A Comparative Phonological Study of Bihari Languages

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Abstract

The major Bihari languages, Maithili, Magahi, and Bhojpuri, represent an important cluster of Eastern Indo-Aryan languages. They have significant speaker populations and rich linguistic features. Despite their shared historical origins in the Magadhi group of Middle Indo-Aryan, these three languages exhibit distinct phonological characteristics while maintaining substantial similarities. This study presents a comparative phonological analysis of the three major Bihari languages, examining their vowel systems, consonant inventories, diphthongs, and distinctive phonological features based on contemporary linguistic data. The study reveals how these languages have evolved from their common ancestor while maintaining contact-induced similarities and developing innovative features that set them apart from neighbouring language groups.

Keywords: Bihari languages, Maithili, Magahi, Bhojpuri, comparative phonology, Eastern Indo-Aryan languages

1. Introduction

The Bihari languages hold a significant place in the linguistic landscape of South Asia. Their combined speaker population exceeds 40 million people, primarily distributed across Bihar, Jharkhand, and neighbouring regions of Uttar Pradesh and Nepal. Historically, these languages have been recognised as part of the Magadhi branch of Middle Indo-Aryan languages (Grierson, 1883-1887). This view has generally been subscribed to by many scholars, including Chatterji (1926) and Katre (1968). However, their exact classification within the New Indo-Aryan language

family has been subject to scholarly debate (Cardona, 1974; Jeffers, 1976). The term "Bihari," although traditionally used to refer to these three primary languages, has often caused confusion, as it was initially employed by Grierson (1883-1887) in his seminal work, Seven Grammars of the Dialects and Subdialects of the Bihari Language (Grierson, 2005).

Unlike the varieties of Hindi, which exhibit considerable mutual intelligibility and are often regarded as varieties of a single language, the Bihari languages demonstrate sufficient phonological, morphological, and lexical divergence to warrant recognition as distinct languages. However, they share sufficient syntactical and lexical similarities to indicate recent common ancestry and continued linguistic contact. The study of their phonological systems provides valuable insights into both diachronic language change and synchronic language variation in the eastern Indo-Aryan region.

1.1 Scope and Objectives

This comparative study focuses on the phonological systems of three languages: Maithili, Magahi, and Bhojpuri. The primary objectives are:

1. To compare the basic vowel inventories of the three Bihari languages
2. To analyse consonant systems and their distinctive features
3. To examine diphthong formation and allophonic variations
4. To identify phonological features that distinguish one language from another
5. To provide insights into historical phonological development from their common ancestor

1.2 Linguistic and Demographic Context

Linguistic Map of Bihar

(https://www.mapnations.com/countries/india/states/bihar-linguistic-map.html) (Accessed at

13:30 on 30/01/2026)

Maithili, spoken by approximately 30 million speakers in Bihar and the Nepali Tarai (foothills), represents the largest Bihari language (Yadav, 1996). It is the second most widely spoken language of Nepal and has been officially recognised as the 20th major language of India in the Eighth Schedule of the Indian Constitution. The standard dialect is identified with the speech of Madhubani in Bihar and Rajbiraj in Nepal.

Magahi, with an estimated 10-12 million speakers, is primarily spoken in the districts of Patna and Nalanda, as well as in the present-day Magadh districts, which correspond to the historical Magadh Kingdom. The language maintains considerable internal regional variation. The standard Magahi and eastern Magahi are the two primary varieties.

Bhojpuri, the third primary Bihari language, is spoken by over 30 million people across eastern Uttar Pradesh, Bihar, and Jharkhand. It represents the western branch of the Bihari group and shows somewhat different phonological characteristics compared to Maithili and Magahi.

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2. The Bihari Languages: Background and Classification

2.1 Historical and Genealogical Status

The Bihari languages are descendants of Magadhi, a Middle Indo-Aryan language that held a prominent position in ancient India, serving as the state language of Emperor Ashoka and being associated with Buddhist texts. Their evolution from Magadhi through the transitional Middle Indo-Aryan period has resulted in three distinct yet closely related languages (Grierson, 1927).

Grierson's classification placed these languages within the Magadhi branch of the Eastern group of New Indo-Aryan languages, along with Bangla, Assamese, and Oriya. This classification has been generally maintained, although some modern scholars have proposed modifications, with certain linguists arguing for an independent Bihari subgroup (Cardona, 1974; Jeffers, 1976). Cardona places it into the Central group together with Eastern Hindi and Western Hindi. Jeffers goes even further and proposes a Bihari subgroup within New Indo-Aryan that is separate from both the Hindi languages and the Bangla languages.

