Chapter 3: Phonotactics and Phonological Processes in Chokri

3.1. Introduction

In the previous chapter, we conducted a detailed examination of the phonemic inventory of Chokri. Through careful acoustic analysis, supported by spectrographic evidence, we were able to confirm the distinctive features of Chokri consonants and vowels. Building on this comprehensive phonemic foundation, in this chapter, we will turn our focus to the phonotactic constraints and phonological processes that shape the sound system of Chokri. We will explore how Chokri organizes its sounds within syllables and words, the rules governing permissible sound sequences, and the dynamic phonological processes, such as assimilation, deletion, etc., that further influence the sound system of Chokri.

"Phonotactics refers to the principles according to which languages allow sound combinations and segment sequencing to form larger units such as syllables and words." (Celata and Calderone, 2015). Haugen (1956) defines phonotactics as the set of language-specific rules that govern the permissible sequences of speech sounds within a given language. Similarly, Goldsmith (1995) highlights that a fundamental goal of phonological theory has been to determine the criteria for identifying a phonologically well-formed word in any given language.

Phonotactics and syllable structure are fundamental components of phonological competence and play a crucial role in uncovering other linguistic properties (Zamuner and Kharlamov, 2016). By defining the permissible combinations of sounds within a language, phonotactic constraints establish structural patterns that guide the formation of syllables and words. These constraints enable speakers to intuitively recognize acceptable sound sequences, facilitating word recognition and fluent speech production. Mattys and Jusczyk (2001) further emphasize that learners who acquire knowledge of phonotactic patterns in a language can use this awareness during real-time language processing to identify potential word boundaries, ultimately aiding lexical acquisition and expansion.

This chapter presents a detailed analysis of the phonotactics of Chokri, exploring the permissible patterns of sounds within the language and the rules governing how phonemes are arranged in syllables and words. Alongside the analysis of Chokri phonotactics, the chapter also explores various phonological processes that influence Chokri sounds in different

linguistic environments. Phonological processes, such as assimilation, lenition, deletion, and epenthesis, play a vital role in shaping how sounds are realized in Chokri and contribute to the fluidity of spoken Chokri. These processes may occur to ease articulation, simplify complex sound clusters, or adapt borrowed words to fit Chokri phonological rules. By examining both phonotactic constraints and phonological processes, this chapter provides a comprehensive view of how phonetic and phonological rules interact to maintain the structure and intelligibility of Chokri speech.

3.2. Syllable Structure

Syllable structure is often used to identify and describe phonotactic patterns observed across the world's languages (Fudge, 1969). Chokri follows a strict open syllable structure. The canonical syllable structure of Chokri is (C_1) (C_2) V T, where V stands for a vowel, C represents an optional consonant, and T represents tone. This structure permits syllables to begin with one or two consonants, though the syllable must always end in a vowel. This can be visualized with the diagram in Figure 3.1.

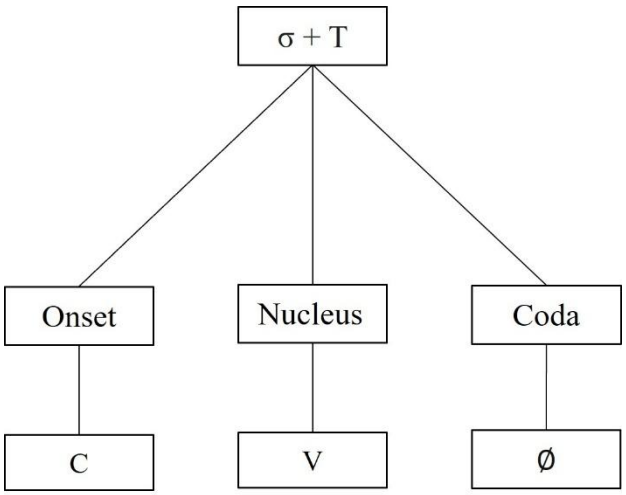

Figure 3.1: Syllable structure

3.2.1. Monosyllabic Word

Reflecting a common typological feature of Tibeto-Burman languages, Chokri predominantly features monosyllabic words. Chokri monosyllabic words display three main configurations: [V], consisting solely of a vowel; [CV], containing one consonant followed by a vowel; and [CCV], featuring a two-consonant onset before the vowel. We begin by looking at

monosyllabic patterns in order to arrive at certain generalizations with regard to the distribution of segments within the syllable.

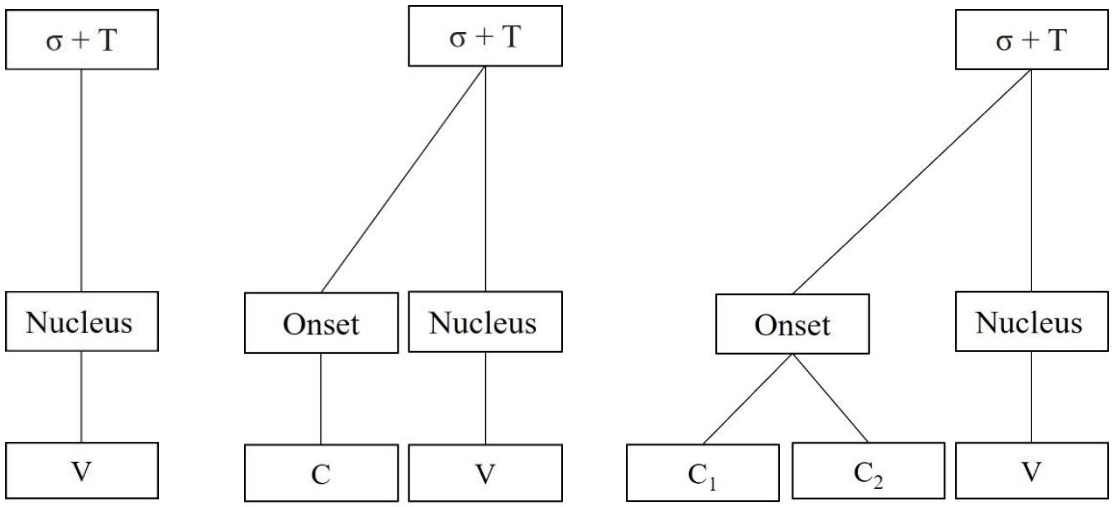

Figure 3.2: Monosyllabic patterns in Chokri

3.2.1.1. Open Monosyllable V or Syllabic Nasals

This syllable pattern consists of a single vowel or a syllabic nasal forming an independent syllable. The vowels /a, ɛ, i, ɔ, u/ and syllabic nasals /m̩, n̩/ can occur in this structure.

