Ling 450: Mystery Language Project

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Contents

1 Introduction

Different languages have different sets of phonetic sounds that comprise them. The set of phonetic sounds that comprise a language is known as its phonetic inventory. For this project, I was given a set of sound files of a mystery language, and I was to determine the phonetic inventory of the given mystery language based on this set of files.

Later, it was revealed that my mystery language was the Togolese language, Kabiyè, language code ISO 639-3 kpb (Eberhard, Simons, & Fennig, 2021). Kabiyè is an Eastern Gur language and is part of the larger Niger-Congo language family (Roberts, 2011). It is closely related to the Tem (ISO 639-3 kdh) and Lukpa (ISO 639-3 dop) languages of Togo and Benin respectively, (Eberhard et al., 2021), and more distantly related to the more widely known language Ewe (Eberhard et al., 2021; Roberts, 2011).

Most speakers of Kabiyè reside in Togo, but a sizable population resides in Ghana and a smaller popultation resides in Benin, due to a southern migration of the Togolese people from their northeastern Togolese homeland, Kozah (Padayodi, 2008; Roberts, 2011).

According to Padayodi (2008), approximately 700,000 speakers resided in Togo in 2008, while another 30,000 resided in Benin, and a handful reside in Ghana[1]. This 700,000 speakers amounts to over 23% of the Togolese population (Roberts, 2011). These numbers put Kabiyè as a mid-sized and stable language, and therefore unendangered (Eberhard et al., 2021).

Kabiyè has four main dialects, namely Kèwɛ, Lámáɖísi, Ligba, Lámbda, where the Kèwɛ is the most prestigious and has the largest population of speakers (Padayodi, 2008). The language data that I was given was recorded from a female speaker from the town of Somdina speaking the Kèwɛ dialect (Padayodi, 2008).

2 Consonants

2.1 Original Consonant Chart

Original Consonant Chart [2][3]

	Bil-abial	Lab. dent.	Den-tal	Alve-olar	P-alveo.	Retroflex	Palatal	Velar	Glot-tal
Plosive	p b			t d		ʈ		k g	
Ejective	p’			t’					
Nasal	m			n		ɳ		ŋ	
Tap/Flap				ɾ					
Fricative		f v		s z					h
Affricate					tʃ dʒ				
Approx	w			ɹ		ɻ	j		
Lat. appr.				l		ɭ			

[1] Interestingly, Roberts (2011) presents conflicting information, claiming: ”There has been considerable emigration to Ghana and there are also a few Kabiye villages in Benin”.

[2] Phonemes that appear to the left in a cell are voiceless. Phonemes that appear to the right in a cell are voiced.

[3] I have placed the Voiced Labial Velar Approximant (/w/) just in the Bilabial column.

2.2 Original Consonant Description

I originally found that this language contains 27 different consonant sounds.

This language contains voiced and voiceless plosives at these three places of articulation: bilabial [p, b], alveolar [t, d], and velar [k, ɡ]. This language also contains a voiceless retroflexive plosive [ʈ]

This language contains voiceless ejective plosives at these two places of articulation: bilabial [p'] and alveolar [t'].

This language contains voiced nasals at these four places of articulation: bilabial [m], alveolar [n], retroflex [ɳ], velar [ŋ].

This language contains a tap/flap at one place of articulation: alveolar [ɾ].

This language contains a voiced and voiceless fricative at two places of articulation: labiodental [f, v] and alveolar [s, z]. This language also contains a voiceless glottal fricative [h].

This language contains a voiced and voiceless affricate at one place of articulation: Palatal-alveolar [tʃ, dʒ].

This language contains voiced approximants at 3 places of articulation: alveolar [ɹ], retroflex [ɾ], and palatal [j]. This language also contains a voiced labial-velar approximant [w].

