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Author(s): Laura McPherson

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The Talking Balafon of the Sambla: Grammatical Principles and Documentary Implications

LAURA MCPHERSON

Dartmouth College

Abstract. This article makes the case for linguists to take part in the study of musical surrogate languages, where linguistic form is transposed onto music. It draws on the case study of the Sambla balafon, a West African resonator xylophone. Seenku (Northwestern Mande, Samogo), the language of the Sambla people, has a highly complex tonal system, whose four contrastive levels and multiple contour tones are encoded musically in the notes of the *balafon*, allowing musicians to communicate without ever opening their mouths. I analyze the grammar of the surrogate language and demonstrate its use in both phonological analysis and language documentation.

1. Introduction. Surrogate languages have long been a source of fascination, from the talking drums of the Yorùbá (U. Beier 1954; Villepastour 2010) to the whistled speech of Spanish pastoralists across the valleys of the Canary Islands (Classe 1957; Rialland 2003). Most scholarly work on these systems has been carried out by ethnomusicologists or anthropologists; while this has afforded much insight into the cultural and musical substance of surrogate speech, it has yielded comparatively few studies of the grammatical structure of surrogate languages. This is a missed opportunity for linguistics. First, in the absence of a firm understanding of the linguistic structure that underlies the surrogate language, including any possible differences between underlying and surface representations, we run the risk of oversimplifying the principles of encoding. Second, since surrogate languages are built from the spoken language, they offer a powerful tool to help the linguist analyze the phonological system of the latter—especially tone. Finally, musical surrogate languages enrich the documentary corpus both by capturing an additional linguistic practice of the community (albeit a nonverbal one) and by revealing the intimate connections between speech surrogates and other elements of the culture, such as farming practices, traditional religion, or social structure. Since many musical surrogate languages are themselves endangered traditions, it becomes all the more important to document them as we document their broader linguistic context.

In the present article, I offer a linguist's perspective on a lesser-known musical surrogate language: the talking *balafon* (xylophone) of the Sambla people of Burkina Faso, West Africa.[1] This surrogate language is based on the complex tonal language of the Sambla people, known as Seenku. By encoding tonal and rhythmic aspects of the language, musicians can convey concrete messages to listeners and each other without ever opening their mouths. While

my immediate goal is to present the grammatical structure of the system, I also describe my experience as a linguist working on the surrogate language, including the role it played in my analysis of the Seenku tone system and the value it has added to my broader documentation of the language.

The present article is structured as follows. In section 2, I briefly summarize the literature on speech surrogates both in Africa and beyond. Section 3 introduces the Sambla people, their musical traditions, and their spoken language (Seenku), with attention to the phonological foundations of the speech surrogate. In section 4, I bring the music and language together in the analysis of the talking balafon, including both a contextualization of the tradition and the formal principles of its grammar. I broaden the discussion in section 5 to include two other facets of balafon communication—a lyrical "singing style" and lexical ideogram elements that convey meaning without being based upon linguistic form. Section 6 considers the linguistic implications of the Sambla balafon surrogate language for phonological analysis. Section 7 sketches some preliminary thoughts on two other Sambla surrogate languages (flute and trumpet). Finally, section 8 discusses the pivotal role that surrogate languages can play in language documentation and lays out avenues for future work.

2. Surrogate languages. The study of surrogate languages dates back over a century, with the most famous cases being whistled speech (e.g., Lajard 1891; Busnel and Classe 1976; Rialland 2005; Meyer 2015) and African talking drums (Carrington 1949; Nketia 1971). However, these are only two types of surrogate languages, which vary greatly both in their substance and their geographic distribution.

Broadly speaking, surrogate languages take language and transpose it to a nonlinguistic modality. Most commonly, the literature on speech surrogates focuses on musical surrogate languages (including whistled languages), but by definition, systems like Morse code, semaphore flag signaling, or even writing could be considered surrogate languages, as these also involve encoding linguistic messages in nonlinguistic modalities.[2]

Stern (1957) distinguishes between two kinds of surrogate language systems: abridgement systems and lexical ideogram systems. In the former, phonemic aspects of the language are represented in the speech surrogate. For example, whistle languages either encode the tone of the spoken language (e.g., whistled Mazateco [Cowan 1948]) or the second formant of the vowel (e.g., Silbo Gomero, a Spanish whistle surrogate [Rialland 2003]) and convey the message in this way. In lexical ideogram systems, concepts are represented directly with little or no reference to the way the language sounds. This is parallel to phonemic vs. ideographic writing systems, an appropriate comparison to draw since writing is at its core also a surrogate language system (see also Ong 1977). As seen below, the Sambla balafon surrogate language is principally an abridgement system, encoding rhythmic and tonal properties of the spoken language.

Musical surrogate languages are found all over the world for both tonal and nontonal languages alike. For example, whistle languages have been reported in Mexico (Mazatec [Cowan 1948]), Brazil (Gavião [Moore and Meyer 2014]), Greece (Greek [Charalambakis 1994]), Turkey (Turkish [Busnel 1968, 1970]), the Canary Islands (Silbo Gomero [Lajard 1891]), Senegal (Diola [Moreau 1997]), Togo (Moba [Rialland 2005]), Vietnam (Hmong [Rialland 2005]), Nepal (Chepang [Caughley 1976]), and Papua New Guinea (Gadsup [Cahill 2011]), among many others. Drum languages are common in Africa—for example, among the Sabar of Senegal (Winter 2014), the Ewe of Ghana and Togo (Locke and Agbeli 1981), the Yorùbá of Nigeria (U. Beier 1954; Villepastour 2010), the Banda Linda of the Central African Republic (Arom 2007), the Lokele of the Democratic Republic of Congo (Carrington 1949), or the Ewondo of Cameroon (Neeley 1996). While African systems are better known, "talking drums" of this sort are found in other areas of the world as well, including the Amazon (Bora [Thiesen 1969]), the Solomon Islands ('Are'are [Zemp 1997]), and Papua New Guinea (Kwoma [Zemp and Kaufmann 1969]).

Whistling and drumming appear to be the two most common forms of musical surrogate languages, and they have received the most attention in the literature (see, e.g., Sebeok and Umiker-Sebeok's 1976 volume *Drum and Whistle Languages*). But surrogate speech has been reported on many other musical instruments as well. Among wind instruments, flute surrogates have been reported among the Amazonian Gavião (Moore and Meyer 2014) and the Mexican Kickapoo (at least historically [Hurley 1968]), and are also found among the Sambla (see section 5 below). Jews' harps, or jaw harps, are not uncommon among Southeast Asian ethnicities, in particular the Khmu (Proschan 1994), Hmong (Falk 2008), and Ifugao (Blench and Campos 2010), this last being of interest because Ifugao is not a tonal language. Trumpets or horns are also a mode of communication for the Asante (Kaminski 2008) and the Sambla (section 8), as are stringed instruments like fiddles in Nigeria and Ethiopia (Bebey 1975, quoted in Arhine 2009:105).

This article focuses on the use of the xylophone in surrogate speech, a less common phenomenon than the other instruments listed above. To my knowledge, xylophone surrogates are only attested in the "balafon region" of West Africa, comprising Burkina Faso and neighboring parts of Mali, Ghana, and Côte d'Ivoire. Beyond the Sambla system that is the focus of this article, talking xylophones or balafons have been described among the Senufo of Côte d'Ivoire (Zemp and Soro 2010), the Lobi of Burkina Faso (Colnago 2007), and the Tusia of Burkina Faso (Strand 2009), from whom the Sambla are said to have borrowed the tradition. Cultural aspects of the xylophone surrogates may differ, for instance in the number of instruments played at the same time (one among the Sambla, multiple among the Senufo), but all appear to be largely abridgment systems, encoding tone and rhythm to carry messages through the music.

3. The Sambla: people, music, and language.

3.1. Sambla people. The Sambla are a small Mande ethnic group living in southwestern Burkina Faso. The majority of the ethnic population live in their traditional villages, with major village centers of Bouendé (Seenku: *gbéné-gɥ̀ɥ́*) and Karangasso-Sambla (Seenku: *təmî*), located about forty kilometers to the west of Bobo-Dioulasso. There are also sizable concentrations of Sambla people living in Bobo-Dioulasso (especially in the neighborhood of Belle Ville) and the capital Ouagadougou. The exact population size is not clear, but *Ethnologue* (https://www.ethnologue.com/language/sos) lists the number of speakers of Seenku at sixteen thousand as of 2009; since many people who migrate to cities, particularly Ouagadougou, no longer speak the language fluently, I would estimate the ethnic population to be closer to twenty thousand people.

The Sambla are traditionally subsistence farmers, growing staple crops like corn, millet, and rice, in addition to cash crops like cotton.[4] Like many other Mande societies, the Sambla have a caste system, with a ruling farming class known as *sáā̃n*, a blacksmith caste known as *kèii*, and a *griot* caste known as *kâ*. Griots, known also by their Bambara (Jula) term *jeli,* are musicians and orators, a hereditary position that involves singing praises and genealogies at important rituals and festivals. Women traditionally sing while men play instruments. In Sambla society, there are three kinds of griots: those who play the balafon (*bą́ą-brɛ̂*), those who play the talking drum *(dənɥ̀-brɛ̂*), and leather workers (*tsɥ̀-dəgɛ̂*). Each profession is hereditary.

3.2. Sambla music. The Sambla balafon, which has become the center of Sambla musical traditions, is in fact a recent development in the area. According to Strand (2009), corroborated by my own interviews with Sambla musicians, it was brought to Sambla country by Tusia musicians in the nineteenth century. Other instrumental and vocal music predated its arrival, though these other traditions have since taken more of a backseat. In this section, I outline first the history, tuning, and apprenticeship practices of the balafon before briefly describing other Sambla instruments and musical traditions, some of which accompany the balafon and others of which are played or performed on their own.

3.2.1. The Sambla balafon. The term "balafon," used in both French and English, refers to a class of West African resonator xylophones, where hollow gourds hang beneath each key, tuned to resonate at that same frequency. The word derives from the Manding words *bála fɔ́* or "xylophone talk" (Zemp and Soro 2010; this *bála* can be seen in the Seenku cognate for the instrument: *bą̂ą*).

Traditional Sambla balafons have twenty-three keys, carved from the wood of a tree known in Seenku as *bɛ̀nɛ̀* (scientific name *Pterocarpus erinaceus*). I am told that only dead trees are cut down for their wood, and that once a dead tree

has been discovered in the bush, it is left there in the elements for around three years to dry out before being cut down and brought home (Mamadou Diabaté p.c. 2017). Once carved into keys, the wood is smoked to dry it out further, until "it becomes like metal" (Sadama Diabaté p.c. 2017).[5] The keys are tied to a wooden frame with string, though traditionally balafons were assembled using the soft thin skin of the royal antelope, both to build the frame and attach the keys. Due to habitat loss and overhunting, it is now difficult to procure this leather, and so goat skin is now used in its place in frame construction.

