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A Preliminary Phonological Illustration of Xavante

A thesis submitted in partial satisfaction of the
requirements for the degree Master of Arts
in Linguistics

by

Teela Rissa Fei-man Yi Lam Huff

2023

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ABSTRACT OF THE THESIS

A Preliminary Phonological Illustration of Xavante

by

Teela Rissa Fei-man Yi Lam Huff

Master of Arts in Linguistics

University of California, Los Angeles, 2023

Professor Ben Eischens, Chair

Xavante (Glottocode: xava1240) is an indigenous language located in Central Brazil, with approximately 15,315 Xavante speakers dispersed throughout six Brazilian indigenous lands. The variety focused on in this thesis is located within the villages Êtênhiritipá and Wede'rá in the Pimentel Barbosa Indigenous Land in the state of Mato Grosso. Novel fieldwork data collection reveals that Xavante exhibits typologically unusual linguistic features, including the absence of velar consonants and, even stranger, the disallowance of non-labial codas, raising questions about the markedness hierarchy, and particularly the status of labials in the absence of other places of articulation.

The thesis of Teela Rissa Fei-man Yi Lam Huff is approved.

Bruce Hayes

Harold Torrence

Ben Eischens, Committee Chair

University of California, Los Angeles

2023

This thesis would not exist without my friends and collaborators in the villages of Êtênhiritipá and Wede'rã. This includes, but is by no means limited to, Cipasse, Siripapa, Utebrewê, Joana, Jonh, Andreus, Sidanere, Sylvestre, Gonzalo, Vinícius, Siñose'upare, Susana, Rea, and Mislene. I extend my personal thanks to my adoptive father, Eurico, as well as my adoptive sister and namesake Penê'su, for their kindness and generosity.

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1 Introduction

In this work I provide a descriptive phonological overview of the Brazilian indigenous language Xavante (Glottocode: xava1240), in which I detail the potential impacts of my novel fieldwork data upon broader phonological theory, especially with respect to predicted coda inventories. Xavante is unique in the fact that it allows only labial consonants in coda position, and this restriction occurs concurrently with the complete absence of velar consonants in the language. I propose that this unnaturalness is systematic and very real, despite its direct contradiction of the predictions made by the markedness hierarchy for possible coda inventories (Rice, 2007). This limitation to a more marked place of articulation carries implications for how the markedness hierarchy functions in Xavante, and challenges existing predictions for the typology of coda consonants more broadly, highlighting the importance of utilizing data from underdocumented languages.

This paper is structured in two parts: (1) a broad phonological overview of Xavante; (2) a narrow discussion of coda bilabial consonants and the markedness hierarchy. §2 details the phonological aspects of my *in-situ* fieldwork data from Xavante. This includes an analysis of the consonants, vowels, phonotactics, stress, and allophonic processes found within the language. This basic analysis is then followed by §3, which is solely dedicated to discussion of Xavante and its implications for the markedness hierarchy. I use this section to expand upon the analysis of this highly restricted set of coda consonants, showing how their unique distributional qualities motivate their distinct position as the only allowed type of coda in Xavante. After presenting the relevant data, I then discuss the implications of this type of inventory for the typology.

2 Phonological description

2.1 Background

Xavante is an indigenous language located in Central Brazil, belonging to the Central branch of the Jê language family, within the Macro-Jê phylum. The Jê language family contains approximately anywhere between ten and fourteen languages, divided into three major branches: Northern (Setentrional), Central (Akuwẽ), and Southern (Meridional) (Nikulin, 2020). The Central branch contains Xavante, as well one other closely related language, Xerente.

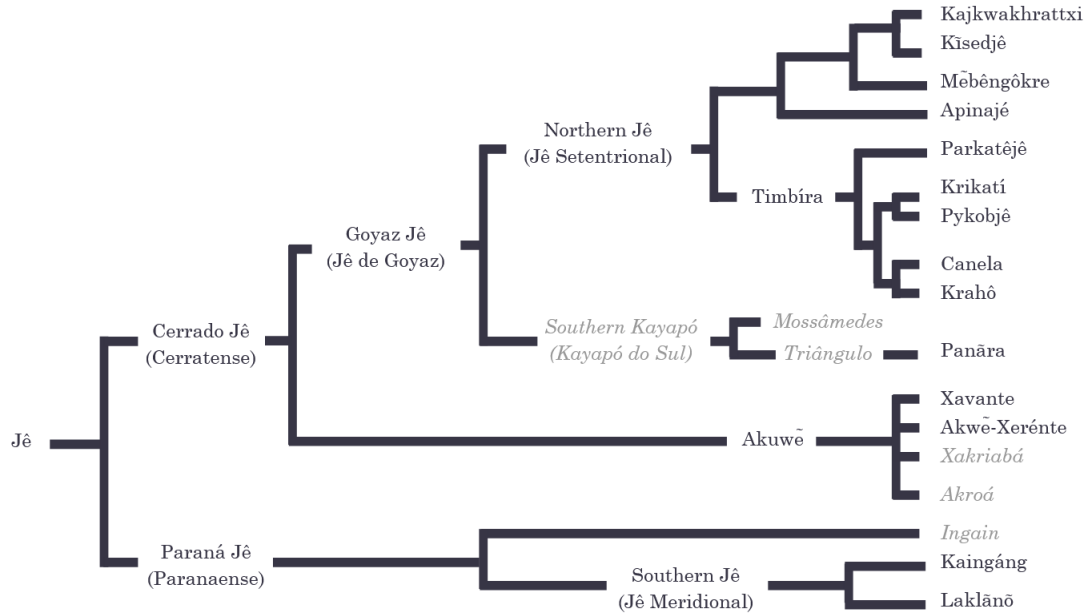


Figure 1: The structure of the Jê family (Nikulin, 2020). Dormant languages are italicized, and relevant names are translated from Brazilian Portuguese.

The Northern, Central, and Southern languages in the family are located in various Brazilian indigenous lands throughout Central and Southern Brazil. These reserves are geographically separated by non-indigenous lands, allowing for noticeable distinctions between and within different Jê languages. This is true for the five different varieties of the language Tímbira (Parkatêjê,

Krikatí, Pykobjê, Canela, and Krahô), and may also be the case for Xavante as well.

