

0. Introduction

This brief paper makes some broad generalities about the sound patterns and phonology of Wolof, based upon data obtained from our language consultant, Mamur Saar. Born and raised on the island of Goree (“about three miles off the coast of Senegal”), Mamur learned Wolof from infancy onward. During his early school years he first learned French, and later, English. Prior to formal education, he also attended Koranic school where he started learning recitations of the Koran (so he also speaks Arabic). Mamur also knows some Serer, Tukula, and Mandinka, as well as several European languages. But Mamur’s first language is Wolof, which he still uses regularly with family and friends via Skype.

This paper is based solely on data collected during class. The paper starts with the Consonant chart and goes on to discuss Plosives, Nasals, Fricatives, and Affricates, followed by Trills, Tap and Flap. These are followed by Vowels, and finally, Syllables. Phonemic items will be discussed throughout, as best as possible at this time.

Figure 1 is a proposal of some of the consonants of Wolof.

Figure 1: Consonant Chart

	Bilabial	Labiodental	Dental	Alveolar	Post alveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d				k g			
Nasal	m			n			ɲ	ŋ			
Trill				r							
Tap or Flap				ɾ							
Fricative		f		s				x	χ	ħ	h
Affricate					tʃ dʒ						
Approximant				ɹ			j	w			
Lateral Approximant				l							

voiced labial-velar approximant

Various suprasegmental characteristics of Wolof, including aspiration, unreleased stop consonants, and geminate consonants are discussed elsewhere in this paper.

1. Plosives

Starting with the bilabial plosives, [p] and [b] may be allophones of a single phoneme in Wolof. We have no minimal pairs in the data and these two sounds do seem to occur in different environments. Specifically, [b] occurs word-initial and intervocalically, while [p] occurs word-final only--with one exception, which may be an error in transcription (underscore denotes voiceless):

[poxɔtan], [boxɔtan] (“armpit”)

We've also observed that when the base word ending in [p] is followed by a vowel, such as to form the imperative or possessive, voiced [b] is always used, so Wolof may have a phonological rule with respect to voicing on final stop consonants by which voiceless stops become voiced under certain conditions. This has been observed in several words in which voiced/voiceless stops are in free variation.

For example, [dʒub] varies freely with [dʒup] meaning "straight," but when [-ə] is added to either of these to form an imperative ("to make straight" or "to go straight"), the only result allowed in Wolof is the voiced plosive, as in [dʒubə]. Examples of this include:

[xub ^ɿ xup ^ɿ xup] ("foamy")	[xubə] ("to make foamy")
[tʃub], [tʃu:b], [tʃup] ("tiedye")	[tʃu:bə] ("make tiedye for sb")

The same type of variation occur with the velar plosives, [k, g]. In making the possessive of some nouns, Mamur voiced the velar plosive in examples such as these:

[dek], [dɪk] ("thorn")	[dɛgu] ("thorn" possessive)
[bik] ("last night")	[bigu] ("last night" possessive)

Thus, it seems [k] and [g] may be allophones of a single phoneme. However, in both cases [p, b] and [k, g], much more research needs to be done before drawing this conclusion. We do find near minimal pairs contrasting as in these:

[deg] ("to hear")	[dek], [dɪk] ("thorn")
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Although Wolof may distinguish based on non-release. So perhaps the underlying phonemes are actually /k̚, k^h, k, g/? Much more analysis, after validating and correcting all the phonetic data, is required.

The alveolar plosives [t] and [d], on the other hand, do seem to clearly contrast, as in this minimal pair:

[tan] ("to choose")	[dan] ("to win")
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As mentioned, Wolof does seem to offer contrasts through aspiration, and in releasing or not releasing a stop, as in this contrastive pair:

[lɛk ^h], [lɛk ^h] ("to eat")	[lɛk] [lɛk] ("hare")
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Wolof also distinguishes between geminate and singleton consonants:

[sɔtti] ("to pour")	[sɔti mɔ:du] ("the ways modu gangs-up on")
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2. Nasals

Wolof has several nasals, the bilabial nasal [m] and the alveolar nasal [n]. In addition, Wolof has a palatal nasal, [ɲ], which at first I found difficult to discern. Any of these nasals can occur word initial, as in [ɲɔʒɔmber] (“rabbit”), [ɲuŋgɪfɪrɛk] (“we are fine”¹). When they do so, and they are followed by the plosive at the same place of articulation, it’s unclear to me if this should always be considered pre-nasalization, or if the nasal occupies the segment as a complete consonant. Looking at some of the sound files was revealing in this regard, and in fact, reveals some inaccuracies in the transcription thus far. The word “thorn,” for example, shows subtle prenasalization before the [d] in the wave pattern. So a proper transcription would be:

[ɲdeŋ], [ɲdɪŋ] (“thorn”)

(Note: Unfortunately, I’ve already used this word as a source of comparison in several other places in this paper, and cannot change it at this point without delaying completing this paper further. But this revelation throws into question my previous supposition, that “to hear” and “thorn” make a near minimal pair for [k/g].)