(i)	[a]	'1 POSS'
	[ɛ]	'yes'
	[i]	'1SG'
	[ɔ]	'okay'
	[u]	'he/she'
	[n̩]	'2 POSS'
	[m̩]	'yes' (agreeing)

3.2.1.2. Open Monosyllable C_1V

These types of syllables are foundational in Chokri and shape the language's phonotactic patterns, supporting the language's preference for open and compact syllabic structures. In this syllable pattern all the consonant sounds except the bilabial approximant /w/ can occur in the C position and all the Chokri vowels can occur in the V position.

(ii)	[pɔ̀]	'drip'	[pʰɔ̄]	'body'	[bí]	'taro'
	[tɛ̄]	'cultivate'	[tʰā́]	'insult'	[dɔ̀]	'weave'

[kɔ̄]	‘stitch’	[kʰù]	‘bitter’	[gá]	‘leafy vegetable’
[mà]	‘grow’	[m̥ʰɔ́]	‘dream’	[nɔ́]	‘you’
[n̥ʰá]	‘grass’	[ŋɔ̋]	‘see’	[ɲɔ̀]	‘to runover’
[n̥ʰɔ]	‘mop’	[fə́]	‘push’	[vɑ̋]	‘erase’
[sí]	‘seed’	[zɛ̄]	‘machate’	[ʃú]	‘pay’
[ʒɛ̋]	‘hunt’	[tʃɛ̄]	‘wet’	[tʃʰɛ̀]	‘knit’
[dʒɔ̄]	‘fry’	[tsə́]	‘small’	[tsʰə̄]	‘sun dry’
[hù]	‘some’	[lɑ̋]	‘think’	[ɾī]	‘aim’
[ɻɔ̄]	‘respect’	[jī]	‘field’	[pfə̄]	‘victory’

3.2.1.3. Open Monosyllable C_1C_2V

In this pattern, only the voiceless stops and voiceless aspirated stops can occupy the C_1 position, and only voiced rhotic can occur in the C_2 position. While all the vowels except high back vowel /u/ can occur in the V position.

(iii)	[pɾī]	‘strand’	[pʰɾə̀]	‘untie’
	[tɾɑ́]	‘drink’	[tʰɾɛ̋]	‘contemporary’
	[kʰɾɑ̋]	‘love’	[kɾɔ̄]	‘many’

3.2.2. Disyllabic Words

As was observed in the monosyllabic words, similar phonotactic restrictions are observed in both the syllables of disyllabic words. In Chokri, the following patterns are attested in disyllabic words: V.CV, CV.CV, CCV.CV and CV.CCV.

3.2.2.1. Disyllabic V.CV

The phonotactic restrictions observed in monosyllabic words extend to both syllables in disyllabic words. The vowels that appear in the V structure of monosyllabic words can also occur in the initial syllable while all the vowels in Chokri are permissible in the final syllable in disyllabic words with V.CV pattern. All the 34 consonants in Chokri can occupy the C position V.CV disyllabic structure.

(iv)	[ū.ní]	‘they’ (exclusive)	[ā.wú]	‘we’ (inclusive)
	[ɔ̄.hɛ̋]	‘rhino’	[ī.lɛ̄]	‘yes’
	[ɛ̄.lɛ̋]	‘slowly’		

3.2.2.2. Disyllabic CV.CV

All the vowels can occur in the V position in the initial as well as the final syllable. All consonants can occupy the C position in both the syllables containing CV.CV structure.

(v)	[pĭ.ɾə̄]	'umbrella'	[tʃĕ.kă]	'door'
	[tʰə̄.zǎ]	'blood'	[mā.tʰɔ̆]	'honest man'
	[bɔ̄.lā]	'shirt'	[vɛ̄.wŭ]	'thank you'
	[dʒə̄.kɔ̆]	'cold water'	[mə̄.ʔə̀]	'smart'
	[bɛ̄.zĭ]	'palm'	[tʰī.zɛ̆]	'deer'

Similarly, all the CCV structures permissible in monosyllabic words are also found in disyllabic words with CCV.CV ([pɾŏ.tʃɛ̆] 'hut') and CV.CCV ([mɛ̄.pɾə́] 'scared') patterns. However, the CCV.CCV structure is not attested in the language. Based on the analysis of monosyllabic and disyllabic word patterns in Chokri, the following conclusions can be drawn regarding its syllable structure:

1. **Syllable Structure Rules**

(i) Chokri has a predominantly open syllable structure.
(ii) All seven vowel phonemes in the language can serve as the syllable nucleus.
(iii) In addition to vowels, the voiced bilabial nasal /m̩/ and the voiced alveolar nasal /n̩/ can be syllabified to occupy the nucleus position.
(iv) Except for the mid-central vowels, all other vowels can occur as a syllable nucleus and also in syllable-initial position.

2. **Consonant Distribution and Restrictions**

(i) All consonants in Chokri can appear in the onset position, except for the voiced bilabial approximant /w/[3], which is attested in this position only in interjectory words.
(ii) The phoneme /tsʰ/ is the most marked consonant in Chokri, with its limited occurrence and attested only with the central vowel schwa /ə/.