2.2 Mutual Relationships and Contact

Within the Bihari group, Maithili and Magahi are generally considered closer to one another, forming an eastern branch, while Bhojpuri constitutes the western branch. This internal grouping is reflected in numerous shared phonological and morphological features. All three languages maintain contact with neighbouring Indo-Aryan languages: Maithili with Nepali and Bangla; Magahi with both Maithili and Bhojpuri; and Bhojpuri with Western Hindi.

3. Methodology

3.1 Data Sources

The phonological descriptions presented in this study are based on contemporary linguistic descriptions and analyses available in peer-reviewed academic sources and comprehensive grammatical studies of each language (Yadav, 1996; Verma, 2007; Verma, 2007). The analysis draws on:

1. Detailed grammatical descriptions by recognised scholars in the field

2. Documented phonemic inventories with clear phonological contrasts

3. Examples from natural language use in contemporary speech

4. Comparative analysis with established phonetic and phonological frameworks

3.2 Framework of Analysis

The analysis follows the framework established in the comparative study of Hindi dialects, examining the following linguistic patterns:

1. Basic vowel inventory and nasalisation patterns

2. Diphthong formation and distributional constraints

3. Basic consonant inventory and place-manner distinctions

4. Allophonic variations and phonological processes

5. Distinctive features that differentiate the three languages

6. Stress and intonation patterns were relevant

4. Comparative Phonological Analysis

4.1 Vowel Inventories

The three Bihari languages exhibit both similarities and significant differences in their vowel systems, reflecting a shared ancestry and divergent phonological evolution.

4.1.1 Maithili Vowels

Maithili maintains the most elaborate vowel system among the three Bihari languages, with eight oral vowel phonemes (Yadav, 1984d):

High vowels: /i/ (front), /u/ (back)

Mid vowels: /e/ (front), /o/ (back)

Low front vowel: /æ/

Central vowels: /ə/ (high-mid), /a/ (low)

Additional vowel: /ɔ/ (low back) in some dialects

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All vowels can be nasalised, producing nasalised counterparts. Lip rounding is not distinctive; only back vowels /u/ and /o/ are phonetically rounded. Length is not distinctive in Maithili, though the Devanagari script provides separate graphemes for what are phonetically long and short vowels.

Vowel contrasts:

- /i/ vs /e/: /*ik*/ 'one' vs /*ek*/ (variant)
- /a/ vs /æ/: /*as*/ 'hope' vs /*æs*/ 'luxury'
- /u/ vs /o/: /*us*/ 'whitener' vs /*os*/ 'dew'
- Nasalised: /ĩ/ in /ĩʈʈa/'brick', /ũ/ in /sũra/ 'grain bug'

4.1.2 Magahi Vowels

Magahi has a somewhat reduced vowel system compared to Maithili, with six basic oral vowels (Verma, 2007):

1. **High vowels:** /i/ (front), /u/ (back)
2. **Mid vowels:** /e/ (front), /o/ (back)
3. **Low vowels:** /ə/ (central), /a/ (low)

All vowels can be nasalised. Magahi has no phonemic length distinction, though allophonic variations in length occur based on stress and syllabic environment. The central vowel transcribed as /ə/ (or /a/) has a phonetic value of [ʌ] in stressed positions and [ə] in unstressed positions.

Magahi vowel system characteristics

The vowel system of Magahi is simpler than that of Maithili, though it retains essential phonemic distinctions necessary for clear contrast among vowels. It shows strong alignment with the reduced vowel systems found in neighbouring Indo-Aryan languages, emphasising efficiency over complexity. Additionally, Magahi exhibits stress-dependent vowel quality alternations, in which the realisation of certain vowels varies with syllabic stress, resulting in subtle phonetic shifts that contribute to its distinctive prosodic profile.

4.1.3 Bhojpuri Vowels

Bhojpuri essentially has a system of six vowels with nasalised counterparts (Tiwari, 1960):

1. **High vowels:** /i/, /u/

2. **Mid vowels:** /e/, /o/

3. **Low vowels:** /a/ (both short and long), /ə/ (schwa)

Two additional high short vowels, high short /ɪ/ and high short /ʊ/, occur with well-defined positional restrictions, but these are treated as subphonemic due to their complementary distribution.