On the other hand, while the pre-nasalization of “thorn” is subtle, the nasal in front of “frog” is quite obvious, both to the ear, in the sound file, and when observing Mamur speak. So that might be transcribed as

[mbɔtʰ] (“frog”)

In other words, prenasalization may be a phonemic attribute of Wolof, but additional research and further analysis is needed at this point.

3. Fricatives

Wolof has several voiceless fricatives [f, s, x, χ, ɸ, h] which appear word initial, final, and medial, as in these examples:

[fɔt] (“to wash (clothes)”)

[sinʰ], [sɪɲ] (“to smile”)

[xam] (“to know”)

[χaf], [xɛ:f] (“eyelash”)

[ju'hu] (“to yell”)

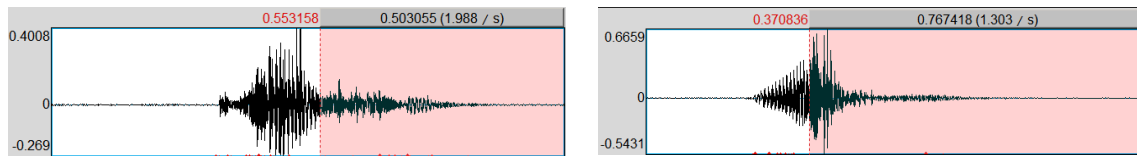
However, we have [h] only word medial, not word initial, and “eyelash” is the only example transcribed with word-initial [χ] –all the other instances of χ seem to be word final, with contrasting geminates in many cases. So perhaps these are allophones of a single phoneme, along with possibly [h], but more analysis (after confirmation of phonetic data) is required.

Regarding fricatives [x, χ, ɸ, h], I’m still unclear as to whether we have a distinction between the pharyngeal, the uvular, and the velar. I think the [x] and [χ] predominate, but I think Wolof also has

¹ Mamur tells us the literal translation is “we are here, meaning, we are not at the healer’s, so we are fine.” An interesting gloss note to keep for future reference.

[h], such as word-final for “sin, wrongdoing,” [ɛh]. Again, further work needs to be done to better distinguish the place of articulation for these fricatives.

For example, comparing the length of time of frication at the end of [ɛχ] (“sin, wrongdoing”) with that of [laχχ] (“to hide”), I can see that the length of time of frication at the end of [laχχ] is about 25% as that of [ɛχ], but I’m not sure that these are the same consonant. Note the extra burst of frication in [ɛχ] (below, left) as compared to [laχχ] (below, right). (Also, note that although it’s difficult to see, the frication does continue the full length of the selected area.)



This exploration using Praat left me with more questions than answers. For further exploration, it’ll be more fruitful to follow-up with Mamur, testing my own utterances (based on my transcriptions) to clarify the the entire cluster of velar, uvular, and possibly, pharyngeal, fricatives.

It’s interesting that Wolof doesn’t seem to have any of the voiced fricatives as companions to the series of voiceless fricatives [f, s, x, χ, h, h]. I’m not sure what this means at this point, but I make a note for future reference, perhaps additional research.

4. Affricates

Affricates [tʃ] and [dʒ] contrast in Wolof, as in this near minimal pair:

[tʃu:b] [(“tiedye”)

[dʒub] (“straight”)

5. Trill, Tap and Flap, Approximant

The trill [r] seems to be a common feature in Wolof, manifesting word initial, word final, and word medial, although in some cases, the transcriptions may inaccurately specify a trill [r] that should be an approximant [ɹ], or possibly the alveolar tap [ɾ]. More work needs to be done. In the following words, for example, I’ve not conclusively determined the sound:

[ɹɛhes] (“to wash” (hands, dishes)

[rak] (“younger”)

[rɛ̃], [ɹɛ̃] (“to laugh”)

[ɹɛ̃], [re] (“to kill”)

[re:o], [re:ɔ] (“nation”)