[3] The phoneme /w/ shows a marked restriction in its distribution, primarily occurring in interjectional words rather than across a broader lexical range (except in a couple of words). This suggests that while phonotactic rules allow /w/ in principle, its usage may be shaped by functional factors. The restricted usage of the phoneme relates to how its occurrence may serve specific communicative or linguistic roles rather than being a purely phonotactic limitation.

3. **Vowel – Consonant Co-occurrence Restrictions**

(i) The central vowel schwa [ə] does not co-occur with stops, approximants, alveolar nasals, bilabial nasals, or glottal.

(ii) The central vowel [ə] does not co-occur with post-alveolars, voiceless aspirated alveolar affricate, bilabial approximant, or palatal sounds.

(iii) The high back vowel [u] does not occur with voiceless aspirated alveolar stop, voiceless aspirated alveolar affricate, alveolar nasals, or voiceless labiodentals.

(iv) The mid-back vowel [ɔ] does not co-occur with voiceless aspirated alveolar affricate, or voiceless labiodentals.

(v) The low central vowel [a] does not co-occur with voiceless labiodentals, post-alveolars, voiceless aspirated alveolar affricate, or palatal approximant.

(vi) The mid-front vowel /ɛ/ does not co-occur with voiceless labiodentals, velars, voiceless aspirated bilabial nasal, or palatal approximant.

(vii) The high-front vowel [i] does not co-occur with voiced velars, voiceless aspirated alveolar affricate, bilabial approximant, voiceless aspirated bilabial nasal, or voiceless aspirated post-alveolar affricate.

(viii) All the bilabial plosives [p, p^h, b], fricatives [v, s, z], affricate [ts], and rhotic tap [ɾ, ɾ̥] are the least marked consonants occurring with all the seven vowels.

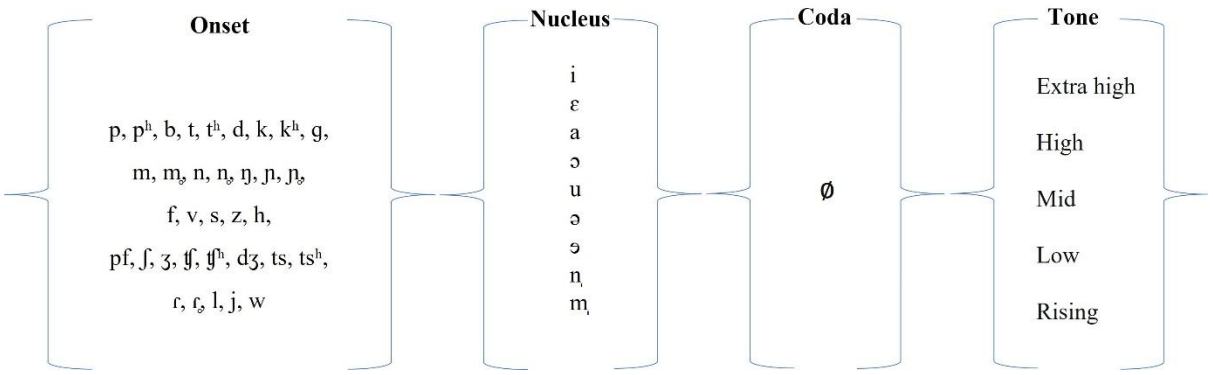

Figure 3.3: Permissible sounds in onset, nucleus, and coda positions

C	C_2	V	T
[p, pʰ, b, t, tʰ, d, k, kʰ, g, m, m̥ʰ, n, n̥ʰ, ŋ, ɲ, ɲ̊ʰ, f, v, s, z, h, pf, ʃ, ʒ, ʧ, ʧʰ, dʒ, ts, tsʰ, ɾ, ɾ̥, l, w]	ɾ, ɾ̥	[i, ɛ, a, ɔ, u, ə, ɘ]	Extra high High Mid Low Rising

Table 3.1: Phonotactic distribution of syllabic constituents.

	[i]	[ɛ]	[a]	[ɔ]	[u]	[ɘ]	[ə]
[p]	✓	✓	✓	✓	✓	✓	*
[pʰ]	✓	✓	✓	✓	✓	✓	*
[b]	✓	✓	✓	✓	✓	✓	*
[t]	✓	✓	✓	✓	✓	✓	*
[tʰ]	✓	✓	✓	✓	*	✓	*
[d]	✓	✓	✓	✓	✓	✓	*
[k]	✓	*	✓	✓	✓	✓	*
[kʰ]	✓	*	✓	✓	✓	✓	*
[g]	*	*	✓	✓	✓	✓	*
[m]	✓	✓	✓	✓	✓	✓	*
[m̥ʰ]	*	*	✓	✓	✓	✓	*
[n]	✓	✓	✓	✓	*	✓	*
[n̥ʰ]	✓	✓	✓	✓	*	✓	*
[ɲ]	✓	✓	✓	✓	✓	*	✓
[ɲ̊ʰ]	✓	✓	✓	✓	✓	*	✓
[ŋ]	*	*	✓	✓	✓	✓	*
[f]	✓	*	*	*	*	✓	✓
[v]	✓	✓	✓	✓	✓	✓	✓
[f]	✓	✓	✓	✓	✓	✓	✓
[s]	✓	✓	✓	✓	✓	✓	✓
[z]	✓	✓	✓	✓	✓	✓	✓
[ʃ]	✓	✓	*	✓	✓	*	✓
[ʒ]	✓	✓	*	✓	✓	*	✓
[h]	✓	✓	✓	✓	✓	✓	*
[ts]	✓	✓	✓	✓	✓	✓	✓
[tsʰ]	*	*	*	*	*	*	✓
[ʧ]	*	✓	✓	✓	✓	*	✓
[ʧʰ]	✓	✓	*	✓	✓	*	✓
[dʒ]	✓	✓	*	✓	✓	*	✓
[pf]	✓	*	*	*	*	✓	✓

[l]	✓	✓	✓	✓	✓	✓	*
[j]	✓	✓	*	✓	✓	*	*
[ɾ	✓	✓	✓	✓	✓	✓	✓
[ɻ]	✓	✓	✓	✓	✓	✓	✓
[w]	*	✓	✓	✓	✓	*	*

Table 3.2: Permissible combination of consonant-vowel in Chokri.