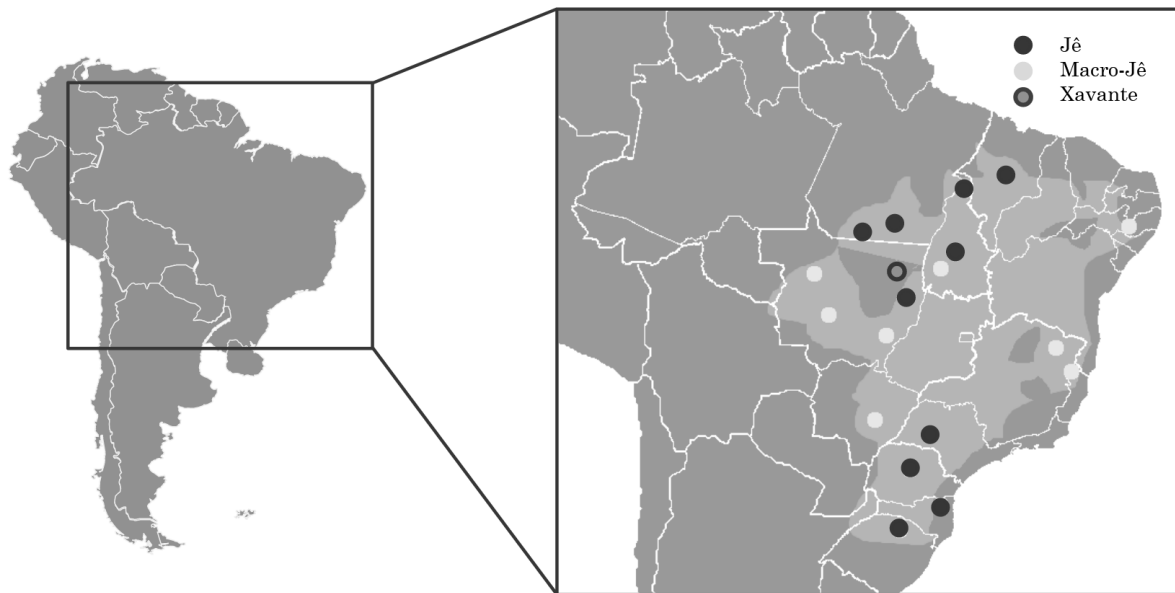


Figure 2: Xavante and the Jê family. Image adapted from Rodrigues and Ferreira-Silva (2011)

There are approximately 15,315 Xavante speakers dispersed throughout six Brazilian indigenous lands: Areões, São Marcos, Sangradouro, Parabubure, Marechal Rondon, and Pimentel Barbosa (?). These reserves span from the northern Brazilian states of Maranhão and Pará to the southern state of Santa Catarina.

When considering linguistic work with Xavante, it is important to recognize that this is a nontrivial geographic displacement, where entire villages are separated by large stretches of intervening land. Given the available data, it is my impression that this geographic distinction between Xavante indigenous lands has led to the development of distinct varieties, though more work is necessary to fully disambiguate their status as dialects.

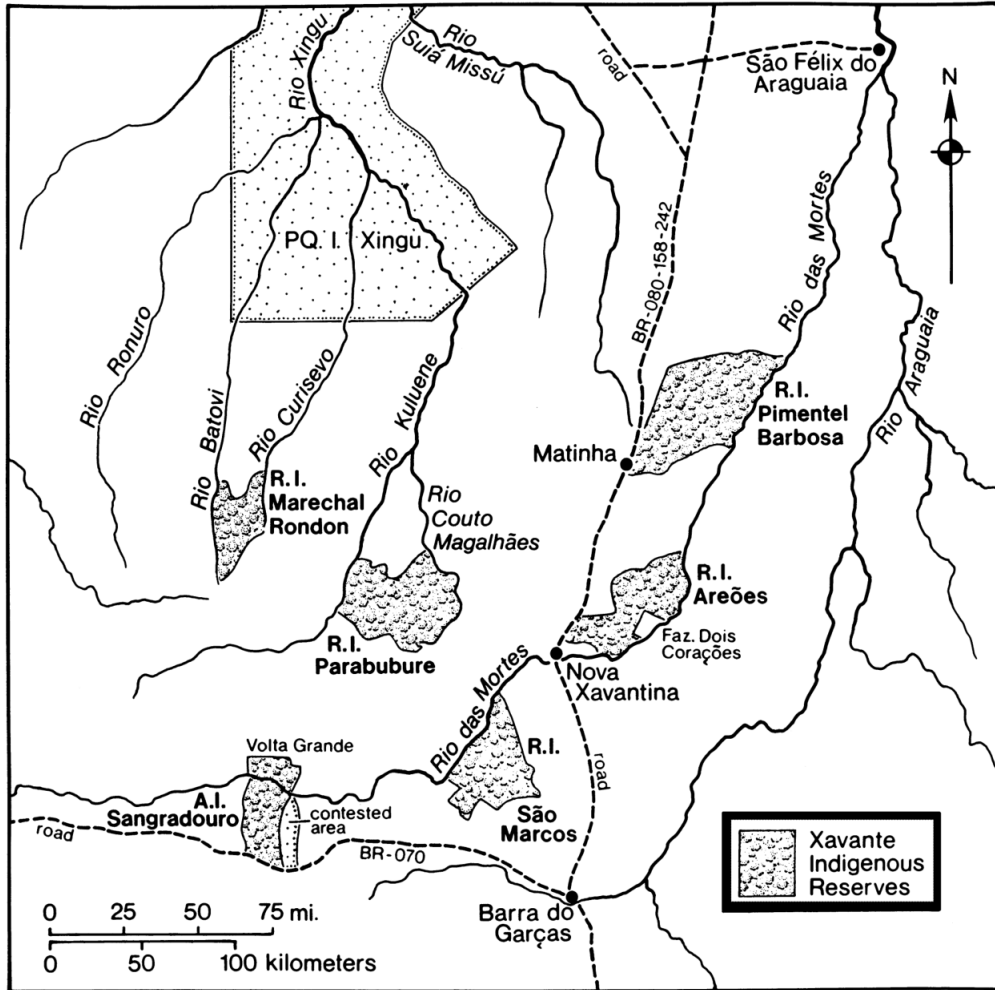


Figure 3: The six Xavante indigenous lands (?)

Previous linguistic work on Xavante is limited and focuses mainly on morphosyntactic phenomena (MacLeod, 1960; Burgess, 1986; Harrison, 2001; Hall and MacLeod, 2004; Oliveira, 2007; Santos, 2008a,b; Machado Estevam, 2011). While there exist some studies of phonological processes (Quintino, 2000, 2012, 2018; Pickering et al., 2010), they focus on other varieties from different locations that are markedly dissimilar from the dialect found in this paper. In particular, the variety of Xavante discussed in this work is located within the villages Êtênhiritipá and Wede'rá in the Pimentel Barbosa Indigenous Land in the state of Mato Grosso.

Under the invitation of Cipasse Xavante, one of the chiefs of the village Wede'rã, I visited these villages twice for the purposes of linguistic fieldwork. The first instance of *in-situ* fieldwork occurred in Summer 2019, with my collaborators Myriam Lapierre and Nicholas Carrick. During this trip, elicitation was performed using a 330 word concept list for the Cerrado region of Central Brazil, which contained items of local flora and fauna, as well as basic verbs and adjectives. Together with Vinícius Supretaprã, a native speaker of the Xavante language and our primary consultant, we recorded over eleven hours of elicitation audio. Scans of our notebooks as well as the audio recordings are archived in the California Language Archive (Carrick et al., 2020). The second instance of *in-situ* fieldwork occurred in Summer 2022, as a solo trip to the two villages. During this trip I recorded over fourteen hours of elicitation focused on family terms, adjectives, and longer utterances with four native speaker consultants: Jonh Xavante, Utebrewê Xavante, Andreus Xavante, and Joana Xavante.

Like many of the villages in the surrounding indigenous land, Êtênhiritipá and Wede'rã were first contacted rather recently. The first peaceful encounters between Xavante people and Brazilian representatives occurred in 1946. This period of contact with an increasing number of Xavante communities lasted for the next 20 years, until the 1960s (?). There are elders within Wede'rã that remember village life prior to this transformative event, who date the time of contact later in this period, near 1960. Today, young Xavante speakers live a different lifestyle from their elders in many ways, and one such aspect of this is their experiencing of a rapid language shift to bilingualism with Brazilian Portuguese. This language shift is especially salient in young male speakers. Most young men in Êtênhiritipá and Wede'rã travel to the nearby town of Canarana relatively frequently for extratribal dealings as well as social events (soccer, mainly). This results in a markedly different knowledge of Portuguese than the rest of the people in the village,

who are mainly monolingual. As such, it is imperative that the current variety of Xavante be documented thoroughly and accurately.

