-Margi-South form can be given as *ⁿ/ybaɗw/.

(22c) Bura (MARGI) 'wind' (PCC ***samaɗa**)
PCC input: *ma-samaɗa-y

Dissimilation & fortition radical *m → b/m(a)_; *ɗ → r	Prosodification *m → Ø^n; prosodification *y → Ø^y	Output (Underlying) + Y *s → ʃ; + N b → ^{m}b
*mØ-sabarØ-y >	*Ø^n-sabar-Ø^y >	ʃa^{m}bar (s^{y}a^{m}bar)

Note: The input is a tri-morphemic word. The Proto-Bura form can be given as *^{ny}/sabar/.

4.4   Spontaneous prenasalisation after hardening

*m → b → ^{m}b

In a second small set of data, the root contains the consonant */m/, which undergoes hardening (*m → b) and subsequent prenasalisation.

In the first examples (23a, b), the root for 'broom' would appear to undergo multiple metatheses in such a way that the original prefix-initial */m/ ends up as C_2 in an intermediate root shape *smk. It would then undergo fortition (*m → b) and prenasalisation. It is not clear whether at all the originally prefixal */m/ prosodises (*m → m^n) for the 'floating' nasal feature to re-associate with the hardened [b] → [^{m}b], therefore we consider this example a potential case of spontaneous prenasalisation.

(23a) Cuvok (MAFA) 'broom' (PCC ***kʷałɗa**)
PCC input: *ma-kʷałɗa

*kʷ → k; *ł → s	Multiple metathesis *mks > smk	Output fortition *m → b; + N b → ^{m}b
*ma-kasØØ >	*samak >	sa^{m}bak

Note: The input is a bi-morphemic word. The Proto-Cuvok form can be given as *^{n}/sabak/ with intransparent origin of the N-prosody.

The alternative option would be to analyse the prenasalised obstruent as being the result of N-prosody stemming from the original prefixal */m-/.

(23b) Cuvok (MAFA) 'broom' (PCC *k^wałɗa)
PCC input: *ma-k^wałɗa

*k^w → k;	Prosodification	Output
*ł → s	*m → m^n	fortition *m → b;
	multiple metathesis	+ N b → ^{m}b
	*m^nks > sm^nk	
*ma-kasØØ >	*sam^nak >	*sa^{m}bak* (sa^{m}bak)

In the following example, we are dealing with an 'areal' root of the lexical item 'six' of rather restricted geographic distribution in two (north-)eastern groups only: HURZA and MAROUA. There is no robust comparative evidence to reconstruct prefixal *{ma-} with this lexical item; only Mbuko has [^{m}b], all four other languages that share this areal root do not: neither HURZA group Vame, nor MAROUA group Giziga-Muturwa, Giziga-Marva, Mbazla. We here suggest alternative analyses. In the first illustration (ex. 24a) of this unique example, we postulate – in an ad hoc fashion – the diachronic existence of a petrified prefixal root-augment *{ma-}. The postulated prefix would explain C_1*m → b dissimilation.

(24a) Mbuko (HURZA) 'six' (PCC *mrkɗa)
Areal root input: *ma-mrkɗa

Dissimilation & fortition of radical	Output (Underlying)
*m → b/*m(a)_	ə-epenthesis
*mØ-brkØa > *m-brka >	*^{m}bərka* (mbərka)

Note: The input is a bi-morphemic word. The Proto-Mbuko form can be given as */mbrka/ with no trace of N-prosody.

Alternatively, as illustrated under (24b), we would be stuck with having to assume spontaneous *m → b fortition plus subsequent likewise spontaneous N-prosody.

(24b) Areal root input: *mrkɗa

Spontaneous fortition	Spontaneous	Output (Underlying)
*m → b	+ N b → ^{m}b	ə-epenthesis
*brkØa >	*^{m}brka >	*^{m}bərka*

Note: The input is a mono-morphemic word. The Proto-Mbuko form can be given as *^{n}/brka/ with intransparent origin of the N-prosody.