Chokri is a tonal language, and tone plays a crucial role in its phonological system. It functions similarly to a phoneme in its ability to convey meaning. This means that tones are as important as consonants and vowels in distinguishing between lexical or grammatical meanings. For example, in Chokri, a syllable such as [ba] could mean one thing with a high tone and something entirely different with a low or a mid-tone. In this sense, the tone behaves like a "coda," supplementing the segmental features of a syllable to encode meaning. Unlike non-tonal languages, where the primary distinction in meaning may rely on consonants and vowels, Chokri utilizes tone as an essential phonemic unit.

When analyzing syllable structure in Chokri, it is thus critical to include tone as part of the syllable template. While the canonical syllable structure of Chokri is $(C_1)(C_2)V$, the tonal component must be acknowledged as an additional layer within the syllable. Without accounting for tone, any discussion of phonotactics, word formation, or minimality requirements in Chokri would be incomplete. Every Chokri syllable inherently bears a tone (detailed tonal contrasts are discussed in the next chapter). While all contrastive tones can be attested in a monosyllabic root, the realization of these tones is position-dependent in a disyllabic root[4]. In a bisyllabic/disyllabic root, the ultimate or the final syllable carries the lexical tone of the word where all the five contrastive tones can occur, whereas the preceding syllable(s) is/are restricted to the mid tone. The initial and penultimate syllables do not carry contrastive lexical tones, but they are not toneless[5]. Instead, they have fixed, predictable tones from the language's tonal system, regardless of the tones of nearby syllables. These tones usually appear in less prominent positions, where the tone does not affect word meaning. This, in turn, indicates the distribution of tone in the language based on the prominence of syllables. We can thus assume that the ultimate syllable is the most prominent in Chokri, which carries the lexical meaning of the word, while the initial or penultimate syllables, which typically carry the default mid tone, serves as a supportive or neutral role (more details in Chapter 4).

[4] More discussion on this can be seen in Chapter 4 and 6

[5] Syllables whose pitch is determined by that of the preceding or following syllables (Yip, 2002).

3.3. Phonemes and Allophones

3.3.1. Complementary Distribution

In Chokri, certain segments alternate with trilled variants in a predictable environment, forming allophonic relationships through complementary distribution. Specifically, bilabial plosives and rhotics shift to their corresponding trills when they occur before the central vowel /ə/. The following patterns are observed:

(i) p > p̚ʙ / ___ ə

(ii) p^h > $p̚ʙ^h$ / ___ ə

Voiceless bilabial plosives /p/ and /p^h/ become the voiceless bilabial trills [p̚ʙ] and [$p̚ʙ^h$] respectively before /ə/.

(iii) b > ʙ / ___ ə

The voiced bilabial plosive /b/ becomes the voiced bilabial trill [ʙ] before /ə/.

(iv) ɾ > r / ___ ə

(v) ɾ̥ > r̥ / ___ ə

The alveolar flap /ɾ/ is realized as the alveolar trill [r] in the same environment, and similarly, its voiceless counterpart /ɾ̥/ surfaces as [r̥] before /ə/.

This transformation is influenced by the articulatory effort required when the central vowel follows a tap, leading to a trill due to increased contact duration or muscular effort. When the central vowel follows a tap, the transition between the quick tap and the vowel can lead to an increased duration or muscular effort in the articulation, causing the tap to transform into a trill. The central vowel allows for a relatively neutral tongue position, which can facilitate the repeated contact necessary for a trill.

3.3.2. Free Variation

The sounds [g] and [ɣ] are allophones of the phoneme /g/ and occur in free variation, meaning they can be used interchangeably without altering the meaning of the word. For example, /ga/ and /ɣa/ both mean ‘leafy vegetables,’ and [məga] and [məɣa] both mean ‘white.’ However, the use of the plosive [g] is more common among younger speakers and those living in urban areas.

In Chokri, the phenomenon of free variation arises as a result of phonological processes: fortition, where the fricative [ɣ], produced with a narrow constriction allowing turbulent airflow, changes to the stop [g], which is characterized by complete closure at the velar place of articulation. The velar fricative [ɣ], which is the base form, is undergoing a phonological shift from weaker to stronger articulation. This claim is made based on the observation that older Chokri speakers primarily use the velar fricative, while the velar stop was not originally part of the Chokri phonetic system. This shift likely resulted from language contact, particularly with the English language. As a result, Chokri speakers, especially among the older generations, often pronounce words like green as [dɾin] and ground as [dɾaɔn], reflecting the adaptation in pronunciation.

