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Consonant Inventory Of Hill Tiwa: A Descriptive Analysis

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Abstract: This paper presents a systematic account of the consonant system of Tiwa, a Tibeto-Burman language spoken in Northeast India, particularly in Assam and Meghalaya. Tiwa has two principal varieties, Hill Tiwa and Plain Tiwa (Moral, 2002). Previous descriptions of Tiwa phonology show considerable disagreement regarding the size and composition of its consonant inventory, especially in the treatment of voiced stops [b, d, g] and the alveolar fricative [z]. To address this, the study re-examines the consonant system of Hill Tiwa based on primary field data collected from native speakers in Umswai area of West Karbi Anglong district, Assam.

The analysis considers place and manner of articulation, phonemic contrasts, and positional distribution, with special attention to intervocalic voicing and distributional restrictions. The findings show that voiced stops [b, d, g] occur exclusively in intervocalic position, do not exhibit contrastive function, and are therefore analysed as allophones of /p, t, k/. The alveolar fricatives /s/ and /z/ are treated as distinct phonemes, although /z/ occurs only in medial position, while /s/ appears word-initially, medially, and finally. The limited distribution of /z/ suggests it may represent a recent innovation due to historical sound change or borrowing.

Based on these data, the study proposes an 18-phoneme consonant inventory for Hill Tiwa: /p, pʰ, t, tʰ, k, kʰ, m, n, ŋ, s, z, ʃ, h, tʃ, ɾ, l, w, j/. This revised inventory provides a more consistent account of Tiwa consonant phonology and contributes to the documentation and comparative study of Tibeto-Burman languages in Northeast India.

Keywords: Tiwa; Tibeto-Burman; Phonemic contrast; Positional distribution; Northeast India; Descriptive phonology.

1. INTRODUCTION

Tiwa is a Tibeto-Burman language of the Bodo-Garo subgroup spoken primarily in Assam and Meghalaya (Grierson, 1903). The speech community is divided into Hill and Plain Tiwa, associated with the varieties Datiyali and Hajowali respectively (Moral, 2002). Etymologically, the word *Tiwa* is often explained as deriving from *ti* 'water' and *wa* 'superior' (Thakur, 1985). Historically, they were referred to as "Lalung" (Bhuyan, 1932) in Assamese Buranjis and colonial records, and this designation also appears in the Constitution of India. However, contemporary community members generally prefer the ethnonym "Tiwa," though the term "Lalung" continues to be used by some neighbouring groups.

Like many languages of the region, Tiwa is characterized by widespread multilingualism, with speakers often proficient in Assamese, Karbi, Khasi, Hindi and other regional languages. While Plain Tiwa speakers have undergone significant language shift toward Assamese, Hill Tiwa continues to be actively used, particularly in regions such as Karbi Anglong district in Assam and Ri-Bhoi district in Meghalaya. The language lacks an indigenous script and is written using Roman or Assamese scripts. According to the Census of India (2011), the Tiwa population is approximately 371,000, of which only about 34,800 individuals are speakers of the language.

Despite its sociolinguistic importance, Tiwa remains insufficiently described in several aspects of its phonology. Existing studies (Gogoi, 1990; Joseph & Burling, 2006; Muchahary, 2016; Dawson, 2020; Brahma, 2022) have provided useful insights into the language, but descriptions of its sound system—especially the consonant inventory—vary considerably across sources. These differences are not unusual in work on lesser-described languages, where limited data, speaker variation, and differing analytical approaches often lead to inconsistent interpretations.

In the case of Tiwa, previous studies differ considerably in their accounts of the consonant inventory, both in terms of the number of phonemes proposed and the treatment of specific segments, especially with regard to voiced stops [b, d, g] and the status of voiced alveolar fricative [z]. These inconsistencies raise important questions about the nature of phonemic contrast and the role of distributional patterns in Tiwa. The extent to which certain segments function as independent phonemes or as contextually conditioned variants remains unclear, highlighting the need for a more systematic re-evaluation based on primary data. Recent phonological research has emphasized the importance of examining sound patterns in terms of their distribution and cross-linguistic variation (Blevins, 2007). Their behaviour in actual speech is also an important factor in phonological analysis.

