

SOUNDS ACROSS BORDERS:
A COMPARATIVE STUDY OF BANGLA AND THAI PHONOLOGICAL SYSTEMS

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A thesis submitted to the Department of English and Humanities in partial fulfillment of the
requirements for the degree of
Bachelor of Arts in English

Department of English and Humanities
BRAC University
January 2026

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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing a Bachelor degree at BRAC University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Ethics Statement

The study was done in compliance with the existing academic and ethical principles. The article is fully reliant on second-hand and documentary materials such as published books, peer-reviewed journal articles, theses, and other reliable linguistic sources. There were no human subjects, and no primary data have been gathered in the form of interviews, surveys, and experimental procedure. In this regard therefore, the research did not necessitate formal ethical clearance of human subject research.

To have a good academic integrity all the sources mentioned in this thesis have been duly credited by proper citation and referencing of sources. The plagiarism, misrepresentation of data, and intellectual dishonesty have been avoided. This confirms that the analysis and interpretations that have been given in this thesis are original and that they are responsibly based on sources that were referenced in this thesis.

Abstract

In this thesis, the phonology of Bangla and Thai is described and compared, paying close attention to the inventories of the vowels and consonants in these languages. Both languages have different language families, i.e. Indo-Aryan and Kra-Dai, but they share the more general South and Southeast Asian lingual zone and have typological differences in addition to contact-influenced convergences. The study employs qualitative methodology of phonetics using International Phonetic Alphabet (IPA) to compare segmental characteristics of aspiration, voicing, retroflexion, vowel quality, and vowel length, and suprasegmental characteristics, including tone, and syllable structure. The results show that Bangla has higher functional load on consonantal contrasts whereas Thai has phonological contrast that is distributed amongst vowel, tone and consonant classes interactions. The analysis placed in the context of the phonological typology and historical contact positions allows the study to make contributions to the cross-linguistic research in the field of Asian phonology and provide the insights that could be applied in language teaching and comparative linguistics.

Keywords: Bangla phonology; Thai phonology; comparative phonology; IPA; phonological typology.

Dedication

This thesis is dedicated to my grandfather, **Md. Abdul Hakim**, and his guidance, values and belief in the importance of education. His wisdom and moral support have shaped the person I have become. Everyday, I am reminded of the legacy my grandfather left me, the belief in the values of perseverance, integrity, and knowledge, and how powerful these values are. His legacy still fuels my growth and learning.

Acknowledgement

I thank Allah first, for the mercy, guidance, and strength which he provided me with throughout this journey.

The most love and appreciation I have received is that of my mother, Nasima Akter. Her sacrifices, love, and support have made me who I am today. She has stuck by me through thick and thin, so wonderfully patient, kindly encouraging, and silent. The belief that she has upon me, has been my biggest motivational factor as well as the source of my strength.

Without my thesis supervisor, Shakika Rubaiat, my thesis would not have been possible. I appreciate the support and the burden she lifted from my shoulders. The quality of this thesis is the result of her mentoring and her support. Her influence has been felt in my academic development and the vision I have for this research.

I want to thank my entire family, whose prayers, emotional support, and encouragement have helped me become stronger in the process of my academic life. Their trust in my capability to achieve something, their insight in times of trouble, and mutual encouragement helped me get this milestone.

I would like to express my sincere gratitude to all the teachers who taught me all my life since my first years at the school up to the university. Their wisdom, guidance, discipline, and influence contributed to my intellectual growth as well as instilling the desire to learn and embrace the best in me.

Finally, I would like to mention my friends, who helped, supported and inspired me, and made this process more worthy and satisfying.

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List of Acronyms

IPA International Phonetic Alphabet

L1 First Language

L2 Second Language

OT Optimality Theory

SLA Second Language Acquisition

Glossary

Aspiration:	The burst of air accompanying the release of certain consonants, especially plosives.
Diphthong:	A vowel sound that involves a glide from one vowel quality to another within the same syllable.
Functional Load:	The extent to which a phonological contrast contributes to distinguishing meaning.
Lexical Tone:	The use of pitch variation to distinguish word meaning.
Phoneme:	The smallest contrastive sound unit in a language.
Retroflex:	A consonant produced with the tongue curled back toward the palate.
Segmental Features:	Phonological elements such as vowels and consonants.
Suprasegmental Features:	Features such as tone, stress, and intonation that extend over segments.

CHAPTER I

INTRODUCTION

Language is an extremely structured and encoded system of sound by means of which human beings encode and decode meaning, and the systematic study of sound pattern scenarios in particular languages is the sub-discipline of linguistics referred to as phonology. In contrast with phonetics, where the primary emphasis is placed on the material and articulative characteristics of the speech sounds, phonology deals with abstract sound structures, phonemic oppositions, and the principles, according to which they are distributed and interacted. Phonological study therefore gives important insights on the cognitive structure of language and the structural variation that is evident in various linguistic systems.

Comparative phonology plays a leading role in linguistic studies and enables researchers to determine both cross-linguistic patterns and language particularities in the arrangement of the sound. Comparing phonological systems of languages that differ in their genetics allows researchers to study the allocation of functional load among segmental and suprasegmental features of different languages, the effect of historical contacts on the phonological structure and the influence of typological constraints on the inventory of sounds. These comparisons are especially useful in areas where languages that belong to different families are both present and interact over long periods of time.

This thesis, *Sounds Across Borders: A Comparative Study of Bangla and Thai Phonological Systems*, is a systematic comparative study of two languages, Bangla and Thai, which are distinctly differentiated in the genealogical affiliation and phonological typology. Bangla is an Indo-Aryan language that is defined as having a segment rich phonological system

and high aspiration, voicing, and retroflexion contrasts. Thai is a Kra-Dai language that is typologically different because of its lexical tonal system, phonemic vowel length differences, and consonant class-tone interaction. Nevertheless, the two languages are found in the larger South and Southeast Asian context and have been influenced by mutual historical interactions with the Indic linguistic traditions, specifically via Sanskrit and Pali.

Through the main emphasis on the inventories of vowels and consonants as well as the interaction between them and suprasegmental characteristics, the current study will help to understand how phonological systems can be structurally different and still be functionally efficient. By developing a qualitative and descriptive-comparative research based on well-established phonological theory and International Phonetic Alphabet (IPA) transcription, the study will be able to make a contribution to a better understanding of phonological typology, language contact, and cross-linguistic variation.

1.1 Problem Statement

Despite the fact that both Bangla and Thai have extensively been studied in their respective linguistic traditions, the direct and systematic comparative analyses of two languages are scarce to date. The body of research on Asian phonology has so far mostly focused on comparison with English, especially within the framework of pronunciation pedagogy and second language acquisition. Consequently, relatively few studies comparing phonological interrelationships of Asian languages themselves (particularly in South and Southeast Asia) exist in the literature.

This gap is particularly pronounced considering that there is a high typological difference between Thai and Bangla. An example of non-tonal, segment based phonological linguistics is

the Bangla, and an example of a language that uses suprasegmental means, e.g. tone and vowel length to encode the meaning of lexical units is Thai. Yet the distribution of functional load between segments and suprasegments in each language, and the relation of these contrastive systems to various strategies of phonological organization, have seldom been studied previously.

In addition, a great deal of the available literature discusses segmental and suprasegmental characteristics independently, as opposed to assessing them as interdependent components of a single phonological system. This piecemeal method does not allow a clear look at phonological structure and typology. The lack of an informed, comparative examination of Bangla and Thai, therefore, represents a definite gap in research which the thesis aims to fill.

1.2 Purpose of the Study

The main idea of this research is to perform a systematized comparative study of the phonological system of Bangla and Thai, the vowel and consonant systems in particular. This paper compares and contrasts the sound systems of the two languages through discussion of articulatory properties, phonemic contrasts, and distributional patterns.

In addition to descriptive comparison, the work is aimed at placing the findings in the context of the larger discourses on phonological typology, functional load, and language contact. By applying IPA-based transcription and qualitative-descriptive methodology, the study will make a contribution to the theoretical insights into how languages arrange the phonological resources differently and yet be communicatively successful. Simultaneously, the research aims to present the insights applicable to the practical areas of language teaching and cross-linguistic analysis.