In the third example, which is a likely borrowing or re-borrowing from Nilo-Saharan Kanuri (see fn. 3), there is no comparative evi-

dence for the presence of a prefix *{ma-} that could be the source of N-prosody. A root-medial *m undergoes fortition (*m → b) and subsequent prenasalisation to [ᵐb]. This would be a clear case of unconditioned 'spontaneous' prenasalisation, possibly reflecting yet unidentified paths of borrowing or simply analogy.

(25a) Muyang (Mofu) 'crocodile' (PCC/Loan *kdma ~ *kʷrma)
PCC/Loan input: *kʷrma

Spontaneous hardening *m → b	Spontaneous prosody + N b → ᵐb; re-segmentalisation *kʷ → k + ʷ	Output (Underlying) ə-epenthesis; + W əʷ → u
*kwrba >	*k + ʷrᵐba >	*kurᵐbu* (kʷəʷrᵐbəʷ)

Note: The input is a mono-morphemic word. The Proto-Muyang form can be given as *ⁿʷ/krba/ with intransparent origin of the N-prosody and with raising of lexical-final */a/ → [ə] → [u] (under W-prosody).

(25b) Moloko (Mofu) 'crocodile' (PCC/Loan? *kdama~*kʷrama)
PCC/Loan input: *kdama

*d → r; hardening *m → b	Spontaneous prosody + N b → ᵐb	Output (Underlying) ə-epenthesis
*kraba >	*kraᵐba >	*kəraᵐba* (kəraᵐba)

Note: The input is a mono-morphemic word. The Proto-Moloko form can be given as *ⁿ/kraba/ with intransparent origin of the N-prosody.

4.5 Spontaneous prenasalisation *b → ᵐb

In the following example of a word for 'donkey', which is a likely borrowing with still unidentified donor language, there is mutual comparative support from only two languages for assuming the presence of a nasal prefix that could be the origin of N-prosody. (Two further languages show no traces of such a prefix: Buwal (Daba) *berɗeŋ*, Afade (Kotoko-North) *ɓoro*.) The examples could be analysed as straight-forward cases of spontaneous prenasalisation of */b/ → [ᵐb]. Under the assumption of the existence of a nasal prefix, however, we would deal with a case of nasal + obstruent cluster /mb/. Because of the unclear status, we will give alternative analyses below.

(26a) Bata (Bata) 'donkey' (Loan? *__brdza__)
Loan? input: *brdza-y / *ma-brdza-y

*dz → s	Prosodification	Output (Underlying)
	*y → Ø^y;	ə-epenthesis;
	(i) spontaneous	+ Y ə^y → ɨ;
	+ N b → ^{m}b	+ Y *a^y → e
(i) *brsa-y >	*^{m}brsa-Ø^y >	^{m}__birse__ (^{m}bə^{y}rsa^y)
(ii) *mØ-brsa-y >	*m-brsa-Ø^y >	^{m}__birse__ (mbə^{y}rsa^y)

Note: The input is either a bi- or tri-morphemic word. The Proto-Bata forms can be given as (i) *^{ny}/brsa/ with intransparent origin of the N-prosody or as (ii) *^{y}/mbrsa/.

(26b) Lagwan (Kotoko-North), Mazera (Kotoko-South) 'donkey' (Loan? *__brdza__)
Loan? input: *brdza-y-k^w / *ma-brdza-y-k^w

	Prosodification	Output (Underlying)
	*k^w → Ø^w;	ə-epenthesis;
	(i) spontaneous	+ W ə^w → u;
	prenasalisation	*y → i
	+ N b → ^{m}b	
(i) *brØØ-y-k^w >	*^{m}br-y-Ø^w >	^{m}__buri__ (^{m}bə^{w}ry)
(ii) *mØ-brØØ-y-k^w >	*m-br-y-Ø^w >	^{m}__buri__ (mbə^{w}ry)

Note: The input is either a tri- or quadri-morphemic word. The Proto-Lagwan forms can be given as (i) *^{nw}/bry/ with intransparent origin of the N-prosody, or as (ii) *^{w}/mbry/.