A small hole is cut into each resonator gourd, which is covered by a thin membrane. Traditionally, this was made from spider egg sacs, but it is now replaced by more durable plastic or paper.[6] This creates a buzzing sound considered to be aesthetically appealing; this is likely an instantiation of a general aesthetic preference in the area for instruments to produce a jingling or buzzing sound in addition to the "pure" notes, which are considered to be otherwise a bit lifeless (see section 3.2.2 for further discussion). The species of gourd used by the Sambla and the neighboring Tusia is different from the gourds used on the more ubiquitous Jula balafon, and they are cultivated specifically for this purpose (Strand 2009). They are more oblong and are coated in a clay that gives them a reddish appearance. The application of this clay is a secretive process, only known by the initiated. See figure 1 for a picture of a Sambla balafon.

Figure 1. A Sambla balafon in Toronsso, Burkina Faso.

Like many musical traditions in West Africa, the Sambla use a pentatonic scale, but the scale degrees differ from better-known pentatonic scales. The closest diatonic equivalents are shown in (1), from 1, the lowest pitch in the scale, to 8, the highest, along with the Seenku names of the pitches, their translations, and the abbreviations used for them in tables and musical examples.

(1) 1 *bə̰a̰-ɲà* lit., 'balafon-mother' (B)
♭3 *jîo-bə̰a̰-dèn* lit., 'fetish-balafon-key' (J)
3 *bə̰a̰-ɲà-gù-nɔ̰* lit., 'the one under the balafon-mother' (Bg)
5 *tərɔ́n-tərɔ́n* (no translation) (T)
6 *səràkùa-kɔ̀-nɔ̰* lit., 'the one above the *sərakua*' (Sk)
(8 *sərà̀kùa* [no translation]) (S)

With twenty-three keys, the traditional Sambla balafon spans four and a half octaves. The lowest key is the *bə̰a̰-ɲà* 'balafon-mother', which also refers to the bass part of the balafon. Interestingly, this key has a different name in higher octaves (typically just the two highest octaves of the instrument): *sərà̀kùa,* for which musicians can offer no translation.

Above the *bə̰a̰-ɲà* is the *jîo-bə̰a̰-dèn,* literally, the 'fetish-balafon-key'. In this context, 'fetish' (cf. French *fétiche*) refers to the animist concept of a person or place inhabited by a spirit or djinn. True to its name, this ♭3 (flat third) is said to be reserved for more sacred uses rather than regular speech in the surrogate language. As described by Strand (2009), it is used to create dissonant intervals in the music, and if not deployed correctly, the result is jarring to a Sambla listener. To a Western listener as well, this pitch stands out most strongly, since unlike 1, 3, and 5, which form a major triad, the *jîo-bə̰a̰-dèn* is on average slightly less than three hundred cents (a minor third) from the *bə̰a̰-ɲà* and slightly more than one hundred cents from the 3 (slightly more than a half step away).

The note above the *jîo-bə̰a̰-dèn,* corresponding to 3 in a diatonic scale, does not have as fixed a name as the first two keys. Depending upon the musician asked, it is referred to either as the *bə̰a̰-ɲà-gù-nɔ̰* 'the one under the balafon-mother' or as the *tərɔ́n-tərɔ́n-kɔ̀-nɔ̰* 'the one above the *tərɔ́n-tərɔ́n*'. In other words, it is defined by its position relative to other important notes in the scale (1 and 5). It is interesting to note that it is called 'the one under the balafon-mother', despite being higher in pitch; musicians typically refer to the relative position of the keys with respect to the ground, and since higher pitches have smaller resonator gourds, they end up being lower to the ground.

The perfect fifth (i.e., 5) is called the *tərɔ́n-tərɔ́n,* which has no translation. Finally, 6, like 3, is defined with regards to neighboring keys. I have heard just one name for this key, *sərà̀kùa-kɔ̀-nɔ̰* 'the one above *sərà̀kùa*', making reference once again to its spatial orientation rather than its acoustics.

Balafons are not tuned to an absolute pitch; as musicians tell me, just like humans, each instrument "has its own voice." For instance, on my own balafon, modeled on the tuning of one of Mamadou Diabaté's balafons, 1 is roughly F in standard concert pitch; on a Sambla balafon played by Sadama Diabaté in Toronsso, 1 is a few cents flat of D. Internal relationships between notes of the scale, however, remain constant, such that the interval between, say, the first and second notes of the scale (i.e., between 1 and ♭3) will be the same on each balafon regardless of their absolute pitches, like a solfege system where "do" can

be on any note. On the one hand, this is reminiscent of linguistic tone, where it is the relationship between pitches that forms the basis of the contrasts rather than the pitch of each tone individually. But on the other hand, as a reviewer points out, the balafon is at the same time more fixed and more free than linguistic tone—more fixed because of the fixed scale and thus clearly defined intervals between notes, but more free because the tonal center that defines the mapping between note and tone in the surrogate system can change depending upon the mode (see section 4.2 for more on the effect of modes).

A single Sambla balafon is typically played by three musicans at the same time. Seated on one side are the musicians playing the bass part (the *bâa-ɲà*) and the treble (the soloist, responsible for the speech surrogate). Seated across from these two is the musician playing the middle part; this sets the tempo but is otherwise the simplest part, played by the youngest musician (often a teenager still in training). The solo part is the most complex. The balafon tradition is passed from father to son in just two extended families in Sambla country, the Diabatés and the Konatés. Boys typically begin their training at the age of five, spending all of their days learning alongside their elders. At least traditionally, this meant that boys would not receive formal schooling, though this is beginning to change; while formal education undoubtedly holds many benefits, it has a detrimental effect on the traditional mode of transmission of this complex musico-linguistic tradition.

The balafon is played at all major events in the village: marriages, funerals, baptisms, religious rituals, festivals, and large collaborative farming efforts known as *kənɔ̂n*. The music remains highly prized by Sambla people, and they can be heard listening to recordings made on their cell phones, even when out working the fields on their own.

The data in this article are drawn from my own primary research on the balafon surrogate language in Burkina Faso and abroad, with contextualization made possible by the dissertation work of Strand (2009). Most of my own work on the system has been thanks to the help of Sambla balafonist Mamadou Diabaté, who lives in Vienna, Austria, and with whom I have worked since 2014. Additional data have been gathered and recorded from members of Mamadou's family in Burkina Faso, including his older brother, Sadama Diabaté, who is the head of the Diabaté balafon clan. Other musicians who have provided data or helped deepen my understanding of the tradition include Nigo Moussa Diabaté, Sabwe Diabaté, Diaka Diabaté, and Yacouba Konaté.

3.2.2. Other Sambla music. Though the balafon has become the most prestigious and highly valued music in Sambla society, other earlier musical traditions also exist, some of which have their own speech surrogates. First, the Sambla have a large amount of vocal music, though it never accompanies the balafon; the only singing done in the presence of balafons is surrogate singing[7] on the balafon itself. Genres of sung music include girls' play songs, women's

work songs (i.e., while grinding or pounding grain), and praise songs (*təmáa–sɔ̂*), sung by griot women. In the mythology of the balafon, it is said that the hunter who brought the balafon with him from the spirits, who had gifted it to him, took women's songs and played them on the instrument, and that this represented the earliest balafon music.

There are a number of drums that can be used on their own or to accompany balafon music. These include the *dənṵ̀*, the cylindrical tension drum known in other contexts as a talking drum (cf. Nigerian *dundun*), and the *dɔ̀nɔ̃́*, barrel-shaped drums of different sizes worn on a strap by the player. The balafon musicians themselves wear metal rattles on their hands while playing, known as *ŋɪ́ɛ̰–ŋɪ̂ɛ̰*; similar to the buzz created by the hole in the gourd, this jingling or rattling is a common feature of instruments in the region. For instance, Jula gourd harps known as *ngoni* can have their necks topped with a removable piece of aluminum with metal rings through it that rattle when the musician plays.

Besides percussion instruments, the Sambla also have two ancient wind instruments. The first is a wooden flute known as *pîɔn*. This flute can be played by anyone who takes an interest, not just griots. The other is the *gbên*, a horn or trumpet made out of the tip of a hartebeest horn (Seenku *sɔ̃́rɔ̃́*) combined with the end of a water buffalo horn (Seenku *tsɪ́̃*); the *gbên* is largely a ritual instrument, used to call people to initiation ceremonies, though it appears to be rarely used today. Both instruments also have speech surrogate systems that I will touch on briefly in section 8.

3.3. The Sambla language: Seenku. The language of the Sambla people is known by a number of names and spelling variants. It has been referred to as "Sambla" or "the Sambla language" (French spelling: *Sembla*), which is an exonym. The endonym for the language is Seenku *sɛ́ɛ̰-kû*, literally, 'thing/language of the *Sɛ́ɛ̰* ethnicity'; while this is spelled as "Seeku" (ISO 639-3: sos) on the *Ethnologue* website, I have chosen to write it with an *n* to better reflect the nasal vowel.

The sixteen thousand speakers noted by *Ethnologue* speak two different dialects. Northern Seenku, spoken in and around Karangasso, is spoken by roughly five thousand people and was described in a grammar sketch by Prost (1971). Southern Seenku, spoken in and around Bouendé, is spoken by the remaining eleven thousand people, and is the focus of the present study. The only previous scholarly work done on this variety is an unpublished master's thesis on aspects of the morphophonology (Congo 2013).

Seenku is a Western Mande language of the Samogo group; its closest relatives are spoken in the areas around the border between Mali and Burkina Faso. Many of the languages in the Samogo group remain undescribed or underdescribed, with the notable exception of Dzùùngoo, for which a thorough reference grammar is available (Solomiac 2007, 2014). The data in the present article are drawn from my own fieldwork on Seenku, totaling almost six months spent

in Burkina Faso from 2013 on, and many other weeks working with speakers living abroad, including Mamadou Diabaté.

Seenku has a rich consonant phoneme inventory, with five places of articulation for oral and nasal stops (bilabial, alveolar, palatal, velar, and labiovelar), plus alveolar affricates *ts*, *dz*, two voiceless fricatives *f*, *s*, and two sonorants *l*, *w*.[8] The vowel inventory is likewise large and complex, with between seven and nine oral vowels (depending upon the speaker), five nasal vowels (nasalization is represented by a tilde beneath the vowel, e.g., *a̰*), and contrastive length for both oral and nasal vowels. In addition to these monophthongs, Seenku also has over a dozen oral and nasal diphthongs, for which length is also contrastive. The first vowel quality in the diphthong is typically realized as a glide, leaving the latter vowel quality to carry the length distinction.

While the phoneme inventory is elaborate, syllable and word structure is limited. Most vocabulary is either monosyllabic or "sesquisyllabic"—the latter term refers to words that consist of a so-called "minor" or "half" syllable followed by a full syllable (Matisoff 1990). Sesquisyllabic structure is more common in languages of southeast Asia, but has developed in Seenku from extensive reduction of formerly disyllabic words. The contrast between monosyllabic and sesquisyllabic words is illustrated in (2a)–(2c) (the sesquisyllabic words being the third items in each example).

