

**A COMPARATIVE STUDY OF REDUNDANCY AND
DISTINCTIVENESS IN BANGLA AND ENGLISH**

BY

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**A THESIS SUBMITTED TO THE UNIVERSITY OF DHAKA FOR
THE DEGREE OF MASTER OF PHILOSOPHY IN APPLIED
LINGUISTICS & ELT**

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**Department of English
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March, 2014**

Dedicated
to
Gita Rani Karmarker, my mother
and
Raushan Ara Hossain, my constant source of inspiration

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Date : 27/03/2014

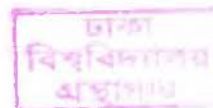
Declaration

I would like to declare and confirm that no part of the material offered in this thesis has previously been submitted by me for obtaining a degree in the present or any other universities.

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Certificate

This is to certify that the work incorporated into this thesis entitled "A Comparative Study of Redundancy & Distinctiveness in Bangla and English" was carried out by Ms. Protiva Rani Karmaker in the light of my directions.

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Abstract

The study explores the concept and use of 'Redundancy' and 'Distinctiveness' in identifying the phonemes of Bengali and English language. While doing so, it focuses on the structure of Bengali and English along with the comparative analysis between the two. The key concepts used in this thesis is that inspite of sharing some properties of phonetic units as well as prosodic features of language, there remains substantial difference between two languages due to redundancy and distinctiveness. This theory has been established on phonetic evidence as well as on phonological grounds. Since 'words' are intrinsic part of language, 'words' have been our principal isolates. To draw a comparative study, at first, the writer gives stress on some key features as (i) Aspiration (ii) Nasalization (iii) Voicing (iv) Phonemes and (v) Distinctive Feature Theory. The present writer will also try to identify the major linguistic features, sound change, articulations involved in speech sounds, resonance features, manner of articulation feature, source features to analyze the existence of redundancy and distinctiveness as the prominent source of phonetic sameness or variation between Bengali and English languages.

However, the basic notion of redundancy and distinctive analysis has been explained with the detailed analysis on several key factors organized in the remaining chapters. Chapter two has focused on literature review, Chapter three deals with the general discussion of nasalization, voicing and aspiration, Chapter four presents a comparative study of Bengali and English phonemes or sounds, Chapter five is centered on the research questions along with the key findings, the study ends in Chapter six presents a review of the summary, recommendation & conclusion are presented.

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CHAPTER ONE

1.1 Introduction

The inventory of human language is well organized by subconscious principles that shape the content of speech sounds and their patterns of occurrence in language. As a pure social science, linguistics attempts to look at human language accurately by providing reliable description and general principles about the usage of it in any speech community. Phonetics which is regarded to be the scientific study of speech sounds is an intrinsic part of linguistics. Linguistics traditionally concentrates on building a model of competence at the various levels of language organization as sounds, words, sentences, meaning and use as well as how languages vary from one another. As a branch of pure social science it mainly deals with how speech sounds are produced in the vocal tract as well as with the physical properties of speech sound waves generated by the larynx and vocal tract.

The Phoneme as a symbolic representation allows us to relate specific speech sound to each other by recognizing their phonological sameness despite their phonetic difference. As Daniel Jones (1931:74) defines the phoneme as a family of sounds in a given language together with other related sounds which take its place in particular sound sequence. Thus /p/ may stand for [p], [p^h] [p:], [p^l] etc. These sounds are present both in Bangla and English. To draw a comparative study between the two we will focus on the study of speech sounds employed in Standard Colloquial Bengali and Standard English.

Bangla is a second cousin to the classical Mediterranean languages and therefore to a good portion of the English language, Sanskrit and Greek are the sister languages of the Indo-European family. Bangla as a daughter of Sanskrit

Prakrit is well known for the complexities and divergences of its dialects as well as proud for the richness of its literature or for a glorious past. Though Bangla has complex geographical inheritance, speakers of Bangla tend to oversimplify the geographical differentiation in terms of a dichotomy of Easterner or Bangal versus westerner or ghoti. However, Bangla “sounds” or ‘lipi’ or ‘barno’ came from the Bangla word ‘lipa’ or ‘lipon’ of something with ‘mud’ or ‘clay’. Later it was done with ‘barno’ or ‘colour’. Thus we call it Bangla ‘barno’ or Bangla letters used or written sounds by continuous Bangla speaking region commonly called Bengali. On the other hand, English as the second language is usually confronted by Bangla speaking people for becoming global citizen. There are many sounds in Bangla which are not found in English or there are many sounds in English which are not seen in Bangla. It proves that two languages can possess similar properties of phonetic units i.e. - sounds but there may be found difference in the systematic arrangement from the functional point of view as because the sounds of human language are more than just sounds. For example the “p” of “pin” is exploded with a puff of air following it where as the “p” of capture is not. These sounds are quite different as mere sounds. But in English, we say they are the same because they function as the same unit in the sound system of English. These functioning units like /p/ are called phonemes by structural linguists. So a phoneme is never a letter rather it is a complex unit of sounds in the system of a language. The same phoneme /p/ contrasts minimally with /f/ not only by voicing but principally by manner of articulation in the pair ‘dipper’ and ‘differ’. Moreover, there remains difference between the surface systems of a language those that are spoken and the underlying organizing system. Our aim is to distinguish the redundant part of sounds of a language from the distinctive one. To do so we would like to draw a comparative study between Bangla and English with special reference to such features as redundancy or distinctiveness in aspiration, nasalization or voicing. There are other levels of linguistic study such as lexical, grammatical

and contextual or semantic difference.

In linguistics Redundancy is the property of having more structures than are minimally necessary. In other words, the phonetic feature that can be predicted as to be present in or absent from a particular environment in a syllable or a word and which seems to be unnecessary to recognize a linguistic unit is redundancy. On the other hand, distinctiveness refers to the phenomenon that differentiates between syllables or words and thus creates meaning contrasts. The phonetic difference between [p] and [p^h] is redundant in English since [pen] and [p^hen] indicate one word whereas the phonetic difference between [d] and [ð] is distinctive since den [den] and then [ðen] are two different words. So this concept of redundancy and distinctiveness can be used to analyze and explain the systematic arrangement of sounds or to draw comparison as well as distinction.