2.2 Consonants

	Labial	Alveolar	Palatal	Glottal
Plosive	/p/ [p]	/t/ [t]		/ʔ/ [ʔ]
	/b/ [b]	/d/ [d] [dʒ] [ⁿ d] [ⁿ dʒ]		
Fricative		/s/ [s] /z/ [z] [dʒ]		/h/ [h]
Nasal	/m/ [m]	/n/ [n]	/ɲ/ [ɲ]	
Tap or Flap		/r/ [r] [r̄]		
Approximant	/w/ [w] [w̃] [ɥ] [ɥ̃]			

Table 1: Consonant inventory. Symbols in slashes are phonemes, and symbols in square brackets are allophones.

There are thirteen consonant phonemes /p, b, t, d, ʔ, s, z, h, m, n, ɲ, w, r/ in Xavante, as illustrated in Table 1 above. There is a notable absence of velar consonants in Xavante, making it one of the only known languages where such a gap in the consonant inventory occurs (Maddieson and Disner, 1984), raising questions of how this cross-linguistic rarity arose. It has been proposed that Proto-Central-Jê *k debuccalized to glottal stop [ʔ] in Xavante (Nikulin, 2020), and it remains possible that *g also underwent velar debuccalization in a similar process *g > (ɣ) > h, leaving Xavante with a typologically unusual lack of velar consonants. Quintino (2000) contains Xavante data where [ɣ] is systematically found in the place of what is now [h]:

- (1) [ɣ] data from Quintino (2000) p. 24 vs. [h] from in-situ data

- | | | |
|----|------------|-----------------|
| a. | [ʔy] | [ʔu] |
| | ‘liver’ | |
| b. | [daʔir̃ti] | [da.hi.ʔr̃a.ti] |
| | ‘knee’ | |
| c. | [ʔædi] | [ʔɜːdi] |
| | ‘cold’ | |

In this section I will first discuss plosives, followed by fricatives, nasals, taps, and approximants. Xavante has five phonemic plosive consonants: /p, b, t, d, ʔ/. The labials share a voicing contrast for the consonants /p/ (2-a) and /b/ (2-b).

- (2) a. /da-pa/
 [da.ʔpa]
 INALIENABLE-liver
 ‘liver’
- b. /da-ba/
 [da.ʔba]
 INALIENABLE-back
 ‘back’

A similar voicing contrast exists for the alveolar plosive consonants /t/ (3-a) and /d/ (3-b).

- (3) a. /da-tɔ/
 [da.ʔtɔ]
 INALIENABLE-eye
 ‘eye’
- b. /da-dɜ/
 [da.ʔdɜ]
 INFINITIVE-die
 ‘to die’

The glottal consonant /ʔ/ contrasts in place with the other voiceless plosive consonants /p, t/

(4) in Xavante.

- (4) a. /daʔu/
 [da.ʔu]
 ‘lice’
- b. /da-pu/
 [da.ʔpu]

- INFINITIVE-scratch
 'to scratch'
- c. /da-tɔ/
 [da.'tɔ]
 INALIENABLE-eye
 'eye'

The voiced plosive consonants /b, d/ share a place contrast between labial and alveolar in (5).

- (5) a. /da-bɜ/
 [da.'bɜ]
 INALIENABLE-penis
 'penis'
- b. /da-dɜ/
 [da.'dɜ]
 INFINITIVE-die
 'to die'

Also found within this inventory are three phonemic fricative consonants: /s, z, h/. The fricative consonants /s, h/ share a contrast between alveolar and glottal place of articulation in (6-a).

- (6) a. /sadu/
 [sa.'du]
 'feather'
- b. /hadu/
 [ha.'du]
 'wait!'

The same is true for the fricative consonants /z, h/ in (7-a).

- (7) a. /abazi/
 [aba.'zi]
 'cotton'
- b. /abahi/
 [a.ba.'hi]
 'food, nutrition'

The following minimal pair shows a manner of articulation contrast for /s/ (8-a) and /t/ (8-b).

- (8) a. /ĩ-wasi/
 [ĩ.'wa:.si]
 1SG-tie
 'I tie'
- b. /ĩ-wati/
 [ĩ.'wa:.ti]
 1SG-tie
 'I squeeze'

A similar contrast appears to be true for /z/ (9-a) and /d/ (9-b).

- (9) a. /uza-dʒ/
 [u.za.'dʒ]
 shirt-??
 'shorts'
- b. /da-dʒ/
 [da.'dʒ]
 INFINITIVE-die
 'to die'

The glottal fricative consonant /h/ (10-a) contrasts with the glottal plosive consonant /ʔ/ (10-b).

- (10) a. /hʒ/
 [hʒ]
 'shell'
- b. /ʔʒ/
 [ʔʒ]
 'water'
- c. /sihʒ/
 [si.'hʒ]
 'spoon'
- d. /siʔu/
 [si.'ʔu]
 'hawk'

There are three phonemic nasal consonants: /m, n, ŋ/, which contrast labial, alveolar, and palatal places of articulation (11).

- (11) a. /mi/
 [mĩ]
 'firewood'

- b. /ɲi/
[ɲĩ]
'meat'
- c. /e niwa/
[(e) 'nĩ:wa]
Q when
'when?'

The nasal consonants /m, n/ contrast not only with each other, but also with their oral counterparts /b, d/. Near minimal pairs for the labials (12) and alveolars (13) are given below.

- (12) a. /da-budu/
[da.'bu:du]
INALIENABLE-neck
'neck'
- b. /da-muri/
[da.'mũ:ri]
INFINITIVE-walk
'to walk'
- (13) a. /da-dɔ/
[da.'dɔ]
INFINITIVE-die
'to die'
- b. /da-ne/
[da.'nẽ]
INFINITIVE-walk
'to walk (alternative)'

The remaining consonants within Xavante are the alveolar tap /ɾ/ and the labial approximant /w/. These consonants share a contrast with one another, as shown in (14) below.

- (14) a. /da-ʔwa/
[da.'ʔwa]
INALIENABLE-teeth
'teeth'
- b. /da-ʔra/
[da.'ʔra]
INALIENABLE-child
'child'

The alveolar tap /r/ contrasts with /t, d/ in the near minimal pairs in (15).

- (15) a. /waih3r3/
[wai.h3:r3]
'parrot'
- b. /h3d3/
[h3:d3]
'stone axe'
- c. /zi-h3t3/
[zi.h3:t3]
??-write
'to write'

The labial approximant /w/ contrasts with both oral labial consonants /p, b/ in (16).

- (16) a. /da-pa/
[da.'pa]
INALIENABLE-liver
'liver'
- b. /da-ba/
[da.'ba]
INALIENABLE-back
'back'
- c. /da-wa/
[da.'wa]
INALIENABLE-fat
'fat'

2.3 Vowels

2.3.1 Oral vowels

	Front	Central	Back
High	/i/ [i] [i:] [ĩ] [ĩ:]		/u/ [u] [u:] [ũ] [ũ:]
Mid	/e/ [e] [e:] [ẽ] [ẽ:]	/ɜ/ [ɜ] [ɜ:] [ɝ] [ɝ:]	
Low	/ɛ/ [ɛ] [ɛ:] [ɛ̃] [ɛ̃:]	/a/ [a] [a:] [ã] [ã:]	/ɔ/ [ɔ] [ɔ:] [ɔ̃] [ɔ̃:]

Table 2: Oral vowel inventory. Symbols in slashes are phonemes, and symbols in square brackets are allophones.