(2a) *sɛ̃́* 'fly'
bɛ̀ 'do (IRREAL)'
səbɛ̃́ 'write'

(2b) *dɔ̀ɔ* 'beer'
gɔ̌ɔ 'dry'
dəgɔ̌ɔ 'place'

(2c) *mĩ́* 'first person plural'
nĩ́ 'father'
mənĩ́ 'woman'

As (2a)–(2c) show, sesquisyllabic words can have either short or long vowels in their full syllable; short vowels are more common, however. In the minor syllable, there is a very short schwa; tone is left unmarked on this schwa, as it is not a tone-bearing unit and does not create lexical tone contrasts. The only words in which the schwa may be absent are words in which the second consonant is a liquid, such as *blě* 'big'. Similarly, tone is marked only once per syllable in the present article, regardless of whether the vowel of the syllable is short or long, monophthongal or diphthongal.

Unless we treat sesquisyllabic words as having an underlying complex onset that is broken up by schwa epenthesis (e.g., /mnĩ́/ → *mənĩ́* 'woman'), Seenku does not allow complex onsets. The only permissible coda in the language is a

nasal with noncontrastive place, and even in this case, the coda is rarely realized with oral closure in isolation; instead, speakers either omit it or realize it as late nasalization of the vowel. In connected speech, the coda nasal is realized as a homorganic nasal before obstruents or as nasalization of sonorants (going so far as to turn liquids and glides into their corresponding nasal stop, e.g., *l* → *n*). In the transcription system used in the present article, words with final nasals are written with a final *n,* although the nasal is rarely realized as such.

While word structure plays a role in the surrogate language, by far the most important phonological aspect is tone. Seenku's tone system is one of the most complex in the region. Unlike its immediate neighbors and the other Samogo languages (to the best of our knowledge), Seenku has four contrasting levels of tone—extra-low (X, represented as *a̗*), low (L, represented as *à*), high (H, represented as *á*), and super-high (S, represented as *a̋*). Minimal and near-minimal sets of level tones are shown in (3a) and (3b).

(3a) *sán* 'God'
sá 'cry'
sà 'second son (birth order name)'
sa̗n 'river'

(3b) *sɨ́* 'tree sp.'
sí 'reciprocal'
sì 'first son (birth order name)'
sɨ̗ 'earthenware jar'

These four level tones can combine to create almost every possible two-tone contour tone, though only a small number of these contours are underlying (i.e., not derived by phonological or grammatical tone processes). The most common lexical contour tones are HX, HS, and LS, whose representations in tonal diacritics are shown in (4a)–(4c), respectively.[9]

(4a) *kʉ̗i* 'néré seed'

(4b) *kʉ̗ɨ́* 'snore'

(4c) *kʉ̌i* 'grass sp.'

Morphologically derived contour tones include SH, HL, SX, and XH.

Three-tone contours are also attested. The only lexical three-tone contour is XHX, found in words such as *da̗ân* 'basket hanger' or *gɔ̗ɔ̂n* 'hibiscus'. The three-tone contour LSX is found in the perfect (e.g., *nàä* 'come [PRF]'). Other complex contours, such as HXS, can be created by the elision of grammatical particles, which leave behind only their tone (e.g., *dôn lɛ́* → *dôɔ́n* 'child PST').

Tone has a very high functional load both lexically and grammatically in Seenku; many morphological processes are marked in part or in whole by tone

(see, e.g., McPherson [2017a] on plural formation or McPherson [2017b] on verb conjugation).

4. The balafon surrogate language. This section covers the cultural and musical contexts of the surrogate language, as well as its formal grammar—how Seenku is transposed onto the instrument to communicate.

4.1. Contextualizing the balafon surrogate language. Surrogate speech pervades all Sambla balafon music; there is no piece of music or occasion in which the balafon is brought out that does not contain instances of surrogate speech. This is not to say that every note played on the balafon encodes a linguistic message. Broadly speaking, the middle and bass parts of balafon music serve simply to set the tempo, rhythm, and musical backdrop for the surrogate speech played on the highest notes by the soloist.[10] But even this soloist flicks in and out of surrogate speech while playing, interspersing passages of speech with repetitious music interlocking with the other parts or free-flowing melodies called *bâa-nè-bɛ̀ɛ-kúi* 'things done on the balafon' that closely resemble speech but do not encode any words.[11]

The soloist's surrogate speech can be categorized into two styles, which tend to differ in the messages they encode. The first is what I call "speaking style," which is used to communicate directly with listeners in a more extemporaneous way. This style of speech can be found in the course of a song when all three musicians are playing, or it can be used between songs to communicate with other musicians or audience members. Common content in the speaking style includes people's names, requests for money and other contributions, or encouragements to dance or farm. In terms of form, the speaking style is the more transparent of the two styles, with surrogate speech closely matching the tone and rhythm of spoken Seenku.

The "singing style," on the other hand, is only found in the course of a song. The lyrics "sung" by the balafon are typically rote, full of proverbs and other forms of indirect messages.[12] Formally, it is characterized by constant rapid-fire note strikes, which to some extent obscure the speech rhythm and other encoding strategies to be discussed in the next subsection. Certain notes may be drawn out by repeated strikes, which allows the musician to time the lyrical phrase with the rhythmic cycle created by the other two players. It is interesting to note that some of these lyrics, at least, appear to be learned as music, without a direct connection to the words that they encode. For instance, a musician may know that a particular phrase refers to the name of the original chief of an area without knowing exactly what that name is. This may explain why it is so much harder to unequivocally map "sung" lyrics onto their words, as the spoken language may have evolved or changed while the musical version has been passed down independently.

Musicians can say anything they want on the balafon, but most nonmusicians will understand only a small repertoire of common phrases. If a listener

does not understand, it is taboo for the balafonist to translate what was said on the instrument. Instead, either a griot playing the talking drum will translate it into spoken Seenku, or if a child apprentice in the balafon family is present, it may fall on him to translate (a stressful task, I am told, since it takes many years and an understanding of the social context to fully understand). The musician himself must remain orally mute, though listeners will respond with regular spoken language. In a similar vein, requests for money via the balafon surrogate language must be honored (if the person has the means, but it is the balafonist's responsibility to know a person's means and ask within them), because it is seen as the balafon and not the musician as a person making the request.

Finally, the words of the balafon play a number of important roles in Sambla society. First, I am told that there are traditional healing practices that require the balafon to come and speak incantations, such as a healing ritual to alleviate a child's herniated belly button. Second, the balafon language is used as a socially acceptable way to criticize members of the community. If a person is critiqued or insulted by the balafon player through the surrogate language he or she cannot get angry, while the same words uttered out loud may result in a fight. The balafon surrogate language is a way to distance the speaker from what is being said, granting special privileges. A similar role for song has been reported in many other traditional societies, such as the Xhosa (Guzana 2000), the Nanti (C. Beier 2010), and the Dogon (in the context of the *ondom piri* festival in Tommo So country [personal fieldwork]). In this way, the Sambla balafon surrogate fits well into the "praise-blame polarity of oral cultures" described by Ong (1977:423).

4.2. Grammar of the surrogate language. With the basic musical and linguistic systems established, we can now turn to the grammar of the balafon surrogate language: the principles of encoding that take Seenku and transform it into music. The analyses in this article draw on a corpus of 138 lines of balafon surrogate speech, played by four different musicians. The number of lines represented from each are shown in table 1.

Table 1. Balafon Corpus: Musicians Represented

NAME	ABBREVIATION	NUMBER OF LINES
Mamadou Diabaté	MD	67 lines
Nigo Moussa Diabaté	NMD	54 lines
Seydou Kanazoe Diabaté	SKD	7 lines
Sadama Diabaté	SAD	9 lines

The phrases that make up the database are only in the spoken style. The reasons for this are twofold. First, these phrases presented the clearest and most unequivocal mapping between the language and music. Second, even if a

singing style phrase were clearly analyzable, the playing style differs, especially in terms of duration of strikes; consequently, it would be misleading to average measurements for the two styles together. Thus, this section should be understood as covering the principles of encoding of the speaking style of the speech surrogate. In section 5.1, I briefly present examples of "sung" data and highlight the differences.

Data were transcribed and durations extracted from audio and video recordings both by hand and by converting the audio recordings into MIDI format using Logic Pro and extracting durations automatically. Each word and its total duration (the sum duration of all note strikes encoding that word) were entered into a spreadsheet, and the data were then coded for a number of factors, including: word shape (monosyllabic or sesquisyllabic), presence of a nasal coda, whether the vowel is a monophthong or diphthong, whether it is short or long, and whether the tone is level or a contour. This process produced a database of 830 words on which all reported statistics are based.

The two phonological aspects that form the foundation of the surrogate language are tone and syllable structure. Segmental identity is stripped away (i.e., the difference between vowel qualities or consonant phonemes), creating many opportunities for ambiguity that musicians must navigate. In the subsections below, I first address the encoding of tone, then turn to syllable structure.

4.2.1. Tone encoding. Arguably the most important and transparent means of encoding Seenku on the balafon is via its complex tone system, which is represented by notes on the balafon. There is no one-to-one equivalence between Seenku's four lexical tones and notes of the balafon, due to a variety of factors including free variation, length of the overall phrase being played, phonological effects, and mode of the song. That being said, strong tendencies emerge in the database. Since the *jîo–bə̀a̱–dèn* (♭3) is usually reserved for ritual or spiritual use, only four scale degrees of the pentatonic scale remain, each of which is most commonly associated with one of Seenku's four tones. The distribution of tone encodings on each pitch of the scale is shown in table 2.

Table 2. Distribution of Tones by Scale Degrees in the Database

	B [1]	J [♭3]	Bg [3]	T [5]	Sk [6]	S [8/1]
S	0	1	8	22	38	**156**
H	4	0	71	85	**154**	28
L	2	1	9	**73**	15	7
X	**100**	2	**93**	57	15	15

NOTE: The most frequent associations of a tone with a note are given in bold type.