The present study addresses this issue by examining the consonant system of Hill Tiwa using fieldwork data. It focuses on patterns of contrast, distribution, and variation in order to establish a more consistent account of the consonant inventory and to clarify areas of disagreement in earlier descriptions.

2. METHODOLOGY

This paper provides an overview of the consonantal inventory in Hill Tiwa, spoken in Assam particularly in Karbi Anglong district. The data for this study is collected from Tiwa-speaking villages in Umswai area of West Karbi Anglong district, Assam. A total of 22 speakers were consulted, including both male and female participants, with an approximate age range of 20-72 years. Umswai is predominantly inhabited by Hill Tiwas, where the language continues to be actively used in everyday communication. Speakers were selected based on linguistic competence, regular use of the language, and willingness to participate in recorded sessions. All consultants were fluent speakers who reported using Tiwa as their primary language in domestic and community settings.

Figure 1: *Map indicating Umswai in West Karbi Anglong District, Assam*[1]

The data consist of elicited wordlists, minimal pairs/near minimal pairs, short sentences, and recorded spontaneous conversations, comprising approximately 700 lexical items and 120 sentences collected during fieldwork. This study forms part of the first author's Ph.D. research. Data were collected by the first author during fieldwork conducted between 2022 and 2024 in Tiwa-speaking areas of Assam. Elicitation was conducted in a quiet environment, and recordings were made using a digital audio recorder (Zoom H4n) with an Audio Technica AT2040 microphone to ensure clarity and accuracy. All data were transcribed using the International Phonetic Alphabet (IPA), and analysis followed standard phonological procedures, including contrastive and distributional analysis. To ensure reliability, elicited forms were cross-checked across multiple consultants, who were older-generation native speakers (ages 55–72), selected for their fluency and knowledge of traditional Hill Tiwa forms to minimize influence from younger speakers or language contact. Although the study is primarily descriptive, spectrographic representations are included where relevant to illustrate salient phonetic properties of the consonants.

[1] Map created by the first author

3. PREVIOUS STUDIES ON TIWA

There has been some linguistic research on Tiwa, and a number of important descriptive and ethnographic works provide valuable insights. One of the earliest substantial documentations of Tiwa appears in Grierson (1904) which gives a brief grammatical remark on Tiwa and classified it within the Tibeto-Burman family, though the linguistic data were limited. More systematic linguistic attention emerged in the late twentieth and early twenty-first centuries. Descriptive studies have addressed aspects such as phonology, morphology, and dialect variation, especially distinguishing between Hill and Plain Tiwa varieties. Moral (2002) discussed the two major speech varieties—Datiyali (Hill Tiwa) and Hajowali (Plain Tiwa) and highlighted certain structural differences.

Studies on Tiwa phonology suggest that its consonant system broadly aligns with patterns observed across the Bodo-Garo subgroup of the Tibeto-Burman family. However, there is considerable variation in the literature regarding the size and composition of the consonant inventory. An important early contribution is the doctoral dissertation by Gogoi (1990), which provides one of the earliest extended discussions of Tiwa phonology. Gogoi proposes a consonant inventory of twenty phonemes, /p, b, t, d, k, g, ph, th, kh, m, n, ṅ, s, z, c, h, ɾ, l, w, y/, in which voiced stops /b, d, g/ and the voiced alveolar fricative /z/ are treated as independent phonemes, implying that voicing is phonemically contrastive. A similar treatment of voiced stops is found in Joseph and Burling (2006), who, in their comparative study of Bodo-Garo languages, propose a slightly larger inventory of twenty-one consonants, /ph, th, kh, p, b, t, d, k, g, c, j, m, n, ŋ, sh, s, h, w, y, r, l/. They included voiced stops /b, d, g/ as independent phonemes alongside their voiceless counterparts. However, their inventory does not include the voiced fricative /z/, indicating variation across studies in the treatment of fricative segments. Muchahary (2016) likewise proposes an inventory of approximately twenty-one consonants, including both voiced and voiceless stops as well as a range of fricatives, /p, b, t, d, k, g, ph, th, kh, m, n, ŋ, s, z, ʃ, h, č, r, l, w, j/, thereby maintaining a phonemic distinction based on voicing. In contrast, more recent studies (Dawson, 2020; Brahma, 2022) argue for a reduced inventory of around seventeen consonants. These analyses differ in their treatment of voiced stops, suggesting that segments such as [b, d, g] may not function as independent phonemes but rather as contextually conditioned variants of /p, t, k/. Brahma (2022), in particular, extends this analysis to fricatives, representing [z] as an alternant of /s/, thereby indicating a non-contrastive role for voicing. However, no substantial evidence is provided to show that /s/ and /z/ are non-contrastive.