This language contains voiced lateral approximants at two places of articulation: alveolar [l] and retroflex [ɭ]

2.3 Revised Consonant Chart

Revised Consonant Chart[4]

	Bilabial	Labio-dental	Alveolar	Retroflex	Alveo-palatal	Palatal	Velar	Labial-velar	Glottal
Plosive	(p) b		t d	(ʈ) ɖ			k ɡ	k͡p ɡ͡b	
Affricate					tʃ dʒ				
Nasal	m		n			ɲ	(ŋ)		
Trill			(r)						
Tap				(ɾ)					
Fricative		f v	s z						h
Approximant						j		w	
Lateral approximant			l						

Figure 1: Revised Consonant Chart courtesy of Padayodi (2008)

2.4 Discussion of Consonants

I originally had found that Kabiyè contained 27 different consonant sounds but according to Padayodi (2008), Kabiyè contains 26 different consonant sounds. I think that discrepancies arose based upon my language background. I am a native English speaker of the Pacific-Northwest dialect, and I have studied (though not extensively) both Spanish and Japanese as a second language.

For plosives, I was unable to distinguish the voiced retroflex [ɖ], as well as the labial-velar doubly articulated voiced and voiceless pair [k͡p] and [ɡ͡b]. Interestingly, I transcribed both the voiced and voiceless doubly articulated pair, [k͡p] and [ɡ͡b], as the voiced bilabial [b][5]. Because [k͡p] and [ɡ͡b] are not phonemes in

[4]Phonemes that appear to the left in a cell are voiceless. Phonemes that appear to the right in a cell are voiced.

[5]As misidentified in files 09, 'bread', and file 10, 'clay pot'.

English (English contains no doubly articulated consonants), I mapped these to the voiced bilabial plosive present in the English phonetic inventory. I missed the voiced retroflex [ɖ̫] because the data that I was given did not contain an example of such a phoneme. Padayodi (2008) gives 'green algae', [àɖ̫ɔ̀ŋ̀ɖ̫ɔ̀là], as an example of [ɖ̫][6].

I was also unable to distinguish the alveolar trill [r]. I missed the alveolar trill [r] because the data that I was given did not contain an example this phoneme either. Padayodi (2008) gives 'very dry', [kúrúŕuŕu], as an example of such a phoneme[7].

I included the voiceless bilabial, [p'], and alveolar [t'] ejectives in the phonemic inventory, but according to Padayodi (2008) these two phonemes are not present in kabiyè. Where I found the ejectives [t'], [p'] to be present, Padayodi (2008) just transcribes them as [t], and [p] respectively[8]. Where I transcribed them as ejectives, they were very aspirated, even more aspirated than you find with word initial voiceless plosives in English, and for this reason I mapped such sounds to the ejective sounds which are non-existent in the English phonemic inventory.

For nasals, I was unable to distinguish the palatal [ɲ̫], while I misidentified the retroflex [ɳ̫] as a part of the kabiyè phonemic inventory. I misidentified the velar [ŋ], alveolar [n], and palatal [ɲ̫] nasals, as well as the low-central (front) unrounded vowel [áà] as the retroflex [ɳ̫][9]. I misidentified both the palatal [ɲ̫] and retroflex [ɳ̫] because neither palatal [ɲ̫] nor retroflex [ɳ̫] nasals are contained in the English phonetic inventory.

For approximants, I misidentified the alveolar [ɹ] and retroflex [ɻ̫] as a part of the kabiyè phonemic inventory. Where a voiceless retroflex plosive [ʈ̫] phoneme is present, I transcribed this as a combination of an aspirated voiceless alveolar plosive and an alveolar approximate [t^{h}r][10], or as a combination of an unaspirated voiced alveolar plosive and retroflex approximant [dɻ̫][11] I misidentified the retroflex plosive [ʈ̫] as a combination of a plosive and an approximate because the retroflex plosive [ʈ̫] is not contained in the English phonetic inventory.

I also misidentified the retroflex lateral approximant [ɭ̫] as a part of the kabiyè phonemic inventory. I transcribed both the alveolar lateral approximant [l][12] as well as the retroflex tap [ɽ̫][13] as the retroflex lateral approximant [l]. Although [ɽ̫] is not in the English phonetic inventory, [l] is. I misidentified [l] as [ɭ̫] because the following vowel has a retracted tongue root (Padayodi, 2008).