5 Conclusion

The answer to the question raised in the title of this paper is negative. Based on massive comparative evidence from the reconstruction of altogether some 220 lexical items with data from up to 66 Central Chadic languages and language varieties (Wolff 2022; Wolff in press), there is no compelling reason to reconstruct neither velar nasals nor prenasalised obstruents for the phonemic inventory of the common proto-language, namely PCC. And if PCC did not have these conso-nants, it would be quite improbable to assume that Proto-Chadic had them, and that they became de-velarised and de-nasalised when PCC

branched off from the rest of PC. Such a scenario is highly implausible and, therefore, it is here rejected as not being a serious historical option.

We therefore explain the presence of velar nasals and prenasalised obstruents in modern Central Chadic languages by diachronic phonologisation and thereby confirm the hypotheses that none of the proto-languages, neither PCC nor PC, had such consonants in their phonemic inventory.

This paper illustrates by a few selected examples the quasi natural conditions under which CC languages eventually and massively developed velar nasals and prenasalised obstruents in phonetic surface realisations. Since most modern CC languages have them in their synchronic inventories, the assimilation and fusion processes behind the occurrence of velar nasals and prenasalised obstruents could have happened rather early in their linguistic history. We may be dealing with phonological processes whose beginnings can be allocated to the PCC period itself, i.e. before PCC became divided into major dialect groups, and which ended in the phonologisation of these consonants to become synchronic phonemes in the modern languages.

The two types of processes that played a major role in the development were segmental fusion, which created velar nasals (plus/minus labialisation depending on input), and desegmentalisation and prosodification pertaining most often to petrified nasal prefixes that can be reconstructed for PCC. When such prefixes lost their vowels, their nasal initial consonant became adjacent to a root consonant, either the original initial C_1 or, after the latter's deletion, the following root consonant. This created nasal + obstruent clusters, which eventually became synchronically re-analysed as prenasalisation. In some cases, however, after desegmentalisation of its original carrier-segment, the disassociated nasal feature jumps the next-in-line root consonant and associates with another consonant in the root, i.e. not creating an intermediate nasal + obstruent cluster, but rather operating as straight-forward N-prosody.

Consequently, both nasal clusters (/NC/) and N-prosody (/^{n}C/) occurred in the historical development of the modern Central Chadic languages. In synchronic descriptions of these languages, however, they cannot always be told apart. The data amply show confusion between the two processes in the transcriptions available from the

database. In historical perspective, however, informed detailed diachronic analysis can usually tell them apart.

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Book reviews

Blench, Roger & Stuart McGill (eds.). 2012. Advances in minority languages research in Nigeria. (African languages monographs 5). Köln: Rüdiger Köppe.

Ludwig Gerhardt, Hamburg

This is an impressive volume of some 370 pages, containing twelve articles of different lengths, devoted to very different aspects of the languages of the Nigerian Middle Belt. Most articles go back to presentations given at a monthly meeting of the Jos Linguistics Circle. Information on all the articles can be found in the preface (by McGill and Blench, pp. xv–xxii) and in an appendix "Abstracts" (pp. 367–372). The main body of the book is in four parts: Part I – Introduction; Part II – General Issues; Part III – Morphosyntax in the Nigerian Middle Belt; Part IV - Topics in Kainji Linguistics. The articles in Part II cover widely diverging topics, such as the relation of Nigerian prehistory to linguistic geography, some unusual sounds in Nigerian languages, the linguistic evaluation of oral traditions, and the use of Arabic script in modern Nigeria.

The preface gives detailed abstracts of all the articles in the volume; strangely, however, the page-numbers deviate from those given in the table of contents. The Introduction (Chapter 1) outlines the sociolinguistic factors that threaten the future development, if not the very existence, of the minority languages of the Nigerian Middle Belt. National and international linguistic academia have largely ignored the minority languages, while grassroots movements, based in several individual communities, have taken the development of their languages into their own hands – with or without official support.