Phoneme	**Allophone**	**Environment**	**Examples**
/p/	[p]	Elsewhere	[pɛ́] ‘mushroom, [pɔ́] ‘tell’, [pí] ‘head’, [pā] ‘balding’ [pɔ̀] ‘one’, [pù] ‘masculine’
	[ʙ̥]	Before the central vowel /ə/	[ʙ̥ə̄] ‘bloom’
/pʰ/	[pʰ]	Elsewhere	[pʰɛ̄] ‘leg’, [pʰɔ̄] ‘body’, [pʰɪ́] ‘act of swearing,’ [pʰá] ‘tie,’ [pʰɔ́] ‘to extract tooth,’ [pʰú] ‘search.’
	[ʙ̥ʰ]	Before the central vowel /ə/	[ʙ̥ʰə̀] ‘to turn over something/ someone.’
/b/	[b]	Elsewhere	[bɛ̄] ‘hand’, [bɔ̄] ‘surround’, [bí] ‘taro,’ [bá] ‘add,’ [bɔ́] ‘scoop,’ [bù] ‘loose fit.’
	[ʙ]	Before the central vowel /ə/	[ʙɔ́] ‘to defecate’
/g/	[g]	Free variation	[mə̄gɑ̆] or [mə̄ɣɑ̆] ‘white’ [gá] or [ɣá] ‘leafy vegetable’ [gə̄] or [ɣə̄] ‘melt’
	[ɣ]		
/ɾ/	[ɾ]	Elsewhere	[ɾī] ‘aim, [ɾɛ́] ‘drive’, [ɾá] ‘pluck’ [ɾɔ̀] ‘bind’, [ɾə̀] ‘to saw’ [ɾū] ‘boat’
	[r]	Before the central vowel /ə/	[rə̄] ‘to rain’, [prə́] ‘fly’
/ɾ̥/	[ɾ̥]	Elsewhere	[ɾ̥ī] ‘to sharpen’, [ɾ̥ā] ‘afford’, [ɾ̥ɛ̄] ‘draw’, [ɾ̥ɔ̄] ‘to respect’

			[ɾ̥ə̄] ‘alive’, [ɛ̄ɾ̥ŭ] ‘throb’
	[ɾ̥]	Before the central vowel /ə/	[ɾ̥ə̋] ‘to insult’

Table 3.3: Allophones of Chokri.

The phenomenon of complementary distribution among bilabial plosives and rhotic sounds illustrates how the language employs specific allophones in different phonetic environments, particularly influenced by the presence of the central vowel [ə]. This system helps maintain phonetic consistency and ease of articulation within the language. In contrast, the occurrence of free variation with the phoneme [g] demonstrates flexibility in pronunciation without impacting meaning, reflecting potential sociolinguistic factors such as age and urbanization

3.4. Consonant Cluster

As seen earlier in section 3.2.1.3., the voiceless stops [p, t, k] and voiceless aspirated stops [pʰ, tʰ, kʰ] can occur together with voiced alveolar tap [ɾ], giving rise to consonant cluster/consonant blend. Chokri clusters do not allow more than two consonants. These clusters can occur in both initial and medial positions.

Consonant cluster C_1C_2	Word-initial		Word-medial	
[p+ɾ]	**[pɾɔ̋ʧɛ́]**	‘hut’	[mɛ̄**pɾ**ɔ́]	‘afraid’
[pʰ+ɾ]	**[pʰɾ**ɔ̄]	‘sour’	[bɛ̄zɪ́**pʰɾ**ɛ̄]	‘slap’
[t+ɾ]	**[tɾ**ɔ̀]	‘tear’	[mɛ̄**tɾ**ɪ̄]	‘ash’
[tʰ+ɾ]	**[tʰɾ**ɪ̄]	‘bold/hard’	[sɔ̄**tʰɾ**ɪ́]	‘shade’
[k+ɾ]	**[kɾ**ɔ̄tʰɔ̀]	‘group’	[kɔ̄ɾɔ̄**kɾ**ā]	‘commemorate’
[kʰ+ɾ]	**[kʰɾ**īstɑ̋]	‘christ’	[kɔ̄**kʰɾ**ə̋]	‘Love’

Table 3.4: Consonant clusters in initial and medial positions

Consonant clusters in Chokri are relatively simple, consisting of only two consonants. The combinations primarily involve voiceless stops or voiceless aspirated stops followed by the voiced alveolar tap [ɾ]. These clusters are versatile, occurring in both initial and medial positions. The limited complexity of Chokri consonant clusters reflects the language’s overall phonological structure, which favors ease of articulation while still allowing for a degree of consonantal variety.

3.4.1. Sonority Sequencing Principle

Studies have found that syllables beginning or ending with consonant clusters tend to adhere to the sonority sequencing principle less regularly (Blevins, 2006). According to the SSP,

within a syllable, sounds should generally progress in a specific way: the sonority of sounds rises toward the nucleus (typically a vowel) and falls again as they approach the syllable's edges. This principle helps create a natural, perceptible flow within syllables, with sounds like obstruent (stops and fricatives) appearing at syllable edges due to their lower sonority, and sonorous sounds like liquids and nasals nearer to the vowel.

In Chokri, the permitted onset consonant clusters align with the SSP by rising in sonority from an obstruent to a more sonorous liquid, thus following a structured sonority sequence. For instance, the clusters in [tʰɾa] 'to spread out (a mat),' [pɾə] 'fly,' and [tɾɔ] 'many' each move from an obstruent [tʰ, p, t] to a liquid [ɾ], creating a smooth, rising pattern that satisfies SSP requirements. This adherence to the SSP may support clarity and distinctiveness in Chokri syllables by reinforcing sonority patterns that listeners can easily recognize and process.

3.5. Word Minimality Requirement.

Tibeto-Burman languages have been noted to have different syllable requirements for nouns and verbs (Teo, 2014). Having different minimal syllabic/moraic requirements for nouns and verbs is not unusual among the Tibeto-Burman languages of Nagaland. In Sumi, an Angami-Pochury language, verbs are minimally monosyllabic, while nouns are minimally disyllabic (Teo, 2014). Chungli Ao verbs are minimally bimoraic, and nouns are minimally monomoraic, while verbs in Mongsen Ao are minimally monomoraic, and nouns are minimally bimoraic (Temsunungsang, 2008). Khezha/Kuzhale, another language of the Chakhesang Naga spoken by a sub-group called 'Kuzhami,' has a minimally disyllabic noun. Kapfo (1989) states that Khezha nouns have the canonical structure of eCV, where CV is a monosyllabic noun root, and the prefix e- is added to fulfill the requirement that words be minimally disyllabic.