I should also note that I consistently transcribed the retroflex tap [ɽ̫] as the alveolar tap [ɾ]. The retroflex tap [ɽ̫] is not a feature of English, while the alveolar tap [ɾ] is a feature of English. The alveolar tap [ɾ] is also realized in my secondary languages, Spanish and Japanese.

[6]It is possible that file 06, 'he walks', is an example of [ɖ̫], but I originally transcribed it as [edʌŋ] and there is no corresponding transcription in Padayodi (2008).

[7]It is possible that file 26, 'tooth', is an example of [r], but I originally transcribed it as [kɛɾe] and there is no corresponding transcription in Padayodi (2008).

[8]As misidentified in files 01, 'to stretch', and file 03, 'story'.

[9]This misidentification happens for the transcription of file 27, 'farmers' where I note that the [áà] sound nasalized.

[10]This misidentification happens for the transcription of file 05, 'salt'.

[11]This misidentification happens for the transcription of file 25, 'strength'.

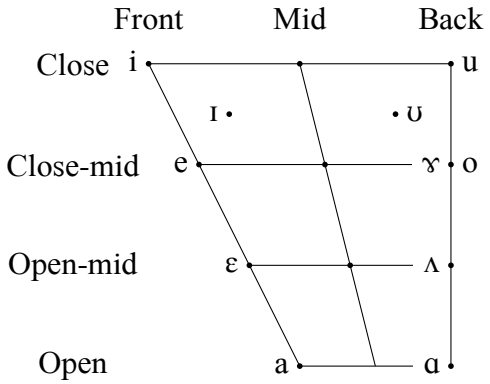
[12]This misidentification happens for the transcription of file 24, 'well'.

[13]This misidentification happens for the transcription of file 27, 'farmers'.

3 Vowels

3.1 Original Vowel Chart

Original Vowel Chart[14]



3.2 Original Vowel Description

This language contains 11 different vowels.

This language contains two open unrounded vowels, one at the front [a] and one at the back [ɑ].

This language contains two open-mid unrounded vowels, one at the front [ɛ], and one at the back [ʌ].

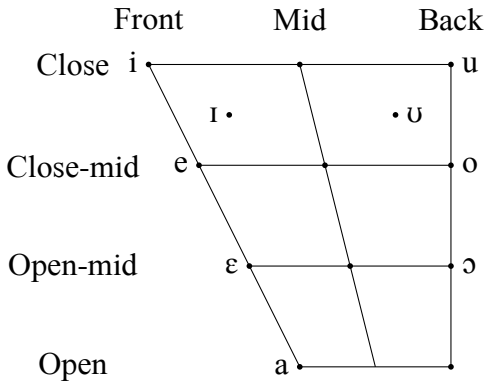
This language contains two close-mid unrounded vowels, one at the front [e], and one at the back [ɤ]. This language also contains a close-mid rounded back vowel [o].

This language contains two near-close vowels: a near-front unrounded [ɪ], and a near-back rounded [ʊ].

This language contains two close vowels: a front unrounded [i] and a back rounded [u].

3.3 Revised Vowel Chart

Revised Vowel Chart[15]



[14] When vowels appear to the right of the dot they are rounded, otherwise they are unrounded.

[15] When vowels appear to the right of the dot they are rounded, otherwise they are unrounded.

3.4 Discussion of Vowels

First, I should note some differences in the IPA conventions used by Padayodi (2008). To denote a long vowel, Padayodi (2008) chooses to repeat the vowel, whereas I chose to use the diacritic [ː], e.g. [siː] is the same sound as [sìì]. Padayodi (2008) also chose to include the tone of a syllable, for low (e.g. [à]) and for high tone (e.g. [á]), while I chose not to include tone in my original transcriptions. Padayodi (2008) also chose to include the diacritic for retracted tongue root [e.g. e̘] on many vowels, which I chose not to include in either my original nor revised transcriptions because not only is a retracted tongue root not lexically contrastive[16] (Padayodi, 2008), but retracted tongue root is lies outside the scope of this paper.