1.3 Central Research Questions

Central Research Question

In what ways do the phonological systems of Bangla and Thai differ, and how are they similar, particularly in the area of vowels and consonants?

Sub-Question One

What are the inventories of vowels in Bangla and Thai, and how are they differentiated in terms of quality, length and distribution?

Sub-Question Two

How are the consonant inventories of Bangla and Thai different in terms of articulation, aspiration, and phonemic contrasts?

Sub-Question Three

How does the comparative study of Bangla and Thai vowels and consonants add to the general study of phonological typology and language contact in South and Southeast Asia?

1.4 Significance of the Study

This research is important both theoretically and practically. Theoretically, it helps to develop comparative phonology because it presents a systematic study on two typologically different Asian languages that have seldom been studied directly against each other. The study contributes to the study of phonological organization and typological diversity by pointing out the way in which Bangla and Thai divide phonological contrast at various levels.

Regionally, the study contributes to the field of linguistics of South and Southeast Asia by prioritizing the comparison within Asia instead of using English as a reference point by default. This methodology helps to make more even-handed typological generalisations and to make contributions to areal influence and historical contact.

In practice, the results have applications in second language learning, teaching pronunciation, and bilingual education. Knowledge of the phonological distinctions between Bangla and Thai can help teachers to recognize possible areas of weaknesses in learners and understand how to implement more efficient teaching techniques.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

The chapter provides both theoretical and empirical basis of the research of the study, *Sounds Across Borders: A Comparative Study of Bangla and Thai Phonological Systems*. It is aimed at the critical synthesis of major concepts and academic views in phonology, comparative linguistics, and cross-linguistic sound analysis. The review looks at the conceptualization of phonological systems, dwells on the methodological importance of the comparative method, and the analysis of previous studies done on Bangla and Thai, in terms of each, as well as in terms of each other. Putting the study within the broader typological and historical frames, the chapter shows what the investigation of phonological similarities and differences can introduce into the analysis styles in the effort to comprehend linguistic contacts in South and Southeast Asian regional frameworks.

The chapter is sub-categorically organized. It begins with the theoretical background of the phonology and conceptualization of the phonological system, proceeds to the methodological approaches of comparative phonology and ends by examining the phonology of Bangla and Thai. Later parts discuss cross-linguistic research and historical-contact views. At the end of the chapter, the theoretical framework is introduced that will incorporate all these dimensions and lead to the descriptive-comparative approach of the current research.

2.2 Theoretical Foundations of Phonology

Phonology is a fundamental branch of linguistics, which investigates the functional structure of sounds in the language systems. Phonology, in contrast to phonetics (the study of the physical pronunciation and the acoustics of speech sounds), is the study of the abstract mental representation of speech sounds and their systematic organization (Laver, 1994; Odden, 2013). It offers the conceptual resources to study patterns, phoneme inventories and phonotactic constraints needed to define the phonological belonging of the language community.

Ladefoged (2001) explains that to study phonology, special attention should be paid to universal and language-specific principles. Although the system of sounds in every language is organized differently, such characteristics as the unique elements, minimal pairs, and the syllable construction are cross-linguistic. Another theory, the distinctive feature theory, which was proposed by Jakobson, Fant and Halle (1951) is also fundamental, and this theory holds that phonemes are compound of binary features, such as [$\pm$ voice], [$\pm$ nasal], and [$\pm$ aspirated]. The system enables the linguists to represent the organized trends of convergence and divergence, which is essential in comparative studies such as the one under consideration.

Advances in the modern world have taken phonological analysis a step further. Optimality Theory (OT) defines phonological patterns in terms of ranked constraints, and not as determinate rules, which makes it easier to explain cross-linguistic variation (Prince & Smolensky, 2004; McCarthy, 2002). Contrary to that, phonology of usage focuses on the important functions of frequency, perceptual actions, and social setting in determining sound systems (Bybee, 2010). Taking these theoretical approaches in combination suggests the dynamic and systematic character of the field of phonology, which is able to provide a strong

conceptual framework that can be used in comparing the typologically different languages like Thai and Bangla, having cultural and historical ties.

2.3 Phonological Systems: Concepts and Dimensions

A phonology system is a closed set of sound to which vowels, consonants, tones, and suprasegmental features belong, and concatenation rules and distribution rules for them. International Phonetic Alphabet (IPA) is a device of standard notation by which phoneticians can render and compare speech sounds in a true translingual fashion (International Phonetic Association, 1999).

Laver (1994) has outlined three levels of phonological analysis: the segmental level, for example, vowels and consonants; the suprasegmental level, for example, stress, intonation, and tone; and the phonotactic level, for example, the establishment of allowed sequences of sound. Odden (2013) also mentions that both the sound inventory and systematic patterns need to be analyzed in order to describe a language's phonology adequately.

Bangla and Thai are distinct phonological typologies. Bangla is a syllable-timed Indo-Aryan language with distinctions such as retroflexion and aspiration. Thai is a tonal Kra-Dai language with pitch distinctions used to distinguish lexical meaning. Comparison of the structural differences provides insightful remarks on typological diversity (Ladefoged & Maddieson, 1996).

2.4 Comparative Phonology: Scope and Significance

Comparative phonology, as a division of historical and typological linguistics, seeks to describe systematic similarities and differences in sound systems of languages (Hock & Joseph, 2019). By contrasting phonological systems, researchers are in a position to track evolutionary

patterns, detect contact-induced change, and test areal convergence. Hock and Joseph emphasize that comparative study of languages from various families will lead to identification of both global constraints and the influence of shared cultural and historical legacies, such as the significance of Sanskrit and Pali for South and Southeast Asia.

According to Odden (2013), comprehensive comparative analysis involves proper classification of sound inventories, which results in the identification of phonemic contrast and allophonic variation. In the course of this paper such principles are employed to map phonological systems of Bangla and Thai systematically. The use of IPA transcription and qualitative categorization places the research on the current comparative norms.

Comparative phonology is applied to theory, taking the field of linguistics into practice. According to Cruttenden (2014), knowledge about the differences in phonology between the native and target language has promoted pronunciation, second language acquisition, and cross-linguistic transfer pedagogy. The current research is therefore a contribution to the theory of linguistics and its application to multilingual education, especially among the students of South and Southeast Asia.

2.5 Phonological Structure of Bangla

Bangla is the language of Bangladesh and the Indian state of West Bengal that has been classified as the Indian branch of the Indo-European language family. It has a phonological system that is influenced by both historical inheritance of Sanskrit and contact-induced innovations of Persian, Arabic and English (Crystal, 2010; Masica, 1991). Bangla has an enrichment of vowels and consonants, unique prosodic systems, as well as a significant

difference in dialect, which is why it is a useful language to compare with tonal languages, such as Thai.

2.5.1 Bangla Vowels

Alternative characterizations of the vowel system of standard forms of Bangla include that it has seven core oral monophthongs /i, e, ε, a, ɔ, o, u/ (Khan, 2010). Other dialects go as high as nine or ten including the vowel length and nasalization variations (Chatterji, 1970). The following table summarizes the monophthong vowels of Standard Bangla:

Height	Front	Central	Back
High	/i/	-	/u/
Mid	/e/	-	/o/
Low	/ε/	/a/	/ɔ/

The presence of diphthongs is also peculiar to Bangla, which is normally the mix of high and mid vowels with /i/ or /u/ like /oi/ and /ou/. The prosodic system is syllable-timed and in most cases, the stress is laid on the first syllable of a word. There is vowel harmony (metaphony), and there is regular assimilation of vowels and consonants of the adjacent ones (Chatterji, 1970).