Xavante has seven phonemic oral vowels: /i, e, ɛ, ɜ, a, u, ɔ/. Each vowel can be allophonically nasalized and allophonically lengthened. Nasalization is also phonemic, which will be detailed in the following §2.3.2. The same is not true for lengthened vowels, as they are only allophonic in Xavante. All vowel sequences in the language show a preference for identity (e.g. a vowel will be the same as the vowel in the preceding syllable), and do not display any other type of harmony.

Xavante has three front vowels: /i, e, ɛ/. These vowels share a height contrast in (17) between high, mid, and low.

- (17) a. /ʔri/
[ʔri]
'house'
- b. /ʔre/
[ʔre]
'egg'
- c. /ʔrɛ/
[ʔrɛ]
'dry'

The central vowels /a, ɜ/ also share a contrast in height between mid and low in (18).

- (18) a. /i-ʔa/
 [(i).ʔa]
 1SG.POSS-white
 'white'
- b. [ʔɜ]
 'water'

The back vowels /u, ɔ/ share a contrast in height between high and low in (19).

- (19) a. /ɔti/
 [ɔ.'ti]
 'grandchild'
- b. /uti/
 [u.'ti]
 'frog'

The high vowels /i, u/ contrast in backness between the front vowel /i/ and the back vowel /u/ in (20).

- (20) a. /ʔi/
 [ʔi]
 'termite'
- b. /ʔu/
 [ʔu]
 'whirlpool'

The mid vowels /e, ɜ/ share a backness contrast between front and middle in (21).

- (21) a. /tebe/
 ['te:.be]
 'fish'
- b. /tebɜ/
 ['te:.bɜ]
 'finished'

The low vowels /ε, a, ɔ/ contrast in backness between front, middle, and back in (22).

- (22) a. /ʔrε/
 [ʔrε]
 'dry'

- b. /ĩ-ʔra/
[ĩ.'ʔra]
1SG.POSS-child
'my child'
- c. /ʔrɔ/
[ʔrɔ]
'bush (place)'

2.3.2 Nasal vowels

	Front	Central	Back
High	/ĩ/ [ĩ] [ĩ:]		
Mid	/ẽ/ [ẽ] [ẽ:]		/õ/ [õ] [õ:]
Low		/ã/ [ã] [ã:]	

Table 3: Nasal vowel inventory. Symbols in slashes are phonemes, and symbols in square brackets are allophones.

Xavante has four phonemic nasal vowels: /ĩ, ẽ, ã, õ/. As is common throughout the world's languages, there are fewer contrastive nasal vowels than contrastive oral vowels (Hajek, 2013). Phonemic nasal vowels occur nearly in all positions and are unpredictable, surfacing in words as the only nasal segment among other oral segments. They are not found in sequences following voiced oral obstruents, but this is due to their effect of local nasalization upon the preceding consonant. These vowels may additionally be unstressed, as in (23-a), or stressed, as in (23-d).

- (23) a. /ĩ-ʔra/
[ĩ.'ʔra]
1SG.POSS-child
'my child'
- b. /tã/
[tã]
'rain'

- c. /wapsã/
[wap.sã]
'dog'
- d. /(wa) ti-ʔrẽ/
[(wa) ti.'ʔrẽ]
(NOM) ACC-eat
'I eat it'
- e. /sõte/
[sõ.'te]
'macaw'

This distribution is markedly different from allophonically nasalized vowels, which are predictable and occur when following nasal consonants, as in (24).

- (24) a. /da-muri/
[da.'mũ:.ri]
INFINITIVE-walk
'to walk'
- b. /da-zamɔ/
[da.za.'mɔ̃]
INALIENABLE-tail
'tail'

The nasal vowel /ĩ/ contrasts with its oral counterpart /i/ in (25).

- (25) a. /ĩ-hi/
[ĩ.hi]
1SG.POSS-bone
'my bone'
- b. /ihi/
[i.hi]
'old'

Nasal /ẽ/ contrasts with its oral counterpart /e/ in (26).

- (26) a. /(wa) ti-ʔrẽ/
[(wa) ti.'ʔrẽ]
(NOM) ACC-eat
'I eat it'
- b. /ʔre/
[ʔre]

‘egg’

Nasal /ã/ contrasts with its oral counterpart /a/ in (27)

- (27) a. /da-ʔrã/
[da.ʔrã]
INALIENABLE-head
‘head’
- b. /da-ʔra/
[da.ʔra]
INALIENABLE-child
‘child’

Note that nasal /õ/ has no oral counterpart, just as /ɔ/ has no nasal counterpart. The following near minimal pair is provided in (28) to show that these two vowels are contrastive.

- (28) a. /piʔõ/
[pi.ʔõ]
‘woman’
- b. /paʔɔ/
[pa.ʔɔ]
‘banana’

2.3.3 Diphthongs

	i	e	ɛ	ɜ	a	u	ɔ
i							
e		ei					
ɛ							
ɜ		zi					
a		ai					
u		ui					
ɔ							

Table 4: Diphthong inventory

There are four diphthongs in Xavante: /ei, zi, ai, ui/. In this language there exists a clear preference for diphthongs whose second vowel is the high front vowel [i]. The only vowels that have not

been found in a diphthong are the two mid-low vowels /ε, ɔ/. The diphthong /ai/ present in the inventory is the most common diphthong cross-linguistically (Kubozono, 2001). Much like long vowels in Xavante, diphthongs may occur anywhere in the word except word finally, and they also prefer penultimate position.

- (29) a. /zeire/
 ['zei.re]
 'sweet'
- b. /hɜiwahɜ-wẽ/
 [hɜi.wa.'hɜ:.ũẽ]
 afternoon-good
 'good afternoon'
- c. /aibɜ/
 ['ai.bɜ]
 'man'
- d. /wesuirã/
 [ʉe.'sui.ã]
 'leaf'

2.3.4 Vowel distribution

Using the entire corpus, I created an N by N chart to visualize whether there exists any vowel harmony for the following features: [HIGH], [LOW], [BACK], [ROUND], [ATR], or [NASAL]. In doing this work, it became apparent that there is very little harmony within adjacent vowel sequences. Nearly any vowel can be reasonably be paired with another across any given consonant. This lack of restriction is true for initial syllables as well, as they also appear to tolerate the same set of vowels as any other syllable. The same is true when comparing stressed and unstressed syllables. Any vowel sequences unattested in the dataset for these contexts do not share any striking similarities, instead they are a casualty of a small dataset and are predicted to exist in the language. Given these patterns, the vowel distribution appears to be quite free.

		V2										
		i	e	ɛ	ɜ	a	u	ɔ	ĩ	ẽ	ã	õ
V1	i	7	4		2	8	4		1	1	3	2
	e		7		1	5	1	1		1	1	1
	ɛ	1		3			1					
	ɜ	8			8	2	1					
	a	27	9	3	5	49	13	10	15	6	12	9
	u	7	4	4	5	8	8		2	1	1	1
	ɔ	1	3	2		3	2	9	3		3	
	ĩ	7	3	8		14	6	3	5	2	7	3
	ẽ		1		1					5		
	ã	5	2	1	2	5	3		4	1	8	1
	õ		4	1	1	1		1	4	1		8

Figure 4: N by N chart for all possible vowel sequences

Although vowels exhibit this robust distribution, the chart above indicates that Xavante shows a preference for vowel identity between two vowels in any given sequence. This is especially true in the case of the nasal vowel /ẽ/, which only has two occurrences with vowels that are not /ẽ/. In addition to this, the low mid vowel /a/ is the most frequent vowel found within the dataset, appearing a total of 160 times as the first vowel in the sequence, and 95 times as the second vowel. In comparison to other vowels, /a/ is much more likely to be V_1 than V_2 , but it still has a very high frequency in both positions. One additional observation to be made about the dataset is that nasal vowels are much less frequent than oral vowels. This is true for sequences that are heterorganic in nasality as well as homorganic.