The vowel system of Bhojpuri eliminates length contrasts, much like Magahi, while maintaining a distinct rhythmic balance through other phonetic means. It features an "attenuation" process, an allophonic length-reduction phenomenon that influences vowel duration in syllabic and prosodic contexts. The language also exhibits stress-based vowel quality variations, in which the timbre of vowels changes with emphasis or position within a word. Among its vowels, /a/ functions as the only truly short vowel, while /aː/ serves as the only genuinely long vowel. Furthermore, all vowels in Bhojpuri can bear word stress, making vowel prominence an essential feature of its phonological system.

4.2 Diphthongs and Vowel Clustering

The three Bihari languages show different patterns of diphthong formation, reflecting their divergent phonological histories.

4.2.1 Maithili Diphthongs

Maithili has an extensive set of diphthong inventory, with most being rising diphthongs (Yadav, 1984d):

- [au]: [ɟaunt] 'husband's brother's son'
- [ɪu]: [pɪuasi] 'father's sister'

Constraints **on** **diphthongisation:**

Diphthongs such as *æɪ, *æu, *eɪ, *ɪɪ, *uu are not permissible in Maithili. Diphthongisation is closely related to vowel clustering phenomena in the language.

4.2.2 Magahi Diphthongs

Magahi shows a diphthong inventory, though somewhat less elaborate than Maithili (Grierson, 1903-1928):

- /aɪ/: [*maɪ*] (from /*mai*/ 'mother')
- /əʊ/: [*əo*] (from /*sau*/ 'hundred')
- Additional diphthongs emerge from vowel clustering in morphologically complex forms

4.2.3 Bhojpuri Diphthongs

Bhojpuri has truly diphthongal forms with more central initiation points (Tiwari, 1960):

- aɪ: phonetically [sɪ]
- [au]: phonetically [su]
- These diphthongs arise from vowel adjacency and word formation processes

4.3 Consonant Inventories

The consonant systems of the three Bihari languages exhibit remarkable uniformity in overall structure, while displaying significant differences in peripheral segments.

4.3.1 Basic Consonant System

Magahi, Bhojpuri, and Maithili uphold a parallel consonantal framework characteristic of eastern Indo-Aryan languages, structured around standard places and manners of articulation. Places include bilabial, dental, retroflex, palatal, velar, and glottal, while manners encompass stops, affricates, nasals, fricatives, taps/flaps, laterals, and glides. All three languages consistently exhibit a four-way stop contrast across these places: voiceless unaspirated (/p, t, ʈ, c, k/), voiceless aspirated (/pʰ, tʰ, ʈʰ, cʰ, kʰ/), voiced unaspirated (/b, d, ɖ, j, g/), and voiced aspirated (/bʰ, dʰ, ɖʰ, jʰ, gʰ/).

1. **Places of articulation:** Bilabial, dental, retroflex, palatal, velar, glottal

2. **Manner of articulation:** Stops, affricates, nasals, fricatives, taps/flaps, laterals, glides

All three languages exhibit a four-way contrast in stops:

1. Voiceless unaspirated: /p, t, ʈ, c, k/

2. Voiceless aspirated: /pʰ, tʰ, ʈʰ, cʰ, kʰ/

3. Voiced unaspirated: /b, d, ḍ, j, g/

4. Voiced aspirated: /bʱ, dʱ, ḍʱ, jʱ, gʱ/

Maithili Consonants

Place	Bilabial	Dental	Retroflex	Palatal	Velar	Glottal
Stops (4-way)	p, pʰ b, bʱ	t, tʰ d, dʱ	ʈ, ʈʰ ḍ, ḍʱ	—	k, kʰ g, gʱ	—
Affricates	—	—	—	c, cʰ j, jʱ	—	—
Nasals	m	n	ɳ	—	—	—
Taps	—	r	—	—	—	—
Laterals	—	l	—	—	—	—
Fricatives	—	s	—	—	—	h
Glides	w	—	—	y	—	—

Magahi Consonant Inventory

Magahi exhibits a notably reduced inventory of nasal and fricative consonants compared to the more expansive systems in related Indo-Aryan languages. The nasals are restricted to only two distinctive phonemes: the bilabial /m/ and the dental /n/. Other nasals, such as the retroflex /ɳ/,

palatal /ñ/, and velar /ŋ/, appear only in limited phonetic contexts, specifically before stops or within consonant clusters, and lack phonemic status. Similarly, the fricative system comprises a single dental sibilant /s/ and the voiceless glottal fricative /h/. Native phonology excludes additional fricatives like the palatal /ʃ/, retroflex /ʂ/, voiced /z/, labiodental /f/ or /v/, velar /x/, or postalvelar /ʒ/.