Taken together, these studies reveal two major areas of disagreement in the analysis of Tiwa consonants: the phonemic status of voiced stops [b, d, g], and the inclusion and distribution of voiced alveolar fricative, [z]. Although earlier studies provide valuable descriptions of Tiwa phonology, these inconsistencies highlight the need for a systematic re-evaluation of the consonant inventory based on detailed distributional evidence and explicit criteria for distinguishing phonemes from allophones.

Therefore, the present study undertakes a re-evaluation of the Tiwa consonant inventory with the objective of presenting a more precise and coherent description of its segmental structure. By drawing on fresh field data and systematic analysis, this research extends earlier scholarship and provides a more comprehensive and detailed account of Tiwa consonant phonology.

4. CONSONANTS

Hill Tiwa has a moderately rich consonant inventory that includes stops, nasals, fricatives, affricate, lateral, tap or flap and approximants. This section provides a systematic description of the consonantal inventory of Hill Tiwa, focusing on phonetic properties and positional distribution. Consonants are classified by manner and place of articulation, and their occurrence in word-initial, medial, and final positions is illustrated with representative lexical items.

4.1 DESCRIPTION AND DISTRIBUTION OF CONSONANTS

4.1.1 Stop Consonants (Plosives)

Stops, also known as plosives, are produced by creating a complete closure at some point in the vocal tract, resulting in a temporary blockage of the airstream. The accumulated air pressure is then released abruptly, producing a characteristic burst of sound. As described by Ladefoged and Johnson (2015), stop production involves three phases: oral closure, pressure build-up, and release.

Hill Tiwa exhibits a three-way contrast in stop consonants at the bilabial, alveolar, and velar places of articulation. The voiceless stops ([p, t, k]) occur in all lexical positions, whereas the voiced stops ([b,

d, g]) are relatively infrequent and occur predominantly in intervocalic position. **Figures 2–4** show clear voicing during the closure phase, as indicated by the presence of low-frequency periodic energy (voicing bar). This provides acoustic evidence for the realization of [b, d, g] in intervocalic position. The voiceless aspirated stops ([pʰ, tʰ, kʰ]) occur only word initially and medially. **Table 1- 3** below illustrates their positional distribution:

Bilabial Stops [p, pʰ, b]

Table 1: *Positional distribution of bilabial stops [p], [pʰ] and [b]*

	Initial	**Medial**	**Final**
[p]	[pe] 'he/she'	[ʃupti] 'spit'	[tɔp] 'banana bud'
	[pasi] 'how much'	[kʰeplaŋ] 'behind'	[kʰup] 'very much'
[pʰ]	[pʰa] 'father'	[napʰlaŋ] 'dry fish'	-
	[pʰansɔp] 'beard'	[pʰuɾumpʰut] 'complete'	-
[b]	-	[abi] 'grandmother'	-
	-	[kabi] 'brother-in-law'	-

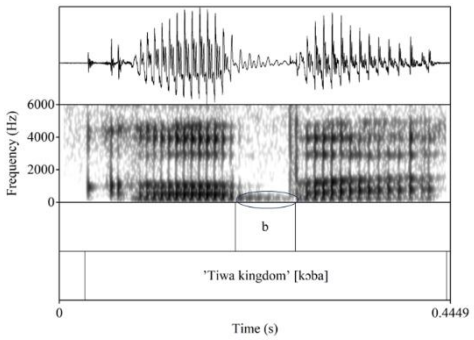

Figure 2: *Waveform and Spectrogram of [kɔba] 'tiwa kingdom' recorded in isolation by a male speaker*

Alveolar Stops [t, tʰ, d]