The Chokri language exhibits a monosyllabic word minimality requirement for both nouns and verbs, meaning that words in Chokri must consist of at least one syllable to be valid. Chokri's phonological system is characterized by predominantly monosyllabic words with an open syllable structure. For example, a structure like [CV] is sufficient to constitute a valid word, meeting the minimal syllabic requirement for both nouns and verbs.

Verbs	Gloss	Nouns	Gloss
[tʰɔ̋]	Write	[pɛ̋]	Mushroom
[bá]	Sit	[sɔ́]	Tree/wood
[tā]	Chew	[tʃɛ̋]	House

[pʰá]	Tie	[pə̃]	Bridge
[ʃə̃]	Wipe	[mɛ́]	Fire
[pɔ̀]	Drip	[lɛ́]	Cooking pot

Table 3.5: Illustrative examples of minimal verb and noun structures in Chokri

The table above shows that both Chokri verbs and nouns are minimally monosyllabic. However, it has been observed that purely monosyllabic nouns are limited compared to those of verbs. In some cases, there are some noun classes whose roots are monosyllabic, but they require an obligatory presence of possessive prefixes such as /ú-, ū, ā, n̩/, particularly the nouns that represent body parts and kinship terms. These patterns arise because body parts and kinship terms are semantically relational nouns: their meanings inherently depend on a possessor. While their phonological roots might meet the minimality requirement, they require affixes to encode relationships, making these nouns functionally complete within the grammar of the language.

3.6. Phonological Processes

Phonological processes are a part of language development. It is a process in which the language is modified in speech for ease of articulation. The phonological processes in Chokri are mostly observed in the affixes, where affixes are modified to simplify the language patterns. These changes make the word structure more consistent with the language's phonological rules and make it easier to pronounce in spoken speech. The language often simplifies affixes to align with its phonological preferences. This simplification process typically involves various phonological changes such as deletion, lenition, assimilation, etc.

3.6.1. Deletion

Deletion is a phonological process where a sound that is present in the underlying form of a word is deleted in the spoken/surface form. Deletion can be of various types depending on where the segment is deleted. When a segment is deleted word initially, it is called aphesis. When a segment is deleted word medially it is called syncope and when a segment is deleted word finally it is known as apocope

3.6.1.1. Vowel Deletion

In Chokri, the suffix "-no" pronounced [-nɔ], often undergoes vowel deletion in spoken speech, where the vowel /ɔ/ is deleted. As a result, the /n/ becomes syllabic, transforming [tsə-nɔ] into [tsə-n̩]. Here, the suffix is articulated as a syllabic [n̩], creating a new syllable nucleus.

(1) tsə̀-**nɔ̄**	ā-zā-lɛ̄	>	tsə̀-**n̩̄**	ā-zā-lɛ̄	
that-TOP	1SG-POSS-DECL		that-TOP	1SG-POSS-DECL	
'That is mine'					

(2) ā-pɔ̄-**nɔ̄**	n̩-ʧə̃-vá-lɛ̄	>	ā-pɔ̄-**n̩̄**	n̩-ʧə̃-vá-lɛ̄	
1POSS-father-TOP	2-call-PROG-DECL		1POSS-father-TOP	2-call-PROG-DECL	
'My father is calling you'					

3.6.1.2. Consonant Deletion

In Chokri, the language's preference for an open syllable structure leads to the frequent dropping of consonants in the coda position when loanwords are adapted. This process of consonant deletion is a key strategy for nativizing foreign words to fit the phonological norms of Chokri.

(3) **"Baltin"** (bucket): In Chokri, the final [n] in "baltin" is dropped, resulting in "**balti**" or **"barüti."**

(4) **"Sabun"** (soap): The final [n] is deleted, yielding the Chokri form **"sabu."**

(5) **"Dukan"** (shop): The final [n] is dropped, producing the Chokri adaptation **"duka."**

(6) **"Light bulb"**: The final [t] and [b] is dropped resulting in **"lai bol"**

These examples illustrate how Chokri simplifies loanwords by removing coda consonants, ensuring that the words conform to the language open syllable structure. This phonological process helps integrate foreign words into Chokri while maintaining the language characteristic sound patterns.

3.6.1.3. Syncope

Syncope, the deletion of a middle segment within a word, is a phonological process observed in Chokri. For instance, in the word [tɔvɛ], (Future-subjunctive) the middle segment [v] is deleted, resulting in the simplified form [tɔɛ].

(7) ā-ɲū	pɔ́-nɔ̄ sə̄-bī	tɔ̀-**vɛ̄**	>	ā-ɲū	pɔ́-nɔ̄ sə̄-bī tɔ̀-**ɛ̄**
my-child	let-TOP that-like	FUT-SUBJ		my-child	let-TOP that-like FUT-SUBJ
'Will let my child be like that'					

(8) hīhī-kʰà John tsə̀	tɔ̀-**vɛ̄**		>	hīhī-kʰà John tsə̀	tɔ̀-**ɛ̄**
DEM-DAT John give	FUT-SUBJ			DEM-DAT John give	FUT-SUBJ
'Will give this to John'					

3.6.1.4. Morpheme Deletion

Morpheme deletion is a phonological process where a morpheme is omitted from a word during speech. Morpheme deletion often results in a more simplified pronunciation.

In Chokri, suffixes that indicate aspects are often dropped in spoken speech like the progressive aspect [-vá], resultative aspect [-jì], perfective aspect [-vɛ̋] and definiteness marker [-pə̀-] and [jɔ̄]. The deletion of the morpheme is compensated by the retention of the tone via floating tone which attaches to the verbal root (more details in chapter 5).