Bhojpuri Consonant Inventory

Bhojpuri preserves a consonant system broadly akin to that of Maithili, yet distinguished by key innovations in its nasal and liquid segments. Unlike the reduced nasal inventory of Magahi, Bhojpuri retains a fuller set of distinct nasals, including the velar /ŋ/ as a phonemic segment. It further extends aspiration to nasals and liquids, yielding contrasts such as /m/, /nh/, /ŋh/, /rh/, and /lh/, as evidenced by minimal pairs like /barma/ 'Verma (surname)' versus /barmha/ 'Brahma'. The phonemic status of /ŋ/ is underscored by pairs like /manani/ '(I) asked', contrasting with /mañani/ '(I) admitted', highlighting Bhojpuri's richer phonological contrasts.

4.3.2 Distinctive Consonantal Features

Aspiration: All three languages extend aspiration as a phonological feature beyond stops to nasals and laterals. Bhojpuri shows particularly rich development of aspirated nasals and liquids.

Retroflex contrast: All three languages maintain distinctive retroflex stops and nasals, distinguishing them from dental counterparts.

Sibilant syncretism: In all three languages, the historical distinction between dental /s/, retroflex /ʂ/, and palatal /ʃ/ has been neutralised, typically in favour of dental /s/. Neither Magahi nor Bhojpuri admit Arabo-Persian fricatives in their native phonology, though they handle such segments differently in loanwords.

Fricatives in Magahi: Magahi particularly demonstrates systematic phonological reshaping of loanwords containing fricatives:

- /f/ → /ph/: /pʰilam/ 'film' (English)
- /z/ → /j/: /jid/ 'stubbornness' /zidd/ (Arabic)

- /x/ → /kh/: /khəra:b/ 'bad' /xəra:b/ (Persian)

- /ʃ/ → /s/: /səhar/ 'city' /ʃəhr/ (Persian)

4.4 Allophonic Variations and Phonological Processes

4.4.1 Vowel-Related Processes

Nasalisation in Maithili:

Vowel nasalisation in Maithili is both phonologically distinctive and phonetically conditioned. Nasalisation can occur within a syllable and occasionally across syllable boundaries:

- [nãk] 'nose' (nasal consonant triggers nasalisation)

- [tõhũ] 'even you' (from underlying /to+hu/, nasalisation across boundary)

Attenuation in Bhojpuri:

Bhojpuri exhibits a phenomenon called "attenuation," which is allophonic vowel shortening not segment-determined but governed by syllabic structure, word structure, or derivation:

- /ra:ja:/ 'king' but /rəjwa:/ 'the king'
- [moti] 'pearl' but [məti] 'the pearl'
- Related to stress patterns and syllable weight

Defective phonemes:

- Maithili /æ/ is defective and often diphthongises as [əĕ], [aĕ], or [ai]
- Maithili /ɔ/ varies with [o] and [əŭ]

4.4.2 Consonantal Processes

Glide replacements in Magahi

Magahi exhibits systematic phonotactic constraints on word–initial glides. It replaces them with stops that correspond to its native phonological preferences. The palatal glide /y/ consistently shifts to /j/, as seen in /jəntər/ 'instrument' (from Sanskrit /yəntra/). Similarly, the labial glide /w/ becomes /b/ (Sanskrit /vənʃ/ → /bəns/). Magahi avoids glide onsets and

adapts its native phonological strategy for incorporating loanwords and inherited lexicon. This represents an essential divergence from standard Sanskrit–derived vocabulary.

- /y/ → /j/: /jəntər/ 'instrument' (Sanskrit /yəntrə/)
- /w/ → /b/: /bəns/ 'lineage' (Sanskrit /vənsh/)

Cluster reduction in Bhojpuri

Bhojpuri employs distinctive strategies to avoid consonant clusters, reflecting its phonotactic preferences across word positions. Word-initially, it employs svarabhakti vowel insertion as in /bharam/ for underlying /bhram-/, prothesis in forms like /asnaːn/ for /snaːna/, or conversion of semivowels to full vowels. Word-finally, clusters are restricted to homorganic nasal-plus-stop sequences to ensure articulatory compatibility. Medially, the language favours geminates over singleton consonants in inherited forms, promoting length-based stability in complex onsets or codas.