Table 2: *Positional distribution of alveolar stops [t], [tʰ] and [d]*

	Initial	**Medial**	**Final**
[t]	[ti] 'water'	[ratɾau] 'public'	[pɔt] 'Alpinia Nigra'
	[tu] 'bird'	[muktɔŋa] 'sir/madam'	[kalat] 'cup'
[tʰ]	[tʰi] 'blood'	[pantʰai] 'eggplant'	-
	[tʰa] 'potato'	[jatʰuŋ] 'leg'	-
[d]	-	[padi] 'how'	-
	-	[kʰɔdɔ] 'mosquito'	-

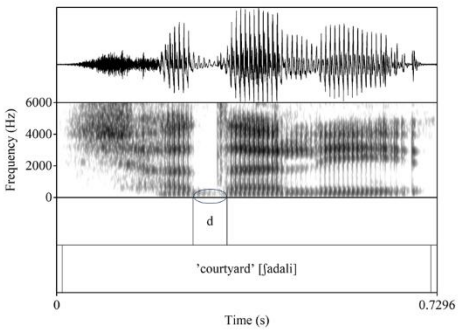

Figure 3: *Waveform and Spectrogram of [ʃadali] 'courtyard' recorded in isolation by a male speaker*

Velar Stops [k, kʰ, g]

Table 3: *Positional distribution of velar stops [k], [kʰ] and [g]*

	Initial	**Medial**	**Final**
[k]	[kana] 'to wear'	[jaskuɾ] 'nail'	[pʰaɾak] 'clear'
	[kɾai] 'village'	[pʰaŋke] 'mud'	[kahɔk] 'right'
[kʰ]	[kʰa] 'chest'	[nɔkʰa] 'rain'	-
	[kʰe] 'stool'	[makʰa] 'mountain'	-
[g]	-	[kage] 'scissors'	-
	-	[tɔgɔi] 'couple'	-

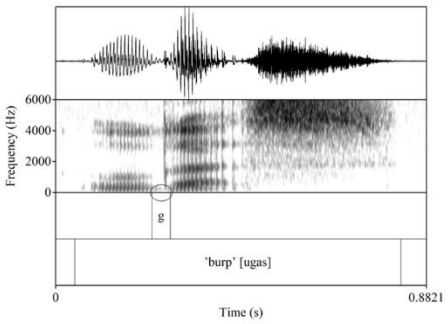

Figure 4: *Waveform and Spectrogram of [ugas] 'burp' recorded in isolation by a male speaker*

4.1.2 Nasal Consonants

Nasals are produced with a complete oral closure while allowing airflow through the nasal cavity. According to Ladefoged and Johnson (2015), nasals are defined by the presence of an oral closure combined with nasal airflow, and they may vary according to place of articulation, which influences their acoustic properties. Hill Tiwa distinguishes three nasal sounds: [m, n, ŋ]. These are articulated at the bilabial, alveolar, and velar places respectively, all of which occur in all lexical positions. In the present dataset, only a single lexical item was found to exhibit [ŋ] in word-initial position, suggesting that initial [ŋ] is highly marginal in Hill Tiwa.[2] The following **Table 4-6** shows their positional distribution:

Bilabial Nasal [m]

Table 4: *Positional distribution of bilabial nasal [m]*

	Initial	**Medial**	**Final**
[m]	[mɔɾ] 'alphabet'	[puma] 'stomach'	[kʰum] 'flower'
	[muŋ] 'name'	[pʰembɔɾ] 'ant'	[tʰam] 'three'

Alveolar Nasal [n]

Table 5: *Positional distribution of alveolar nasal [n]*

	Initial	**Medial**	**Final**
[n]	[ni] 'see/look'	[ani] 'aunty'	[tʰrun] 'push'
	[niu] 'mother-in-law'	[pina] 'break'	[pʰadɔn] 'disciple'

[2] Robbins Burling (2006) notes that despite the apparent improbability of isolated retention, '*ŋá*', 'fish' is attested with initial /ŋ/ in the speech of some Tiwa speakers.