If a phrase is played neutrally, outside of the context of a song that is played in a different mode (centered around a pitch other than the *bə̂a̱–ɲà*), these are

the most typical encodings of tone. Two short example phrases contrasting in tone are shown in (5a) and (5b); in this transcription system, the notes are listed along the left-hand side, and the grid is filled in for each note that is struck. The words are listed along the bottom, with the duration of the note strike underneath. Duration in milliseconds was measured as the time between the strike of that note and the strike of the next note; the duration of the final note in a phrase is not measured, since there is no following note. Here and elsewhere, "➢" indicates the note that defines the melodic center (or tonic) of the mode. I return to the notion of mode shortly below.[13]

(5a) 'Don't hit me' (NMD: July 13, 2015)

	S [8]				
	Sk [6]	■	■		■
	T [5]				
	Bg [3]			■	
	J [♭3]				
➢	B [1]				
	Words	*á*	*mó*	*bə̀a̰*	*ŋɛ́*
	Durations	181	216	207	…

(5b) "Don't hit us' (NMD: July 13, 2015)

	S [8]		■	■	
	Sk [6]	■			■
	T [5]				
	Bg [3]				
	J [♭3]				
➢	B [1]				
	Words	*á*	*mɪ́*	*bə̀a̰*	*ŋɛ́*
	Durations	231	235	198	…

The first word in each phrase, *á* 'second person singular', remains the same, as does the final negative particle *ŋɛ́*; both are H-toned, and in both phrases, H tones are played on scale degree 6 (*sərà–kùa–kɔ̰̀–nɔ̰̀*). The phrases differ in the pronoun for who is being hit (H-toned *mó* 'first person singular' in (5a) and S-toned *mɪ́* 'first person plural' in (5b)), and they also differ in the grammatical tone effects of that pronoun on the following verb. Importantly, in both examples, the notes on the balafon directly encode the tones of the spoken phrases, whether that tone is lexically or grammatically determined.

As discussed above, speech tones[14] do not always get encoded in musical pitches in a one-to-one correspondence. Deviations from these patterns occur both predictably and unpredictably, due to free variation or stylistic preferences. Predictable deviations, though, relate to the melodic mode of a song. Although the Sambla balafon has fixed keys that cannot be replaced mid-performance to play a different scale, songs can be played in different melodic modes by shifting the melodic center from the conventional *bə̂a̰–ɲà* to another pitch. Such a shift

gives a song a different feeling or flavor, while also shifting the way speech tones are encoded in the surrogate language. The highest tone S typically is mapped to the highest pitch in the scale (*səràkùa*); the lowest tone X may also be mapped to the lowest pitch, an octave below (*bə̰a̰-ɲà*), but it is also commonly mapped to the third scale degree, which corresponds to a major third above the tonic in the most common *bə̰a̰-ɲà* mode. If the pitch center of the mode is shifted from the *bə̰a̰-ɲà* to centering instead on the *tərə́n–tərə́n*—the scale degree located at the interval of a fifth above the tonic, then S gets mapped to the *tərə́n–tərə́n* and all the other tones are likewise shifted around this point. Examples (6b) and (6c) show the same phrase, *jʊ́`–mənɨ̀ nă mó bɔ̀ təgòn–təgòn* 'I am dying of thirst' in (6a), played in two different modes, first in the most common mode centered around *bə̰a̰-ɲà* (scale degree 1), and then in a mode centered around the *jîo–bə̀a̰–dèn* (scale degree ♭3). The balafon transcriptions are preceded by an interlinear gloss of the phrase.

(6a) *jʊ́`–mənɨ̀* *nă* *mó* *bɔ̀* *təgòn–təgòn*
water-drink.ANTIP PROSP 1SG.EMPH kill.IRREAL RED-completely
'I am dying of thirst.'

(6b) *Bə̰a̰-ɲà* mode (MD: October 14, 2016)

	S [8]												
	Sk [6]												
	T [5]												
	Bg [3]												
	J [♭3]												
➢	B [1]												
	Words	*jʊ́`*		*mənɨ̀*		*nă*		*mó*	*bɔ̀*	*təgòn*		*təgòn*	
	Durations	107	152	65	217	73	182	190	193	99	188	85	…

(6c) *Jîo–bə̀a̰–dè n* mode (MD: October 6, 2016)

	J [♭3+]												
	S [8]												
	Sk [6]												
	T [5]												
	Bg [3]												
➢	J [♭3]												
	Words	*jʊ́`*		*mənɨ̀*		*nă*		*mó*	*bɔ̀*	*təgòn*		*təgòn*	
	Durations	61	157	49	182	63	171	153	157	81	168	52	…

NOTE: The symbol "+" in "♭3+" here and in "1+" below means one octave up.

Other aspects of encoding (contour tones and sesquisyllabic words) are discussed shortly. The first mode, that in (6b), is the neutral mode used for speaking when not playing during or after another song that requires a different mode; indeed, this example phrase was offered as a means of disambiguating two other phrases played out of context (see section 7.1 below). The version in (6c) was played immediately after the musicians played a song in this mode, and

the mode carried over to the surrogate speech phrases. Similarly, if a musician is going to "speak" to someone, he will already have the song he is planning on playing in mind (typically the song for that person's family), which will determine the musical mode and thus the tone encoding principles for the surrogate speech. Interestingly, despite the fact that the two renditions begin in different modes, both end on the *tərɔ́n–tərɔ́n*.

Contour tones are encoded on the balafon by striking the notes associated with each tone; for example, in (6b) above, the LS contour tone on the prospective auxiliary *nă* is encoded by striking the *tərɔ́n–tərɔ́n* for the L followed by the *sərà*k*ùa* for the S. The first note of the contour tone is almost like a grace note, followed almost immediately by the second tone of the contour. In this example, the note corresponding to L is left to resonate only 73 milliseconds before the note for S is struck. In this way, a contour tone is distinguishable from a sequence of two syllables with different tones.

Examples of three-tone contours in the balafon surrogate language are rare (as they are in the spoken language). However, the few attested examples show a somewhat surprising realization: based on the behavior of the two-tone contours, we might have expected both nonfinal tones to be played as grace notes, but instead these complex contours are played like a two-tone contour (a grace note followed by a full note) followed by another note occupying the same space as a note for a regular syllable. For example, the phrase *á nàä* 'you have come' in (7) shows a verb with a three-tone LSX contour typical of perfect formation. Only the initial L is played as a grace note.

(7) 'You have come' (NMD: August 12, 2015)

	S [8]				
	Sk [6]				
	T [5]				
	Bg [3]				
	J [♭3]				
➢	B [1]				
	Words	*á*	*nàä*		
	Duration	243	81	202	…

Syllables carrying three tones in Seenku are lengthened to accommodate the tones, but not to the extent that they take up the space of two syllables. Certainly the final tone of three-tone contour in the spoken language does not receive the sort of prominence that it does in the surrogate language.

Example (7) shows a three-tone contour arising from grammatical tone; it may be that in an earlier stage of Seenku, the X came from a grammatical particle that has since been elided, and the trace of this syllable remains in the balafon language.[15] Lexical three-tone contours, though, are played in exactly the same way, as can be seen in the encoding of the phrase *á nă dàáǹ sà̰* 'you will buy a basket hanger' in (8).

(8) 'You will buy a basket hanger' (NMD: August 12, 2015)

	S [8]							
	Sk [6]							
	T [5]							
	Bg [3]							
	J [♭3]							
➢	B [1]							
	Words	*á*	*nă*		*dàáǹ*			*sà̰*
	Duration	253	68	288	49	249	275	…

This phrase contains two contour tones, the first another instance the LS *nă*, and the second the three-tone contour XHL. In the encoding of the latter, the initial X is encoded at the same level as the final L. It is unclear to me whether this indicates a tonal process raising X to L of which I am unaware, or whether this is a quirk of surrogate language encoding.[16] Regardless, the same pattern is seen: the initial tone is played as a grace note, resonating only 49 milliseconds before the strike of the second tone, which lasts a full 249 milliseconds before the final tone is struck.

It is unclear why three-tone contours are stretched out so much in the balafon language. One hypothesis is that there is a musical ban on consecutive grace notes, while another is that even in lexical cases like that in (8), the three-tone contour results historically from a separate syllable that has since been lost, but I know of no way to definitively prove either of these possibilities.

While this section provides a basic overview of tonal encoding in the surrogate language, closer examination of the system finds disconnects between the spoken language and the surrogate language. For example, in the spoken language, rising tones like *nă* in (8) are almost always simplified to a downstepped S (i.e., [á ˈnā̋ dàáǹ sà̰]); as we can see, this simplification is not reflected in the surrogate language. This raises questions about precisely what level of phonological structure is encoded. I address the practical benefits of this disconnect in section 7.1; for its implications for phonological theory, see McPherson (2019a).

4.2.2 Syllable structure encoding. It is noted at the beginning of section 4.2 that segmental phonemes play no role in the surrogate language; in other words, differences in place or manner of articulation for consonants and vowels are not encoded. Syllable structure, on the other hand, is. Specifically, vowel length, sesquisyllabicity, and, variably, coda nasals result in different encoding. Curiously, though, all three are encoded in precisely the same way—with the same sort of grace note used to encode contour tones, followed by the main note of the syllable. The consequence is a great deal of ambiguity, made especially severe when the syllable also carries a contour tone. However, close examination of durational data reveals subtle but statistically significant differences in the encoding of some of these factors, as I show below.

Turning first to vowel length, we see in examples like (7) above that simple *(C)V* syllables with level tones are encoded with just a single note strike. Level-toned *CV:* syllables, on the other hand, are encoded with a double strike on the same note. This can be seen in (9a) and (9b).

(9a) *mó* *nă* *bɛ̀ɛ* *sà̰* *ŋɛ́*
1SG.EMPH PROSP pig buy.IRREAL NEG
'I will not buy a pig.'

(9b) 'I will not buy a pig.' (MD: November 24, 2014)

	S [8]							
	Sk [6]							
	T [5]							
	Bg [3]							
	J [♭3]							
➢	B [1]							
	Words	*mó*	*nă*		*bɛ̀ɛ*		*sà̰*	*ŋɛ́*
	Duration	169	49	169	62	153	156	…

Here, the vowel length of *bɛ̀ɛ*'pig' (raised to *bɛ̀ɛ* by grammatical tone processes; see McPherson 2017a, 2019b) is encoded with two strikes of the *tərɔ́n–tərɔ́n,* the first lasting only 62 milliseconds.

The same encoding strategy is used to encode sesquisyllabicity, introducing a layer of ambiguity into the system. For instance, the compound noun in (10) could be interpreted as either *bɛ̀ɛ–kərê* 'boar' or *səgə̀–bâ* 'ram', depending on the context.

(10) 'boar' or 'ram' (MD: November 24, 2014)

	S [8]				
	Sk [6]				
	T [5]				
	Bg [3]				
	J [♭3]				
➢	B [1]				
	Words 1	*bɛ̀ɛ*		*kərê*	
	Words 2	*səgə̀*		*bâ*	
	Duration	78	294	71	…

In the case of the first root in the compound, it is clear that the two strikes represent something about syllable structure (vowel length, sesquisyllabicity) rather than tone, because both strikes are on the same pitch. The second stem, however, carries a contour tone, and thus the grace note structure becomes ambiguous; the contour tone is apparent, because different pitches are played, but the listener can no longer reconstruct the syllable structure. In (10), the encoding of the HX contour tone of the final word is the same regardless of whether

the syllable hosting it is a simple *CV* or a more complex sesquisyllabic structure. The same ambiguity is found if a long vowel carries a contour tone, since both length and contours are encoded with two strikes. This can be seen in the common balafon phrase shown in (11a) and (11b).