Part II (General Issues) contains four articles covering a wide spectrum of topics. Using linguistic data, Roger Blench (Chapter 2) gives insights into the prehistory of the Nigerian Middle Belt. Unfortunately, archaeology receives even less attention than linguistics in Nigeria, so that a comparison between results provided by both disciplines is hardly possible. The most wide-reaching hypothesis put forward in the paper is connected to a nearly extinct language: Jalaa. Blench argues that this language is the last remnant of a formerly widely-spread family of languages spoken by hunter-gatherers and which has been superseded by invaders from the North-West (Proto-

Songhay) and North-East (Proto-Saharan). In the text there is some confusion in the numbering and labelling of maps: map 4 appears both on p. 28 and p. 31 with the heading "Expansion of Chadic and Volta-Niger", map 5 on p. 33 is identical with map 4 – however with a different heading ("Ijoid and surrounding languages"); map 7, mentioned on p. 34 in the text, is missing.

The next paper in Part II (Chapter 3) by Matthew Harley demonstrates the richness of phonetic phenomena in the languages of central Nigeria and beyond. The sounds in question are a) labio-coronals in Eastern Chadic (Bura-Higi). In Bura-Higi an amazing number of labio-coronals can be found whose apparent historical source is a reduction of CVC-sequences where, after loss of the vowel, labio-coronal clusters may result; b) interdental approximants of the Bauchi cluster of Kainji. Gerhardt (1983: 86) notes that these sounds are also found in the Hyamic subgroup of Central Plateau where they are the product of the palatalization of labials.

Of a more exotic nature is Harley's description of the "explosive bilabial nasal" of Ningkyoob; this is articulated with "the lips [...] open [and] with an audible pop", i.e. a click-like sound. Gerhardt's data on Ningkyoob – collected in 1969 under the heteronyme Kaningkom – (published 1983: 131f.) correspond exactly to the phonemic transcription of the items presented by Harley (p. 60), although the phonetic realisation is different:

Gloss	Harley	Gerhardt
'ground'	/mwi/	[mwi]
'swallow'	/mwe/	[mɣir] /mwir/
'inside'	/mwiŋ/	[mɣiŋ] /mwiŋ/
'children'	/mweŋ/	[mbɣiŋ]
'dew'	/mweŋ/	[mɣeŋ] /mweŋ/

Instead of the click-like sound, I noted a velarized variety of the sound in question. Given the relatively high age of my data and the fact that this pronunciation is found in only a limited number of Ningkyoob speakers it seems reasonable to assume that the development of this click-like sound is a recent phenomenon.

Selbut Longtau's paper on oral traditions of migratory history (Chapter 4) highlights the contradictions in the various traditions concerning the possible north-eastern origin of the languages and peoples of the region under discussion. Often, the theoretical origins are prominent empires or even areas outside Africa in the Near East.

However, the evidence gained from linguistic research can, in many cases, be used to deconstruct the myths of north-eastern or extra-African origin.

Andy Warren-Rothlin (Chapter 5) gives an overview of the use of the Arabic script in modern Nigeria outlining the difficulties associated with using different script-types and different orthographies to write languages other than Arabic. The chapter contains tables for the transcription of Hausa and Fulfulde sounds into Arabic script, and adds useful comments on the historical spread and present use of the Arabic script. Most of the examples are taken from Hausa.

Part III treats problems of morphosyntax in individual languages: Chapter 6 "Focus in Rigwe syntax" by Daniel Gya; Chapter 7 "Tense, aspect and manner encoding in Ikaan" (Sophie Salffner) and finally Chapter 8 "Jukun verbal nouns" (Anne Storch). In Rigwe, various types of focus constructions have to be differentiated: pronoun focus, noun focus, verb focus and adjective focus. In each of these settings different devices are used to mark what is relatively the most salient information.

The most important section in Salffner's article treats a category of adverb-like elements which show specific phonological, morphological and syntactic features. They are described individually in terms of their semantic properties and the contexts in which they occur. Even if these elements are somewhat outside the semantics of TAM, they are, nevertheless, integrated into the verb and occur between the verb prefix and the verb root. To make things even more complicated almost all of these morphemes present their own tonal specifications.