Velar Nasal [ŋ]

Table 6: *Positional distribution of velar nasal [ŋ]*

	Initial	**Medial**	**Final**
[ŋ]	[ŋa] 'fish'	[kʰaŋra] 'machete'	[aŋ] 'I'
		[taŋa] 'boast'	[kraŋ] 'wing'

4.1.3 Fricatives

Fricatives are articulated when air is pushed through a tight passage in the vocal tract, creating audible friction. According to Ladefoged and Johnson (2015), fricatives are defined by the degree and location of constriction, which determine their acoustic properties. Hill Tiwa distinguishes four fricative phonemes: [s, ʃ, z, h]. These are articulated at the alveolar, postalveolar, and glottal places respectively. The voiceless alveolar fricative [s] occurs in all lexical positions whereas its voiced counterpart, [z] occurs only in medial/ intervocalic position. **Figure 5** below shows the aperiodic frication noise concentrated in the higher frequency range, with no evidence of low-frequency periodic energy, indicating the absence of voicing. This contrasts with the acoustic profile of [z], which exhibits continuous voicing. **Figure 6** is characterized by continuous voicing throughout its duration, visible as low-frequency periodic energy (voicing bar) alongside frication noise in the higher frequency range. This combination of periodicity and aperiodic energy distinguishes [z] as a voiced fricative. The post-alveolar fricative [ʃ] and glottal fricative [h] occurs in word initial and medial positions only. The positional distribution of them is shown in **Table 5**.

Alveolar Fricative [s, z]

Table 7: *Positional distribution of alveolar fricative [s, z]*

	Initial	**Medial**	**Final**
[s]	[sa] 'son'	[musi] 'rat'	[ɔs] 'give'
	[si] 'wife'	[pisi] 'pain'	[mɔs] 'deer'
[z]	-	[azɔ] 'grandfather'	-
	-	[kʰuzuɾ] ‘lips’	

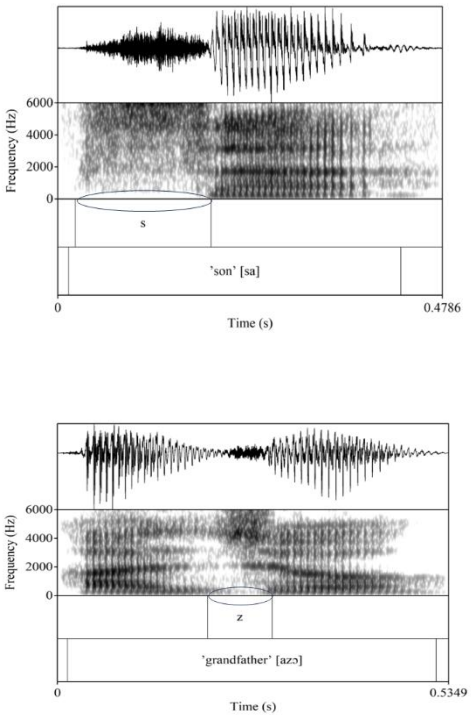

Figure 5: *Waveform and Spectrogram of [sa] ‘son’ and [azɔ] ‘grandfather’ recorded in isolation by a male speaker*

Post-alveolar Fricative [ʃ]

Table 8: *Positional distribution of post-alveolar fricative [ʃ]*

	Initial	**Medial**	**Final**
[ʃ]	[ʃili] 'tongue'	[kiʃa] 'one'	-
	[ʃɔŋ] 'cook'	[miʃa] 'tiger'	-

Glottal Fricative [h]

Table 9: *Positional distribution of glottal fricative [h]*

	Initial	**Medial**	**Final**
[h]	[ha] 'soil'	[tahaja] 'protection'	-
	[hu] 'father-in-law'	[mahaɾ] 'herd'	-

4.1.4 Affricate

Affricates combine a stop closure with a fricative release. As noted by Ladefoged and Johnson (2015), affricates function phonologically as single segments despite their internal complexity. Hill Tiwa has a single affricate: [tʃ], articulated at the postalveolar place of articulation, which occurs only in word-initial position. While this distribution may suggest a positional restriction, it remains unclear whether this reflects a phonotactic constraint of the language or a gap in the current dataset. **Table 10** shows its positional distribution:

Table 10: *Positional distribution of affricate [tʃ]*

	Initial	**Medial**	**Final**
[tʃ]	[tʃa] 'eat'	-	-
	[tʃiŋ] 'we'	-	-

Nevertheless, [tʃ] is treated as a phoneme based on its distinct articulation and its contrastive behaviour in the initial position. The affricate [tʃ] exhibits a characteristic two-stage articulation, consisting of an initial stop closure followed by a fricative release. In **Figure 7**, the stop component is visible as a short interval of reduced energy (closure), followed by a burst of energy marking the release. This is immediately followed by aperiodic high-frequency frication noise, which is characteristic of the fricative component. The absence of low-frequency periodic energy during the frication phase indicates that the segment is voiceless. This combination of stop closure and fricative noise distinguishes [tʃ] from a single segment to confirming its status as an affricate.

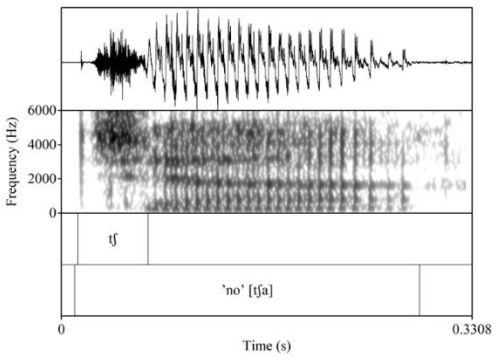

Figure 6: *Waveform and Spectrogram of [tʃa] 'no' recorded in isolation by a male speaker*

4.1.5 Lateral

Laterals are consonants produced by a central oral closure while allowing the airstream to pass along one or both sides of the tongue. According to Ladefoged and Johnson (2015), laterals are classified as approximant consonants due to the absence of turbulent airflow. Hill Tiwa has one lateral sound: [l], articulated at the alveolar place of articulation, which occurs in all lexical positions. Its positional distribution is illustrated in **Table 11** below:

Table 11: *Positional distribution of alveolar lateral [l]*

	Initial	**Medial**	**Final**
[l]	[lam] 'street'	[pila] 'lightning'	[sal] 'sun'
	[libiŋ] 'person'	[tʰilɔ] 'banana'	[ɔndal] 'shadow

4.1.6 Tap / Flap

A tap (or flap) is a consonant produced by a quick, single contact of the tongue against the alveolar ridge. The tongue moves quickly upward to strike the ridge and then immediately retracts, resulting in only one brief closure within the segment. Unlike trills, taps do not involve repeated vibration; the articulatory gesture is momentary and not sustained. Voicing may continue through the contact depending on the phonological environment. Hill Tiwa has one tap, [ɾ], realized as an alveolar tap. It occurs in all lexical positions and functions as a distinct consonantal segment in the language. **Table 12** below shows its positional distribution:

Table 12: *Positional distribution of alveolar tap/ flap [ɾ]*

	Initial	**Medial**	**Final**
[ɾ]	[ɾe] 'cloth'	[paɾa] 'very much'	[kuɾ] 'skin'
	[ɾi] 'do(v)'	[kagɾa] 'waterfall'	[kaɾ] 'abandon'

4.1.7 Approximants

Approximants are produced with lip rounding and a simultaneous narrowing at the velum, allowing smooth airflow without turbulence. Vocal fold vibration is present during articulation. According to Ladefoged and Johnson (2015), approximants are characterized by vowel-like resonance patterns alongside consonantal distribution. Hill Tiwa distinguishes two approximant sounds: [w] and [j], articulated at the bilabial and palatal places respectively, occurring in word initial and medial positions. In the data examined for this study, approximants occur exclusively before the vowel [a]. This pattern corresponds with observations made in previous comparative work on Tiwa (Joseph & Burling, 2006). **Table 13-14** shows their positional distribution:

Bilabial Approximant [w]

Table 13: *Positional distribution of bilabial approximant [w]*

	Initial	**Medial**	**Final**
[w]	[wa] 'pig'	[mewa] 'male'	-
	[wan] 'rice flour'	[nitʰawa] 'beautiful'	-

Palatal Approximant [j]

Table 14: *Positional distribution of palatal approximant [j]*

	Initial	**Medial**	**Final**
[j]	[ja] 'hand'	[mijau] 'cat'	-
	[jasi] 'finger'	[pijal] 'evening'	-

5. CONTRASTIVE DISTRIBUTION OF CONSONANTS

The contrastive distribution of consonants in Tiwa is established following the principles of phonemic inventory, particularly, the Principle of Contrastive Distribution where two sounds are treated as separate phonemes if they occur in the same environment and differentiate meaning (Bloomfield, 1933; Pike, 1947). Minimal pairs and positional distribution were systematically examined to determine phonemic status. In Hill Tiwa, several consonantal phonemes occur in contrastive distribution, indicating that these segments function as distinct phonemes in the language.