2.5.2 Bangla Consonants

Bangla consonantal system contains aspirated and unaspirated plosives, affricates, nasals, fricatives, approximants, and lateral approximants. The concept of retroflexion which is a Sanskrit creation is important in the distinction of phonemes. The following table summarizes the initial consonant inventory of Standard Bangla (Khan, 2010):

	Bilabial	Labio-	Dental	Alveolar	Post-	Velar	Glottal
--	----------	--------	--------	----------	-------	-------	---------

		Dental			Alveolar		
Plosive	/p, b, b ^h /	-	/t̪, t̪ ^h , d̪, d̪ ^h /	-	/t, t ^h , d, d ^h /	/k, k ^h , g, g ^h /	-
Affricate	-	-	-	-	/tʃ, tʃ ^h , dʒ, dʒ ^h /	-	-
Nasal	/m/	-	-	/n/	-	/ɳ/	-
Fricative	-	/f/	-	/s/	/ʃ/	-	/h/
Approximant	-	-	-	-	/ɹ/	-	-
Lateral Approximant	-	-	-	/l/	-	-	-

The existence of retroflex vs dental contrasts (e.g., /t/ vs /t̪/) is also a characteristic phonetic-phonological attribute, which produces meaningful minimal pairs, i.e. /t̪ara/ (‘star’) vs /t̪ara/ (‘they’) (Masica, 1991). Assimilation processes (e.g., nasal assimilation, voicing assimilation) and stress placement (generally on the initial syllable) are part of the phonological behaviour of Bangla.

Place	Unaspirated Voiceless	Aspirated Voiceless	Voiced Unaspirated	Voiced Aspirated
Bilabial	/p/ (প)	/p ^h / (ফ)	/b/ (ব)	/b ^h / (ভ)
Dental	/t̪/ (ত)	/t̪ ^h / (থ)	/d̪/ (দ)	/d̪ ^h / (ধ)
Post-Alveolar	/t̪/ (ট)	/t̪ ^h / (ঠ)	/d̪/ (ড)	/d̪ ^h / (ঢ)
Velar	/k/ (ক)	/k ^h / (খ)	/g/ (গ)	/g ^h / (ঘ)

Instrumental research by Islam (2022) also shows how articulatory imaging reveals subtle motor-control and velopharyngeal dynamics in Bangla production, complementing impressionistic accounts.

2.5.3 Syllable Structure and Dialectal Variation

Bangla syllables generally follow the (C)V(C) pattern, where the onset may include a single consonant or a permissible cluster, the nucleus contains a vowel or diphthong, and the coda is restricted to a limited set of consonants. Dialects such as Sylheti and Chittagonian show additional vowel and consonant contrasts, distinctive intonation patterns, and nasalization. Western dialects retain certain Sanskrit-inherited retroflex consonants and minor vowel shifts. Urban varieties in Dhaka exhibit influence from English, leading to loanword adaptations and phonetic variation (Alam & Applebaum, 2021).

2.5.4 Rational for Comparison with Thai

The comparison between Bangla and Thai is theoretically motivated by both typological contrast and phonetic interest. Bangla is part of the Indo-Aryan and Thai the Tai-Kadai as they are two languages with rich vowel inventories, complex stop/ aspiration contrasts and differing suprasegmental properties. The difference between the use of segmental contrasts in Bangla and the use of tonal dimension in Thai provides an interesting platform to analyze how various languages make use of various applications that are found in phonological resources to achieve communicative purposes. This kind of comparison illuminates the cross-linguistic phonological organization, the influence of contact and variation, and typological diversity in phonological systems.

2.6 Phonological Structure of Thai

The type most commonly used in education, media, and official communication is called Standard Central Thai and is part of the Kra-Dai language family, which has a highly developed phonological system (Abramson, 1962). It is marked first of all by its lexical tonality, by a

complicated system of vowels, short and long vowels and diphthongs, by the consonantal system with certain phonotactic restrictions. These characteristics would help to differentiate Thai among non-tonal languages like Bangla and would therefore make it the best to compare it especially in the study of the interplay of segmental and suprasegmental characteristics.

2.6.1 Thai Tone System

One of the characteristics of Thai is a tonal system. The Standard Central Thai is dependent on five lexical tones high, mid, low, rising and falling, all of which may distinguish meaning even on the syllabic level (Tingsabadh & Abramson, 1993). As an illustration, the syllable *maa* can either mean “to come” when it is pronounced with a mid-tone, “areca nut” when it is pronounced with low-tone, “much” when it is pronounced with a falling tone, “horse” when it is pronounced with a high tone, and “dog” when it is pronounced with a rising tone. Tone is used to interact with other phonological characteristics, such as the type of syllable, vowel length, and the type of the first consonant. Dead syllables consist of syllables that have short vowels or unreleased stops to restrict the tonal possibilities, whereas live syllables contain the entire five-tone contrast of syllables that end in a vowel or sonorant consonant. The application of a tone in Thai is quite different to Bangla wherein phonemic variation is determined mainly by the segmental characteristics like aspiration, retroflexion, and vowel duration (Britannica, n.d.; Morén & Zsiga, 2006).

2.6.2 Thai Vowels

Thai has a rich vowel system which has a total of nine simple vowel qualities and each has a short and a long form, giving a total of eighteen monophthongs. These vowels are different in height, backness and tenseness. The combination of monophthongs forms diphthongs and

triphthongs which enlarge the vowel inventory further so as to have sequences like /ia/, /ua/, /ua/, and triphthongs such as /uai/ and /uai/ (Tingsabadh & Abramson, 1993). The following table summarizes the monophthong vowels of Standard Central Thai (Slayden, 2009):

Height/ Frontness/ Roundness	Short	Long
High/ Front/ Unrounded	/i/	/i:/
High/ Near-Back/ Unrounded	/ɯ/	/ɯ:/
Close/ Back/ Rounded	/u/	/u:/
Mid/ Front/ Unrounded	/e/	/e:/
Mid-Low/ Front/ Unrounded	/ɛ/	/ɛ:/
Mid/ Near-Back/ Unrounded	/ɤ/	/ɤ:/
Low/ Central	/a/	/a:/
Mid/ Back/ Rounded	/o/	/o:/
Mid-Low/ Back/ Rounded	/ɔ/	/ɔ:/

Dialectal variation affects the vowel inventory; for instance, Southern Thai dialects exhibit additional vowel contrasts not present in Standard Central Thai. The length of the vowels and quality are directly related to tonal realization, and the syllable nucleus structure may affect perception of tonal contours (Roengpitya, 2007; Tsukada, 2008).

2.6.3 Thai Consonants

Thai consonantal system is made of plosives, nasals, fricatives, affricates, trill, approximants, and a lateral approximant with three initial classes of consonants (high, middle, low) to interact with tones (Tingsabadh & Abramson, 1993).

	Bilabial	Labio-	Alveolar	Post-	Palatal	Velar	Glottal
--	-----------------	---------------	-----------------	--------------	----------------	--------------	----------------

		Dental		Alveolar			
Plosive	/p, p ^h , b/	-	/t, t ^h , d/	-	-	/k, k ^h /	/ʔ/
Nasal	/m/	-	/n/	-	-	/ɲ/	-
Fricative	-	/f/	/s/	-	-	-	/h/
Affricate	-	-	-	/tʃ, tʃ ^h /	-	-	-
Trill	-	-	/r/	-	-	-	-
Approximant	-	-	-	-	/j/	/w/	-
Lateral Approximant	-	-	/l/	-	-	-	-

2.6.4 Syllable Structure and Dialectal Variation

Thai syllables are typically (C)(C)V(C) with the tone dependent on the class of initial consonant, length of vowel and type of syllable. Northern Thai (also known as Kham Mueang or Lanna), Northeastern Thai (or Isan), and Southern Thai are some of the examples of Thai variants that have tonal and vowel variation, which proves that dialects need to be considered in phonological analysis (Morén & Zsiga, 2006).

2.7 Cross-Linguistic Phonological Comparison: Key Studies

Past studies of comparative phonology in Asia have often made English a reference point. Kanokpermpoon (2007) reported the variations in Thai and English in aspiration, voicing and syllable final constraints, whereas Khan (2010) focused on the Bangla's phonological issues in learning the English language, especially consonant clusters and the correct placement of lexical stress in multi syllabic words. This is challenging due to the fact that Bangla is more likely to place all the syllables of a word with approximately the same level of intensity but English is

based on the principle of primary and secondary stress and the position of stress is essential to the expression of intelligibility. Recent studies in multilingual contexts suggest that historical influences, such as Sanskritization and Pali loanwords, contribute to observed cross-linguistic similarities. Collectively, these investigations inform typological studies mapping structural correspondences and areal convergence across South and Southeast Asia (Enfield & Comrie, 2015).