1.2 Background of the Study:

The background of the study is to concentrate on speech sounds i.e. phonemes and words of the two languages Bengali & English to find out redundancy & distinctiveness. The levels of study in this thesis are phonetic and phonological and so we shall be concerned mainly with the pronunciation of speech sounds employed in Standard Colloquial Bengali (SCB) and Standard English from the perspectives of redundancy and distinctiveness. Such a study is necessary from the point of view of drawing a distinction between forms and meaning of two languages or a symbolic manifestation which allows us to relate specific speech sounds to each other especially their phonological sameness in spite of having phonetic difference or vice versa. Moreover, this research will focus on major acoustic problems as well as linguistic problems originated for redundancy and distinctiveness in Bangla and English. Since we expose these two languages almost every day we need to focus on the special areas of phonetic usage and

influences as well as their significance in an insightful way.

1.3 Research Questions

This research article is mainly based on secondary sources. The study focuses on the examination of secondary sources in order to make an inquiry to the existence of redundancy & distinctiveness in two different languages like Bengali & English. While doing so the writer focuses on the existing theories propagated by the famous phoneticians, books, publications, journals etc. After presenting the theories of other researchers the writer presents her own ideas. The basic questions that the author has are the basis of the research:

- What are the phonetic features of aspiration, nasalization and voicing in Bengali & English? Are they redundant or distinctive?
- Is there any difference or similarity between Bengali & English in respect with the existence of some other features?
- Are the distinctive features independent or dependent?
- What are the problems that may arise due to having redundancy or distinctiveness in the two languages?

Since the levels of study in this thesis are related with the abstraction what have been made to find distinction or sameness between the sounds of Bengali and English we will put stress on the pronunciation of sounds employed in Standard Colloquial Bengali (SCB) and Standard English and also on the meaning of them. As 'speech' is the primary level of language and 'sound' is an intrinsic part of speech, we will not, however, be concerned with other levels of linguistic study such as lexical, grammatical, and contextual or semantic more deeply. In any language not only phonemes or the length of its vowels or consonants, stress or tone are important but also features like aspiration,

nasalization, retroflexion have syntagmatic implications within a word. Therefore these features have been abstracted and treated as properties of words within the limits to draw sameness or difference

1.4 Purpose of the Study

From the phonemic analysis of sounds in Bangla and English and their articulation we find some problems. Bengali language makes a phonemic distinction between aspirated and unaspirated sounds. But in English that difference is not phonemic and as a result English speakers learning Bengali usually do not hear the difference between /pol / পল / and / fal / ফল / or two 'n' ন, ণ, or among three 'Sha' শ, ষ, স as well as জ, ঝ, ছ etc. sounds of Bangla. Sometime in case of diphthongs or triphthongs, or redundancy in aspiration or nasalization in English language, Bengali speakers face problems. So the acoustic problem arises for several reasons. Among them redundancy and distinctiveness are two important factors present in both of the languages. Same is the case for the other. Since aspirated /p/ and unaspirated /p^h/ are distinctive in Bangla, Bengali speakers find it difficult to realize the sameness or redundancy between aspirated /p/ and unaspirated /P^h/ in English. Because the speaker of one language listening to another does not actually hear the foreign language sound units (phonemes). He interprets it according to his own language. So phonetic difference in the foreign language will be consistently missed by a foreign speaker, if there is no similar phonemic difference noticed in his/her native language.

Based on all these observations, reflections and findings special attention has been paid on the problems of the speakers in isolating the sounds that are the same or different due to phonological sameness or difference. Thus the main purpose of the author is to draw comparison between two languages in order to make the language learners aware about the usage of it in different phonetic & phonological situation.

1.5 Limitation of the study

The title of the study indicates comparison of redundancy and distinctiveness between two languages i.e. Bangla and English. So it should focus on the detailed analysis of grammatical aspects of the two. But the present study mainly concentrates on speech sounds i.e. phonemes and words of the two languages from secondary research methodology. Moreover, the study could include more examples of colloquial words along with their different meaning in English and Bangla for drawing comparison. Due to time limit the researcher could not focus on that.

However, the basic notion of redundancy and distinctive analysis has been explained with the detailed analysis on several key factors organized in the remaining chapters. Chapter two has focused on literature review, Chapter three deals with the general discussion of nasalization, voicing and aspiration, Chapter four presents a comparative study of Bengali and English phonemes or sounds, Chapter five is centered on the research questions along with the key findings, the study ends in Chapter six where a review of the summary, recommendation & conclusion are presented.

CHAPTER TWO

Literature Review

Though many theories on distinctive feature have been propagated in the last two decades, there has been an attempt to bring a conceptual integration in the area of defining these special characteristics features of units as distinctive features. In an attempt to bring analysis to speech Roman Jakobson, C. Gunner M. Fant and Morris Halle (1951) stated that like the Harvard features only twelve units can be sufficient to define all the phonemes of the world language. They will be known as the “ultimate distinctive entities of language” and there will be no more division in them. Later on, they adopted nine distinctive features to analyze the theories. Whereas all the world languages contain more or less 30 to 40 phonemes, if these nine distinctive features get appropriate to define them, it will save enough labor and time to the phoneticians.

A review of the literature indicates that while suggesting unique features of distinction these researchers give stress on articulatory phonetics, acoustic phonetics and auditory phonetics. Depending on it we have got these features as popularly known Harvard Features:

2.1 Theory of Jakobson, Fant and Halle

Roman Jakobson was also a member of the Prague school of linguistics and worked closely with Trubetzkoy. Distinctive feature theory, based on his own work and the work of Trubetzkoy, was first formalised by Roman Jakobson in 1941 and remains one of the most significant contributions to phonology. He was one of the influential linguists of twentieth century. The features of phonemes of Jakobson, Fant and Halle are divided into three parts as configurational features, expressive features and distinctive feature. The distinctive features are again divided into two parts as inherent features, prosodic feature. Inherent features are the fundamental features. Jakobson's original formulation of distinctive feature theory was based on the following

ideas of resonance features. The prosodic features are secondary features. On the basis of fundamental feature the contrast of phonemes occur as as স্বরধ্বনি [+vocalic, – consonantal], ব্যঞ্জনধ্বনি [–vocalic, + consonantal], তরলধ্বনি [+vocalic, + consonantal], শ্রুতিধ্বনি বা Glides [–vocalic, – consonantal]. Based on the secondary consonantal source there comes two other features as envelope feature or stridency feature. They are the result of auditory effect or kymograph. So it is related with auditory phonetics. In the Original distinctive features of Jakobson, Fant & Halle these variations are seen as vocalic vs non vocalic, consonantal vs non-consonantal, sonorant vs obstruent, rhotic vs nonrhotic (Vowels), advanced vs non-advanced (vowels and diphthongs), front vs non-front (vowels), coronal vs non coronal (acute vs grave), anterior vs. non-anterior (compact vs diffuse) (consonants) . More other general features of distinction include high vs non-high, low vs non-low, back vs non-back, lateral vs non-lateral, rounded vs non-rounded, distributed vs non-distributed, nasal vs non-nasals, continuant vs stop, tense vs lax (vowels), voiced vs voiceless, strident vs mellow or non-strident. Jakobson's original formulation of distinctive feature theory was based on the following ideas of resonance features:

1. All features are privative (i.e. binary). This means that a phoneme either has the feature e.g. [+VOICE] or it doesn't have the feature e.g. [-VOICE]
2. There is a difference between PHONETIC and PHONOLOGICAL FEATURES
 - Distinctive Features are Phonological Features.
 - Phonetics Features are surface realizations of underlying Phonological features.
 - A phonological feature may be realized by more than one phonetic feature, e.g. [flat] is realized by labialization, valorization and pharyngealisation.

3. A small set of features is able to differentiate between the phonemes of any single language

4. Distinctive features may be defined in terms of articulatory or acoustic features, but Jakobson's features are primarily based on acoustic descriptions. Jakobson and colleagues (Jakobson, Fant and Halle, 1952, Jakobson and Halle, 1956) devised a set of 13 distinctive features. This theory represents a starting point for the set defined by Chomsky and Halle.

2.2 Theory of Chomsky and Halle:

Distinctive feature theory was first formalized by Roman Jakobson in 1941. There have been numerous refinements to Jakobson's (1941) set of features, most notably with the development of Generative Phonology and the publication of Chomsky & Halle's (1968) in the *Sound Pattern of English*. According to this theory the sound pattern of English divided distinctive feature in three parts as follows:

- **Major class features**

Major class features deal with the fundamental *vocalic/nonvocalic* and *consonantal/nonconsonantal* distinctions. So the distinction suggested by Chomsky and Halle is essentially an articulatory one: the uttering of vowels did not involve any major obstruction in the way of the airstream, while a major constriction at some point along the vocal tract is always associated with the articulation of consonants. Just as with Jakobson, liquids are described as being [+consonantal; +vocalic], glides are [-consonantal; -vocalic], a combination of features that also characterizes the glottal fricative h and the glottal stop?

So, all the full vowels are [+vocalic]. In the way all the full consonants are [+consonant]. So semivowels are [-vocalic], [-consonantal;]. Thus [+cons] are plosives, affricates, fricatives, nasals, laterals and [r], While [-cons] are vowels, glides like [v, w, j]. Here we are getting similarity between the feature of Jakobson and Chomsky.

The distinction *sonorant/obstruent* is introduced as sounds allowing spontaneous voicing. Vowels, glides, liquids and nasals are naturally included, though it is not clear why /h/ and the glottal stop receive the same specification.

Syllabic/nonsyllabic. Consonants are described as *contoids* and vowels as *vocoids* while the same distinction *syllabic/nonsyllabic* that differentiates between vowels and glides operates in the case of consonants too. It keeps apart *syllabic* consonants like nasals and liquids and *nonsyllabic* ones. We must mention that +/- *syllabic* is a different type of feature since it refers to the possibility of occurrence (distribution) of a sound in a given position or context – i.e. syllable nucleus.

2. Cavity features are essential places of articulation features containing these:

- a) *Coronal* sounds are defined as sounds produced with the blade of the tongue raised from the neutral position like dental, alveolar, palato-alveolar consonants.

Moreover we find coronal vs. non-coronal sounds. Like ক, গ [-coronal], চ, ত, ঠ.

[+coronal]. Coronal sounds are articulated with the blade of the tongue raised from its neutral position in the mouth. Hence any of the dental, alveolar or palato-alveolar consonants are defined as coronal. *Anterior* sounds are sounds produced in front of the palato-alveolar region. Anterior sounds are produced at the frontal position of the palate. So প, ত, চ, are [+anterior] but ট, ক are [-anterior]. For example,

প, ত, ক

Anterior + + +

Coronal - + -

So, প [+ant, -cor], ত is [+ant, +cor], and ক [-ant, -cor]

- c) The *body of the tongue features* actually distinguishes among vowels having different degrees of aperture as a result of the higher or lower position of the tongue in the mouth. It is, however, extended, not very convincingly, to [-anterior; -coronal] consonants.
- d) The feature *rounded/unrounded* makes a distinction between sounds pronounced with either rounded or spread lips. Front or backness is responsible for rounded or unrounded distinction.
- e) The feature *distributed/nondistributed* differentiates between sounds produced with a constriction that extends for a considerable distance along the direction of the air flow, and sounds articulated with a constriction that extends only for a short distance in the direction of the air flow. Apical from laminal and retroflex from nonretroflex consonants, respectively are thus distinguished.
- f) The feature *covered/noncovered* refers to the position of the pharyngeal walls.

- g) *Glottal constrictions* involve the complete closure of the glottis.
- h) The features involving *secondary apertures* mainly differentiate between:
 1. *nasal/nonnasal* sounds, the opposition being based on the different cavities nasal and oral respectively through which the air is released.
 2. *lateral/nonlateral* sounds, the opposition being again based on the type of release: the air is or is not allowed to flow laterally.

3. ***Manner of articulation features*** essentially distinguishes between stops and fricatives on the one hand and plosives and affricates on the other.

a) *continuant/noncontinuant*. Continuant sounds are produced with a primary constriction that does not entirely block the air flow, while the articulation of noncontinuant sounds (stops) involves such a complete closure.

b) *instantaneous release/delayed release* is a feature that keeps apart plosives from affricates. It refers then to sounds produced with a complete closure of the tract, but which differ in the manner of the release: instantaneous or abrupt in the case of plosives and delayed in the case of affricates.