(11a) *á à bâa dzɔ̀-tsɩ̀ mó tè wɛ́n dán sóen*
2SG 3SG balafon mouth-cut 1SG.EMPH GEN money 10,000 one
'Be the first to give 10,000 francs to the balafon!'

(11b) 'Be the first to give 10,000 francs to the balafon!' (SAD: July 11, 2017)

	S [8]													
	Sk [6]													
	T [5]													
	Bg [3]													
	J [♭3]													
➢	B [1]													
	Words	*á*	*à*	*bâa*		*dzɔ̀*	*tsɩ̀*	*mó*	*tè*	*wɛ́n*		*dán*	*sóen*	
	Duration	59	179	75	146	150	171	148	113	108	279	141	81	…

The word *bâa* 'balafon' has a long vowel and a HX contour tone. It is encoded by striking the *bâa-ɲà-gʊ̀-nɔ̀* for the H tone with a 75-millisecond grace note, followed by 146 milliseconds for the X tone played on the *bâa-ɲà*. Ongoing research is investigating whether there are subtle durational differences in either the grace note or the combined length of the syllable that can disambiguate long and short vowels.

The example in (11a) and (11b) also encapsulates coda nasal encoding in the balafon surrogate language. The final three words of the phrase, *wɛ́n dán sóen* '10,000 francs', each carry a coda nasal; the first and third are encoded with two note strikes, i.e., the same grace note structure used for other complex syllable structures, but the middle word is encoded with just a single note strike. There appears to be nothing systematic about this variation, and in fact, in repetitions of the same phrase, *dán* likewise is encoded with two strikes.[17] The variable encoding of coda nasals may be symptomatic of their weak lexical representation, another subtle way in which the phonological structure of the spoken language finds parallels in the surrogate.

Finally, while the distinction between short and long vowels is reflected in the speech surrogate, the distinction between monophthongs and diphthongs is not. Short diphthongs are encoded exactly the same way as short monophthongs (with a single note strike) and long diphthongs are encoded like any other long vowels (with two note strikes).

4.2.3. Summary of encoding strategies. The Sambla balafon surrogate language encodes two dimensions of the spoken language: speech tone and syllable structure. Speech tone is encoded through the pitches played on the balafon, with the highest speech tone S generally identified with the highest

scale degree of whatever melodic mode the musician is playing in; the other tones are encoded relative to that (see discussion in section 4.2.1 above, especially that relating to examples (6a)–(6c)). There is only a binary encoding of syllable structure: *(C)V* syllables are represented with just a single note strike (unless they carry a contour tone, in which case both tones must be represented), while complex syllables (long vowels, sesquisyllabic words, and in some cases nasal codas) are represented with two note strikes. Contour-toned syllables are thus necessarily ambiguous as regards syllable structure.

Although this surrogate grammar is simple and results in a considerable amount of ambiguity, it does ensure that word boundaries are clearly delimited, since Seenku's vocabulary is overwhelmingly monosyllabic or sesquisyllabic. Simply put, two notes played in rapid succession can be safely interpreted as a single word, and otherwise the listener can assume a word boundary. This may represent an advantageous processing trade-off, offsetting the ambiguity.

5. Beyond the spoken surrogate: "singing" on the balafon and lexical ideogram elements. Section 4 focuses on the grammar of the speaking style of the balafon surrogate language, where encoding is relatively transparent, primarily due to the close match between spoken rhythm and surrogate rhythm. However, there are two other ways in which the balafon can transmit information. The first is the "singing style," used primarily for rote lyrics, and the other comprises certain common expressions that are lexical ideograms, i.e., are not based on phonemic encoding principles. I address each of these in turn below.

5.1. Singing style of encoding. In the singing style of the surrogate language, lines are much more fluid, with note strikes evenly but closely spaced; in other words, there are no clear grace notes that indicate that a note is part of a contour tone or a syllabically complex word, because all notes are played with more or less equally rapid timing. Making things even more challenging, the words that are sung tend to be highly symbolic and rote, based on old proverbs[18] that may reflect an older stage of the language itself. In many cases, it appears that lyrics to songs are passed down in the musical tradition, meaning that musicians may be more comfortable with the lyrics as music than as speech. Hence, the connection between language and music is much harder to deduce than in the spoken style.

Most cases of singing-style lyrics that have been translated for me provide very few footholds to map the speech tones to the musical pitches. Nevertheless, a few phrases are still fairly transparent and demonstrate the ways in which the singing style can be manipulated to make lyrics fit better with the overall song being played. One example comes from the song *kèii–dón–sǫ̀* 'Blacksmith Family's[19] Song'. This song has short lyrics that are repeated at intervals throughout the song; the lyrics as told to me by Mamadou Diabaté are shown in (12a) and (12b), and their musical representations in (12c) and (12d), with words mapped as clearly as possible.

(12a) *kɛ̀ɛii* *kərɛ́–bɔ̂ɔ* *lɛ̃́* *í* *bɔ́n* *jərɑ̃́* *wɛ̃́* *òo*
blacksmith man-old PST LOG back turn PART EXCL
'The old blacksmith man has died (lit., 'has turned his back')!'

(12b) *dənɪ̃́* *lɛ̀* *sú* *ɪ̀i* *mərŋên* *bɑ̰̀*
child.PL SUBORD get.up 3PL.SUBORD iron beat
'The children got up and beat the iron.'

(12c) Transcription of first lyric to *kɛ̀ɛii–dón–sɔ̂* (example (12a)) (MD: 2002)

	S [8]							
	Sk [6]							
	T [5]							
➢	Bg [3]							
	J [♭3]							
	B [1]							
	Bk [6–]							
	Words	*ɪ̀*	*kɛ̀ɛii*		*kərɛ́*		*bɔ̂ɔ*	
	Dur.	142	78	92	71	110	63	83

	S [8]									
	Sk [6]									
	T [5]									
➢	Bg [3]									
	J [♭3]									
	B [1]									
	Bk [6–]									
	Words	*lɛ̃́*								
	Dur.	110	102	131	107	122	83	142	100	129

	S [8]										
	Sk [6]										
	T [5]										
➢	Bg [3]										
	J [♭3]										
	B [1]										
	Bk [6–]										
	Words	*í*	*bɔ́n*		*jərɑ̃́*		*wɛ̃́*		*òo*		
	Dur.	83	95	104	129	93	104	99	79	127	...

(12d) Transcription of second lyric to *kɛ̀ii–dón–sɔ̂* (example (12b)) (MD: 2002)

	S [8]														
	Sk [6]														
	T [5]														
➢	Bg [3]														
	J [♭3]														
	B [1]														
	Bk [6–]														
	Words	*dəníʃ*						*lɛ̀*	*sú*						*ɪ̀i*
	Dur.	87	116	103	93	105	85	102	90	116	106	101	100	120	64

	S [8]										
	Sk [6]										
	T [5]										
➢	Bg [3]										
	J [♭3]										
	B [1]										
	Bk [6–]										
	Words	*məŋ̂ɛn*		*bə̀*							
	Dur.	60	183	126	80	225	98	95	136	85	...

According to the principles of encoding above, we would expect perhaps fifteen note strikes to represent (12a); instead, this phrase played on the balafon consists of twenty-six strikes. Similarly, we would expect just nine note strikes for (12b), but instead we see twenty-four. Note that the *kɛ̀ii–dón–sɔ̂* is played in the *bə̰̀a̰–ɲà–gʊ̀–nɔ̃̀* mode. The *bə̰̀a̰–ɲà* itself is very rarely touched in this song. The rhythm and pitches played in the song are meant to represent the sound of blacksmiths striking metal.

What we can see clearly in these transcriptions is that in the singing style, words can be drawn out with multiple strikes in a stylistic manner. I am told this is to make sure that the lyrics line up correctly with the rest of the music, though an in-depth study of what lines up to what has yet to be undertaken. These examples also show that tone encoding is not totally straightforward: the X tone on *bɔ̂ɔ* does not dip as far as expected, and there is a stylistic low note ending the phrase on the exclamative *ɔ̀ɔ*. In the second phrase, we see a descending melody from *lɛ̀* to *sú*, which ascends tonally in the spoken language. We also would expect two strikes for the long vowel *ɪ̀i*, but instead see only one. In short, the principles of encoding are much looser in the singing style than in the spoken style, or, as a reviewer suggests, they may be governed by an entirely

different set of rules, perhaps more similar to the constraints imposed on tone-tune mapping in sung language (Schellenberg 2012; McPherson and Ryan 2018; Kirby and Ladd forthcoming). Ongoing analysis of Seenku vocal music will test this prediction.

In many cases, there is a major disconnect between the oral translation of the lyrics and what is played on the balafon, to the extent that I am unable to believably map them to one another. Cases like this lead me to suspect that melodies are learned prior to learning their "meaning," and that the latter may have been handed down in translation differently from generation to generation, leading to these disconnects. In other words, the "original" lyrics of the singing style may reflect an older stage of language; such archaic speech in surrogate languages is found in other traditions, such as the sabar drumming of Senegal (Winter 2014), the Lokele drumming of the Democratic Republic of Congo (Carrington 1949, quoted in Ong 1977), or instrumental speech among the Gavião (Moore and Meyer 2014). Similarly, learning surrogate speech first as music and only later associating it to words has been reported in other traditions, such as among the Akan (Nketia 1963, quoted in Winter 2014). Song lyrics and the singing style of the balafon surrogate are the subject of ongoing research.

The division of surrogate languages into different styles or genres is not unique to the Sambla. Spoken and sung registers of whistling languages are also found in Amazonian language, including the Bora (Thiesen 1969) and the Gavião (Moore and Meyer 2014). Nketia (1963) reports a similar division in Akan drumming, where a "speech mode" closely resembles spoken language, a "signal mode" is based on more poetic language, and finally a "dance mode" uses a so-called "heightened form of poetic language" (Agawu 2001), transcending language itself. It is possible that the lyriclike phrases known as *bə̂ə̰-nɛ̀-bɛ́ɛ-kʉ̋i* could be an instance of this dance mode, drawing upon melodies that resemble the poetic language of the lyrics but that serve instead to drive the music forward (and encourage dance). Then again, Agawu reports that Akan drummers also sometimes play in the style of the speech mode without necessarily saying anything.

5.2. Lexical ideogram elements. Though the Sambla balafon language is predominantly an "abridging" surrogate language, in Stern's (1957) sense, encoding phonemic aspects of the language, there are still lexical ideogram or signaling elements to the language. These are expressions played on the balafon that carry meaning without directly encoding linguistic aspects of spoken Seenku. I briefly discuss two known but very different cases below, though I am certain that others exist.

The first case is a more contentious one, blurring the boundary between music and semantic message. When a musician first sets up the balafon to play, there is a customary set of melodies that must be played before doing anything

else. The soloist is the one to play these melodies, and these lines span the whole range of balafon pitches rather than being confined to the highest octaves where speech is typically represented. The reason I classify this relatively long (over a minute) rote expression as a kind of lexical ideogram is that it is played to ask permission of the various spirits, ancestors, and chiefs who brought the balafon to the Sambla and to thank them for that gift. Musicians can identify different parts of these opening melodies that correspond to these different groups, though none of melodic passages can be translated directly. (Supplementary materials online contain a recording of this ritual opening.)