1. Word-initially: Svarabhakti insertion (/bʰaram/ for /bʰram-/), prothesis (/asnaːn/ for /snāna/), or semivowel to vowel conversion

2. Word-finally: Clusters restricted to homorganic nasal + stop

3. Medially: Preference for geminates over singleton consonants in inherited forms

Geminate preservation in Bhojpuri

Bhojpuri distinguishes itself through robust geminate preservation in positions where Hindi and Bangla opt for simplification accompanied by compensatory lengthening. For instance, Bhojpuri retains the geminate in /ujjar/ 'white, bright' in contrast to Hindi /ujaːla/ and Bangla /ujjvəlaː/. Similarly, /pittər/ 'brass' preserves the geminate unlike Hindi /piːtal/, and /bajjər/ 'thunderbolt' contrasts with Bangla /baːj/. These patterns highlight the phonotactic integrity of Bhojpuri and its resistance to length substitution in geminate contexts.

- Bhojpuri /ujjar/ 'white, bright' (with geminate) vs Hindi /ujaːla/, Bangla /ujjvəlaː/
- Bhojpuri /pittər/ 'brass' vs Hindi /piːtal/
- Bhojpuri /bajjər/ 'thunderbolt' vs Bangla /baːj/

4.4.3 Morphophonemic Alternations

Maithili:

Maithili exhibits two highly productive and regular phonological processes that systematically alter vowel quality and structure in morphological contexts. The first, schwa deletion, eliminates the schwa as the second vowel when a vowel–initial suffix attaches, as in /həmər–o/ → /həmro/ 'even mine'. The second process involves a → ə substitution, whereby the initial syllable /a/ shifts to /ə/ upon addition of a vowel–containing affix, yielding forms like /babhən/ 'brahmin' versus /bəbhinia/ 'brahmin (F, IMPOL)' and /mar/ 'kill' versus /məra/ 'caused to kill'. These rules underscore sensitivity to morpheme boundaries of Maithili and its efficient vowel–reduction strategies.

Schwa deletion: Schwa, as the second vowel, is deleted when a vowel-initial suffix is added.

> E.g., /həmər-o/ → /həmro/ 'even mine'

a → ə substitution: First syllable /a/ becomes /ə/ when an affix containing a vowel is added.

> E.g., /babʰən/ 'brahmin' vs /bəbʰinia/ 'brahmin (F, IMPOL)'
>
> /mar/ 'kill' vs /məra/ 'cause to kill'

Magahi

Similar to Maithili, Magahi too exhibits two highly productive and regular phonological processes that systematically alter vowel quality and structure in morphological contexts (Kumar & Sinha, 2022). The first, schwa deletion, eliminates the schwa as the second vowel when a vowel-initial suffix attaches, as in /həmər-o/ → /həmro/ 'even mine'. The second process involves a → ə substitution, where vowel length is shortened when any inflexional suffix is attached to (Kumar & Sinha, 2022, 2024). E.g., ra:ja 'king' + wa: 'diminutive' → rəjwa: 'the king'

4.5 Stress and Intonation

4.5.1 Stress Patterns

Maithili: Stress plays only a marginal role in distinguishing words. The general pattern places stress on the penultimate syllable with some exceptions.

Bhojpuri: Bhojpuri displays a more intricate prosodic system than its eastern Indo-Aryan sister languages. Predictable yet variable stress patterns characterise it. In disyllabic words, stress typically falls on the penultimate syllable, while longer words favour antepenultimate stress unless overridden by other prosodic factors. Stress assignment is sensitive to syllable weight, with heavy syllables (i.e., with a coda (CVCC) or containing /a/ or a diphthong in CVC structure) exerting stronger attraction. Additionally, derivational and inflexional affixes often induce stress shifts, contributing to rhythmic flexibility and morphological transparency.