The two features then combine to describe the respective consonant classes. Stops are characterized as [-*continuant*; +*instantaneous release*], while fricatives are [+*continuant*] and affricates are [-*continuant*; +*delayed release*] in English.

c) Supplementary movements characterise sounds articulated with two simultaneous closures, such as clicks, the labiovelars or the glottalized sounds.

d) The feature *tense/lax* parallels the feature *long/short* in vowels and *voiceless/voiced* in consonants. It describes the higher or lower muscular articulatory effort required by the uttering of the respective sound.

2.3 The Theory of Trubetzkoy

Nikolai Trubetzkoy was a core member of the Prague school of linguistics which was highly influential in developing some areas of linguistic theory (including phonology), particularly in the 1930s. His most influential work was published posthumously in 1939, shortly after his death. One aspect of Trubetzkoy's work examines the idea of different types of "oppositions" in phonology. These oppositions are based on phonetic (or phonological) features. We won't look at all of the types of oppositions that he described, but only a few that are of particular relevance to this topic. That is, we will examine types of opposition that are relevant to the definition of phonological features. About distinctive feature theory Trubetzkoy focused on opposition more than the consideration of phoneme as the smallest units of sounds. His theory was more apparently related with old theory. The old theories were n-nary. But modern view is binary. For instance the assumption of the binary feature [$\pm$ Voice] implies that language refer to group of voiceless segments as well as voiced segment. From the above analysis we get the opposition which contributes in distinctive feature theory:

a) Bilateral oppositions

A bilateral opposition refers to a pair of sounds that share a set of features which no other sound shares fully. For example, voiceless labial obstruents = /p, f/. Here obstruents are defined as having a degree of stricture greater than that of approximants (that is, stops and fricatives).

b) Multilateral oppositions

A group of more than 2 sounds which share common features. For example, labial obstruents, /p,b,f,v/, are both labial and obstruents, so they share two features.

c) Privative (Binary) Oppositions

One member of a pair of sounds possesses a mark, or feature, which the other lacks. Such features are also known as binary features which a sound either possesses or lacks. Voicing is such a feature. A sound is voiced or not voiced. The sound which possesses that feature is said to be marked as [+voice] whilst the sound lacking the feature is unmarked as [-voice].

d) Gradual Oppositions

The members of a class of sounds possess different degrees or gradations of a feature or property. For example, the three short front unrounded vowels in English /a, e, æ/ which are distinguished only by their height. In this system height would be a single feature with two or more degrees of height.

e) Equipollent Oppositions

The relationship between two members of an opposition is considered to be logically equivalent. Consonant place of articulation can be seen in this sense. Changes in place involve not just degree of fronting but also involve other articulator changes.

Since the theory of Trubetzkoy can pose complexities in the identification of phonemes, the modern phoneticians preferred simpler feature as either has '+' value or '-' value, we can define distinctive feature theory on another ground of phonetics and phonology. The distinction occurs with respect to the phonological features of distinctive feature theory; and both articulatory and acoustic features have been employed here. In so far as phonology, unlike phonetics, can be thought of as making no direct reference to the phonic medium though distinctive-feature theorists, on the whole, tend not to take this rather abstract view of phonology, one should perhaps operate with phonological features that are neither articulatory nor acoustic, but relatable

equally well to both and, when auditory phonetics is more highly developed than it is at present, to auditory features. For simplicity of exposition, we will employ articulatory labels. To make it clear when we are talking about phonological features, rather than phonetic features, we will put oblique strokes, rather than square brackets, around the articulatory labels. Thus, whereas the speech-sound [p] can be described, with reference to above, as the set {[+labial], [+stop], [—voiced], [—nasal]}, so the English phoneme /p/ is analyzable as the set {/+labial/, /+stop/, /-voiced/}.

From the study of the distinctive feature theories of English language the key point that we notice is that it deals mainly with the factors on which ground phonemes vary from each other depending on their special phonetic feature or phonological difference.

2.4 Distinctive feature theory of Bengali

Later on Dr. Rameswar Shaw drew phonemic contrast or distinctive features of Bangali phonemes in his book *General Linguistics and the Bangali Language*. Based on the presence or absence of certain features of sounds as propagated by Jacobson, Halle, Chomsky and others we get these following features. The concise illustration of these two has been pointed out below.

i. General Features

- (a) Consonantal
- (b) Vocalic
- (c) Obstruent
- (d) Alphabetical

ii. Features based on Vocalic Sounds

- (a) Compact vs. Diffuse
- (b) Grave vs. Acute
- (c) High vs. Low
- (d) Buccal
- (e) Middle
- (f) Low tonality
- (g) Peripheral

iii. Applied features

- (a) Flat
- (b) Sharp
- (c) Back expanded sounds

iv. Mannered features

- (a) Continuant
- (b) Strident
- (c) Abrupt
- (d) Lateral
- (e) Tense

v. Rhythmic Sounds

- (a) Long
- (b) Low-mid

Based on all these characteristics of distinctive features of Bangla consonant is shown below:

	p	t	t̪	c	k	b	d	d̪	j	g	ph	th	th̪	ch	kh	bh	dh	dh̪	jh	gh	s	m	n	ɳ	l	r	ɽ
1. Vocalic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
2. Consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
3. Grave	+	-	±	-	+	+	-	±	-	+	+	-	±	-	+	+	-	±	-	+	-	+	+	+	-	-	+
4. Compact	-	-	-	+	+	-	-	-	+	+	-	-	-	+	+	-	-	-	-	+	+	-	+	+	-	-	-
5. Nasal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Tense	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
7. Voiced	-	-	-	-	-	+	+	+	+	+	-	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-
8. Discontinuous	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	i	e	æ	a	ɔ	o	u	ĩ	ē	æ̃	ā	ũ	õ	ū	ĩ	c	o	u	h
1. Vocalic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
2. Consonantal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Grave	-	-	-	±	+	+	+	-	-	-	±	+	+	+	-	-	-	+	-
4. Compact	-	±	+	+	+	±	-	-	±	+	+	+	±	-	-	±	±	-	-
5. Nasal	-	-	-	-	-	-	-	+	+	+	+	+	+	+	-	-	-	-	-
6. Tense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-
7. Voiced	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table-1: distinctive features of Bangla consonant

/aʃ/ আশ/ a / oral

Compact vs Diffuse

This result has been adopted based on acoustic result. Compact sounds are short lasting but diffuse sounds are long-lasting . They can create minimal pair and distinction like.