Aspiration is contrastive in Hill Tiwa. The minimal pairs below illustrate the phonemic distinction between voiceless unaspirated stops and their voiceless aspirated counterparts in bilabial, alveolar and velar places of articulation:

/p/ versus /pʰ/	/pala/ 'arrow'	/pʰala/ 'sell'
/t/ versus /tʰ/	/ti/ 'water'	/tʰi/ 'blood'
/k/ versus /kʰ/	/ku/ 'grasshopper'	/kʰu/ 'mouth'

Voiceless stops also contrast in places of articulation. The minimal pairs below illustrate the phonemic distinction between voiceless stops in bilabial, alveolar and velar places of articulation:

/p/ versus /t/	/pau/ 'where'	/tau/ 'today'
/t/ versus /k/	/tap/ 'penknife'	/kap/ 'slug'
/k/ versus /kʰ/	/puɾ/ 'sacrifice'	/kuɾ/ 'skin'

The nasal series displays contrastive place distinctions. The minimal pairs below illustrate the phonemic distinction between bilabial, alveolar and velar nasals:

/m/ versus /n/	/mat/ 'language'	/nat/ 'well'
/m/ versus /ŋ/	/am/ 'mat'	/aŋ/ 'I'
/n/ versus /ŋ/	/na/ 'you'	/ŋa/ 'fish'

Fricatives exhibit several contrasts between voiceless alveolar, voiceless palatal and voiceless glottal fricatives as mentioned below:

/s/ versus /ʃ/	/su/ 'fibre'	/ʃu/ 'grandchild'
/s/ versus /h/	/sa/ 'son'	/ha/ 'soil'

Lateral /l/ and tap /ɾ/ are contrastive in Hill Tiwa. The following minimal pair demonstrates the contrast between voiced alveolar lateral and voiced alveolar tap (flap):

/l/ versus /ɾ/	/pala/ 'arrow'	/paɾa/ 'very much'

Approximants also contrast in Hill Tiwa. The following minimal pair demonstrate contrast between bilabial and palatal approximants:

/w/ versus /j/ /wa/ 'pig' /ja/ 'hand'

6. DISCUSSION

1. An important distributional pattern emerges in the stop system of Hill Tiwa with respect to voicing. For voiceless stops/plosives there exists a contrast between /p, t, k/ as in words: **/pu/** 'there'; **/tu/** 'bird' and **/ku/** 'grasshopper'. In contrast, the voiced stop consonants [b, d, g] show a highly restricted distribution, occurring exclusively in intervocalic position and not attested word-initially or word-finally in the native lexicon. Crucially, no minimal pairs have been identified that contrast voiced and voiceless stops in identical phonological environments. Furthermore, elicitation data indicate that the substitution of these voiced stops with their corresponding voiceless counterparts (/p, t, k/) in intervocalic environments does not result in a change in lexical meaning. For instance, forms such as **[ʃupu]~ [ʃubu]** 'snake'; **[tipan] ~ [tiban]** 'flood'; **[ʃutum] ~ [ʃudum]** 'narrow'; **[kʰuti] ~ [kʰudi]** 'saliva' and **[sikun] ~ [sigun]** 'eagle'; [**tikar] ~ [tigar]** 'urine' are accepted by speakers as phonetic variants with no difference in meaning. This free variation, together with the absence of semantic contrast, suggests that [b, d, g] do not function as independent phonemes in Hill Tiwa but rather as positional variants of the voiceless stops /p, t, k/. The voiced stops can therefore be analyzed as intervocalic allophones of their voiceless counterparts. From a phonological perspective, voicing in Hill Tiwa stops appears to be non-contrastive and positionally conditioned. This pattern may be formalized as an intervocalic voicing rule:

/p/→ [b] / V_V
/t/→ [d] / V_V
/k/→ [g] / V_V

Therefore, based on the principles of phonemic analysis, voicing in Hill Tiwa stops is non-contrastive and positionally conditioned, whereas features such as aspiration remain phonemically contrastive.