(9) Deletion of progressive aspect [-vá]

a. í lɔ̄vā tì-**vá**-lɛ̄ > í lɔ̄vā tì**í**-lɛ̄
1SG food eat-PROG-DECL 1SG food eat.PROG-DECL
'I am eating food'

b. í lé ɟʰɔ́-**vá**-lɛ̄ > í lé ɟʰɔ́ɔ́-lɛ̄
1SG pot cook-PROG DECL 1SG pot cook.PROG-DECL
'I am cooking'

(10) Deletion of resultative aspect [-jì]

a. í lɔ̄vā tì-**jì**-tɛ́-lɛ̄ > í lɔ̄vā tì**ì**-tɛ́-lɛ̄
1SG food eat-RES-PRF-DECL 1SG food eat.RES-PRF-DECL
'I have eaten food'

b. í lé ɟɔ́-**jì**-tɛ́ lɛ̄ > í lé ɟɔ́ɔ̀-tɛ́-lɛ̄
1SG pot cook-RES-PRF-DECL 1SG pot cook.RES-PRF-DECL'
'I have cooked'

(11) Deletion of Perfective aspect [-vɛ̋] or [vā̋]

a. í dimapur-lɔ̄ vɔ́-**vā̋**-lɛ̄ > í dimapur-lɔ̄ vɔ́ɔ̋-lɛ̄
1SG Dimapur-LOC go.PFV-DECL 1SG Dimapur-LOC go.PFV-DECL
'I have been to Dimapur'

b. í hīhī tì-**vā̋**-lɛ̄ > í hīhī tì**ī̋**-lɛ̄
1SG DEM eat-PRF-DECL 1SG DEM eat.PRF-DECL

'I have eaten this'

(12) Deletion of definiteness marker [-pə̀-]

a. hī-**pə̀**-hī ā-bɔ̄lā lɛ̄ > hī**ì**hī ā-bɔ̄lā-lɛ̄
this-DEF-this my-shirt-DECL this.DEF.this my-shirt-DECL
'This one is my shirt'

b. hīhī sɔ́-**pə̀**-zā? > hīhī sɔ́**ɔ̀**-zā?
This who-DEF-POSS This who.DEF-POSS
'Whose is this?'

3.6.2. Insertion

Chokri, like many languages with a strong preference for open syllable structures, the language also adapts foreign words ending in consonants by inserting a vowel at the end of the word. This process, often referred to as epenthesis, aligns the loanword with the language's phonotactic rules, which favour syllables that end in vowels rather than consonants. For example, a foreign word such as (bus) might be adapted into Chokri as (busü), where the additional vowel ensures that the final syllable conforms to the open-syllable requirement. This vowel insertion not only facilitates smoother articulation but also harmonizes the borrowed word with the rhythmic and phonological patterns of the native lexicon. The selection of the inserted vowel is influenced by phonotactic constraints, with the central vowel schwa [ə] being the preferred choice. However, when [ə] is restricted by phonotactic rules discussed above, alternative vowels such as [i] or [ɘ] are used instead.

This adaptation strategy reflects the language's inherent tendency to maintain its structural integrity while integrating foreign lexical items, demonstrating a balance between linguistic innovation and adherence to traditional phonological norms. However, the specifics of vowel insertion may also depend on sociolinguistic factors, including the frequency of the borrowed word in everyday use and the extent of exposure to the source language.

(13) Bus > bus**ə**
Hass > has**ə** (duck)
Kettle > kitil**i**

However, there are notable instances where Chokri permits the retention of coda consonants in loanwords. In such case, the language shows a marked preference for preserving sonorants sounds, such as nasals and liquids, in the coda position. This preference can be attributed to the

higher sonority of nasals and liquids compared to obstruent. However, this is not to generalize that all nasals and liquids in the coda position will be retained.

(14) Ground > droun
Drum > dram
Long pant > lon pan

3.6.3. Lenition

Lenition is a phonological process where consonants become less forceful or softer in articulation. In Chokri, this process is evident in the transformation of words like [dipə] to [di-wə].

(15) hīhī dǐ-**pə̀** nā̋? > hīhī dǐ-**wə̀** nā̋?
DEM what-one QP? DEM what-one QP
'What is this?'

(16) n̄-zā sɔ̋-**pə̀** nā̋? > n̄-zā sɔ̋-**wə̀** nā̋?
2_{SG}-name who-one QP 2_{SG}-name who-one QP
'What is your name?'

Languages often favor sound transitions that align with increasing **sonority** in syllables. The shift from a plosive to an approximant follows this pattern, making syllables smoother in pronunciation (Selkirk, 1984). The weakening of the plosive **[p]** to the approximant **[w]** in Chokri, as seen in *di-pɘ* → *di-wɘ*, is an example of **lenition**, a common phonological process where a consonant becomes weaker or more sonorous when it occurs between two vowels. This process is known as intervocalic lenition and is often attributed to the principle of ease of articulation, as weaker consonants require less articulatory effort.

A similar process is found in Spanish, where /b, d, g/ undergo lenition between vowels, often becoming approximants [β, ð, ɣ] (Hualde, 2014). For example, lobo [ˈloβo] 'wolf' demonstrates how /b/, when positioned between vowels, weakens to [β]. In Celtic languages, lenition is a systematic feature where stops become fricatives or approximants in specific morphophonemic environments. In Irish, for instance, /p/ → /f/ and /b/ → /w/ in leniting contexts (Ó Siadhail, 1989).

Another motivation for lenition is to ease speech articulation. The shift from a plosive [p] to a glide [w] reduces the effort needed to produce the sound, making the word smoother to

pronounce (Kirchner, 2001). Additionally, the entire morpheme [pə] can be deleted rather than lenition while retaining the tone of the deleted morpheme as seen in (17 and 18).

(17) hīhī dǐ-**pə̀** nă? > hīhī dǐ-**wə̀** nă? or hīhī dǐ**ì** nă?
DEM what-one QP DEM what-one QP DEM what.one QP
'What is this?'

(18) n̄-zā sɔ̋-**pə̀** nă? > n̄-zā sɔ̋-**wə̀** nă? or n̄-zā sɔ̋**ɔ̀** nă?
2_{SG}-name who-one QP 2_{SG}-name who-one QP 2_{SG}-name who.one QP
'What is your name?'