/dan/ দান... /a/ আ compact

/den/ দিন /i/ ই diffuse

For the phonemes like র, ল, শ, হ, ড, য়, ওয় / r l ʃ h r e o/. This phonemic contrast is redundant.

Abrupt vs. Continuant

Abrupt sounds end very suddenly but continual sounds take much time. Phenetically in Bengali we get প্ ত্ ট্, চ ক্, ফ্, থ্, ঠ্, ছ্, খ্, ব্, দ্, ড্, জ্, গ্, ভ্, ধ্, ঢ্, ঝ্, ঞ্, ঞ্, /p t ʈ c k p^h t^h ʈ^h c^h k^h b d ɖ ʒ g b^h d^h d^h g^h r ɽ/ as abrupt and শ, ল / ʃ l/ as continuant. For the rest phonemes this contrast is redundant.

The contrast of Abrupt vs. continuant can produce such sounds as :

/cal/ চাল /c/ ছ abrupt

/ʃal/ শাল /ʃ/ শ্ continuant

Voiced vs. voiceless

In Bengali voiced sounds are known সঘোষ and voiceless sounds are অঘোষ phonetically voiced sounds are / b d ɖ ʒ g b^h d^h d^h g^h r ɽ/ and voiceless are / p t ʈ c k p^h t^h ʈ^h c^h k^h/.

The pairs like / ʃal/ জাল.... / ʃ/ জ (সঘোষ)

[tal/ তাল /...../t/ (অঘোষ)

But depending on pronunciation ম, ন, ঙ, র, ল, হ, ড, ঝ /m n ŋ r h r e o/ are voiced and শ /ʃ/ is voiceless. But in their case this contrast is redundant.

Grave vs Acute:

In Bengali grave sounds are / ɔ o u ʊ ʊ̃ p p^h b b^h k k^h g g^h m ŋ ʊ̃ / and acute are / i e æ ĩ ē, æ̃, t t^h, d d^h t̃ t̃^h d̃ d̃^h c c^h ʃ ʃ^h n r e h ɽ/. In Bengali / a a/ are central sound so they stand between the distinction of grave vs acute. So this contrast is not necessary for them as also for র and ল.

Tense vs Lax:

Tense sounds are mahapran but lax are known as alpapran. In Bengali /p^h b^h t^h d^h t̃^h d̃^h c^h ʃ^h k^h g^h/ are tense but / p b t d t̃ d̃ c ʃ k g/ are lax. In Bengali for the case of ম, ন, ঙ, র, ল, শ, হ as well as for vowel and short vowel this distinction is redundant.

Based on all this analysis we can attach the more simplified form of Rameswar shaw to define the existence of redundancy and distinctiveness in the phonemes as through these tables:

The more simplified form as suggested by modern phonetician like Dr. Rameswar Shaw is attached below to define the matrix of distinctive features of consonants and vowels of Bengali sounds is also attached with it:

[illegible]

Table-2: Matrix of Distinctive Features of Bengali Phonemes (Consonants):

Symbolic Interpretation:

Presence of phonetically distinctiveness (+)

Absence of phonetically distinctiveness (-)

Presence of redundancy (Δ)

467395

ডাকা
বিশ্ববিদ্যালয়
গ্রন্থাগার

So it is found that there are several theories or strategies to suggest distinctive feature of the phonemes of any language. They may be considered distinguished as for being phonemic or non-phonemic theories, according to whether they take phonemes to be the basic elements of phonological analysis or not.

CHAPTER THREE

Aspiration, Nasalization and Voicing

3.1 General Discussion on Aspiration, Nasalization, Voicing & Distinctive or Redundancy

Every language consists of speech sounds called phones. These different sounds do not all have the same status in the system of phonology. The occurrence of certain phonetic features is entirely predictable, as is the case in English with voicing in sonorants, nasality of vowels, or length in vowels. Features whose presence is entirely predictable based on the phonetic environment are called redundant phonetic features as the phonetic difference between /p/ and /ph/ is redundant in English since /pen/ and /phen/ indicate one word having same meaning but different pronunciation. In a broad sense of phonetic transcription, redundant features can be ignored. The occurrence of other sounds and features in a particular language is not predictable based on phonetic context. In English, for example, voicing in obstruent is never predictable as in pat/bat/ tip/dip/ girl/curl; the contrast between fricatives and stops is also not predictable as in send/tend. Or the difference between central and lateral in liquids in red/led; ball/bar. Such features are called distinctive, or contrastive, phonetic features. Phonetic features whose presence or absence can alter meaning are called phonemic features. The presence of a phonemic feature is not predictable according to phonetic context. Adding or subtracting a phonemic feature normally results in a change of meaning as well as in a change in pronunciation. Based on the theories we will now focus our study on the general discussion of aspiration, voicing and nasalization as some of the key features of creating redundancy and distinction. Since they are found both in Bengali & English in different phonetic environment, they are important in drawing a comparative study between the two languages.

3.2 Aspiration in Bengali & English:

Aspiration as a phonetic property of the English stop categories is usually said to be non-distinctive in English language on the ground that its occurrence can be accounted for by context sensitive rules. The word pair (pin-spin) is often cited as example while the first is characterized by a feature of aspiration absent from the second. According to phonetic spelling of the forms, the two are commonly represented as aspirated [p^h] and unaspirated [p]. Whether the phoneme [p] is produced with or without aspiration is said to be determined by context or to be predictable by rule. As this aspiration never serves as the sole basis by which lexical distinctions are signaled in English, it is then termed as redundant. For example English contains aspirated [p^h t^h k^h] and unaspirated [p, t, k]. The initial stops of the set pill, till, kill are followed by a short puff of air called aspiration in English and the plosives which are followed by it are said to be aspirated. The IPA diacritic for aspiration is superscript [h] in /pill/ [p^hɪl], /till/ [t^hɪl], /kill/ [k^hɪl]. It is noticeable here that the aspiration observed in pill or [p^hɪl] is irrelevant in phonological representation as distinct units. Since here aspirated [p^h] and unaspirated [p] do not make any meaning difference, we assign them to the same phoneme [p]. In the same way if [p] is substituted for [p^h] in [sp^hɪn], we do not obtain a different word but rather a slightly distorted mispronunciation which is likely to be interpreted as [spin] in any case. But it should be noticed here that there remains a relation between aspiration and voicing and it is that a word initial voiced stop like [bin] is never followed by aspiration in English. So we can say that the presence of aspiration depends on this phonetic feature as:

[+aspirated]----- [-voiced] = (/p/)

[+voiced]----- [-aspirated] = (/b/)

So from the points it can be said that the predictability of the aspiration feature of the English stops is not phonetically based and aspiration is redundant in

English but distinctive in Bengali. As for Bengali, aspiration has been described to be a distinctive element like most other Indian languages. Aspiration of plosives which is a distinctive feature in Bangla, is separately shown with an /h/ after the plosives which is aspirated in accordance with the recommendation of IPA. Bengali words are characterized by a two term distinctions of aspiration and non-aspiration. Bengali uses separate letters for unaspirated and aspirated consonants. The unaspirated consonants are called 'alpaprana varna' and the aspirated ones 'mahaprana varna'. The first and third words of each varga are characterized by soft articulation therefore they are called alpaprna (exasperated) and the second and fourth sounds are characterized by hard articulation, they are, therefore called mahaprana. Aspirated stops creating meaning difference are distinctive in Bengali as [kal] কাল or 'time' and [khal] খাল or 'canal' are two different words or [k^h] in [k^hata] খাটা or work or [k] in [kata] কাটা or 'cut' are two different words. Similarly, we have prosodic and non-prosodic structures in initial positions of trisyllabic words in Bengali as will be seen from the following examples:

Hevevev ghatana ঘটনা

H evevev ganana গণনা

There is full contrast between unaspirated and aspirated stops and between h and zero in initial position. The aspirated stop is generally a voiceless or voiced feature of release depending on the voicing of the stop. There are cases where the aspiration is a partial or complete spirantization of the stop and accordingly is simultaneous with the features of labiality, voice etc. rather than successive to them. In the same way we find non-aspiration or aspiration in medial positions like /paka/ /পাকা/ and /pakha / /পাখা/ or /kata / /কাটা/, and /kāthā / /কাথা/ or word final positions as in probas /প্রবাস/ or /probhat/. প্রভাত. Another similar distinctive feature of Bengali sounds is nasalization.

3.3 Nasalization in Bengali & English:

In all these examples nasal Consonants have prosodic implications in the fact that V elements preceding or following them and in some cases, both of them, are also nasalized; thus this nasalization has become an essential feature associated with the nasal consonants in Bengali even though have no phonemic value. But nasalization of vowels without complete association with any nasal consonant has phonemic value in Bengali. In words like [p̃ɑ:k] and [nɑ:k], the latter has no phonemic value. Moreover the nasal [ŋ] and [ɳ] being in complementary distribution with [n] can be considered as allophones of the phoneme n (ন) and represent as /ñ/ or /n̄/. Whereas in Bangla nasalization is not limited for any consonant or vowel sounds, in English only three consonant sounds are characterized by nasalized air flow. English vowels are only nasalized when they occur near a nasalized consonant in a word. They are /ñ/, /m̃/ and /ŋ̃/. These three sounds are produced using oral articulators such as the lips for m, alveolar ridge for n, soft palate for ng. However, although there are no English vowels with nasalization as a distinctive feature, vowels in proximity to nasal consonants will often become nasalized during normal speech production due to a process called assimilation. Nasality like aspiration is only a contextual feature in English. Nasal vowel systems originate generally from the assimilation of oral vowels by adjacent nasal consonants. The idea of pharyngonasal target is supported as follows consonantal place contrasts (labial, coronal etc) neutralize into the so-called nasal appendix /ŋ/ like. We will now look at some ways in which distribution of /ŋ/ is unusual. In initial position we find m, n occurring freely but /ŋ/ never occurs in this position. Medial /ŋ/ occurs quite frequently but not initially or following plosives. Whatever the position, it is said to be redundant in English. In English cat [kæt] or cat [kæt̃] suggest the same thing. There is no group of nasality or non-nasality as /m̃æt̃/ or /mæt̃/ are same thing. Nasal plosion is common in English

both within words and at word junctions as in submarine, topmost, apeman, Sydney, Totnes, that night. Sometime it is also found before syllable [ŋ] as in suddenly, eaten, bidden. Others, however avoid it in this position and use oral position. So one may occasionally hear oral plosion instead of nasal plosion at word junctions for example, “that night”, in a rhetorical style of delivery; but this is usually considered to be affected by nasalization without meaning change.

3.4 Voicing in Bengali & English:

Voicing or voice is a term used in Phonetics and Phonology to characterize speech sounds with sounds described as either voiceless or voiced. It can also refer to the articulatory process in which the vocal cords vibrate. It is tend to be associated with vocal cord vibration but not actually be voiced at the articulatory level. So the voiced sounds are produced with voice or distinguished by the greater element of voice from those classed as voiceless. Voicing is very important factor in any language. In English the voiceless [p] of pill and voiced [b] of bill form two words of different meaning. In the same way in Bangla /pol/পল and/ bol/বল create two words of different meaning .In Bangla this feature is redundant for all phonemes except for the stops it is distinctive. In English the symbols for voiced and voiceless stops [b, d, g] and [p, t, k] are used for a variety of physical events. Strictly speaking, [b, d, g] are supported to be reserved for stops with voicing during their closures and [p, t, k] for voiceless unaspirated stops. In English [b, d, g] occur mainly in medial position and sometime in initial position; [p, t, k] occur after [-s] and sometime medially.

Actually, voicing in Phonetics suggests buzzing sound made in the larynx by the vibration of the vocal cords or folds. In terms of vibration, sounds are said to be voiced or voiceless. Voiced sounds such as /b,d,g,z/ are made by bringing the vocal folds close together so that the air stream forces them to vibrate as it

passes through the glottis. This action reduces the amount of noise generated in the mouth for obstruents like stop and fricative consonants. Voiced obstruents are therefore said to be lenis or weak. Voiceless sounds such as /p,t,k,s/ are made by pulling the folds apart to allow the air to pass through unimpeded and increase the amount of noise generated in the mouth for obstruents. Voiceless obstruents are therefore said to be fortis or strong.