Anne Storch's paper explores the typology and grammar of verbal nouns in Jukun. Although most of the Central-Jukunoid languages have lost nearly all of their nominal class exponents, verbal nouns continue to be marked. The derivative character of verbal nouns is indicated by different morphological means in individual languages, e.g. reduplication of, and tonal changes in, the verb stem. Moreover, in some languages different markers are used for transitive and intransitive nouns.

Part IV treats topics in Kainji linguistics. Chapter 9 by Stephen E. Dettweiler shows that long consonants in C'Lela should be represented in the orthography. Due to an incorrect analysis of the sound system, the orthography has failed to mark the vowel-length contrast.

Dettweiler points to the need for careful phonological analysis as necessary basis for orthographic decisions and suggests a consistent marking of vowel length in the language despite the fact that, in some environments, this contrast is neutralized.

Rebecca Smith Paterson (Chapter 10) maintains that in ut-Ma'in the attribution of nouns to individual noun-classes is regulated by semantic features. Here, she engages in a discussion that has left its traces in the literature on nominal class-systems for decades. Readers that belong to the adherents of the position that noun-classes are simply morphological categories void of any inherent meaning will certainly not subscribe to Paterson's ideas. The arguments she adduces in favour of the semantic motivation for class assignment are a) derivational evidence and b) the assignment of loanwords to particular classes. As fascinating as the idea of semantic determination of noun-classes may be, the examples given show that the semantic range of the single classes/class pairs is too wide to allow the term 'semantic motivation' to be used as a label. One of Paterson's examples is the class pair 5/6 "round shape – pairing" (containing nouns such as "basket", "well (water)" or "crowd/swarm"); the degree of semantic range here is quite substantial and surely requires more evidence. The same can be said of the class pair which is described as containing nouns from the semantic field "life cycle"; the members of this class range from animals to human beings, body parts, cereals and natural phenomena (class pairs 7u/2 and 7Ø/2). Semantic similarity can certainly be found in some noun-classes, however, it seems that this is not a promising approach to the analysis of the whole ut-Ma'in noun class system.

Stuart McGill (Chapter 11) gives an overview of the development of long consonants in Cicipu. After a detailed description of the function of long consonants in the grammatical system of the language, he devotes a section to the historical development of long consonants, especially in nouns. Some noun-classes show geminate consonants while in other classes they are never observed. McGill postulates that long consonants have their origin in noun class prefixes; he supports this hypothesis with data from other Eastern Kainji languages such as Kambari. As long ago as 1974 Gerhardt (1974: 574–582) suggested that the long consonants of Western Kainji language Dakarkari go back to a nominal class prefix *bu-* that has been assimilated to the stem-initial consonant.

The last chapter (David Crozier: "From verb morphology to discourse: a study of Central Kambari") gives a detailed overview of verbal morphology and an introduction to information structure including different ways of focus marking. It ends with an annotated text that exemplifies the many topics discussed in the paper. The conclusion maintains that further study of verbal extensions could be interesting for reconstructing the proto-forms of Benue- and even Niger-Congo.

The twelve papers of this volume – each in its own field – present a remarkable and welcome contribution to our knowledge of this severely neglected area. A lot of language data is provided to exemplify the statements of the papers. However, a final proofreading could have emended quite a number of misprints and editorial flaws.

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Hurst-Harosh, Ellen. 2020. Tsotsitaal in South Africa: Style and metaphor in youth language practices. (Language Contact in Africa 6). Köln: Rüdiger Köppe.

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During the last three decades, African Youth Languages (AYL) have become an established field of research in linguistics. Detailed descriptions abound, not only about individual examples such as Sheng & Engsh in Kenya (Abdulaziz & Osinde 1997, Githiora 2002, Ogechi 2005), Camfranglais in Cameroon (Kießling 2005, de Féral 2006, Stein 2022), Nouchi in Côte d'Ivoire (Kouadio 1990, Kube 2005), Yanké in DR Congo (Nassenstein 2014) or Lugha Ya Mitaani in Tanzania (Reuster-Jahn & Kießling 2006), but also about the general research area (Kießling & Mous 2004, Mesthrie et al. 2021). For the South African variety Tsotsitaal, Ellen Hurst (now Hurst-Harosh) has established herself as leading expert, having studied diverse aspects of the linguistic phenomenon (Hurst 2008, 2009, 2016, Hurst-Harosh 2019).