[rɛx], [ɹer re:r] (“dinner”)

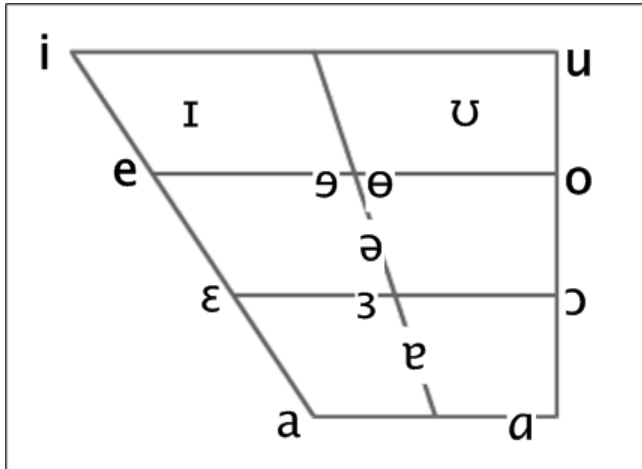
[rɛχ], [ɹer rɛ:r] (“to be lost”)

6. Vowels

Distinguishing among the vowels has been a real challenge. Figure 2 is just a best guess at this point. In the data that we do have, it seems the vowels used in Wolof are predominantly central

between close-mid and open-mid. In the transcriptions, more work is needed to better distinguish among [ɛ], [ə], and [ɐ]. There may be minimal pairs hiding out in the data that I'm not seeing due to transcription errors (I suppose this statement could apply to much of the data.) The back vowels are rounded, while the front vowels are not.

Figure 2. Vowel Chart



Wolof seems to make phonemic vowel length distinctions, as in these examples:

- | | |
|----------------------------------|--------------------------------|
| [dɛk], [dɪk] (“thorn”) | [de:k] (“pond”) |
| [fɛs] (“to be obvious”) | [fɛ:s] (“to be full,” a glass) |
| [gɔr] (“noble,” same as hatchet) | [go:r] (“man”) |
| [lax] (“to hide”) | [la:x] (“millet, porridge”) |
| [tu] (“name”) | [tu:] (“to spill”) |

Here are some other possible long vowels in the data, sorted in terms of the vowel chart:

[bi: ^h r] (“belly, stomache”)		[do:m] (“ash”)
[tɛ:] (“to be calm”)		[dɔ:m] (“offspring”)
[lɛ:χ] (“cheek”)	[tɛ:l] (“to light”)	[nɛha:r] (“suffering”)
	[na:χ] (“school of fish”)	

It’s interesting to note that we have very few vowel-initial words in our data. Here’s a complete list of the vowel initial words in the Wolof inventory thus far:

- [a:l] (“forest”)
- [ɛɪbəs], [aɪbəs] (“week”)
- [ɛm] (“to have”)
- [asamɛn], an arabic borrowing (“sky”)
- [ax] | [ɛχ] | [ɛh] (“sin, wrongdoing”)

[axxu] (“sin,” possessive)

[ubi] (“to open”)

This amounts to less than 5% of all the data we’ve collected so far (through 17 Sept only), which I only make a note of for possible future exploration. This leads us to discussion of syllable pattern.

7. Syllable Structure

Common patterns observed so far in Wolof include CVC, CVCC, CVCVC, as in these examples:

CV	dafa] [dafa] (“he is”) (assuming this is two syllables)
CVC	[gəŋ] (“teeth,” plural)
	[gɛdʒʰ] (“dried fish”)
	[gɛdʒ], [gɛtʃ] (“ocean”)
CVCVC	[gɛmɪŋ] (“mouth”)
CVCC	[tank], [tankʰ] (“leg, foot”)
CVCCV	[baχnɛ] (“it’s good”)
	[nɔppʰə] (“love”)

Regarding the CVCCV example, however, it’s still an open question as to whether the word-final schwa is part of an actual vowel sound or whether it’s residual release.

Given the distinctive long vowels and differentiating geminate consonants, further research is needed to fully identify the syllabification pattern in Wolof.

As mentioned above, we have just a handful of sample words with V-initial, so that’s not listed here.

8. Conclusion

These conclusions are sketchy at best. I’m concerned that many of my transcriptions are inaccurate and need further validation. In the process of organizing the data and analyzing waveforms using Praat, I only threw my transcriptions further into question. Nonetheless, as the semester continues, I look forward to further analysis—and, ideally, much better understanding—of the Wolof language.