A clearer case of a lexical ideogram on the balafon is found when musicians wish to say "yes" or otherwise indicate that a person has understood their request. This is one of the rare cases where the *jîo–bə̀a̱–dèn* is used in regular surrogate speech (i.e. outside of the *jîo–bə̀a̱–dèn* mode). In its base form, it involves (usually) three repetitions of the sequence *jîo–bə̀a̱–dèn* followed by *tərə́n–tərə́n* (♭3-5), which can also be accompanied by lower notes played with the left hand. An example of a simple affirmation is shown in (13).

(13) 'Yes (that's it)' (SAD: July 11, 2017)

	S [8]						
	Sk [6]						
	T [5]						
	Bg [3]						
	J [♭3]						
➢	B [1]						
	Words	('yes', lexical ideogram)					
	Duration	299	262	272	216	238	…

This phrase is played, for instance, if a musician has asked for a specific sum of money (such as 1,000 CFA) and the listener has understood and brought that money. I am told that because the sound of the balafon travels so far, the father or family elder back in the compound will be listening for the sums of money requested and the sound of approval, calculating the amount that should be brought back at the end of the engagement. If that amount is not handed over in full, there will be a reckoning!

6. The Sambla talking balafon as a tool in tonal analysis. My work on the Sambla balafon came about unexpectedly as part of a larger documentation project on Seenku. The two enterprises have shown themselves to be symbiotic in unanticipated ways. Here I reflect on the role the balafon system has played in the analyzing the tone system itself; I return to the bigger picture of how surrogate languages fit into language documentation in the conclusion.

In addition to being fascinating in its own right, the balafon surrogate language has proven to be an invaluable tool in the description and analysis of Seenku's complex tone system. When I first began working on Seenku in 2013, I

expected a three-tone language, which is both typologically more common and consistent with what we know about surrounding languages.[20] Lexical elicitation largely supported this hypothesis, since level L-toned vocabulary is quite rare in the lexicon. Early on, it became clear that plurals are marked partially through a process of tone raising, which I analyzed as a chain shift (L → M → H). I argued that this process was driven by tone features (Yip 1980; Pulleyblank 1986; McPherson 2017c), with two distinct representations of M tone that are homophonous on the surface, as shown in table 3.

Table 3. Original (2013) Analysis of Seenku Tone

	L	$M_{Derived}$	$M_{Lexical}$	H
[upper]	–	–	+	+
[raised]	–	+	–	+

I recognized subtle pitch differences when the "two Ms" were placed next to each other, but equated these acoustic differences to processes like downstep or register reset across a phrase boundary.

During my second trip to the field in 2015, I recorded instances of the "derived" and "lexical" M tones played on the balafon; the two were consistently played differently, regardless of tonal environment, with the derived tone always lower than the lexical note. This suggested that the featurally distinct tones were in fact also surface-distinct, prompting a reanalysis of the former three-way L, M, H contrast to the current four-way X, L, H, S. Around the same time, a small number of lexically L-toned stems were also discovered, such as *nɔ̀* 'five' (cf. *sóen* 'one' or *sùɛ* 'three') or birth order names like *Sà* 'second son'. A pair of these balafon phrases illustrating the singular (*á cɛ̀* 'your hand') and the plural (*á cè* 'your hands') are given in (14a)–(14c). Here, the verb undergoes tone sandhi triggered by the tone of the object, as described in McPherson (2019b).

(14a) *mó* *nă* *á* *cɛ̀/cè* *bə̀/bà*
1SG.EMPH PROSP 2SG hand/hand.PL hit
'I will hit your hand/hands.'

(14b) 'I will hit your hand' (NMD: July 13, 2015)

	S [8]						
	Sk [6]						
	T [5]						
	Bg [3]						
	J [♭3]						
➢	B [1]						
	Words	*mó*	*nă*		*á*	*cɛ̀*	*bə̀*
	Duration	233	276		209	249	…

(14c) 'I will hit your hands' (NMD: July 13, 2015)

	S [8]						
	Sk [6]						
	T [5]						
	Bg [3]						
	J [♭3]						
➢	B [1]						
	Words	*mó*	*nă*		*á*	*cè*	*bà*
	Duration	240	315		221	279	…

The singular X is played in (14b) on the *bâa-nà-gù-nɔ̀* while the plural L is played on the next scale degree, the *tərɔ́n–tərɔ́n*. Importantly, both of these are lower than where the H tone of the pronouns *mó* and *á* are played—on the *sərà́kùa*. Notice that the X or L tone on the object 'hand(s)' spreads onto the verb, an indication that Seenku's argument-head sandhi process is encoded on the balafon (McPherson 2019a). After three more years working on the language, my ears became attuned to these differences, whose distinct realizations are confirmed by instrumental analysis. See figure 2 for a normalized plot of one speaker's four tone levels, with tone normalized to the speaker's mean f0.

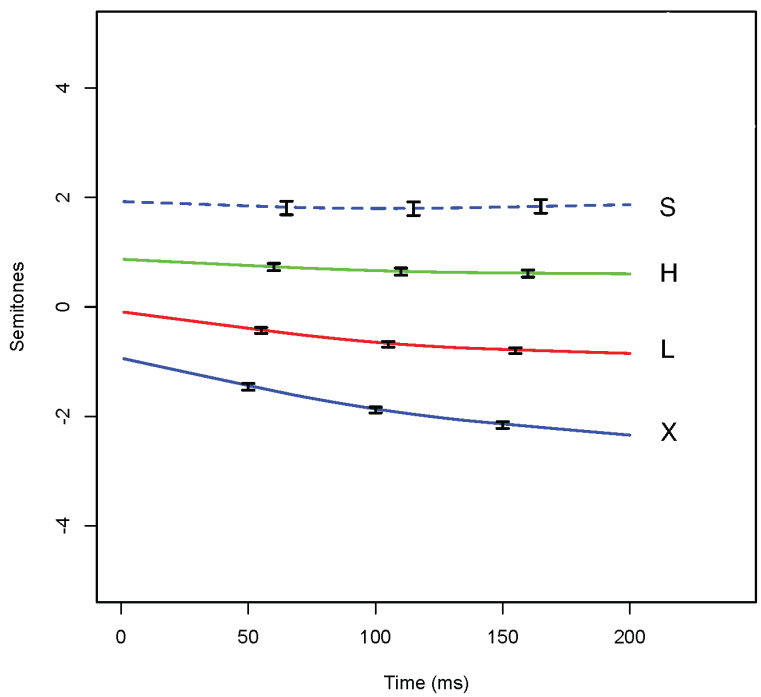


Figure 2. Normalized f0 traces of Seenku's four level tones (female speaker).

Contour tones presented another challenge in understanding the tone system in the spoken language. Many contrasts are based on subtle differences in slope (e.g., LS vs. HS) that are difficult to distinguish for the untrained ear. When played on the balafon, though, the two (or three) component tones are clearly articulated, allowing the researcher to confirm hypotheses about underlying form.

In the case of the LS rising tone in particular, the balafon provided a perspective that the spoken language itself could not. This is because in the spoken language, LS almost always simplifies to either L or ˈS (downstepped S), depending on its tonal context, which in my three-tone understanding of the language I heard as M or H. Interestingly, while both lexical and grammatical tone are exceptionlessly encoded in the balafon surrogate languages, phonological tone processes like contour tone simplification are not: regardless of surface realization in the spoken language, the rising tone is almost always played in the balafon surrogate (which can be seen in examples like (9) and (14) above). Thus, in conjunction with a shift to a four-tone anaylsis, I came to realize that alternating elements like the future auxiliary *nă* carry a LS rising tone.

As a final illustration of the balafon's value in analyzing the tone system, I show a related case where the lack of contour tone simplification on the balafon renders phonology that is opaque in the spoken language fully transparent. The case in question involves the progressive, in which the verb stem is followed by a particle *nɛ́*, diachronically (if not synchronically) related to the locative postposition. In this inflection, the tonal contrast between H- and S-toned stems is neutralized, to S for transitive verbs and to H for intransitive verbs. Following intransitive verbs, the particle *nɛ́* is always X-toned, as in (15a) and (15b).

(15a) *à sɩ̰ sá nɛ̀*
3SG be cry LOC
'He is crying.'

(15b) *à sɩ̰ cɛ̀rɛ̀ nɛ̀*
3SG be sleep LOC
'He is sleeping.'

This realization is consistent with sandhi behavior of underlying H tone after H and X. Following transitive verbs, though, it is always S-toned. For two years, even after the discovery that the language has four tones, I thought X-toned verbs remain unchanged in the progressive, making this S-toned particle a mystery. Examples (16a) and (16b) represent what I heard until the balafon showed me otherwise.

(16a) *mó sɩ̰ à sɔ̃́ɔ nɛ̃́*
1SG.EMPH be 3SG sell LOC
'I am selling it.'

(16b) *á* *sǐ* *kú* *lɛ́* *bà* *nɛ̋*
2SG be thing which do LOC
'What are you doing?'

Example (16a) is consistent with sandhi processes (all tones are realized as S following S in a sandhi domain), but (15b) and (16b) show conflicting behavior after X-toned verbs. Rather than attribute the tone changes to sandhi, given this inconsistency, I instead analyzed the system as involving two fixed allomorphs of the progressive particle, one for the intransitive and one for the transitive.

Coincidentally, I happened to record (16b) on the balafon, and its encoding, shown in (17), shed a new light on the system.

(17) Balafon encoding of 'What are you doing?' (cf. (16b)) (NMD: July 15, 2013)

	S [1+)								
	Sk [6]								
	T [5]								
	Bg [3]								
	J [♭3]								
➢	B [1]								
	Words	*á*	*sǐ*		*kú*	*lɛ́*	*bǎ*		*nɛ̋*
	Durations	206	53	198	79	187	60	205	…

As this example shows, the underlyingly X-toned verb stem *bà* 'do' is played with a LS rising tone. The S-toned realization of *nɛ̋* thus follows naturally, since it follows an S-final syllable. What I heard as X on the verb is in fact L, the result of "tonal absorption" (Hyman and Schuh 1974), a regular process whereby rising tone is simplified before another S. The transitive progressive is thus formed by suffixing S to the verb, which causes X to raise to L by register assimilation (the rising tone must share the feature [+ raised]); this suffix S triggers *nɛ́* to raise to S through regular sandhi processes, which then creates the environment for tonal absorption to apply. These steps are illustrated in the rule-based phonological derivation shown in table 4.