2.4 Phonotactics

The syllable structure schema for Xavante is as follows:

(C1)(C2)(C3)V(:)(C)

Xavante exhibits a clear preference for syllables containing an onset, allowing for an onset with a maximum of three consonants in some words. These complex onsets are highly infrequent, however, so a word containing the maximal possible syllable (i.e. CCC onset with an overt coda) has not yet been elicited. That being said, I anticipate that such a word is possible. This is exemplified in the following forms, one of which contains a three-consonant onset with a long vowel in (30-a), and the other which contains a two-consonant onset with a coda consonant in (30-b):

- (30) a. /da-tɔʔbrada/
[da.tɔ.ʔbra:da]
INALIENABLE-forehead
'forehead'
b. /ʔrɔmpize/
[ʔrɔm.pĩ.ze]
'smoke'

All possible consonants in Xavante may appear in onset position of C1V syllables, allowing for the following onsets: the five plosive consonants /p/ (31-f), /b/ (31-a), /t/ (31-f), /d/ (31-c), and /ʔ/ (31-d); the three fricative consonants /s/ (31-d), /z/ (31-f), and /h/ (31-a); the three nasal consonants /m/ (31-e), /n/ (31-g), and /ɲ/ (31-e); the tap consonant /r/ (31-f); and the approximant consonant /w/ (31-f).

- (31) a.
b. /abahi/
[a.ba.hi]
'food, nutrition'

- c. /da-ʔra/
[da.ʔra]
INALIENABLE-child
'child'
- d. /siʔu/
[si.ʔu]
'hawk'
- e. /wapimizahziʔɜ/
[wa.pĩ.mi.za.hzi.ʔɜ]
'crab'
- f. /pezapɔtɔwara/
[pe.za.pɔ.tɔ.'wa:.ra]
'meat'
- g. /nozɜ/
[nɔ.'zɜ]
'corn'

For syllables with two-consonant onsets, there are two possible options for their construction.

Either the first consonant is a plosive followed by the flap [r] as in (32-a), or the first consonant is a glottal stop [ʔ] and must be followed by [r, w, b] as in (32-b).

- (32) a. /da-wapru/
[da.wa:.pru]
INALIENABLE-blood
'blood'
- b. /siʔbeze/
[si.'ʔbɛ:.zɛ]
'knife'

The only possible three-consonant complex onsets in Xavante are [ʔmɾ̃] and [ʔbr], making this type of syllable rather infrequent in the language:

- (33) a. /ʔmra/
[ʔmɾ̃ã]
'hunger'
- b. /uʔmɾ̃ɛ/
[u.'ʔmɾ̃ɛ]
'gourd'
- c. /dapitɔ-ʔbru/

[da.nĩ.tɔ.'ʔbru]
??-warrior
'enemy'

Codas in Xavante are limited to labial consonants [p, m, b], present in the following sequences: [pt, ps, bd, bz, mɲ, mh]. These are mainly sequences of flat sonority, in contrast to the onset sequences of rising sonority in Xavante.

- (34) a. /rɔptɔ/
[rɔp.tɔ]
'mud'
- b. /wapsã/
[wɔp.sã]
'dog'
- c. /ubdɜ/
[ub.dɜ]
'capybara'
- d. /abzuma-wẽ/
[ab.zu.mã:ũẽ]
afternoon-good
'good afternoon'
- e. /rɔmɲi/
[rɔm.ɲĩ]
'meat'
- f. /rɔmhuri/
[rɔm.'hu:.ri]
'work'

One might notice that these consonant sequences must agree in voicing and nasality, and that they must also disagree in place, as Xavante bans geminate consonants. Another point of note is the fact that of the available labial, coronal, and glottal consonants, only labial consonants are allowed in coda position. This is typologically unusual, and will be motivated in §3 on labial markedness.

2.5 Stress

The location of primary stress in Xavante is contrastive, falling on either the final or penultimate syllable of every word. When stress is penultimate, that syllable must be heavy by having either a long vowel or diphthong. If a word instead has final stress, the stressed vowel will remain short. In fact, long monophthongal vowels in Xavante occur solely in stressed penultimate position, and the same is very nearly true for diphthongs, which are almost always found in stressed penultimate position.¹ The following example contains a minimal pair for stress in Xavante.

- (35) a. /wãrĩ/
[ˈwã:.rĩ]
'tobacco'
b. /wãrĩ/
[wã.'rĩ]
'shell, peel'

If certain suffixes are attached to words with a penultimate stressed long vowel, the stress can shift to the suffix, and the previously lengthened vowel shortens.

- (36) a. /tebe/
[ˈte:.be]
'fish'
b. /tebe-wa/
[te.pe.'wa]
fish-below
'fish that has an item on top of it'

Penultimate vowel lengthening in stressed position is not limited to Xavante, as this process is shared with two other languages within the Jê family, Panãra and Tapayuna (Lapierre, 2018).

These languages are members of the Northern branch of the language family, while Xavante is a

¹There are instances of diphthongs in word-initial position in longer words within Xavante. These diphthongs occur in words with penultimate stress that already have a different long vowel or diphthong in stressed position, so it remains possible that this may be the impact of a secondary stressed position.

member of the Central branch, yet all three languages share this phonological process.

- | | | | | | | |
|------|----|---|----|--|----|---|
| (37) | a. | Xavante
/tebe/
[^h tɛ:.be]
'fish' | b. | Panãra
/tɛpi/
[^h tɛ:.pi]
'fish' | c. | Tapayuna
/t ^h ɛ.wɛ/
[^h t ^h ɛ:.ɥɛ]
'fish' |
|------|----|---|----|--|----|---|

2.6 Allophonic processes

2.6.1 Palatalization

In Xavante there are two different palatalization processes. The first is obligatory palatalization of the labial approximant /w/ to the labiopalatal [ɥ] when preceding front vowels [i, e].

- | | | |
|------|----|--|
| (38) | a. | /wɛ̃di/
[^h ɥɛ̃:. ^(m) di]
'good' |
| | b. | /sawidi/
[sa. ^h ɥi:.di]
'love' |

The second palatalization process is more restricted, occurring only in environments preceding front vowel [i]. In this process, the alveolar consonants /d, z/ optionally palatalize to [dʒ].

- | | | |
|------|----|---|
| (39) | a. | /wɛ̃di/
[^h ɥɛ̃:. ^(m) di] ~ [^h ɥɛ̃:. ^(m) dʒi]
'good' |
| | b. | /zurãzi/
[zu.ã.ã. ^h zi] ~ [zu.ã.ã. ^(m) dʒi]
'person's name' |

This process is unique in that only young male speakers exhibit these palatalized allophones. This may be a result of their higher level of bilingualism with Brazilian Portuguese, which is well known for its palatalization of alveolar consonants /t, d/ when preceding [i] (?).