I originally had found that kabiyè contained 11 vowels, but according to Padayodi (2008), kabiyè only contains 9 vowels. I mainly struggled with back-vowels, particularly those which were more open. These discrepancies arose based upon my language background. As a native English speaker of the Pacific-Northwest dialect with the cot-caught merger, I was unable to distinguish between several open-back vowels. I am unsure how studying Spanish and Japanese as a second language affected my discernment of Kabiyè vowels.

I was unable to distinguish the open-mid back rounded vowel [ɔ], which Padayodi (2008) includes in the phonemic inventory of Kabiyè. I misidentified [ɔ] as the close-mid unrounded back vowel [ɤ][17], the open-mid unrounded back vowel [ʌ][18] and the open unrounded back vowel [ɑ][19]–vowels which are articulated close to [ɔ]. Interestingly, because I have the cot-caught merger, this phoneme is not in my phonetic inventory, which is most likely the reason why I was unable to discern [ɔ] as part of the phonetic inventory of Kabiyè.

I also include three vowels which are not present in the phonetic inventory of Kabiyè according to Padayodi (2008). I misidentified the open unrounded back vowel [ɑ], the open-mid unrounded back vowel [ʌ], and the close-mid unrounded back vowel [ɤ].

For [ɑ], I consistently misidentified the open unrounded front vowel [a][20] regardless of tone and length as [ɑ]. I also misidentified the open-mid unrounded front vowel [ɛ][21] and the open-mid rounded back vowel [ɔ][22] as [ɑ]. These vowels are all open and low vowels, and the place of articulation is very close to [ɑ]. Because of my cot-caught merger, [ɑ] is the only low back vowel present in my phonetic inventory, which is why I had trouble discerning them.

For [ʌ], I misidentified the velarized open front unrounded long vowel [áˠàˠ][23] as [ʌ]. Because [áˠàˠ] is low and velarized, the place of articulation is farther back in the mouth and therefore closer to [ʌ]. I also misidentified the open-mid back rounded vowel [ɔ][24] as [ʌ]. This vowel is the unrounded counterpart of [ʌ]. Both vowels occur close to [ʌ], and I had trouble discerning them.

For [ɤ], I misidentified the the close-mid back rounded vowel [o], the open-mid back rounded vowel [ɔ], and the the near-close near-back rounded vowel [ʊ] as [ɤ]. These back vowels are articulated close to where [ɤ] is. I also misidentified the velarized long front close and close-mid vowels, [ìˠìˠ] and [èˠ] respectively. These vowels are velarized, so they also are taking place closer to the back of the mouth where [ɤ] is articulated. It is important to note that unlike Padayodi (2008), Lébikaza and Delord include [ɤ] in the phonetic inventory of Kabiyè (Padayodi, 2008), so my inclusion of [ɤ] should be explored further.

[16] As we see in files 24a 'to bind', and 24b 'to bind (ungrammatical), a retracted tongue root is a phonological rule, rather than lexically contrastive.

[17] As misidentified in file 05, 'say'.

[18] As misidentified in file 28, 'they eat'.

[19] As misidentified in file 14, 'eat'.

[20] For example, as misidentified in files 16, 'smear', file 20, 'nose mucus', and file 27, 'their corn'.

[21] As misidentified in file 25, 'their lie'.

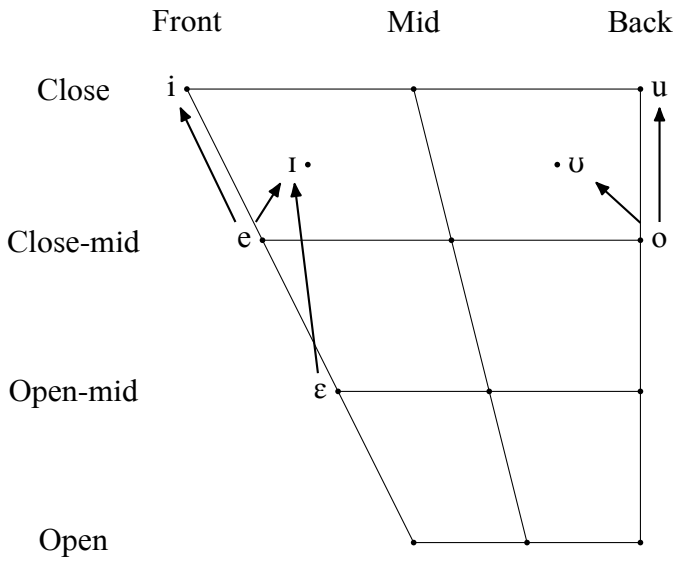
[22] As misidentified in file 14, 'eat'.