Table 4. Derivation of Transitive /X/-toned Progressive Verbs

/bà–S nɛ́/	Underlying representation
bǎ nɛ́	S docking and register assimilation
bǎ nɛ̋	Tone sandhi
bà nɛ̋	Tonal absorption
[bà nɛ̋]	Surface representation

The surface form is opaque, since the trigger for S on the particle *nɛ̋* and the reason X raises to L are both lost in the derivation. In the balafon surrogate language, though, this rising tone is maintained, offering a crucial piece of evidence for the analysis of the verbal morphophonology. With this newfound understanding of the progressive, thanks to the musical surrogate, I could now

hear the subtle raising of X-toned verb stems—easy to miss, since it is non-contrastive in this position.

As Agawu so deftly put it, "At the acoustic and phonological levels, language study and music study can share many mutually valuable lessons" (2001:10). This is most certainly the case for the Sambla balafon surrogate, which has proven to be an unexpected source of evidence in the analysis of Seenku tone. This potential has long been recognized for whistled speech, but the discrete notes of the balafon and the nonapplication of regular phonological rules offer a deeper and more concrete look at tonal representations.

7. Surrogate speech on other Sambla instruments. In the present day, the balafon and its surrogate language dominate Sambla music. However, this is a relatively new tradition, and surrogate speech is attested on both of the Sambla's more ancient instruments, the horn (*gbên*) and the flute (*pîɔn*) described in section 3.2.2. I briefly describe their surrogate systems here, comparing them to that of the balafon.

First, the horn surrogate language differs slightly from that of the balafon, if only because the horn does not have the same fixed notes that the balafon has. The sound is produced on the horn by blowing through tensed lips, creating vibrations that are amplified by the horn. The pitch depends upon the speed of vibration (the frequency), and thus a whole spectrum of pitches can be produced. This is evident in the glissando notes played on the horn, which are able to more accurately portray contour tones in the spoken language. Despite the fact that the horn would be able in principle to encode precisely the spoken tones of the language, notes close to those found on the balafon scale are primarily used; that is, it is still at its base a musical system rather than a direct representation of spoken pitch. In the example of horn speech I have in my data corpus, the primary notes played on the horn are approximately the tonic, the fifth, and the sixth, or in other words the 1, 4, and 5 scale degrees of the balafon's pentatonic scale. The higher notes tend to be a few cents sharp and the lower notes a few cents flat, but otherwise the horn appears to match the scale used in balafon music.

To illustrate the flexible nature of pitch on the horn, in addition to the articulation between notes played by the horn player, I provide a spectrogram with overlaid pitch track for two consecutive phrases. Examples (18) and (19) provide glossed versions of the phrases; spectrograms corresponding to these examples are shown in figures 3 and 4, respectively.

(18) *ì à bâa à kɛ́ kɛ̀*[21]
3PL 3SG do.IPFV 3SG go.IRREAL EMPH
'It was done like this.'
(Cf. figure 3.)

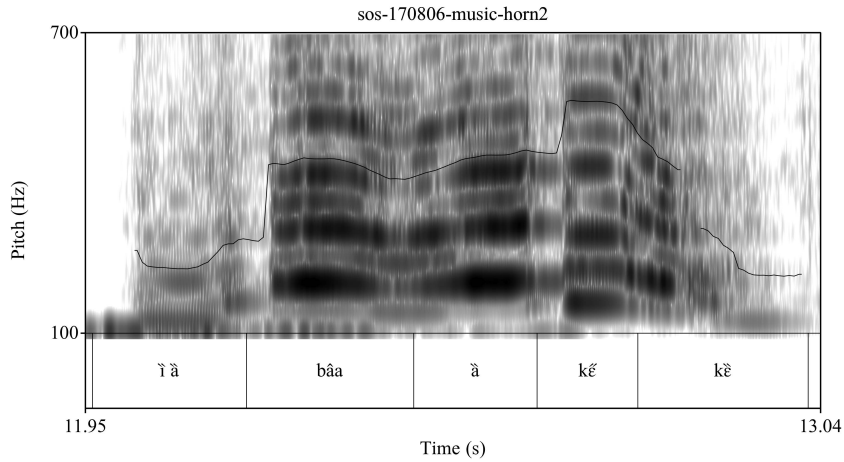


Figure 3. Spectrogram and pitch trace of horn surrogate for 'It was done like this' (example (18)).

(19) *ì̀ sɛ́ɛ̱–gûa tsì̀ɛɛ*
QUOT Sambla-country word
'In the words of the Sambla.'
(Cf. figure 4.)

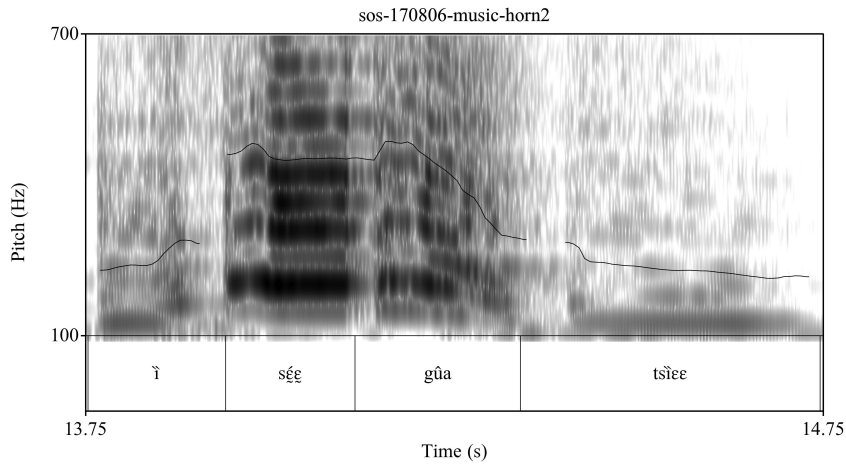


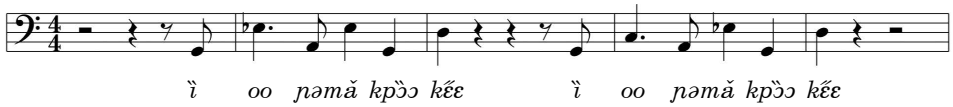
Figure 4. Spectrogram and pitch trace of horn surrogate for 'In the words of the Sambla' (example 19)).

The closer match to spoken Seenku tone is particularly clear for contour tones like that in *gûa* in figure 4; a glissando of this sort is simply impossible on the balafon due to its physical characteristics. My sample size of horn surrogate speech is not large enough to determine whether there is any consistent encoding of segmental contrasts in the articulations of notes.

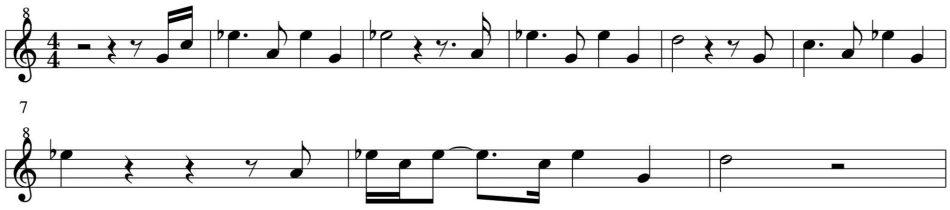
The *pîɔn* is a wooden transverse flute that can also be used to encode speech. It is the most casual of the instruments, able to be played by any (male) Sambla and played for any reason, including just for the joy of it. (The horn can also be played by any male, but its uses seem to be more ritually oriented.) Once again, the flute uses more or less the same scale as the balafon (despite the fact that the two are not played together!), though in playing, the flat third (i.e., ♭3) is more commonly played than the major third (i.e., 3). Interviews with musicians (both balafon musicians and *pîɔn* players) suggest that the balafon may have been tuned to match the scale of this flute. To the best of my limited knowledge, the flute is used less as a means of communication (encoding spontaneous speech intended to convey a message to a listener) than it is to "sing" Sambla songs, with their traditional lyrics. In the data available to me, one man plays songs on the flute, then the other provides a sung rendition. Since each song is played in full then sung in full, it is not always possible to be sure that each man is following the same sequence of lines to allow for direct association of words to flute music. In supplementary materials available online, I provide an audio sample of a flute rendition and sung rendition of another song for comparison, but in-depth analysis awaits further work. For the time being, we can see a short example in the phrase below, which is repeated multiple times in a song for women who are going to collect clay for pottery. The glossed words are provided first in (20a), followed by the sung rendition (two repetitions) in (20b), followed by the flute rendition (full cycle of four repetitions) in (20c).

(20a) *ì̀ oo ɲəmǎ kpɔ̀ɔ kɛ̂ɛ*
QUOT VOC Nyuma paw break.PTCP
'Oh, broken-legged Nyuma!'

(20b) Sung rendition of (20a)



(20c) *Pîɔn* rendition of (20a)



In this simple example, the sung rendition in (20b) and the *pîɔn* rendition in (20c) are nearly identical, except that the *pîɔn* rendition has two more melodic variants that cycle; the sung rendition, provided only in snippets by the singer,

corresponds (roughly) to the second and fourth *pîɔn* melodic variants, rather than to the first and third. The melody matches the tone quite closely, including the difference between the L of *ɲəmă* vs. the X of *kpɔ̀ɔ*, though in the *pîɔn* rendition, these are occasionally played on the same note. Artistically, the S of *kɛ̋ɛ* can be played at a lower note than that of *ɲəmă*; this is also natural from a spoken perspective, where this second S tone would be lower due to downdrift. As we can see once again, though, it is not obligatory to encode the effects of downdrift in music if aesthetic considerations prefer it played higher (and closer to its "phonemic level").

Finally, this last example begins to scratch the surface of tone-tune association in sung Sambla music, a topic that has garnered more linguistic attention than musical surrogates (for literature summaries, see Schellenberg 2012; McPherson and Ryan 2018; Kirby and Ladd forthcoming; inter alia). Preliminary study of this and other phrases suggests a fairly close match between tone and melody; this is unsurprising given the close match with tone in the surrogate language systems, but since sung music retains all of the segmental content of the lyrics, greater diversions from the tonal contours might be predicted. Future work will focus more closely on the role of Seenku tone in shaping sung melodies and comparison between vocal music and surrogate language.

8. Conclusions. This article provides a linguistic analysis of the Sambla talking balafon tradition, in which Seenku tone and syllable structure are transposed onto the keys of the balafon. Though ambiguity is rife due to the loss of segmental contrasts, musicians are still able to communicate with spectators and other musicians to laud ancestors, to make financial requests, or even to criticize in ways that would not otherwise be socially acceptable. I hope that the discussion above shows not only what linguists bring to the table in the study of speech surrogates, but also what the field of linguistics stands to gain by broadening its focus in this way.

I want to end with a discussion of how musical surrogate languages also enrich the language documentation as a whole. Language documentation aims to produce "a lasting, multipurpose record of a language," representing "a comprehensive record of the linguistic practices" of a community (Himmelmann 2006:1, 1998:166). If our documentation of linguistic practices is to be complete, we must include musical surrogates, which I show above to be, at their core, very much a linguistic practice. Recording and archiving instances of musical surrogates makes it possible not only to understand and document their formal structure but also their sociolinguistic and pragmatic uses: What is it that speakers say through these instruments, and why is this modality chosen over an oral one? In the case of the Sambla, one use is to distance the individual from the message, allowing him to make financial requests and voice criticisms that would otherwise be inappropriate; however, this is but one of many uses for the balafon.