1. Penultimate syllable stress in disyllabic words
2. Antepenultimate stress in longer words (unless other factors intervene)
3. Stress influenced by syllable weight (CVCC or CVC with /a/ or diphthong is heavy)
4. Derivational and inflectional affixes can shift stress

4.5.2 Intonation Patterns

Maithili employs distinct intonational contours to signal sentence types, aligning with typical Indo-Aryan prosodic patterns. Declarative sentences and polite commands typically feature falling intonation, with a rising onset and a descending end. Information questions, which contain 'what' or 'why' words, such as 'k-questions', likewise exhibit falling intonation, maintaining continuity with declarative phrasing. Yes-no questions initiated by /ki/ 'what' follow the falling pattern, whereas those without /ki/ are marked by rising intonation, providing a clear auditory cue for interrogativity.

1. Declarative sentences and polite commands have falling intonation
2. Information questions with k-question words have falling intonation
3. Yes-no questions with initial /ki/ 'what' have falling intonation
4. Yes-no questions without /ki/ have rising intonation

5. Distinctive Features and Language Differentiation

5.1 Features Distinguishing Maithili

Maithili stands out among the eastern Indo-Aryan languages due to several distinctive phonological and morphosyntactic features. It possesses the most elaborate vowel system, comprising eight vowels subject to systematic nasalisation, alongside a complex diphthong inventory that exceeds those of its relatives. The schwa vowel /ə/ holds greater prominence in Maithili than in Magahi or Bhojpuri, while the defective /æ/ exhibits strong tendencies toward diphthongisation. Morphologically, Maithili features an extended verbal agreement system, unique among Bihari languages, which enhances its expressive capacity for person, number, gender, and honorific distinctions.

1. **Most elaborate vowel system:** Eight vowels with systematic nasalisation
2. **Complex diphthong system:** Most extensive diphthong inventory
3. **Schwa vowel:** /ə/ is more prominent than in Magahi or Bhojpuri
4. **Defective vowels:** /æ/ with diphthongisation tendencies
5. **Extended verbal agreement system:** Unique among Bihari languages

5.2 Features Distinguishing Magahi

Magahi distinguishes itself among eastern Indo-Aryan languages through a streamlined phonological profile marked by simplification and systematic alternations. Its vowel system comprises six vowels whose quality varies predictably with stress, yielding realisations such as [ʌ] in stressed positions versus [ə] in unstressed ones. The nasal inventory is markedly reduced, featuring only /m/ and /n/ as primary phonemes. At the same time, the fricative series includes a single dental sibilant /s/, which systematically reshapes loanwords lacking native equivalents. Additionally, glides undergo consistent replacement. /y/ becomes /j/ and /w/ shifts to /b/ word-initially, reflecting Magahi's adaptive phonotactics and stress-driven allophony.

1. **Simplified vowel system:** Six vowels with stress-dependent quality
2. **Reduced nasal inventory:** Only /m/ and /n/ as primary nasals

3. **Single sibilant:** Dental /s/ only, with systematic loanword reshaping

4. **Systematic glide replacement:** /y/ → /j/, /w/ → /b/ word–initially

5. **Stress-dependent vowel quality:** [ʌ] in stressed vs [ə] in unstressed positions

5.3 Features Distinguishing Bhojpuri

Bhojpuri sets itself apart among eastern Indo-Aryan languages through innovative consonant contrasts and prosodic processes that enhance its phonological complexity. It extends aspiration beyond obstruents to nasals and liquids, permitting forms like /mh/, /nh/, /rh/, and /lh/, while preserving geminates in positions where Hindi exhibits simplification. The language features a systematic attenuation process involving complex allophonic length reduction, vowel harmony shared with Magahi, and stress-based vowel quality shifts tied to syllable weight. Additionally, complex nasal gemination arises in /nC/ sequences, yielding distinctive geminate patterns that underscore Bhojpuri's robust phonotactic structure.

1. **Extended aspiration:** Nasals and liquids can be aspirated (/mh/, /nh/, /rh/, /lh/)

2. **Geminate preservation:** Retains geminates where Hindi shows simplification

3. **Attenuation process:** Complex allophonic length reduction system

4. **Vowel harmony:** Shares with Magahi

5. **Stress-based vowel quality shifts:** Related to syllable weight

6. **Complex nasal gemination:** /nC/ → nasal geminate patterns

6. Comparative Summary: Phonological Similarities and Differences

6.1 Shared Features

Magahi, Bhojpuri, and Maithili share core phonological characteristics that unify their eastern Indo-Aryan profile. Collectively, they are referred to as Bihari languages. All three maintain a four-way stop contrast encompassing voiceless unaspirated, voiceless aspirated, voiced unaspirated, and voiced aspirated stops, alongside a robust distinction between retroflex and dental stops. They exhibit the elimination of phonemic vowel length contrasts, a single sibilant /s/ (varying in distribution), and nasalisation as a suprasegmental feature, with basic SOV word order

shaping phonological phrasing and stress patterns centred on penultimate or antepenultimate syllables.