With "Tsotsitaal in South Africa: Style and metaphor in Youth Language practices", she now presents a monograph that sums up previous research, contributes new material and initiates novel directions of thinking, making it the most comprehensive treatment of Tsotsitaal, a non-standard linguistic variety using material from different languages that has been in use in South Africa since the 1940s, to date. The author herself describes the book as "(…) an attempt to map a field and to describe a linguistic phenomenon" (p. 1), and she approaches the subject from different perspectives to do so (socio-historically, grammatically, lexically, stylistically as well as concerning the attitudes and perceptions of its speakers).

Divided in seven chapters, the reader gets a good overview of what to expect when looking at the directory, and a total of eleven tables and eight figures illustrate the content, even depicting Tsotsitaal speakers in action – a rarity in sociolinguistic research. This hands-on approach prevails throughout the book, which presents many examples of conversation transcripts and in-depth analyses of spoken interaction.

The introduction (Chapter 1) first embeds Tsotsitaal studies in the wider context of African (urban) Youth Language research, discussing both theoretical tools and the state of the art. This discus-

sion includes important excursions into the field of denominations and "semiotic meaning making systems" (p. 6) such as gestures and clothing, which are an essential but as yet neglected part of Youth Language studies. The author then describes the data foundation of her own work, including different research projects from 2005 onwards with fieldwork in Mdantsane (East London), Gugulethu, and Khayelitsha (Cape Town), Kwamashu (Durban) as well as Springs and Soweto (Johannesburg).

Chapter 2 is dedicated to an overview of "Tstotsitaal history and background" (p. 27), covering the first emergence of a novel slang among South African gangs in prison and mining compounds in the mid 1940s, its spread to Sophiatown and Soweto as well as its connection to crime and gangsterism, and how it came to be called Tsotsitaal: by expanding the denomination "tsotsi", which described members of a Sophiatown street gang who were notorious in wearing so-called "zoot-suits" (p. 35), to the slang they spoke (*taal* means "language" in Afrikaans, p. 38). The last part of the chapter sums up the current state and spread of this "language style" (p. 44) to new domains and functions, such as usage in non-criminal peer groups, "by older people and women" as well as "in many forms of popular media" (p. 45), slowly shedding its hitherto negative image.

Turning to the linguistic structure of Tsotsitaal, Chapter 3 presents the grammatical framework of the variety. From a more general summary of the different base languages from which various versions of Tsotsitaals developed (e.g. Setswana, Sesotho, isiZulu, isiXhosa or Afrikaans, p. 47) to a discussion of its morphosyntactic features, the reader learns a lot about how this linguistic phenomenon works. In subchapters 3.3 and 3.4, the author presents a detailed analysis of Cape Town Tsotsitaal, which is based mainly on urban isiXhosa, including 50 examples with interlinear glosses and translations. Hurst-Harosh here comes to the conclusion that Tsotsitaal "is dependent on the urban vernacular to provide the grammatical frame" (p. 69) into which lexical material from other African languages, Afrikaans and English is embedded. Other interesting outcomes of this chapter are the concept of "light" and "deep" varieties of Tsotsitaal, something that has been discussed for other Urban African Youth Languages as well (e.g. Stein 2022 for Camfranglais), as well as the statement that Tsotsitaal is neither the result of code-switching nor a mixed language.

The following three chapters represent the heart of the monograph. Here, Hurst-Harosh goes well beyond traditional structural descriptions of languages and varieties to include questions of attitudes, functions and style. She underlines the importance of Tsotsitaal for the construction of a young, urban, in most cases male and black South African identity, describing the various subcultures that have developed in the younger generation. Also, she explains why the association between Tsotsitaal and criminal activities is still active in the attitudes of the people (p. 85). To do so, the author ana-lyses interviews both with speakers and non-speakers of the variety, quoting the informants in 49 instances to present their views on Tsotsitaal and its users. Chapter 4 further subdivides in discussions about generational identity (p. 93 ff.), urban vs. rural identity (p. 98 ff.), streetwise style (p. 112 ff.), and peer groups (p. 120 ff.), thus painting a comprehensive picture about Tsotsitaal's contemporary functions, the main of which are:

- indexing "youth, rather than middle aged and married" (p. 92)
- expressing "an urban, western modernity identity rather than rural and African traditional" (ibid.)
- indexing "a streetwise knowledge rather than formal education, and hustling […] rather than formal employment" (ibid.)
- portraying "a black masculinity linked to particular forms of music […] and cultural artefacts such as clothing styles" (ibid.) and
- "having fun, making jokes, and trying to make each other laugh", which is the most important function according to the author (p. 120)

Having established the importance of Tsotsitaal for its speakers and its functions, Chapter 5 analyses the semiotic resources used to express social and individual identity by "performed discursive practice" (p. 124). Hurst-Harosh has proposed the term "stylect" in earlier works (e.g. Hurst 2008, 2009) to define Tsotsitaal (and, in extension, similar Youth Language practices), and introduces it again here to explain what is happening in Tsotsitaal interactions. After a short literature review about style, register and gender, the author describes how certain terms can be used to mark a conversation as informal (or "Tsotsi") and then turns to other semiotic modes used, such as gestures, body language, clothing and music preferences

(p. 132 ff.). She also discusses the issue of gender in Tsotsitaal usage, paying special attention to the emerging discourses in online spaces (p. 149 ff.). She concludes that "[…] women who speak Tsotsitaal are interpreted and represented as less feminine, and their Tsotsitaal as less authentic despite very similar practices of use" (p. 158), but that it "[…] can be utilized by women to gain power in township spaces" (ibid.).

Focusing on questions of relexicalization and metaphor, Chapter 6 again turns to the linguistic characteristics of Tsotsitaal, more specifically to its lexicon. The theoretical discussion of the terms "antilanguage" and "metaphor" in the beginning of the chapter could have been integrated in the introduction, but the remaining sections about domains and topics of Tsotsitaal use, including many examples and word etymologies, are highly revealing. Especially the discovery of a "national core lexicon of Tsotsitaal", i.e. "(…) some lexical items [that] have become relatively stable and appear across many if not all of the varieties of Tsotsitaal around the country" (p. 166 ff.) is an exciting contribution to the field and might inspire similar comparative works in other contexts.

The final Chapter 7 summarizes the preceding sections as follows: "The book has argued that Tsotsitaal is a stylized register of South African urban varieties, and that it distinguishes itself through relexicalization including metaphor, and through stylisation, not only of the linguistic performance but also other semiotic systems including gesture, body language and consumer artefacts." (p. 194). The author then painstakingly describes the questions still open for investigation in Tsotsitaal and other African Youth Languages, including:

- ambiguity, and whether it can be "considered a driver for borrowing and language alternation" (p. 195)
- games, metaphor and creativity: "[H]ow linguistic performances lead to fun, and in turn, what impact fun and humour has on language change"? (p. 196)
- taboo, avoidance and respect: "[H]ow [is] language […] used in social processes to signal respect"? (p. 197)
- poetics and phonology: investigating "the interface between AYLs, poetry, music, and related youth cultural forms" (p. 198)

- Tsotsitaal as decolonial: understanding "why and how youth language practices emerge, and why Africa has become such an interesting site of focus for youth language researchers" (p. 199)

Hurst-Harosh closes her monograph with the observation that describing Tsotsitaal and similar linguistic forms as registers "can provide us with a way to break out of traditional classifications" (p. 200), and that their function of expressing identity and establishing power relations should be central to future research.

Overall, this work is written in easily understandable wording, renouncing complicated constructions without losing scientific appeal, thus making it accessible to laypersons as well as both academic beginners and advanced scholars. The book comes in a handy hard-back in shiny dark red including a slightly blurred cover picture of two young men walking down a street, and although an index is missing, the compact size of 203 pages (plus references and appendix) and a well-structured chapter division makes it easy to find individual readers' special interests. A great contribution to African Urban Youth Language and especially Tsotsitaal studies!

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