2. In addition to the positional voicing observed in stops, a similar distributional restriction is found with the fricative [z] in Hill Tiwa. This segment occurs exclusively in intervocalic position and is not attested word-initially or word-finally in the available data. The phonemic status of /z/ has been a point of disagreement in previous studies of Tiwa phonology; however, the present analysis supports its inclusion as a distinct phoneme in the consonant inventory.

Unlike the intervocalic voicing observed in stops, no alternation is observed between [z] and its voiceless counterpart [s] in comparable environments. Substitution of [z] with [s] results in forms that are judged unacceptable by native speakers, indicating that the two segments are not in free variation. Acoustic evidence further supports this distinction: [z] exhibits sustained voicing throughout the fricative segment, visible as low-frequency periodic energy, which is absent in [s].

Although /z/ is positionally restricted, the absence of alternation, lack of substitutability, and consistent acoustic distinction together indicate that it cannot be analysed as an allophonic variant of /s/. Rather, it is best treated as a distinct phoneme with limited distribution in Hill Tiwa.

However, the restricted occurrence of /z/ raises important questions regarding the nature of its distribution. At present, it is not possible to determine conclusively whether this pattern reflects a phonotactic constraint, a lexical gap, or the result of historical or contact-induced processes. One possibility is that the distribution is lexically restricted, with /z/ occurring in a limited set of items. Alternatively, it may reflect diachronic developments, such as the intervocalic voicing of earlier *s, or influence from contact languages in which voiced fricatives are more common.

7. CONCLUSION

This study has provided a descriptive account of the consonant system of Hill Tiwa, with particular attention to its phonemic inventory and distributional patterns. The analysis shows that consonant contrasts in the language are primarily structured around place and manner of articulation, as well as aspiration, while voicing in stops is positionally conditioned rather than phonemic.

On the basis of contrastive distribution and the presence of free variation (in the case of intervocalic stop voicing), the study proposes a consonant inventory of eighteen phonemes /p, pʰ, t, tʰ, k, kʰ, m, n, ŋ, s,

z, ʃ, h, tʃ, ɾ, l, w, j/ in Hill Tiwa, presented in **Table 15,** offering a more systematic representation of its segmental structure.

Table 15: *Consonant phonemes in Hill Tiwa*

Sounds	Bilabial	Alveolar	Post-alveolar	Palatal	Velar	Glottal
Stops	p	t			k	
Aspirated stops	p^h	t^h			k^h	
Nasal	m	n			ŋ	
Fricative		s z	ʃ			h
Affricate				tʃ		
Tap/ flap		ɾ				
Lateral		l				
Approximant	w			j		

Symbols to the right in a cell are voiced, to the left are voiceless.

This revised inventory provides a more consistent account of Hill Tiwa consonant phonology, contributing to the documentation and preservation of an understudied Tibeto-Burman language. It also lays a foundation for comparative phonological studies within the Tibeto-Burman family and guides future research on Tiwa phonetics, phonology, and potential sound changes.

8. DELIMITATION OF THE STUDY

The present study is limited to the analysis of the consonant system of the Hill Tiwa variety, based on primary data collected from a selected group of native speakers. It focuses specifically on segmental phonology, with particular attention to the phonemic status and distribution of consonants. Suprasegmental features such as tone, stress, and intonation are not addressed in this study.

Geographically, the data are restricted to speakers from Umswai region of Assam, where Hill Tiwa is actively used, and therefore may not fully represent variation across all Tiwa-speaking areas. While acoustic evidence is incorporated to support the phonological analysis, the study does not aim to provide an exhaustive phonetic description. Instead, acoustic data are used selectively to illustrate key arguments related to voicing and segmental contrast. These delimitations are intended to maintain a focused and systematic analysis of the consonant inventory of Hill Tiwa.

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