- (40) /dia/
 [dʒiɐ]
 ‘day’

Young male speakers frequently travel to the city of Canarana, Mato Grosso, Brazil for social purposes, which results in a markedly different knowledge of Portuguese than the rest of the people in the village, who are mainly monolingual. In contrast, all speakers of Xavante exhibit the labial palatalization process, which is not optional. This consistent labial process is therefore unlike the optional alveolar palatalization process, which occurs with variation in casual speech. It appears that palatalization may also be more frequent in young male speakers from the smaller ($n=50$) village of Wede’rã, but more work is needed to confirm this impression.

2.6.2 Local nasalization

Xavante has three processes of local nasalization: rightward nasalization of vowels, rightward prenasalization of /d/, and leftward nasalization of sonorants. The first process is the most frequent in the language, resulting in nasal allophones of oral vowels. When oral vowels follow nasal consonants /m, n, ɲ/, they become nasalized.

- (41) a. /da-muri/
 [da.mũ:ri]
 INFINITIVE-walk
 ‘to walk’
 b. /mi/
 [mĩ]
 ‘firewood’
 c. /ɲi/
 [ɲĩ]
 ‘meat’

It is necessary to recognize that this process may be analyzed as a process by which underlying voiced plosives are nasalized by nasal vowels. This opposing analysis was not adopted due to the

distribution of vowels that undergo this local nasalization process. Phonemically nasal vowels and allophonically nasal vowels exhibit a very asymmetrical distribution in Xavante, including as undergoers of this process. The nasal vowels [ɛ̃, ẽ, ã, õ] only occur following a nasal consonant [m, n, ɲ]. In contrast, the nasal vowels [ĩ, ẽ, õ, ã] occur in all possible syllable types in Xavante, including word-initially, and even in words that contain no other possible source of nasality, as described in §2.3.2.

- (42) a. /tã/
 [tã]
 ‘rain’
 b. /wapsã/
 [‘wap.sã]
 ‘dog’
 c. /sõte/
 [sõ.‘te]
 ‘macaw’

This motivates the analysis of /ĩ, ẽ, õ, ã/ as phonemically nasal and [ɛ̃, ẽ, ã, õ] as allophonically nasal. It follows that these allophonically nasal vowels are nasalized by the preceding nasal consonant, as was proposed in the rightward local nasalization process.

There is an additional process of optional rightward local nasalization in Xavante, by which the alveolar stop /d/ nasalizes to the prenasalized [ᵐd] when following nasal vowels. This process occurs with variability in the language and is found more often in casual speech, but is nonetheless present in all speakers. Interestingly, this local nasalization does not apply to the other oral plosive /b/, which fails to nasalize when following nasal vowels as in (43-c).

- (43) a. /mredi/
 [mrẽ.ᵐdi]
 ‘fat’
 b. /wẽdi/
 [‘wẽ:ᵐdi]

- ‘good’
 c. /ɲibaʔe/
 [ɲi.ˈba:ʔe]
 ‘necklace’

The final process of nasalization in Xavante is the leftward local nasalization of sonorants /r, w/ to [ř, ỹ, ũ] when preceding nasal vowels.

- (44) a. /arãrãre/
 [a.řã.řã:re]
 ‘hummingbird’
 b. /utebre-wẽ/
 [u.te.bre.ỹẽ]
 ??-good
 ‘a person’s name’

2.6.3 Final V raising

In Xavante the high-mid front /e/ optionally raises to [i] word finally. This process occurs in casual speech for all speakers. In careful speech, the /e/ reemerges as [e] word finally.

- (45) /amere/
 [a.ˈmẽ:re] ~ [a.ˈmẽ:ri]
 ‘bee’

2.6.4 Word-initial V deletion

At the beginning of words in Xavante, the high front vowel /i/ may optionally be deleted if it is unstressed. This occurs more frequently in casual speech, but is not obligatory, such that words in Xavante are sometimes pronounced without an initial [i] by all types of speakers, but not always. This deletion of [i] is especially frequent in faster speech.

- (46) a. /ĩ-sahi/
 [(ĩ).ˈsa:hi]

- ADJ-brave
 ‘brave’
- b. /ĩ-pipa/
 [(ĩ).pi.'pa]
 ADJ-dangerous
 ‘dangerous’

2.6.5 Copy vowel epenthesis

In extremely slow and careful speech there appears to be a process of copy vowel epenthesis, whereby syllables with complex onsets are divided into two syllables, each sharing the same vowel. This process is incredibly rare, having only been attested in the following words below:

- (47) a. /ĩ-wastu-di/
 [ĩ.wa.s(u)'tu:di]
 ADJ-tired-??
 ‘I am tired’
- b. /triresu/
 [t(i)ri.'re:su]
 ‘type of tree’
- c. /maprane/
 [mã.p(a).ra.'nẽ]
 ‘two’

In all other contexts, these words do not contain copy vowels. This includes in slow speech that is not extremely stilted. For all other optional processes in Xavante, the unmodified word appears in slow speech, but this is not true for these words in particular. It is therefore reasonable to disregard the possibility that this may be vowel deletion of underlying vowels, which would also violate the language’s preference for vowel identity.

2.6.6 Utterance final breathiness

At the end of phonological phrases in Xavante, utterance final breathiness optionally occurs. This breathiness is realized as the glottal fricative [h] generally, and as the palatal fricative [ç] when following the high front vowel /i/.

- (48) a. /ʔrɔ-tiʔwa/
[ʔrɔ.ti.ʔwa(h)]
bush²-??
'chief'
b. /mredi/
[mɾẽ.^(m)di(ç)]
'fat'

This process only occurs once at the end of a phrase, as is seen below in (49). The word 'fly' no longer has the utterance final breathiness that it had when it was the only word in an utterance, and instead that breathiness moves to the end of the following word for 'many.'

- (49) a. /ubu/
[ʔu.bu(h)]
'fly'
b. /ubu ahɜdi/
[ʔu.bu a.hɜ:.di(ç)]
fly many
'many flies'

2.7 Summary

Xavante has thirteen consonant phonemes /p, b, t, d, ʔ, s, z, h, m, n, ɲ, w, r/, seven oral vowel phonemes /i, e, ε, ɜ, a, u, ɔ/, four nasal vowel phonemes /ĩ, ê, ã, õ/, and four diphthongs /ei, zi, ai, ui/. These phonemes may be arranged to allow a maximal syllable with a three-consonant onset

²The meaning of 'bush' is approximate here, as it is translated from 'mato,' meaning the general outdoor environment of the area, and the namesake of the Brazilian state of Mato Grosso.

and a single coda consonant. Stress in Xavante falls on either the final or penultimate syllable and is lexically determined, and penultimate stress requires a heavy syllable weight, either through a long vowel, diphthong, or coda. Xavante has the following allophonic processes: labial palatalization, alveolar palatalization, rightward nasalization of oral vowels, rightward nasalization of /d/, leftward nasalization of sonorant consonants, final vowel raising, word-initial vowel deletion, copy vowel epenthesis, and utterance final breathiness.

3 Labial unmarkedness in Xavante

3.1 Markedness and place of articulation

It has been proposed that the world's languages follow a particular place markedness hierarchy, wherein certain places of articulation are more *marked* than others:

DORSAL >> LABIAL >> CORONAL >> GLOTTAL

This place markedness hierarchy makes certain predictions for the distribution of consonants within the world's languages, namely that less marked places of articulation (e.g. GLOTTAL) will be more frequent and more widely distributed than more marked places of articulation (e.g. VELAR) (Rice, 2007). One place in which this distributional asymmetry is found is in syllabic position. In many languages, a larger number of places of articulation are contrasted in onset position than in coda position. An example of this pattern is found in Kashaya, a member of the Pomoan language family (Buckley, 1994). In this language, a debuccalization process neutralizes stops in coda position to either [ʔ] or [h] as in (50), leaving the inventory with only glottal consonants in coda.