Despite geographical proximity and shared exposure to Indic linguistic traditions, systematic comparative studies between Bangla and Thai remain limited, highlighting the necessity of the present research.

2.8 Historical and Contact Linguistics Perspectives

Historical and contact-linguistic considerations also enrich comparative analysis between Bangla and Thai. They have both taken on Pali and Sanskrit features via Buddhism and religious studies, including phonetic spelling of borrowed words and writing conventions (Hock & Joseph, 2019). Thai's incorporation of Indic scripts and lexical patterns parallels Indo-Aryan phonological features (Diller et al., 2004), while Bangla retains Pali-origin words exhibiting contrasts in voiced aspirates and retroflex consonants (Masica, 1991).

The existence of such influences shows there is an areal influence across the region that demonstrates the existence of the spreading phonological features across languages in religious and cultural contact. The newest studies testify to Southeast Asia as an act of linguistic area (sprachbund) whereby structural traits permeable between non-genetically indicative languages (Baxter & Sagart, 2014; Matisoff, 2001). The placement of Bangla and Thai in the given situation enhances information regarding their phonological structure and provides

supplementary information about the investigation of the contact linguistics and the area typology.

2.9 The Role of IPA and Phonetic Transcription in Comparative Studies

It is possible to represent and compare the sounds of languages using one of such comparative phonology tools as the International Phonetic Alphabet (IPA). The symbols of the IPA standard ensure that the perception of speech is not doubtful and is consistent during the analysis as indicated by the various scholars like Ladefoged and Laver. Later revisions of the IPA, however, with Esling and others describing it, were designed to be more appropriate to cross-linguistic analysis. IPA transcription in this case is employed to facilitate qualitative comparisons of Thai and Bangla close-in articulation, aspiration, tonality, and distribution.

2.10 Theoretical Framework

The theoretical framework, which forms the basis of the study, is a combination of comparative phonology, phonological typology, and socio-historical contact linguistics used to examine the phonological system of Bangla and Thai. The conceptual framework of phonological theory provides insights into the mental representation of speech sounds, the systematic organization and functional distribution of these sounds across languages (Laver, 1994; Odden, 2013). Whereas phonetics is the study of the physical realization of sounds, phonology is the study of abstract sound patterns, phonemic contrasts, and the laws which govern their interaction. The theoretical approach gives the research the capability of going beyond the description of the surface and searching an explanatory description of the cross-linguistic phonological organization.

The pivot of this system is the comparative phonology that enables systematic comparison of sound systems of genetically non-related languages. Comparative phonology presupposes that substantial insights into the phonemic structure could be gained by identifying the similarities and differences based on the phonemic inventories, distribution and functional load (Hock & Joseph, 2019). The language implemented in this paper to be compared by the comparative approach is Bangla, which is an Indo-Aryan language with segment-heavy phonology and Thai, which is a Kra-Dai language with the lexical-tone and vowel-length contrast. This oppositional approach offers a formal framework in the examination of the allocation of phonological contrast in segmental and suprasegmental parameters in different languages.

The framework also includes distinctive feature theory, a theory that views phonemes as groups of contrastive features including: [$\pm$ voice], [$\pm$ aspirated], and [$\pm$ retroflex] (Jakobson, Fant & Halle, 1951). One theoretical approach that enables this comparison of consonantal and vocalic differences in Bangla and Thai is to simplify complex sound systems into similar feature systems. The use of features is especially useful in understanding why Bangla has a four-way stop next involving voicing and aspiration, and Thai has a restricted use of voiced stop but rather utilizes consonant class distinctions with interaction of tone. The feature-based perspective adopted by the study will make sure that the phonological contrasts are discussed in a coherent and theoretically sound way.

It is also based on phonological typology, a study of sound organization patterns across the languages to determine cross-linguistic patterns and limitations (Ladefoged & Maddieson, 1996). The structural differences between Bangla and Thai cannot be interpreted without typological knowledge. Bangla is claimed to be a segment-intensive, non-tonal language of high

consonantal complexity, whereas Thai is a vowel-intensive, tonal language, in which phonemic contrasts are shared between tone, vowel length and consonant classes. Typological analysis allows the study to place these differences in the context of larger patterns of linguistic variation instead of viewing them as phenomena in isolation.

It also rests on constraint-based and usage-based approaches to phonology, such as Optimality Theory and usage-based phonology (McCarthy, 2002; Prince & Smolensky, 2004; Bybee, 2010). These practices highlight the point that phonological systems are stipulated by interacting constraints, frequency influences and communicative effectiveness beyond and despite rigid use of rules. Although the present study does not involve a strict hierarchy of constraints, the theoretical methods inform the study of the phonological patterns because they, in a manner, highlight the dynamism of the sound-system and how different structural strategies could lead to the same communicative outcomes. This point of view is especially pertinent in relation to the discussion of the dependence of Bangla on segmental contrasts as compared to the incorporation of segmental as well as suprasegmental characteristics in Thai.

The socio-historical and contact-linguistic perspective plays a significant role in the theoretical framework as it puts phonological systems into larger contexts of historical and cultural processes. Bangla and Thai are influenced by Indic linguistic traditions of Sanskrit and Pali, and have similar phonological and lexical characteristics even though their genetic roots are different (Masica, 1991; Diller et al., 2004). The use of contact linguistics allows the study to explain some of the similarities as a consequence of long-term cultural interaction, borrowing, and areal convergence in South and Southeast Asia rather than genetic relatedness. Such an approach guarantees that phonological patterns are analyzed as historically grounded phenomena and not as systems of pure structure only.

The theoretical framework is methodologically operationalized by using IPA-based phonetic analysis which provides a standard and objective way of describing and comparing speech sounds among languages (International Phonetic Association, 1999). The use of IPA transcription allows the accurate determination of the vowel and consonant inventories, articulatory differences and phonemic differences in both Thai and Bangla. The application of IPA offers the empirical base relating to comparative, typological, and theoretical understanding.

Practically, the structure has a direct impact on the analytical procedures involved in this study. Phonetic transcription and segmental inventories based on IPA were categorized, comparative phonology was applied to contrast vowels and consonants in a systematic way, typological principles were applied to explain differences in the distribution of functional loads, and socio-historical perspectives contextualized the similarities and differences that were observed. Consequently, the discussion in Chapter IV extends beyond a descriptive one, since it links micro-level phonetic detail to macro-level explanations of phonological organization.

Overall, this combined theoretical framework provides coherence between theory, methodology, and analysis. The analysis gives a detailed and theoretically enlightened explanation of the phonological systems of the Bangla and Thai languages by merging the phonological theory, comparative methodology, typological reasoning, and historical contextualization. The framework thus enables the research to contribute meaningfully to the understanding of cross-linguistic phonological variation, typology, and language contact in South and Southeast Asia.

2.11 Research Gap

Much work has been done on the phonological systems of single languages (Bangla and Thai) and their interaction with other languages, and in particular with English. The study of Bangla has documented the list of vowels and consonants, contrast of aspiration, retroflexion, stress patterns and the dialects of Bangla (Chatterji, 1970; Khan, 2010; Masica, 1991; Barman, 2012). Likewise, studies on Thai have explored the tonal system, the difference in length of the vowels, types of consonants and syllables (Abramson, 1962; Roengpitya, 2007; Morén & Zsiga, 2006). Cross-linguistic differences with the English language have been a common topic of comparative phonology in Asia, and issues such as aspiration, voicing, consonant clusters, and placement of stress have been the subject of the research (Kanokpermpoon, 2007). Recent research also shows that the historical processes of Sanskritization and Pali loanwords influence the phonological features of South and Southeast Asian languages (Peiros, 1998; Erickson, 1976).

Nevertheless, systemic comparative studies that directly compare Bangla and Thai have been limited in terms of research. The majority of the previous research involves the study of either single languages or comparative studies as compared to English. Limited research has been done into cross-linguistic articulatory and phonemic equivalences between Bangla and Thai particularly in terms of socio-historical backgrounds and areal factors. Moreover, no study has been conducted to combine segmental, suprasegmental and tonal features into one comparative framework.