To be multipurpose, a language documentation should be of interest to other parties than just linguists. By including musical surrogate languages, the researcher invites the insights of anthropologists, ethnomusicologists, and even historians interested in the content of the texts passed down from generation to generation through the lyrics of these songs. In the case of the Sambla balafon, filming the surrogate in its natural surroundings has meant learning about traditional farming practices, traditional religious ceremonies, dance, and village festivities. Interviews and texts about the tradition have led to insights on population movements, natural species and their decline, and caste structures. Each of these topics has enriched the documentary materials on Seenku and the Sambla people.

In making an archive or a documentation multipurpose, we also must not forget the interests of the speech community itself. Nowhere have I found such passion for the materials I have gathered as in the context of the balafon surrogate. The music is highly prized by the community, and thus its inclusion increases the perceived value of the archive (while also providing recordings community members can share amongst themselves to accompany work in the field). If language is what makes us human, music is what highlights our shared humanity and speaks to us on a deeply emotional level.

Lastly, documentary linguistics usually aims to create records of endangered languages; I would argue that musical surrogate languages are endangered at an even greater rate than spoken languages, with chains of transmission being lost even in linguistic communities where the spoken language is relatively stable (see, e.g., Ong [1977] on the loss of drum languages). This is certainly the case for the Sambla balafon. The practice, begun with daily apprenticeship when a boy is around five years old, takes years to master. Traditionally, this was possible because formal schooling did not exist, or if it did, musician families refused to send their boys so they could stay home and learn their profession. In recent years, more children are attending school in Sambla country, which is, of course, a positive development in many respects, particularly by allowing these children to participate in the global marketplace, but it means less time spent acquiring the musical tradition and its speech surrogate. Greater access to and interest in outside music also threatens the continued existence of traditional musical forms. Thus, including music surrogate languages in a language documentation does double duty: it provides a comprehensive view of linguistic practices while also documenting threatened forms of oral expression.

Similar calls to document endangered musical forms and methodologies for doing so have been made by Marett and Barwick (2003), Grant (2014), Marett (2010), Barwick (2006), Turpin and Henderson (2015), Fitzgerald (2017), among many others.

To sum up, the present article focuses on the ways in which the balafon surrogate sheds light on questions of phonological description: the number of contrastive tones, the underlying form of contour tones, etc. Future work will

pursue this line of inquiry further, showing how musical surrogate languages can advance questions of phonological theory, as the study of metrics (e.g., Kiparsky 1977; Hayes 1988) or text-setting (e.g., Halle and Lerdahl 1993; Hayes and Kaun 1996) have done for decades. For instance, a focus on precisely which phonological processes are encoded and which are not may point to cognitively real distinctions between levels of the grammar that musicians tap into when encoding speech.

With musical surrogate languages, and the spoken languages on which they are based, at risk of extinction all around the world, time is of the essence. Bringing together the expertise of anthropologists, ethnomusicologists, and linguists will allow us to paint the most detailed picture of this artistic form of expression at the intersection of two uniquely human behaviors.

Notes

Acknowledgments. First and foremost, my deepest gratitude goes to Mamadou Diabaté, without whose passion and patience this project would not be possible. Many thanks as well to Sadama Diabaté, Nigo Diabaté, Seydou Kanazoe Diabaté, Sabwe Diabaté, and Yacouba Konaté for their time and insights into the balafon tradition. This project has benefited from valuable feedback to presentations of this work from audiences at the Linguistic Society of America's annual meeting, at the Tonal Aspects of Language (TAL) meeting, at the University of California, Los Angeles, at the University of Rochester, at Harvard University, and at Dartmouth College. I am grateful as well to Ted Levin, Yana Stainova, and the editors at *Anthropological Linguistics*, and also to two anonymous reviewers for suggesting ways in which the arguments in this article could be honed and strengthened. All remaining errors are my own. This material is based upon work supported by the National Science Foundation–National Endowment for the Humanities Documenting Endangered Languages Program under National Science Foundation Award No. BCS-1664335 as well was the Leslie Center for the Humanities at Dartmouth College.

Transcription. In this article, the transcription system for consonants and vowels uses IPA symbols, with the following exceptions that bring it closer to orthographic systems found in the region: [ɾ] is transcribed as *r*, [dʒ] ~ [ɟ] is transcribed as *j*, [j] is transcribed as *y*, and nasalization is represented with a tilde below the vowel rather than above to leave room for tonal diacritics. Long vowels are represented by doubling the vowel. For tone and its representation, see the description of the phonology in section 3.3.

Abbreviations. The following grammatical abbreviations are used in examples: 1 = first person; 2 = second person; 3 = third person; ANTIP = antipassive; EMPH = emphatic; EXCL = exclamative; GEN = genitive; IRREAL = irrealis; LOC =locative; LOG = logophoric; NEG = negative; PART = particle; PRF = perfect; PL = plural; PROSP = prospective; PST = past; PTCP =participle; QUOT = quotative; RED = reduplication; SG = singular; SUBORD = subordinate; VOC = vocative.

Abbreviations for names of musicians (cf. table 1) are: MD = Mamadou Diabaté; NMD = Nigo Moussa Diabaté; SAD = Sadama Diabaté. (No examples included in this article were produced by Seydou Kanazoe Diabaté.)

For abbreviations of names of musical notes, see example (1) in section 3.2.1.

1. As I am not an ethnomusicologist or anthropologist, my own analysis may lack nuance in those areas. I am fortunate that an ethnomusicologist has written a dissertation on the tradition (Strand 2009), offering deeper insights in this regard; any remaining shortcomings are a reflection of my training and expertise.

2. I have been asked, primarily by students, whether sign language is a form of surrogate language; this would not be considered a speech surrogate because sign is an accepted linguistic modality and, for native signers, sign is the primary linguistic essence that would form the basis of any speech surrogate.

3. See section 3.3 below for a discussion of the tone system and transcription conventions.

4. However, these supposed cash crops bring in very little cash. Cotton farmers end up in what is essentially indentured servitude to multinational corporations.

5. The exact amount of time the keys are smoked is a matter of debate. Strand (2009) states that the Sambla claim their keys are smoked up to a year; my own interviews with Sadama Diabaté push this time up to three years over the fire, but Mamadou Diabaté suggests that this is instead the amount of time the dead wood is left in the bush and that the actual smoking lasts only a matter of days. As I have not witnessed the full construction of a balafon firsthand, I cannot say with certainty.

6. I am told that children, understandably, no longer want to go out and hunt for these spiders. In addition, the material of the spider egg sacs is very fragile and pierces easily, though the buzzing sound created in this traditional way was apparently sublime.

7. The balafon can both speak and sing during the performance of a song, with different degrees of both improvisation and also strictness of tone mapping in both styles.

8. A third sonorant, IPA [j] (represented with *y* in the transcription system used here) is marginally attested, primarily in loanwords from Jula.

9. The diacritics of, e.g., *â* and *ă* represent HX and LS, respectively. The other diacritic used to represent a contour tone is the umlaut, often used as a "wild card" in Mande tonology; I use it to represent the falling tone SX, e.g., *bä* 'hit (PRF)'. The other contour tones tend to be found on long vowels, and are represented as a sequence of level-tone diacritics.

10. Note that this is the opposite of the Senufo talking balafons, where the lower notes encode speech and higher notes provide accompaniment, though in this case each instrument is played by just one musician.

11. To a naïve listener, *bâa̰–nɛ̀–bɛ̀ɛ–kű i* and lyrical speech are completely ambiguous. I have a suspicion that these *bâa̰–nɛ̀–bɛ̀ɛ–kű i* may be rote learned passages that at one time did encode a message that has since been lost, but more in-depth study is required to gauge the amount of variation between musicians that may help determine the extent to which they are improvised. See section 6.3 for further discussion.

12. These sorts of fixed phrases or proverbs are common in speech surrogate systems as a form of redundancy that can disambiguate otherwise tonally identical words and promote comprehension (see, e.g., Carrington 1949; Ong 1977; Arom 2007; etc.). However, unlike cases of so-called "lexical expansion" proverbs, like the use of "moon looking down at the earth" in place of "moon" in Lokele (Carrington 1949), the proverbs in Seenku balafon lyrics are not used explicitly to expand upon individual words. Rather, they are part of the overall poetic expression found in Seenku verbal arts, including vocal praise songs.

13. Supplementary audio files for examples and figures are available in the electronic version of this article on Project MUSE online.

14. Below, I use the term "speech tone" where appropriate to refer to Seenku's phonemic tones—X, L, H, S—in order to avoid confusion with the musical usage of the word "tone."

15. Such a process of elision of functional elements, leaving behind their tone, is indeed active in the language in other domains. For instance, past tense is marked by a post-subject "predicate marker" *lɛ́*, but more commonly, the segmental content is omitted and instead the final vowel of the subject is lengthened by an S-toned mora, e.g., *á lɛ́ nà* ~ *áá̰ nà* 'you came'.

16. In isolation, the word for 'basket hanger' is *dàân*, with an XHX melody. In this configuration with an irrealis verb (here *sà̰* 'buy'), the combination of X + X yields the surface pattern L + L, but to the best of my knowledge, the raising of X to L only occurs on adjacent tones. Further study will be necessary to determine whether tone raising can be found in the spoken language on the initial X in this environment.

17. The encoding of the H tone on these final two words is also unusual; it is played at the same level as preceding X tones. In repetitions of this phrase immediately afterwards in the recording, the tone is raised and the coda nasal is encoded with two strikes in what appears to be an effort on the part of the musician to increase the likelihood of my comprehension.

18. The proverbial basis of African lyrics is widely attested, both in surrogate languages and sung music; see, e.g., Dakubu (1971), Villepastour (2010), Ashipu and Amende (2013).

19. I translate *dôn* here as 'family', though literally it means 'child'. In the context of balafon songs, 'blacksmith children', 'elephant children', etc., refer to different clans or families represented by these songs. Note that the rendition of *kèii–dón–sô* used for this article is taken from Mamadou Diabaté's (2002) album *Keneya* (Extraplatte), where it is transcribed as "Tye Don So."

20. Prost (1971), in his sketch grammar of Northern Seenku, did report four contrastive tone levels, but his descriptions often err on the side of overreporting tones (e.g., his analysis of Donno So, a Dogon language of Mali, as a three-tone system).

21. Nonmusician consultants translated this horn phrase as *ì à bâa kó tɔ́ kɛ̀* 'it was done like this', the tones of which match the pitch contours of the horn more closely. MD, more familiar with musical traditions, translated it as above. It is not clear what the actual musician playing the horn intended.

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