(50) Debuccalization in Kashaya (Buckley, 1994, p. 173)

- a. /c^hiwoɬ-t^h/
[c^hiwóht^h]
'didn't stir it'
- b. /suwac-no/
[suwáʔdo]
'they say it dried'

Kashaya's coda inventory is an example of what De Lacy (2006) considers to be a *harmonically complete* inventory, or an inventory in which the allowance of a more marked place of articulation within coda position will then imply the allowance of every place of articulation that is less marked within the hierarchy.

It is necessary to mention that place of articulation markedness is not only way in which coda consonants are restricted. Asymmetries are, in fact, common between a given language's set of onset consonants and its set of coda consonants. One such pressure governing these two sets is a preference for high sonority in codas and low sonority in onsets (Gouskova, 2004). This specifically motivates the disallowance of less sonorous places of articulation in coda position, as in the case of Kashaya, and the typology more broadly.

One fascinating aspect that Xavante shares with a small handful of the world's languages is an unusual set of allowed coda consonants. It must be restated that the inventory of Xavante itself is already unusual, as it is completely lacking in velar consonants. This may be one potential explanation for the non-standard activity of the remaining places of articulation, which are now no longer a complete set of four. Xavante contrasts the remaining labial, coronal, and glottal consonants in onset position, yet only labial consonants are allowed to be codas in Xavante, to the exclusion of glottal and alveolar consonants.

(51) a. /rɔptɔ/

- [ʀɔp.tɔ]
'mud'
- b. /wapsã/
[ʀwap.sã]
'dog'
- c. /ubdɜ/
[ʀub.dɜ]
'capybara'
- d. /abzuma-wẽ/
[ab.zu.mã.ũẽ]
afternoon-good
'good afternoon'
- e. /rɔmpɪ/
[ʀɔm.pɪ]
'meat'
- f. /rɔmhuri/
[ʀɔm.'hu:.ri]
'work'

This distribution is surprising. Given the predictions made by the place markedness hierarchy, the presence of labial coda consonants should then imply the presence of coronal as well as glottal coda consonants. This is not the case for the data at hand. The Xavante data directly violates the expected set of coda consonants that would be predicted by the place markedness hierarchy, in which the allowance of the most marked bilabial place would then imply the allowance of the less marked places. Instead, the more typologically marked place of articulation has a wider distribution than the typologically less marked places of articulation, namely alveolar and glottal.

Previous work by De Lacy (2006) surveys the handful of languages that have similarly gapped inventories, but the author limits the types of predicted gapped inventories, specifically excluding the possibility of a language with a coda inventory like that of Xavante. De Lacy argues that the removal of the two least marked places of articulation, glottal and alveolar, rather than just one or the other, is not possible. Xavante directly contradicts this claim.

It must be noted that, especially given the status of other languages with gapped invento-

ries, that the place markedness hierarchy is not absolute. Work on Sri Lankan Portuguese Creole (Hume and Tserdanelis, 2002), for instance, has proposed that labial consonants may be less marked than coronal consonants in some cases, arguing that the place markedness hierarchy may be more fluid than originally anticipated. The presence of an unattested pattern such the one in Xavante begs justification, and also carries with it interesting implications for the sets of allowed codas within the linguistic typology.

3.2 Coda labials in Xavante

There are two types of consonant sequences in Xavante that could be reasonably analyzed as coda consonants. The first set contains the aforementioned labial consonant sequences [pt, ps, bd, bz, mp, mh], which are analyzed in this work as a labial coda followed by a single consonant onset. The second set of consonant sequences are glottal consonant clusters [ʔbr, ʔm̃], which are analyzed as three-consonant onset clusters.

- (52) a. /da-tʔbrada/
 [da.tʔ.ʔbra.da]
 INALIENABLE-forehead
 ‘forehead’
 b. /ʔrɔmpize/
 [ʔrɔm.pi.ze]
 ‘smoke’

Throughout this work, such sequences have been syllabified into three-consonant onset clusters, but it remains true that these could conceivably be analyzed as a coda glottal stop followed by a separate onset, as in the hypothetical (53), which is the counterpart to (52-a) but syllabifies the glottal stop as a coda:

- (53) /da-tʔbrada/

*[da.tɔʔ.'bra:.da]
INALIENABLE-forehead
'forehead'

This would imply that consonant sequences with a labial coda followed by an onset in the next syllable are not unique, and that the markedness place hierarchy is not being so blatantly violated. Though tempting, it is clear that the unique analysis of labial codas as distinct remains a better fit to the data. This is motivated by distributional distinctions between glottal consonant clusters and labial coda sequences, namely allowance word-initially, as well as allowance following heavy penultimate syllables.

3.2.1 Distribution word-initially

The first key difference between the two consonant sequences is the following: glottal consonant clusters are found word-initially, as in (54), and sequences of a labial and a following stop, nasal, or fricative are not found word-initially.

- (54) a. /ʔmra/
[ʔm̃ã]
'hunger'
b. /ʔri/
[ʔri]
'house'
c. /ʔruʔa/
[ʔru.'ʔa]
'ash, gray'

There exist no similar examples for any of the the allowed labial consonant sequences [pt, ps, bd, bz, mp, mh] in word-initial position. Xavante shows a clear preference for syllabification in order to maximize onset size, allowing all possible consonants to occur in onset position. If it were possible to syllabify the labial consonant sequences into onset clusters, it would follow that

they may appear word-initially, much like every other allowed onset cluster and singleton within the language.

3.2.2 Distribution following heavy syllables

Additional, and perhaps stronger, evidence is the difference in distribution between these consonant sequences in penultimate stressed position. As noted in §2.5, penultimate stress requires the presence of a heavy syllable, either through a diphthong (55-a) or a lengthened monophthong (55-b). This vowel length is not underlying, as it fails to be realized in cases where stress shifts to a stress-attracting suffix, as in the case of (55-c).

- (55) a. /aibɜ/
 ['ai.bɜ]
 'man'
 b. /tebe/
 ['te:.be]
 'fish'
 c. /tebe-wa/
 [te.pe.'wa]
 fish-below
 'fish that has an item on top of it'

It follows that lexically stressed vowels must be heavy in the language, and short vowels lengthen in order to satisfy this requirement. This process of stress lengthening a vowel is a clear sign of a stress-to-weight system, where the presence of lexical stress results in a heavier syllable weight (Gordon, 2002). This is highly relevant to the question of glottal consonant cluster syllabification, as these heavy syllables do not occur in contexts with all types of consonants. More specifically, glottal consonant clusters may occur following heavy penultimate syllables, as in (56), but labial coda sequences may not.

- (56) a. /aihziʔre/
 [ai.'hzi.ʔre]
 'alligator'
- b. /teza ʔaʔre/
 [te.'za ʔa:.ʔre]
 2SG rot
 'you will rot'

All labial coda sequences follow the same structure: they are obligated to follow a short vowel, as in (57). These labial codas may indeed occur in the penultimate syllable of the word, likely indicating that they satisfy the requirement for a heavy stressed syllable. These consonant sequences never occur after a stressed long vowel or a diphthong.