This is where the current study is required because it seeks to present a thorough comparative study of Bangla and Thai phonology. This study using a combination of IPA-based

phonetic analysis, a comparative approach, and socio-historical contextualization will help fill gaps in the typological comparison of South and Southeast Asian languages. It provides not only theoretical knowledge of phonological systems but also to their practical use in multilingual education and cross-linguistic studies.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Overview

This paper tries to give a compare and contrast of the Bangla and Thai phonology with special emphasis on the vowels and consonants. The research aims to explain the phonological similarity and differences between the two languages and to explain in detail how the phonological characteristics of the two languages are organized and realized in their phonological system. The research study plan is a qualitative descriptive-comparative study, which uses documentary evidence alongside secondary linguistic data to provide a systematic and credible comparison.

The sources used to compile the information pertaining to the research were scholarly literature in the form of books, dictionaries, theses, journal articles, and credible online resources. The analysis is entirely based on documentary data rather than field interviews or live pronunciation tasks. Existing phonological descriptions, transcriptions, and IPA-based analyses have been used to represent the vowel and consonant inventories of both Bangla and Thai.

Methodology of the study is described in this chapter. It is subdivided into the following sections: research design, research questions, sources of data, research tools, data collection procedures, data analysis framework, trustworthiness, and a concluding summary.

3.2 Research Design

In the framework of the current research, a qualitative, descriptive-comparative research study design was chosen, to research the phonology systems of both the Bangla and Thai with a

special focus on the vowels and consonants. The most appropriate approach has been a qualitative research approach because phonological dimensions are understandable more through data description and interpretations rather than through generalizations that are statistically applied (Creswell & Poth, 2016; Tisdell et al., 2025). The system allowed obtaining a systematic study and description of those features of the language that can be called systematic in their nature but subjected to historical, cultural and social pressures.

A comparative phonology approach is a form of study according to which researchers aim to determine the areas of similarities and differences between two or more linguistic systems (Hock & Joseph, 2019; Odden, 2013). The two languages selected in this work are the Indo-Aryan language, Bangla, and the Kra-Dai language, Thai, because they differ typologically and because they share a common historical factor of being exposed to the Pali and Sanskrit language. A descriptive-comparative design allows the systematic categorization of vowels and consonants in each language and then systematic comparison. This strategy is not only to point out oppositional features, as in retroflexion in Bangla and tonality in Thai, but also to point out areas of convergence due to common historical roots. Previous comparative studies of Thai phonology have demonstrated that systematic contrasts such as aspiration, voicing, and syllable-final restrictions are key sites of divergence across languages (Kanokpermpoon, 2007), reinforcing the relevance of a comparative design in this study.

It is also documentary research because the works of other authors have been taken as references in order to come up with a premise description of the two languages, and these involve dictionaries, grammar books, scholarly articles, and theses (Given, 2008; Richards & Schmidt, 2013). Such materials were carefully cross-referenced and verified to ensure that the phonological data accurately reflect standard varieties of both Bangla and Thai. The use of

various documentary sources ensure that the analysis is not only up-to-date, but also reflects the existence of real phonological systems.

The use of the qualitative design also offers an opportunity to include the International Phonetic Alphabet (IPA) transcription and phonetics which offer the accurate representation of the phonological information (International Phonetic Association, 1999; Laver, 1994). The methodology of the study provides a systematic grouping of the vowel and consonant inventories of the two languages, Bangla and Thai, through IPA and phonological theory, and so the comparison is available, rigorous, and replicable.

Therefore, the qualitative descriptive-comparative research design fits well in this research; as it allows the complexity of the phonological structures, makes an accurate description possible, and gives a concise framework to compare the two typologically different languages.

3.3 Sources of Data

All the data of this study were based solely on documentary and secondary sources of linguistics. They are published phonological descriptions, dictionaries (Bangla-English and Thai-English), grammar books, theses, journal articles, linguistic corpora, and online sites about the phonology of Bangla and Thai. The data are thus not collected in terms of live elicitation or interviews but are archival and secondary in nature. This method provides uniformity, academic rigor, and reproducibility of data analysis.

3.4 Research Tools

The research materials in the study were the documentary materials, which assisted in collecting all the phonological information of Thai and Bangla. These were dictionaries, theses, journal articles and credible sources available online that were dedicated to the phonology of the Bangla and Thai languages. These were viable sources of the categorization and comparison of the vowels and consonants in the two languages.

3.5 Data Collection

The data to this comparative study on Bangla and Thai was collected based on academic and documentary sources including phonological texts, dictionaries, theses, grammar textbooks and articles. There were no interviews and data based on participants. Rather, the available linguistic descriptions and analysis have been tabulated and cross-tabulated into vowel and consonant inventory.

The information was then tabulated based on the IPA transcriptions in known phonological studies to make sure that the pronunciation is represented well. These inventories represent the common varieties of both languages (Dhaka-Bangla and Bangkok-Thai) based on what is found in the linguistic literature.

3.6 Data Analysis

The data collected through documentary sources were examined based on the study objectives of the consonant and vowel systems of the Bangla and Thai language. The phonological data were written using the International Phonetic Alphabet (IPA) so as to be

precise. The data were then typed as per the reviewed literature and the available phonological studies and separated vowels and consonants by language using typological classification.

Qualitative analysis followed after organizing the data, in order to locate the existing themes, associations, and discrepancies in the systems of phonology in Bangla and Thai. The coding in this sense entailed naming and classifications of the linguistic elements that facilitate the comparison of the main phonological characteristics (Saldaña, 2021). Just like earlier studies regarding phonological comparison, the voicing, aspiration, and final plosive realization were paid special attention in terms of difference between the Thai and other languages (Kanokpermpoon, 2007).

The phonological data were systematically coded, categorized, and compared, which made the findings obtained following the study valid, reliable, and interesting in carrying out a comparative study of the vowels and consonants in the two languages, that is, Bangla and Thai.

3.7 Trustworthiness

In order to make this study credible, there are several steps that were taken in data collection and data analysis. The term trustworthiness in qualitative research implies credibility, transferability, dependability and confirmability of the findings (Lincoln & Guba, 1985).

3.7.1 Credibility

Triangulation of documentary sources like phonological descriptions, dictionaries, theses and peer-reviewed articles in journals was used to accomplish credibility (Denzin, 2017; Patton, 2002). Triangulation of various sources made the data reliable and reduced researcher bias.

3.7.2 Transferability

The transferability was reached through in-depth descriptions of the research plan, data collection methods, and analytic methods (Lincoln & Guba, 1985; Shenton, 2004). The use of IPA transcription and comparative analysis were properly described in the study, which allows all other researchers to replicate the method or implement it in the case of similar studies.

3.7.3 Dependability

Reliability was ensured by means of systematic recording of all the procedures such as collection, classification, and analysis of phonological data (Miles et al., 2014; Noble & Smith, 2015). The comparison and coding process are replicable and transparent.

3.7.4 Confirmability

This was done by confirming all aspects of the data collection and data analysis processes which were well documented. Triangulation of data also provided objectivity and minimized bias on the researcher (Denzin, 2017; Patton, 2002). Peer feedback and supervisor review were added to provide consistency in the interpretation and analysis (Shenton, 2004; Korstjens & Moser, 2018).

3.7.5 Ethical Considerations

As the research is based on documentary materials only, and no human subjects were to be engaged, no ethical risks connected to interviews and personal information were to be considered. All secondary sources were referenced and cited appropriately in order to uphold academic integrity. Ethical compliance in research and writing was done by plagiarism checks and responsible citation practices.

3.8 Summary

Chapter Three outlined the processes and the study design of this qualitative research of a comparative phonological study. This kind of research design was descriptive-qualitative in nature since it provided an in-depth analysis of the vowel and consonant systems of both the Bangla and Thai languages. Data collection was completely based on documentary and secondary sources, i.e. phonological descriptions, dictionaries, theses and academic articles. There were no field interviews and direct data of participants.

The data was gathered and systematically represented by the use of the International Phonetic Alphabet (IPA). The similarities, patterns, and differences between Bangla and Thai were identified by using qualitative coding and comparative analysis. The use of triangulation of information provided by various documentary sources also made the results of the research plausible, reliable, and verifiable. In general, the methodology was a good and systematic guide to compare the phonological nature of Bangla and Thai.