[23] As misidentified in file 21, 'dog'.

[24] As misidentified in file 28, 'they eat'.

3.5 Diphthongs

Original Diphthong Chart[25]



3.6 Diphthong Description

I originally found that this language contains 5 different diphthongs as follows:

Nucleus → Glide
ɛ → ɪ
e → ɪ
e → i
o → ʊ
o → u

3.7 Discussion of Diphthongs

According to Padayodi (2008), Kabiyè does not have any diphthongs. I mainly struggled with distinguishing unrounded close front and rounded close back vowels in word final positions with a low tone. The discrepancies arise most likely because of the two tones that are present in Kabiyè, because English, Spanish, and Japanese are non-tonal languages, although Japanese does employ pitch accent.

For unrounded close front vowels, I misidentified [ɛ̀][26] as the diphthong [ɛ→ɪ] as well as the diphthong [e→i]. I also misidentified [è][27] as the diphthong [e→i]. I misidentified the long vowel [ɛ̀ɛ̀][28] as the diphthong [e→ɪ]. All these vowels occur close to the place of articulation for each diphthong. Also, all these vowels occur at word final positions with a low tone. It is possible that because English is not a tonal language, the tone affected the way that I heard the unrounded close front vowels in word final positions.

[25] When vowels appear to the right of the dot they are rounded, otherwise they are unrounded.

[26] As misidentified in file 04, 'finish'; file 27, 'their corn'; and file 33, 'their stone'.

[27] As misidentified in file 19, 'back'.

[28] As misidentified in file 12, 'sing'.

For rounded close back vowels, I mainly misidentified [ù][29] as the diphthong [o→ʊ]. I also misidentified [ò][30] as either [o→ʊ] or [o→u]. I also misidentified [ɔ̀][31] as the diphthong [o→ʊ] once. Like the unrounded close front vowels that I misidentifed, these rounded close back vowels were also realized in a word final position, had a low tone, and are articulated close to the diphthong that I transcribed instead.

4 Suprasegmentals

4.1 Vowel Length

Originally, I found that meaning also relied on vowel length of three particular vowels, namely the close front unrounded vowel [i], the close back rounded vowel [u], as well as the diphthong [oʊ]. We will represent the different phonemes in the following chart:

Table 2: Vowels whose Length Provide Phonemic Distinction

short	long
i	iː
u	uː
oʊ	oʊː

But according to Padayodi (2008), all 9 vowels in the Kabiyè phonetic inventory can be lengthened to create a lexical distinction, as we see in the following chart:

Basic (short) vowels				Long vowels			
i	tì	*ti*	'cut down!'	ii	tìì	*tii*	'descend!'
ɪ	tɪ̀	*tɪ*	'estimate!'	ɪɪ	sɪ̀ɪ̀	*sɪɪ*	'lay down!'
u	tù	*tu*	'clear (land)!'	uu	tùù	*tuu*	'crawl!'
ʊ	lʊ̀	*lʊ*	'wrestle!'	ʊʊ	lʊ̀ʊ̀	*lʊʊ*	'weave!'
a	tà	*ta*	'bind!'	aa	tàà	*taa*	'smear!'
e	tè	*te*	'catch!'	ee	tèè	*tee*	'sing!'
ɛ	tɛ̀	*tɛ*	'finish!'	ɛɛ	tɛ̀ɛ̀	*dɛɛ*	'leave!'
o	lò	*lo*	'cut at!'	oo	lòò	*loo*	'serve!'
ɔ	tɔ̀	*tɔ*	'say!'	ɔɔ	tɔ̀ɔ̀	*tɔɔ*	'eat!'

Figure 2: Chart courtesy of Padayodi (2008).