- (57) a. /rɔptɔ/
 [rɔp.tɔ]
 'mud'
- b. /rɔmhuri/
 [rɔm.'hu:.ri]
 'work'

The presence of heavy syllables followed by one type of sequence, but not the other, can be explained by a disallowance of super heavy syllables in Xavante. If one assumes that the addition of a coda consonant to otherwise heavy syllables creates a super heavy syllable, and that super heavy syllables are disallowed in Xavante, it follows that consonants that appear in coda (e.g. labial codas) would not follow long vowels or diphthongs, but that consonants that appear in onset (e.g. glottal onsets) would indeed follow long vowels and diphthongs. This remains true in the case of Xavante: a sequence of a long vowel or diphthong followed by a labial coda is unattested. The same is not true for glottal consonant clusters, as they syllabify to onset position of the following syllable, not increasing the weight of the preceding syllable to a disallowed super heavy syllable, and are therefore attested in Xavante.

This is the strongest available evidence that labial consonants are the only allowed codas in Xavante. These two arguments are corroborated by native speakers, who when asked to clap on each syllable of the word while speaking slowly appear to syllabify syllables with labials in coda position. The labial consonants are pronounced separately as the final consonant during one clap, while the following onset is pronounced during the beginning of the next clap. This is by no means a standalone piece of evidence for this theoretical proposal, but it is nonetheless relevant, as speaker metalinguistic knowledge is not to be discounted. Holistically, the evidence indicates that Xavante is potentially unique with respect to coda consonant distribution.

3.3 Implications for the markedness hierarchy

This data makes an exciting new prediction for a language that only allows labial codas, which has, until now, remained nearly unattested (Hume and Tserdanelis, 2002). De Lacy (2006) predicts that it is not possible to produce such an inventory, yet the data appears to show that it is, indeed, possible. It does appear true, however, that the frequency at which inventories allow only a single consonant in coda position remains heavily influenced by place markedness. There exist multiple languages (Kashaya (Buckley, 1994), Kelantan Malay (Teoh, 1988; Trigo Ferre, 1988), Toba Batak (Hayes, 1986)) that allow only glottal consonants in coda position. This number reduces significantly for coronal consonants, for which there appears to be only one language (Uradhi (Hale, 1976; Dixon, 1983)) with codas limited to coronals alone. The more marked places of articulation, labials and velars, had no such languages, until now. As it stands, Xavante is a language whose very existence was previously predicted to be impossible, potentially opening the door for undocumented languages that share similarly unusual coda consonant distributions.

4 Conclusion

Like many other underdocumented languages, Xavante is no stranger to the presence of typologically unusual linguistic features. These include, but are not limited to, a lack of velar consonants, restriction of coda consonants to bilabials, and complex three-consonant onset clusters beginning in glottal stop. While this work remains a preliminary survey of the language and its qualities, these facets alone are enough to raise questions about the status of bilabials within a markedness hierarchy that is lacking another place of articulation entirely. There is more work to be done with Xavante, including the documentation of other aspects of the language aside from the phonology. The language contact situation provides this project with a sense of urgency to document not only the ever-present aspects of the language, but also the emerging ones with accuracy and care, and it is my hope that this paper is the first step to a comprehensive survey of the language Xavante.

References

- Buckley, E. (1994). Theoretical aspects of Kashaya phonology and morphology. Center for the Study of Language (CSLI).
- Burgess, E. (1986). Focus and topic in xavante. Sentence Initial Devices. Summer Institute of Linguistics, 75:27–41.
- Carrick, N., Huff, T., Lapierre, M., Supretaprã, V., Xavante, U., and Xavante, S. (2020). Xavante Fieldwork Materials. University of California, Berkeley: Survey of California and Other Indian Languages. DOI: <http://dx.doi.org/doi:10.7297/X24Q7SGG>.
- De Lacy, P. (2006). Markedness: Reduction and preservation in phonology, volume 112. Cambridge University Press.
- Dixon, R. (1983). Nyawaygi. handbook of australian languages, vol. by rm w. dixon and barry j. blake, 431–525.
- Gordon, M. (2002). A phonetically driven account of syllable weight. Language, pages 51–80.
- Gouskova, M. (2004). Relational hierarchies in optimality theory: The case of syllable contact. Phonology, 21(2):201–250.
- Hajek, J. (2013). Vowel nasalization. In Dryer, M. S. and Haspelmath, M., editors, The World Atlas of Language Structures Online. Max Planck Institute for Evolutionary Anthropology, Leipzig.
- Hale, K. (1976). Phonological developments in particular northern paman languages. Languages of Cape York, pages 7–40.
- Hall, J. and MacLeod, R. A. (2004). Pequeno dicionário xavante-português, português-xavante. Summer Institute of Linguistics.
- Harrison, A. J. (2001). Xavante morphology and respect/intimacy relationships. SIL Brazil

Technical Publications.

- Hayes, B. (1986). Assimilation as spreading in toba bata. Linguistic inquiry, 17(3):467–499.
- Hume, E. and Tserdanelis, G. (2002). Labial unmarkedness in sri lankan portuguese creole. Phonology, 19(3):441–458.
- Kubozono, H. (2001). On the markedness of diphthongs. Kobe papers in linguistics, 3:60–73.
- Lapierre, M. (2018). A fonologia do panãra: Sincronia e diacronia. In Talk presented at Café com Ciência, Museu Paraense Emílio Goeldi, Belém, Brazil.
- Machado Estevam, A. (2011). Morphosyntaxe du xavante. Langue jê du Mato Grosso (Brésil). PhD thesis, Université de Paris VII.
- MacLeod, R. (1960). Xavante grammar, volume 97 of Arquivo Lingüístico. SIL, Brasília.
- Maddieson, I. and Disner, S. F. (1984). Patterns of sounds. Cambridge university press.
- Nikulin, A. (2020). Proto-Macro-Jê: um estudo reconstrutivo. PhD thesis, Universidade de Brasília.
- Oliveira, R. C. d. (2007). Morfologia e sintaxe da língua Xavante. PhD thesis, Universidade Federal do Rio de Janeiro.
- Pickering, W. A. et al. (2010). A fonologia xavante uma revisão. PhD thesis, Universidade Estadual de Campinas.
- Quintino, W. P. (2000). Aspectos da fonologia xavante. Master's thesis, Universidade Estadual de Campinas.
- Quintino, W. P. (2012). Aspectos da fonologia Xavante e questões relacionadas: Rinoglotalofilia e nasalidade. PhD thesis, Universidade Federal do Rio de Janeiro.
- Quintino, W. P. (2018). Harmonia nasal e rinoglotalofilia em xavante. Polifonia, 25(38.1):39–57.
- Rice, K. (2007). Markedness in phonology. The Cambridge handbook of phonology, pages 79–97.

- Rodrigues, C. K. C. and Ferreira-Silva, M. d. N. (2011). Comparando as consoantes das línguas tapajúna e suyá. Alfa: Revista de Linguística (São José do Rio Preto), 55(2):601–611.
- Santos, J. P. d. (2008a). Marcas pessoais, concordância de número e alinhamento em xavánte. Master's thesis, Universidade de Brasília.
- Santos, O. (2008b). Languages of the world and their case marking: the Brazilian language Xavante; a case study. PhD thesis, Univ. Federal de Minas Gerais Belo Horizonte.
- Teoh, B. S. (1988). Aspects of Malay phonology revisited: A non-linear approach. University of Illinois at Urbana-Champaign.
- Trigo Ferre, R. L. (1988). The phonological derivation and behavior of nasal glides. PhD thesis, Massachusetts Institute of Technology.