CHAPTER IV

ANALYSIS AND DISCUSSION

4.1 Introduction

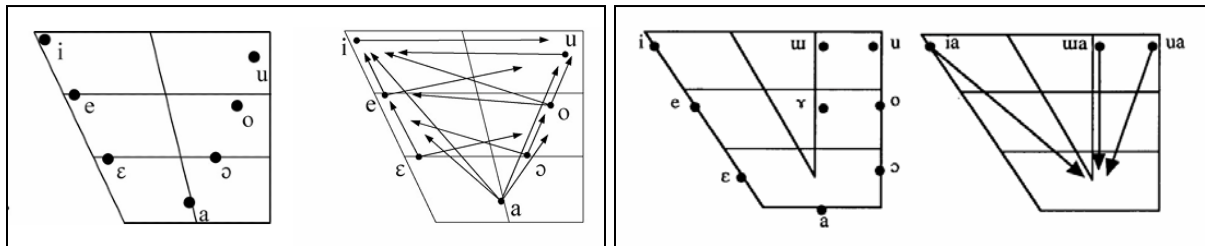
The chapter provides a comparative analysis of phonological systems of the Bangla and Thai language with a closer look at their vowel and consonant inventories, suprasegmental characteristics and the typological suggestion of their phonological structures. The analysis is based on the systematic comparison of the segmental systems, phonotactic structure and socio-historical contact factors, with reference to documentary sources (e.g., Chatterji, 1970; Masica, 1991; Iwasaki, 2007; Kanokpermpoon, 2007) and being guided by the larger typological system of Tingsabadh and Abramson (1993), Ladefoged and Maddieson (1996), and Khan (2010). It is hoped that the convergences and divergences between the two languages will be traced, placed within world phonological typology, and implications made on areal phonology and language contact in South and Southeast Asia.

4.2 Segmental Analysis

4.2.1 Vowel Systems: Inventory and Distribution

An inventory comparison of the vowel systems of standard Bangla and Central Thai shows that there are gross structural differences. Bangla has seven monophthongs and a restricted category of diphthongs including /aɪ/, /ɔɪ/, /aʊ/, and others that the literature indicates (Khan, 2010). The vowel system in the language bears the characteristics of moderate segmental richness, and the variety of the vowel length is less systematic than in the Thai language. Thai, conversely, has a greater number of monophthongs, and a large number of diphthongs and

triphthongs such as /ia/, /ua/, /uai/ and /iaj/ (Tingsabadh & Abramson, 1993; Roengpitya, 2007; Tsukada, 2008). Thai vowel length is a phonemic opposition and consequently connected with the tonal system, which creates a complex phonological system, where the segmental and suprasegmental characteristics mutually control each other (Yang & Xu, 2019).



Figures: Bangla and Thai Vowel Charts respectively (Khan, 2010; Tingsabadh and Abramson, 1993).

Table 4.1: Vowel Comparative Chart

A. Monophthongs

Category	Bangla Vowels	Thai Vowels
High/ Front	/i/	/i, i:/
High/ Near-Back	-	/ɯ, ɯ:/
High/ Back	/u/	/u, u:/
Mid/ Front	/e/	/e, e:/
Mid-Low/ Front	/ε/	/ε, ε:/
Mid/ Near-Back	-	/ɤ, ɤ:/
Mid/ Back	/o/	/o, o:/
Mid-Low/ Back	/ɔ/	/ɔ, ɔ:/
Low/ Central	/a/	/a, a:/

B. Diphthongs

Bangla	Thai
--------	------

/aj, ai, au, aɔ, aɔ̌, oɛ, oe, oi, ou, oǔ, əe, ao, ei, əi, əu, ɔi, ɔu, iə, uə, eə, oə, aɪ, aʊ/	/ia, ma, ua, iu, eu, e:u, eiu, au, a:u, iau, ai, a:i, oi, o:i, ui, r:i, uai, uai/
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Table 4.2: Vowel Inventory Comparison (Monophthongs + Diphthongs)

Language	Number of Vowels (Monophthongs)	Diphthongs/ Complex Vowels	Notable Features
<i>Bangla</i>	7 (11 <i>Swaroborno</i>)	/aɪ/, /ɔɪ/, /aʊ/ etc.	Contrast of vowel length less salient
<i>Thai</i>	18	/ia/, /ua/, /uai/, /iaj/ etc.	Rich vowel length contrast; strong relation to tone; many complex nuclei

The complexity of vowels in Thai, in terms of both quantity and functional load as seen in Table 4.1 is much more complex than in Bangla. This difference aligns with typological expectations for languages of Southeast Asia exhibiting both tone and vowel-length distinctions (Ladefoged & Maddieson, 1996). Bangla, by comparison, has fewer vowel distinctions and lacks the tight interplay of vowel length and tone found in Thai.

In qualitative terms, both languages share the presence of front, central and back vowels. However, Thai includes a high near-back vowel /ɯ/ and a mid near-back vowel /ɤ/, and their long counterparts /ɯ:, ɤ:/ respectively, which have no direct equivalent in Bangla. The diphthongal and triphthongal nuclei of Thai are far more numerous and phonemically relevant, whereas in Bangla the status of diphthongs is smaller and sometimes subject to dialectal variation (Iwasaki, 2007). Concerning distribution, in Thai, vowel length and quality are conditioned by syllable type, tone, and vowel length interplay, whereas in Bangla, vowel

distribution correlates with stress patterns, syllable structure (C)V(C) and historical contact phenomena (Chatterji, 1970).

From a typological viewpoint, Bangla may be characterized as a syllable-timed, segment-rich Indo-Aryan language with moderate vowel complexity; Thai may be characterized as a tone-language, syllable-timed, vowel-rich system in which segments and suprasegments interweave.

Table 4.3: Typology Matrix: Vowels and Phonological Typology

Dimension	Bangla	Thai	Interpretation
<i>Vowel Quantity (Monophthongs)</i>	Moderate (7)	High (18)	Thai exhibits greater segmental richness
<i>Vowel Length Contrast</i>	Present but less salient	Salient (short vs long)	Thai uses length as phonemic; Bangla less systematically
<i>Complex Nuclei (Diphthongs/ Triphthongs)</i>	Present but limited	Extensive	Thai places higher functional load on complex vowels
<i>Tone Interaction with Vowels</i>	Minimal or none	Strong (tone-vowel interaction)	Thai's vowel system is deeply entwined with tone; Bangla remains largely segment-based

4.2.2 Consonantal Systems: Place, Manner and Contrasts

The consonantal systems of Bangla and Thai differ markedly in inventory size, articulation, and functional weighting. Bangla retains a classical Indo-Aryan system in which stops are distinguished by voicing and aspiration, producing a four-way stop contrast: voiceless unaspirated, voiceless aspirated, voiced unaspirated, and voiced aspirated (Masica, 1991). It also

features retroflex consonants—/ʈ/, /ʈʰ/, /ɖ/, /ɖʱ/—in contrast to dental counterparts /t̪/, /t̪ʰ/, /d̪/, /d̪ʱ/ (Khan, 2010).

Thai, on the other hand, has an inventory of approximately forty-four consonants that contains voiceless unaspirated and aspirated stops but restricts voiced initial stops in the normal usage; it also features the phonological system that categorizes initial consonants into a high, middle and a low category that interacts with the assigning of tones (Kanokpermpoon, 2007; Noss, 1964).