I was able to distinguish three of these long vowels as a lexical distinction, but not the others. Some of the long vowels I transcribed as a diphthong[32], others I transcribed as a similar but different short vowel[33], and others I distinguished the correct vowel but was unable to discern the length[34]. These misidentifications occurred because English does not use vowel length to create lexical distinctions.

[29] As misidentified in file 09, 'wrestle', file 24a, 'to bind'.
[30] For example, as misidentified in file 26, 'their shirt'; file 08, 'cut at'; and file 17, 'serve'.
[31] As misidentified in file 28, 'they eat'.
[32] e.g. [ou] instead of [ùù] as seen in file 17, 'serve'
[33] e.g. [a] instead of [ɔ̀ɔ̀] as seen in file 14, 'eat'.
[34] [ɛ] instead of [ɛ̀ɛ̀] as seen in file 13, 'leave'.

4.2 Velarization

I originally did not include velarization in my transcriptions. But according to Padayodi (2008), velarization also provides a lexical distinction. For example, the non-velarized vowel in [sàà] means 'drive' while the velarized vowel in [sàˠàˠ] means 'sculpture' (Padayodi, 2008).

Instead of transcribing velarization, I often would represent such sounds as a back vowel, such as [ɤ] or [ʌ]. Interestingly, [ɤ] appears in the orthography of kabiyè to represent velarized front vowels (Padayodi, 2008). Because velarization pushes the place of articulation further back in the mouth, the distinction between a back vowel and a velarized front vowel was hard for me as an English speaker, especially because velarization is not lexically distinctive in English.

4.3 Tone

I originally did not include tone in my transcriptions, while Padayodi (2008) did. According to Padayodi (2008), there are two tones in Kabiyè, a high tone (e.g. [á]) and a low tone (e.g. [à]). It is not yet known what function tone plays in Kabiyè, (e.g. whether tone is lexically or grammatically contrastive) (Padayodi, 2008), but Kabiyè has very distinct tones.

As a native English speaker, these tones made it difficult for me to discern certain sounds, especially vowels. For example, the same vowel with different tones can occur in subsequent environments (e.g. [àá][35]).

5 Conclusion

For this project, I was given a set of sound files of a mystery language and my goal was to create the phonetic inventory of the given language from the set of files that I was given. The sound files came either labeled as a a "Vowel" or as a "Consonant". In order to determine the phonetic inventory, I transcribed these sound files into the International Phonetic Alphabet (IPA). In order to transcribe them, I used Praat and viewed the sound file's spectrogram while I listened to them. Originally, I found that my mystery language has 27 different consonant sounds, 11 different vowel sounds, and 6 diphthongs. I also found that vowel length was a phonemic distinction as well. I later learned that Kabiyè has 21 different consonants, and 9 different vowels (Padayodi, 2008). I also learned that Kabiyè uses vowel length and vowel velarization for lexical distinction. Further research should be conducted to check whether [ɤ] is truly not a part of the phonetic inventory of Kabiyè as well as to determine the function of tone in the language.

This project was very interesting, and it enabled me to practice listening to different sounds that I am not accustomed to listening to. As a native English speaker I found myself subconsciously mapping sounds in this mystery language to sounds that I already know in English. For this reason, there is a higher concentration of English-centric phonemic sounds that appear in my transcriptions than there ought to be. I especially struggled with Kabiyè vowels and the lexical distinction that both vowel length and velarization create. I also struggled with the labial-velar doubly articulated voiceless and voiced sounds, [k͡p] and [g͡b] respectively.