Both Bangla and English use different phonological features to distinguish /p,t,k/ from /b,d,g/. This is because these feature systems use physical features describing specific articulatory states, both to represent phonetic categories and to serve as the basis for phonological representations. In English voiced stop are fully voiced. The presence or absence of voicing in a plosive in English may affect the preceding sound in a significant way. When a voiced stop follows a liquid, nasal or vowel, it causes that sound or segment to lengthen like, *gulp*, vs *bulb* or *sent* vs *send*. In each case, the segment preceding the voiced stop is noticeably longer than that preceding the voiceless stop. Like all obstruents, the voiced affricate lengthens a preceding sonorant segment like nasal, liquid or vowel. For example, in */lunch/* vs */lunge/*.

The presence of voicing or the absence of voicing depends on place of articulation. It is shown through the table below:

Table: 4 Fricatives in English

Place of articulation	Voicing	Symbol	Example
labio-dental	–	[f]	* <u>f</u> ox*
	+	[v]	* <u>v</u> ixen*
dental	–	[θ]	*mo <u>th</u> *
	+	[ð]	* <u>th</u> is*
alveolar	–	[s]	* <u>s</u> nake*
	+	[z]	* <u>z</u> ebra*
palato-alveolar	–	[ʃ]	* <u>sh</u> rew*
	+	[ʒ]	*mea <u>s</u> ure*
glottal	–	[h]	* <u>h</u> addock*

Note: ‘+’ indicates the presence of voicing ‘-’ indicates the absence of voicing

Here Voiceless /f/ in /fox/ differs from voiced /v/ in /vixen/. Sometime voiceless /p/ in /pæt/ differs from voiced /b/ in /bæt/. Because /pat/ or /pæt/ means to touch someone or something gently and usually repeatedly with the hand flat whereas /bat/ or /bæt/ means a specially shaped piece of wood used for hitting the ball in many games. Here only for difference of voicing in two phonemes the meaning change is occurring. So voicing or voice stop as distinctive feature is considered to be very significant element in English. Voiced phonemes are characterized by the prosodic vibration of the vocal cords. Since this is part of the characterization of the vocalic feature, the Jakobsonian analysis assumes that the voiced/voiceless feature is relevant only for consonants. Standard colloquial Bengali includes voiced stops as /b d d̪ g bh dh d̪h jh gh/. Other stops are voiceless. There is however substantial difference between voiceless sounds or voiced sounds as /পল/ means time or /ফল/ means fruit or /টক/ means sour while/ বক/ indicates a species of long-necked white bird etc. There are lots of examples where just for one single voiceless or voiced phoneme, two different words produce.

CHAPTER FOUR

Phonemes of Bengali and English Sounds and Critical Discussion

Phonetics is the science of describing and classifying sound segments or phonemes according to specific features they have in common. Any sound in the natural speech of any language is discernible based on such features, which are the smallest units of distinction between any two phonemes. In fact, changing one feature of any given phoneme will yield a different sound. For instance, the phoneme [k] in English is distinguished from all other phonemes when described by its features: [voiceless, velar, non- aspirated stop]. No other phoneme belongs to this category. Furthermore, if the voicing feature is altered, then [k] becomes changes to [g], which is [voiced, velar, non-aspirated stop]. And no other phoneme belongs to this category. If place feature of [g] becomes alveolar instead velar, [g] becomes [d]. Based on this phonemic analysis of speech sounds used in Bengali and English We will focus on the key features of Bengali and English sounds or letters as well as redundancy or distinctiveness in them. We have designed to focus on the key features of Bengali and English separately for our convenience.

4.1 Bengali Phonemes:

The language used by Bengali people is Bengali language. It has its origin in Magadhi Prakriti, though it is true that traces of Magadhi in Bengali is extremely difficult to establish with any cogency. Bengali as one of the major Indic or Indo-Aryan language of South Asia includes variety of languages from different sources. All these have enriched the inventory of Bengali phonemes. The inventory of the phonemes of standard colloquial Bengali (SCB) consists of twenty eight consonants, four semi vowels and fourteen vowels; in addition there are seven marginal consonants and one marginal vowel which are present only in certain styles of speaking.

4.2 Redundancy and Distinctiveness in Bangla Vowels:

In ancient accounts of Greek and Latin vowel is a minimal unit of speech that could be produced on its own and could, on its own, form a syllable. Bangla's seven vowels /i, e, æ, a, ɔ, o, u/ are high front, mid front, low front low back unrounded, low back rounded, mid back rounded and high back rounded. The front vowels, oral and nasal and /á æ/ are unrounded; the back vowels are rounded. The high vowels are considerably lower than the highest possible and the back (rounded) vowels are not strongly rounded. All vowels are considerably lone when they constitute the single vowel of a micro segment. The back vowels are /u, o, ɔ, ũ, õ, ɔ̃/. They are much closure than those of the front vowels /i, e, æ, ĩ, ĕ, æ̃/. The phonemes of front and back vowels are listed in the accompanying table,

	Vowels		Semi-Vowels	
	Front	Back	Front	Back
high	i	u	<i><u>i</u></i>	<i><u>u</u></i>
high-mid	e	o	<i><u>e</u></i>	<i><u>o</u></i>
low-mid	æ	ɔ		
low	a			

Figure 1: Inventory of phonemes

According to the view of standard sounds of Bengali it has eleven vowels. They are অ আ ই ঈ উ ঊ ঋ এ ঐ ও ঔ. In addition we have ঞ. The following diagram reflects the position of Bengali vowel sounds.

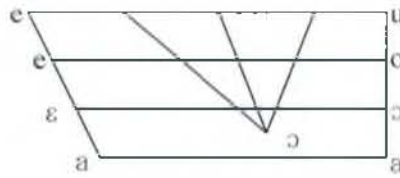


Figure 2: The position of vowels

On the basis of the vowel position and articulation we can say that A and Av are distinct and so are not redundant. Actually the distinction occurs due to their general factors:

(i) presence or absence of a single phoneme at the middle or end of word like /khil/ খিল means “bolt” but the absence of ‘i’ in “khel” creates separate meaning as /play/.