3.6.4. Fortition

Fortition is a phonological process where a consonant becomes stronger or more constricted in its articulation. This typically involves a sound shifting from a less obstructive manner of articulation to one that requires more closure or increased resistance in the vocal tract. An example of fortition can be observed in Chokri, where the fricative [ɣ], produced with a narrow constriction allowing turbulent airflow, changes to the stop [g], which is characterized by complete closure at the velar place of articulation. The velar fricative [ɣ] which is the base form is undergoing a phonological shift from weaker to stronger articulation (fortition). This change is evident across all word positions and in all environments, as illustrated in the following examples:

(19) [ɣa̋] > [ga̋] 'to winnow'
[ɣāɲɔ̋] > [gāɲɔ̋] 'curry'
[ɣāt^{h}ɾɔ̃] > [gāt^{h}ɾɔ̃] 'roselle'
[mɛ̄ɣɔ́] > [mɛ̄gɔ́] 'tickle'
[t^{h}ɛ̄ɣɔ́] > [t^{h}ɛ̄gɔ́] 'frog'
[t^{h}ɔ̄ɣa̋] > [t^{h}ɔ̄ga̋] 'bear'

Another motivation behind this sound change is the ease of articulation, as stops are generally simpler and more precise to produce compared to the narrow constriction required for fricatives. The process of complete closure followed by a release burst is less demanding than the sustained, accurate constriction needed for fricatives. As the language reinforces the use of the velar plosive, the velar fricatives are gradually disappearing. However, it is in a transitional phase where both the sounds are found in the Chokri sounds with the velar fricative

predominantly found among older generations and individuals who have had less exposure to other languages[6].

3.6.5. Vowel Lengthening

Vowel lengthening is a phonological process where the duration of a vowel sound is extended. This can affect the meaning of a word or its grammatical function. In Chokri, vowel lengthening is use to indicate grammatical features such as mood and aspect. Chokri does not distinguish between short vowel and long vowel to derive lexical meaning. However, we see instances of vowel lengthening as a result of segment deletion. When a morpheme is deleted, the tone which carries the lexical/grammatical meaning is retained as a floating tone in the representation level which surfaces and concatenates with the tone of the preceding lexical unit. The hosting tone bearing unit (TBU), which is usually the vowel undergoes the process of vowel lengthening in order to accommodate the floating tone in the surface level as seen in examples (9) to (12). This deleted morpheme are often grammatical particles particularly aspects and mood. When the vowel gets lengthened it host not only the tone but also carry the grammatical meaning of the deleted morpheme.

Vowel lengthening also serves a critical function of adding intensity or emphasis to a word or phrase. This elongation can signify several nuances: it can intensify the meaning of an adjective, an action, or convey emphasis in an emotional expression. By extending the duration of a vowel sound, speakers give added weight to the word, making it stand out and enhancing its meaning.

3.6.6. Assimilation.

Assimilation is a process where a sound changes to become more similar to a neighbouring sound, making pronunciation easier. The goal of assimilation is often to simplify speech by reducing the effort needed to transition between different sounds.

[6] We support this claim by observing that the velar fricative is primarily used by older Chokri speakers, while the velar stop was not originally part of the Chokri phonetic system. This shift likely resulted from language contact, particularly with the English language. As a result, Chokri speakers, especially among the older generations, often pronounce words like *green* as /dɾin/ and *ground* as /dɪaɔn/, reflecting the adaptation in pronunciation.

3.6.6.1. Voicing Assimilation

In Chokri, the perfect marker suffix [-tɛ] changes to [-dɛ]. This phonological process is a form of assimilation, where the voiceless plosive [t] becomes voiced to harmonize with the vowel [ɛ], making the transition between sounds easier to articulate.

(20) í lɘ̄vā tì-**t**ɛ́ > í lɘ̄vā tì-**d**ɛ́
1sg food eat- PRF 1sg food eat-PRF
'I have eaten food'

(21) ā-zŭ yĭ-lɘ̄ tsɘ̄-**t**ɛ́ > ā-zŭ yĭ-lɘ̄ tsɘ̄-**d**ɛ́
my-mother field-LOC go- PRF my-mother field-LOC go- PRF
'My mother has gone to the field'

3.6.7. Syllabification

Syllabification is the process where a consonant serves as the nucleus of a syllable. In Chokri, the bilabial and alveolar nasals [m] and [n] can undergo syllabification, functioning as syllabic contoid: phonetic consonants that behave like phonological vowels. The following examples illustrate syllabic contoids in Chokri:

(22) [**n̩**.p^{h}ɛ] 'your leg'
(23) [**m̩**] 'yes'
(24) [**n̩**.t^{h}ɔ] 'yourself'
(25) [**n̩**] '2 POSS'

3.7. Conclusion

The syllable structure and phonological processes of Chokri reflect its typological alignment with other Tibeto-Burman languages while showcasing unique characteristics that distinguish it from other related languages. Chokri follows an open syllable structure with a canonical (C)(C)V pattern. This structure highlights the language's phonotactics, where consonant clusters, though limited, adhere to principles like the Sonority Sequencing Principle (SSP), maintaining phonological harmony. Additionally, Chokri's allowance of nasals and liquids in coda positions for lexical adaptation highlights its flexible approach to foreign borrowings while adhering to its core structural principles.

Phonological processes such as vowel deletion (apocope), vowel insertion, lenition, fortition, consonant simplification, etc., further demonstrate the dynamic interplay between phonotactics

and morphophonology. Tone plays a crucial role in Chokri, not only distinguishing lexical meanings but also influencing syllable structure. The presence of default tones and their position-dependent realization in polysyllabic roots showcases a systematic integration of tonal hierarchy within the language. Together, these features contribute to a highly systematic and nuanced phonological profile for Chokri. In the next chapter, we shall explore the tonal properties observed in Chokri.

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