Table 4.4: Consonant Comparative Chart

A. Plosives

Place	Bangla	Thai
Bilabial	/p, b, bʰ/	/p, pʰ, b/
Dental	/ʈ, ʈʰ, ɖ, ɖʱ/	-
Alveolar	-	/t, tʰ, d/
Post-Alveolar/ Retroflex	/ʈ, ʈʰ, ɖ, ɖʱ/	-
Velar	/k, kʰ, g, gʰ/	/k, kʰ/
Glottal	-	/ʔ/

B. Affricates

Place	Bangla	Thai
Post-Alveolar/ Retroflex	/tʃ, tʃʰ, dʒ, dʒʱ/	/tʃ, tʃʰ/

C. Nasals

Place	Bangla	Thai
Bilabial	/m/	/m/
Alveolar	/n/	/n/

Velar	/ŋ/	/ŋ/
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D. Fricatives

Place	Bangla	Thai
Labio-Dental	/f/	/f/
Alveolar	/s/	/s/
Post-Alveolar/ Retroflex	/ʃ/	-
Glottal	/h/	/h/

E. Approximant

Place	Bangla	Thai
Post-Alveolar/ Retroflex	/ɹ/	-
Palatal	-	/j/
Velar	-	/w/

F. Lateral Approximant

Place	Bangla	Thai
Alveolar	/l/	/l/

G. Trill

Place	Bangla	Thai
Alveolar	-	/r/

Table 4.5: Consonants Inventory Comparison (Initial Stops + Other Selected Segments)

Language	Approximate Number of Consonants	Key Features
<i>Bangla</i>	28 (39 <i>Byanjonborno</i>)	Aspirated vs unaspirated stops; retroflex vs dental

		contrasts; voiced aspirates
<i>Thai</i>	21 (44 <i>Phayanchana</i>)	Aspirated vs unaspirated stops; initial consonant class (high/ middle/ low) interacts with tone; restricted voiced stops in onset

From an articulatory and manner perspective, Bangla's four-fold stop contrast is more elaborated than Thai's, thereby placing Bangla in a segment-rich typological position. The phonology of Thai, where there is interaction of consonant class with tone and length of vowel, has a more distributed functional load at both segmental and suprasegmental levels. The dental contrast in Bangla is not very pronounced in Thai where post-alveolar affricates like /tɕ/ and /tɕʰ/ are dominant (Tingsabadh & Abramson, 1993).

Phonotactic restrictions also add to the typological difference: Thai contains a limited number of codas (such as unreleased stops and glottalized endings) and onset clusters (up to two consonants); moreover, the type of the syllable (live vs dead) also has an effect on tone realization (Yang & Xu, 2019). Bangla permits easier onset clusters and comparably more liberated syllable codas in line with Indo-Aryan expectations (Masica, 1991).

Table 4.6: Typology Matrix: Consonants and Phonological Typology

Dimension	Bangla	Thai	Interpretation
<i>Stop-Contrast Richness</i>	High (four-way stop system)	Moderate (aspiration + voiceless unaspirated; limited voices)	Bangla exemplifies classical Indo-Aryan stop complexity
<i>Retroflex vs Dental Distinction</i>	Present and phonemic	Absent or weak	Retroflexion typifies Indo-Aryan systems; Thai lacks it
<i>Interaction with</i>	Minimal	Substantial (initial	Thai's consonants

<i>Tone via Consonant Class</i>		class conditions tone)	serve a dual segmental–suprasegmental role
<i>Coda Restrictions and Final Stops</i>	(C)V(C) with moderate codas; voicing contrasts in onset	(C)(C)V(C) with restricted codas; voicing contrasts reduced in coda	Thai’s consonantal system aligns with typological tendencies for tone languages

4.3 Suprasegmental Analysis

Bangla and Thai diverge markedly in their suprasegmental systems. Bangla is primarily syllable-timed, with lexical stress acting as a rhythmic and prominence feature; however, stress does not serve as a primary phonemic contrast in the way tone does for Thai (Hayes & Lahiri, 1991). Thai, on the other hand, is a canonical tone language, with five phonemically contrastive lexical tones—high, mid, low, falling, and rising—that may distinguish meaning even on monosyllabic bases (Abramson, 1962). Thai tonal system is in a systemic interaction with initial consonant group, vowel length and syllable category: such syllables as those with short vowels or unreleased final stops (so-called dead syllables) are restricted in the performance of tonal features in comparison to the live syllables (Yang & Xu, 2019).

Another typological distinction is present in the syllable structure analysis. Bangla has comparatively easy onset groups, codas with relatively free variety of consonants and segment centric phonology. Thai also allows clusters of onsets with as many as two consonants, as well as codas limited and an immediate interplay between the type of syllable and the tone allocation (Iwasaki, 2007). The difference between live and dead syllables in Thai cannot be directly compared with Bangla. In this respect syllable structure of Thai communicates with tone and

vowel length to a significantly larger extent, whereby Thai is typologically a tone-language with strongly integrated segmental and suprasegmental structure.

4.4 Cross-Linguistic and Historical Considerations

Although the two languages have different genealogical origins, i.e. Bangla is an Indo-Aryan language and Thai is Kra-Dai language, there are significant convergences between the two languages that could be due to historical contact and diffusion across the region. The aspiration and retroflexion of stops in Bangla are inherited through the Sanskrit and Pali influence, whereas Thai, which has no genetic relations with it, has also taken over the Indic lexical and orthographic features (Hock & Joseph, 2019; Diller et al., 2004). According to the idea of the Southeast Asian linguistic area (Sprachbund), structural phonological elements, including thick vowel systems, diphthongs/ triphthongs and some syllable restrictions, can be diffused between the languages of the region regardless of the genetic origin (Baxter & Sagart, 2014; Matisoff, 2001).

Typologically, there is a divergence between Bangla and Thai, one is non-tonal, the other is tonal; one is Indo-Aryan, another is Kra-Dai, but there is convergence in the richness of the segmentation (albeit in different fields). The richness of Bangla is mostly consonantal and that of Thai, mostly vocalic and suprasegmental. These convergences could be well explained using historical contact and areal phenomena, which brings out how genetic lineage, structural innovation and functional load distribution interact to form phonological systems.

4.5 Typological Synthesis

An extensive typological table provides an overview of phonological pictures of the languages Bangla and Thai and shows both divergence and specific convergence.

Table 4.7: Comprehensive Typology Matrix

Dimension	Bangla	Thai	Typological Commentary
<i>Family Affiliation</i>	Indo-Aryan	Kra-Dai	Genetic difference emphasizes value of contrastive study
<i>Tone System</i>	Absent (lexical)	Present (five tones)	A major typological axis: segmental vs segmental + suprasegmental strategy
<i>Vowel Quantity/ Complexity</i>	Moderate	High	Thai exhibits marked vowel complexity
<i>Vowel Length Contrast</i>	Weak/ Moderate	Strong	Thai leverages length as phonemic contrast; Bangla less dependent
<i>Consonantal Stop Contrast Richness</i>	High (aspiration, voicing, retroflex)	Moderate	Bangla typifies classic Indo-Aryan complexity
<i>Segment-Suprasegment Interaction</i>	Low (segments dominate)	High (tone, class, length interact)	Thai distributes functional load across levels
<i>Syllable Structure Constraints</i>	(C)V(C), moderate clusters/ codas	(C)(C)V(C) with restricted codas, cluster + tone linkage	Thai's typology aligns with tone-language constraints
<i>Contact/ Areal Influence</i>	Sanskrit/ Pali, Perso-Arabic, English layers	Indic lexical/ script, Southeast Asia linguistic area influence	Both languages show historical layering though via different vectors

It can be concluded that Bangla aligns with the typology of a segment-rich, non-tonal Indo-Aryan language with moderate vowel complexity and high consonantal contrast, whereas Thai aligns with a vowel-rich, tonal Southeast Asian language characterized by integrated

segmental and suprasegmental features. The comparison underlines typological generalizations—such as tonal languages tending to have vowel length contrasts and more restricted codas—and simultaneously demonstrates that typology is shaped by a combination of genetic lineage, areal contact and functional load distribution.

4.6 Dialectal Variation

Though this paper focuses mainly on regular forms of the Bangla and Central Thai, it is important to understand the dialectal variation to have a complete phonological comparison. Bangla has a systematic difference in suprasegmental and segmental differences in the local dialects. An example is that vowel inventories are simplified in the Sylheti dialect, some diphthongs are coalesced or simplified and retroflex consonants can be expressed differently, which influence the syllable organization and stress distribution (Chatterji, 1970). On the same note, the Chittagonian type displays changes in consonantal and vowel pronunciation such as the loss of some terminal consonants and the change of the vowel quality that may modify phonotactic patterns and syllable mass (Masica, 1991).