[35] as seen in file 48, 'he had lied'

6 Appendix: Transcriptions

6.1 Consonant Transcriptions

Consonants

Word Number	Word Gloss	Original Transcription	Revised Transcription	Notes
01	to stretch	[p'oʊ]	[pɔ́wʊ̀]	Highly aspirated voiceless bilabial stop, maybe an ejective?
02	mosquito net	[ˈsʌbɔɾeɪ]	[sɔ́bɔ́ɽɛ́]	
03	story	[t'ɑm]	[tɔ́m̀]	Highly aspirated voiceless alveolar stop, maybe an ejective?
04	disease	[hudɑŋ]	[kʊ̀dɔ́ŋ̀]	
05	salt	[tʰɹʌm]	[ɽɔ́m̀]	/t/ not as aspirated as 03
06	he walks	[edʌŋ]		This is not transcribed in Padayodi (2008). Possibly could be transcribed as something like [eɖɔ̀ŋ].
07	to come	[kwʌm]	[kɔ́m̀]	
08	guest	[egʌm]	[ègɔ̀m̀]	
09	bread	[bɑnɑ]	[k͡pɔ́nɔ́]	the first vowel sounds a little nasalized
10	clay pot	[ʊɳbɑoʊ]	[ŋ̀g͡bɔ̀ʊ́]	
11	to wash	[t͡ʃʌtoʊ]	[tʃɔ̀tʊ́ʊ̀]	
12	beauty	[kod͡ʒoka]	[kɔ̀d͡ʒɔ̀ká]	/a/ sounds a bit nasalized
13	noses	[mauŋ]	[mɔ̀ɔ́ŋ̀]	
14	cow	[ɳa]	[nɔ́]	
15	to congratulate	[ɳoko]	[ɲɔ́kʊ̀ʊ̀]	/o/ sounds a bit nasalized
16	bad smell	[sɑŋ]	[sɔ́ŋ̀]	
17	fiber bag	[fɜlɜtʌ]	[fɔ̀lɔ̀tɔ̀]	
18	red ants	[sanoˈvo]		Padayodi (2008) has an entry for "army ants" transcribed as [sànìvɔ́]
19	bad smell	[sɑŋ]	[sɔ́ŋ̀]	This is the same sound file as 16
20	mess	[azoːta]	[àzɔ̀ɔ̀tà]	
21	hearts	[hɤ]	[hɔ́]	
22	mother in law	[josaʌ]	[jɔ́sɔ́]	

Word Number	Word Gloss	Original Transcription	Revised Transcription	Notes
23	sun	[wɤsi]	[wìsí]	
24	well	[l̥okʌ]	[lɔ̀kɔ̀]	
25	strength	[dɻoŋ]	[ʈóŋ̀]	
26	tooth	[kɛɾe]		This is not transcribed in Padayodi (2008)
27	farmers	[hɑl̥aɳ]	[háʈáà]	/a/ sounds a bit nasalized. This is not transcribed in Padayodi (2008)
28	drive	[sa]	[sàà]	
29	sculpture	[sʌ]	[sàʸàʸ]	
30	descend	[t'i]	[tìì]	highly aspirated /t/, maybe an ejective?
31	rub	[tʰu]	[tìʸìʸ]	aspirated /t/, but not as aspirated as 30
32	sing	[tʰe]	[tèè]	aspirated /t/, about as aspirated as 31
33	singing	[tʰɤ]	[tèʸèʸ]	aspirated /t/, about as aspirated as 30/31
34	to greet	[sɛu]	[sɛ́wú]	
35	to greet children	[piɛzɛu]	[píyàzèwú]	
36	he greeted children	[ɛzɛbijɤ]	[èzébíyà]	
37	to cut	[sɛʈou]	[sètúù̀]	
38	cut the rope	[sɛtɛndɤmije]	[sétínìmìyé]	
39	the children cut the rope	[piɤzɛtɛndɤmije]	[píyàzètínìmìyé]	
40	to lock	[kaɾou]	[kàʈúù̀]	different sound file than 50
41	he locks	[ɛgaɾu]	[ègáʈʸíʸ]	
42	then he locked	[ɛkaɾi]	[ɛ́káʈí]	
43	he locked	[ɛgaɾɑ]	[ègàʈáà]	/ɑ/ sounds very nasalized; different sound file than 51
44	he had locked	[iːkaɾɑ]	[ììkàʈáàː]	/ɑ/ sounds very nasalized, different sound file as 53
45	to lie	[t͡ʃatou]	[tʃètúù̀]	different sound file as 54
46	he lies	[ɛd͡ʒɛtɤ]	[èd͡ʒétìʸìʸ]	