1. Four-way stop contrast (voiceless unaspirated, voiceless aspirated, voiced unaspirated, voiced aspirated)
2. Elimination of length contrast in vowels
3. Single sibilant /s/ (with variations in distribution)
4. Retroflex vs dental contrast
5. Basic SOV word order influences on phonological phrasing
6. Nasalisation as a phonological feature
7. Stress patterns centred on the penultimate or antepenultimate syllable

6.2 Significant Differences

Feature	Maithili	Magahi	Bhojpuri
Vowel	8 vowels	6 vowels	6 vowels
Nasal distinctions	3 phonemic (/m/, /n/, /ŋ/)	2 phonemic (/m/, /n/)	3 phonemic (/m/, /n/, /ŋ/)
Nasal aspiration	Minimal	Absent	Rich (/mh/, /nh/, /rh/, /lh/)
Diphthong richness	Most extensive	Moderate	Moderate
Geminate handling	Simplification	Simplification	Preservation
Schwa prominence	High	Moderate	Moderate
Attenuation process	Absent	Present	Present
Glide treatment	Preserved	Replaced (y→j, w→b)	Mostly preserved

7. Phonological Implications and Historical Development

The phonological similarities and differences among the three Bihari languages provide important insights into their linguistic evolution:

Common ancestry: The shared four-way stop contrast, retroflex system, and basic vowel features reflect descent from Magadhi.

Divergent evolution: Different treatment of historical sibilants, glides, and nasals suggests differential language contact and internal phonological change since the languages separated.

Contact effects: Maithili's close contact with Nepali and Bangla appears to have contributed to the development of its elaborate diphthong system, reflecting phonological influence from these neighbouring languages. In contrast, Magahi's systematic adaptation of loanwords suggests a stronger historical interaction with Persian, which has shaped its phonetic assimilation processes and expanded its sound inventory. Bhojpuri, on the other hand, demonstrates consistent preservation of geminates, a feature that likely reflects specific inheritance patterns from earlier stages of Middle Indo-Aryan, showing its tendency to retain conservative phonological traits within the Bihari group.

- Maithili's contact with Nepali and Bangla may have influenced its elaborate diphthong system.
- Magahi's systematic loanword adaptation suggests stronger contact with Persian.
- Bhojpuri's geminate preservation may reflect specific patterns of inheritance.

Typological shifts: Magahi's reduction of its nasal and fricative inventories marks a distinct shift toward phonological simplification, streamlining its sound system relative to its sister languages. Bhojpuri, by contrast, exhibits an extension of aspiration across nasals and liquids, representing an elaboration and diversification of pre-existing phonological features. Meanwhile, Maithili's continued maintenance of fine-grained phonemic distinctions reflects both its large and stable speaker base and its long-standing literary and cultural tradition, which have helped preserve greater phonological complexity over time.

- Magahi's reduction in nasal and fricative inventory represents a shift toward phonological simplification

- Bhojpuri's aspiration extension represents the elaboration of existing features
- Maithili's maintenance of distinctions reflects its large speaker population and literary tradition

8. Conclusions

This comparative phonological study reveals that while the three Bihari languages share a substantial phonological structure reflecting their common origin in Magadhi, they have undergone significant divergence over time. Each language maintains its own distinctive phonological characteristics:

- **Maithili** represents the most conservative system in terms of vowel inventory and the most innovative in terms of diphthong development

- **Magahi** shows systematic simplification tendencies, particularly in nasal and fricative inventories

- **Bhojpuri** demonstrates rich elaboration of aspiration features and selective geminate preservation

These phonological systems reflect not only historical sound change but also the social, geographic, and linguistic contexts in which each language has evolved. The study of Bihari phonology contributes to a broader understanding of Indo-Aryan language evolution, phonological typology, and language contact dynamics in South Asia. Further research should include:

1. Acoustic analysis of phonological distinctions in each language
2. Detailed dialectal variation studies within each language
3. Investigation of language change in progress among younger speakers
4. Analysis of code-switching effects in multilingual communities
5. Comparison with neighbouring language systems to assess contact-induced change

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