Phonological differences are also very high in Thai dialects. Northern Thai (Kam Mueang) does not show tonal similarity to that of Central Thai (or Standard Thai) and the tone contours and distribution is different in many lexical items (Iwasaki, 2007). In Southern Thai (Pak Tai), however, there is a shortening of vowels and lessening of the number of diphthongs, which influence rhythms and intonation patterns of syllables. This dialect variation is historical, social, and geographic in nature, and carries an implication of the placement of both segmental and suprasegmental contrasts (Roengpitya, 2007).

The comparison of the dialectal differences points to the flexibility and adaptability of the phonological systems. It further emphasizes the fact that the phonological typology can be broadly classified, but which is a dynamically changing interaction with the sociolinguistic variables, which include the regional identity, language contact, and the historical development. This knowledge further enhances cross-linguistic comparisons because the normal phonological patterns are placed in a spectrum of variation as opposed to considering them as fixed norms.

4.7 Pedagogical Implications

The phonological differences between languages of Bangla and Thai have profound implications on language teaching, multilingual education, and second language acquisition (SLA). Thai students studying Bangla have to give special attention on the consonantal contrasts such as aspiration and retroflexion because they are phonemically loaded and define the meaning in Indo-Aryan languages (Masica, 1991). On the other hand, Thai speakers learning Bangla experience difficulties because they must adjust to a different system where tonal contrasts are not used to differentiate word meaning (lexical differentiation) (Abramson, 1962; Yang & Xu, 2019).

Pedagogically, knowing about these structural differences will enable teachers to set up special drills on pronunciation and listening exercises. As an example, those studying Thai as a second language with a first language that is Bangla may find tone-mapping activities that explicitly associate tonal contour with syllable type and vowel length useful, whereas students learning Bangla may be in need of special attention to retroflex consonants, and the /s/ and /t/ contrast. The typology of the vowels and consonants can be used to provide strategies on

cross-linguistic transfer where learners are able to predict problem areas according to their native phonological system (Ladefoged & Maddieson, 1996).

Such insights can be used in multilingual classrooms in South and Southeast Asia by teachers in order to contextualize pronunciation difficulties, introduce learners to systematic contrasts, and construct curriculum that mediates phonological differences. Also, these results are applicable to the creation of instructional materials which can be digital language tools, acoustic visualization, and phonetic transcription to improve the level of engagement and precision of learners. The combination of phonological typology and pedagogical practice will make language education more effective and evidence-based and more sensitive to structural and sociolinguistic aspects of language learning.

4.8 Research Limitations

While this study provides a comprehensive documentary analysis, it has several limitations. To begin with, the use of secondary literature and mainstream types of varieties restricts the possibility of recording fine-grained phonetic and phonological variation, particularly in dialects that are under-documented. Second, lack of experimental or acoustic data makes it impossible to make accurate quantitative comparisons of vowel formants, consonantal articulation or tonal pitch contours. Third, sociolinguistic variables like register, age or urban/rural variables are not dealt with systematically, but they can play a role in the phonological realizations. Fourth, time constraints restricted the extent of data collection and did not allow a more comprehensive survey of the dialectal and regional variation. Lastly, the cross-linguistic emphasis limits the consideration to intra-language phonological development, which would give further information about the diachronic process, and the phenomenon of contact. These

limitations can be overcome by using fieldwork, instrumental phonetic measures, sociolinguistic sampling, and longitudinal studies in future research and improve the comparative analysis.

4.9 Summary

The comparative analysis in this chapter shows that both Bangla and Thai, although genetically and typologically different, both are using elaborate phonological systems but differently. Bangla loads its phonemic burden on segmental differences, especially consonants, whereas Thai loads phonemic burden on segments as well as the tone, vowel length and syllable structure. Some of the causes of selective convergences are areal diffusion and historical contact; especially, in vowel complexities and loan phonology. These results point to the relevance of comparative phonology and typological analysis in the attempt to provide light on the ways languages exploit different structural means in order to accomplish phonemic variation. Besides this, the results have pedagogical implications to the study of multilingual education, the teaching of cross-linguistic transfer and pronunciation in South and Southeast Asia.

CHAPTER V

CONCLUSION

5.1 Overview

This final chapter is a synthesis of the research findings and the placement of the findings in relation to larger theoretical, typological, and applied linguistic frameworks. Whereas the earlier chapters were more descriptive in nature and involved comparative analysis, this chapter is reflective in nature and assesses the contributions made by the implications of the findings to the study of phonology. Returning to the main research questions, the chapter emphasizes the ways the comparative study of Bangla and Thai helps to gain more insight into phonological organization, typology, and language contact.

Instead of presenting new data, the conclusion combines the findings of the study into a logical interpretive system. The other important point that the chapter makes is the fact that there is a need to study phonological systems as a whole, both segmental and suprasegmental, and their interactions. In such a manner, the chapter emphasizes the relevance of comparative phonology as a means of bringing to focus the several structural means of achieving communicative contrast adopted by languages.

5.2 Summary of the Findings

The findings of the provided research prove that Bangla and Thai can be considered two various phonological typologies which are defined by various structural priorities. Bangla is rooted primarily on segmentation contrasts, particularly on the part of its consonant system wherein the aspects of aspiration, voicing, and retroflexion plays a major role in the creation of

the meaning line. It has a fairly lower phonemic load but its vowel system, even though of functional importance, has less load.

Thai, in its turn, has a phonological system, which is highly interactive in terms of vowels, vowel length, tone, and consonant group. Lexical tone is one of the main bases of phonemic distinction and it increases the influence of suprasegmental characteristics. In addition, the Thai vowel system is also comprehensive, where vowel length is a phonemically contrastive factor, which directly determines tonal realizations.

In spite of these differences, certain areas of overlap between the two languages in terms of patterns of aspiration and certain constraints of syllable structure were also found in the analysis. To some degree, one can explain these similarities by the historical contact as well as regional influences, the diffusion of Indic linguistic elements in South and Southeast Asia.

5.3 Practical Implications

The results of this paper have great implications on the way language is taught and how the process of the second language acquisition takes place. Bangla learners need to acquire the sensitivity to consonantal variations that are phonemically salient and Thai learners need to build competence in tonal perception and production, including the differences in vowel length.

To teachers and curriculum developers, the comparative data presented in this research can be used to guide the teaching of pronunciation by emphasizing systematic phonological disparities as opposed to viewing the problems faced by learners as individual mistakes. In a multilingual education setting, this knowledge could be relevant in terms of reducing negative transfer, enhancing intelligibility with specific pedagogical intervention.

5.4 Recommendations

Future phonological studies are suggested to take the form of integrated analysis frameworks that view both segmental and suprasegmental aspects as mutually dependent parts of a whole system. It is also recommended that researchers should undertake more intra-Asian comparative studies to offset the prevalence of English-based phonological studies.

Pedagogically, there should be explicit training of phonological awareness in language teaching, i.e. IPA-based, tone perception and articulatory practice should be included in language teaching to increase phonological competence of learners.

5.5 Further Studies

Future studies might further develop this research by involving instrumental phonetic study, involving acoustic measures of vowel formants and tonal contours. It would also be beneficial to extend the scope of the dialectal varieties of both Bengali and Thai to gain a more detailed picture of internal phonological variation.

Alongside, the comparison of other South and Southeast Asian languages would also help shed more light on areal convergence trends and typological heterogeneity. The descriptive findings of this thesis would be complemented by research in perception, socio-phonetics, and language acquisition.

5.6 Conclusion

To sum up, in this thesis it has been demonstrated that the phonological strategies of Bangla and Thai are completely different even though they are close in geography and have been in contact with each other through their history. The Bangla language is an example of a segment

rich non-tonal Indo-Aryan system and the Thai language is an example of a tonal vowel rich system with a large suprasegmental incorporation. The study shows that languages allocate phonological functional load differently, but they are still communicatively efficient through systematic comparison.

This study strengthens the significance of the cross-linguistic study by placing the phonological description in a comparative and typological framework to comprehend language diversity. The findings also emphasize that genetic predisposition, functional requirements, and historical interaction is a crucial factor in the formation of the phonological systems; therefore, the relevance of comparative phonology in the linguistic study.

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