Word Number	Word Gloss	Original Transcription	Revised Transcription	Notes
47	then he lied	[ɛd͡ʒɛti]	[édʒétì]	
48	he lied	[ɛd͡ʒɛtɑ]	[èd͡ʒètàá]	/ɑ/ a little bit nasalized
49	he had lied	[id͡ʒɛtɑ]	[ìì d͡ʒètàá]	
50	to lock	[kaɾiʊ]	[kàɽúù]	different sound file than 40
51	he locked	[ɛgaɾa]	[égáɽáà]	different sound file than 43
52	he did not lock	[ɛdukaɾi]	[èdìkàɽí]	
53	he had locked	[iːkaɾɑ]	[ìì kàɽáà]	different sound file as 44
54	to lie	[t͡ʃatoʊ]	[tʃètúù]	different sound file as 45
55	he lied	[ɛd͡ʒɛta]	[èd͡ʒètàá]	different sound file as 48, first consonant sound is less of an affricate
56	he did not lie	[ɛdid͡ʒɛti]	[èdìd͡ʒétì]	
57	he had lied	[ijɛta]	[ìì d͡ʒètàá]	different sound file as 49

6.2 Vowel Transcriptions

Vowels

Word Number	Word Gloss	Original Transcription	Revised Transcription	Notes
01	cut down	[ti]	[tì]	shorter /i/ than 10
02	estimate	[t^he]	[tì]	
03	catch	[de]	[tè]	
04	finish	[tɛɪ]	[tɛ̀]	
05	say	[t^hɤ]	[tɔ̀]	
06	clear land	[t^hu]	[tù]	
07	bind	[t^ha]	[tà]	
08	cut at	[lou]	[lò]	glide more rounded than 09
09	wrestle	[l̥ou]	[lʊ̀]	glide less rounded than 08, shorter vowel than 18
10	descend	[tiː]	[tìì]	longer /i/ than 01
11	lay down	[siː]	[sìì]	
12	sing	[deɪ]	[tèè]	
13	leave	[dɛ]	[t̪ɛ̀ɛ̀]	
14	eat	[dɑ]	[tɔ̀ɔ̀]	
15	crawl	[t^huː]	[tùù]	
16	smear	[tɑ]	[tàà]	
17	serve	[lou]	[lòò]	glide is more rounded
18	weave	[louː]	[lʊ̀ʊ̀]	longer vowel than 09
19	back	[sujei]	[sì^{ˇ}ʊ́^{ˇ}jè]	
20	nose mucus	[mɤnɑ]	[mì^{ˇ}ɪ̀^{ˇ}ná]	/ɤ/ and /ɑ/is nasalized
21	dog	[hʌ]	[há^{ˇ}à^{ˇ}]	
22	race	[sɤje]	[sè^{ˇ}é^{ˇ}jè]	
23	little pot	[p^heɑ]	[pɛ́^{ˇ}ɛ́^{ˇ}à]	almost a /w/ sound between /e/ and /ɑ/
24a	to bind	[damsoʊ]	[tə̀m̀sɨ̀ʊ̀]	
24b	to bind (ungrammatical)	[damsʊ]	[tàm̀sìù]	The ungrammaticality relies on the fact that the vowels [ì] and [ù] do not have a retracted tongue root (Padayodi, 2008).

Word Number	Word Gloss	Original Transcription	Revised Transcription	Notes
25	their lie	[bɑijɛʧim]	[pèd͡ʒètím̀]	
26	their shirt	[pɤdɤkoʊ]	[pòdókò]	
27	their corn	[pɑzɑmiɾei]	[pàzààmíɽè]	
28	they eat	[pʌdoʊki]	[pɔ̀dɔ̀kì]	
29	his money	[iːlildije]	[ìlíídìjé]	
30a	his root	[elile]	[èlíɽè]	
30b	his root	[eliɾe]	[ìlíɽè]	
31a	his shirt	[ɛdokoʊ]	[èdókò]	
31b	his shirt	[odokoʊ]	[òdókò]	
32	their goat	[pabɤnʊ]	[pàbʊ̀nʊ́]	
33	their stone	[pabijei]	[pàbíjè]	

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