(ii) presence or absence of nasality or nonsyllability as কাঁটা or কাটা

(iii) phoneme acting as nucleus in a syllable like /æ/ in /bat/ and /i/ in /bee/ /bi:/ in English.

5.3 Bangla consonants:

The consonants of Standard Colloquial Bengali (SCB) are generally lenis in articulation with some tendency to spirantization. Standard Colloquia Bengali has thus the following sounds, viewed historically with reference to the language as a whole:

Seven Vowel sounds: [i, e., a, æ, ɔ, o, u] and the rare foreign vowel [ʌ]

ক, খ, গ, ঘ, ঙ = [k] [kh] [g] [gh] [ŋ]

চ, ছ, জ, ঝ, ঞ = [cʃ] [cʃh] [ʒ ʒ̥] [ʒ̥h] [ɳ]

ট, ঠ, ড, ঢ, ণ = [t] [th] [d] [dh] [ɳ]

ড়, ঢ় = [r] [rh]

ত, থ, দ, ধ, ন = [t], [th], [d], [dh], [n]

প, ফ, ব, ভ, ম = [p], [ph], [b], [bh], [m]

য, র, ল = [e] [r] [l]

শ, ষ, স = [ʃ]

স, স = [s]

হ = [h]

য় = [e]. Moreover we have got (ঈ, ঔ, ঐ)

So the number of consonant phonemes are 31 (thirty one). Although ণ (ṇ) and ঞ (ṇ) occur as separate symbols in Bengali, the sounds that they represent are in complementary distribution.

More over the dental ণ [ṇ] and ন [n] are allophones of the same phoneme [ṇ] or /n/. Same is the case for শ [ʃ] and ষ [ʃ]. They are also allophone of the phoneme স [s]. So from this view they are redundant. But ভ and ঙ though are in complementary distributions as the former occur only in initial position and the later in medial and final position of words, are separate for their functional position. Now we will focus on the phonemes more elaborately from the position of their utterance.

So according to place of articulation SCB are classified into groups

A. i) plosives or স্প্রুট- ক, গ, ত, দ, প

ii) Spirant or উস্ম, শ, স

iii) Resonant or রনিত ন ম, র, ল

B. Post-palatal or Dorsal

i) Palatal or তালব্য য

ii) Velar or কণ্ঠ ক গ, ঙ

iii) uvular or কণ্ঠমূলীয়-আরবী ক

C. Frontal or অগ্রজিহ্বা

i) Alveopalatal like চ, ছ, জ, ঝ, শ

ii) Front-palatal like য়

D. Apical বা জিহ্বামূল

i) Dental or ত থ দ ধ

ii) Alveolar or ন র ল ব

iii) Retroflex or ট, ঠ, ড, ণ, ঙ, ঢ

e. Labial or ঔষ্ঠ

(i) Bilabial প, ফ, ব, ভ, ম

(ii) Labio-dental English f, v or similar sounds, অশ্বত্থ ব or w like sounds.

Sounds can also be distinctive according to aspiration or nasalization. Minimal pairs can contribute here to draw distinctive sets. For example, Dhan 'rice' (paddy), Dan 'give' tin 'three' thin' poor, tik 'mark' thik' right etc.. The consonants /n/ and /l/ are retroflex before retroflex consonants, palatal before palatals, dental before dentals, otherwise alveolar. The consonant /n/ before /l/, except in very careful speech is simply a nasalized [l], /d/ after /l/ is a flap, so the cluster /ld/ closely resembles the /ll/ in auditory effect. Although the allophones of /n/ and /l/ vary phonetically from palatal retroflex, these two phonemes are classed as dentals. Their positions can create distinction like 'lal' means read, 'nal' means correct or 'lepa' to wipe, 'nepa' a bad person, 'kinlam' to buy, 'shunlam' to hear. Thus we find each sounds of Bengali language as separate units depending on their phonemic position or function though sometime redundancy arises for their unnecessary existence. The same thing is true for English phonemes. Each one of the meaning distinguishing units of sounds in a language described as a phoneme. So the concept of phoneme is the single stable sound type which is represented by a single written symbol.

4.3 English phonemes:

Since our study is comparative analysis, we will focus on English phonemes. English phonemes are viewed according to separate diameters. Phonetics as the study of production, perception of speech sounds is variously divided into acoustic phonetics, articulatory phonetics and auditory phonetics. To study the distinctive feature of redundancy in English phonemes we are going to focus on these different aspects of phonemes especially articulatory phonetics as it goes with our study.

In articulatory Phonetics speech sounds are classified in terms of the speech-organs that produce them and the manner in which they are produced. The term organs of speech is used to refer to parts of the body in the larynx and the vocal tract that are involved in the production of speech or through pronunciation. The pronunciation of words is conventionally represented with the help of phonetic symbols. A phonetic symbol stands for a particular speech sounds or segment or may be accompanied by diacritics, signs which are spotted below or higher of a phonetic symbol. For example, in the transcription [K^hæt] the pronunciation of the English word cat is represented. Here [K^h] is accompanied by aspiration without necessity. This unnecessary [h] like sound occurring between the [k] proper and the following [æ] is redundant in English. It is not always necessary or even desirable, to indicate all the features of the pronunciation of a word in a transcription: the transcriptions [kæt] are often sufficiently informative if the reader knows the language concerned hence it is redundant. Similarly vowels differ from consonants and stops differ from fricatives etc.

All vowels in English are voiced. But both voiced and voiceless consonants are common in English. They create distinction. Actually in the theory that we are dealing here with, phonemes are defined with reference to two principal

criteria: (a) phonetic similarity and (ii) distribution. Phonetic similarity is multidimensional. It follows that a particular speech-sound may be similar to a second speech-sound on one or more dimensions, whilst differing from it on one or more other dimensions.

Thus in the phonemic medium consonants seem to be distinguished from one another. Voiceless consonants include [p] [t] [k] [s] [f]; the corresponding voiced are [b], [d], [g], [z], [v].

Another phonetic difference lies in the articulation of vowels and consonants. Consonants differ from vowels in that consonants are produced by temporarily obstructing or restricting the airstream as it passes through the mouth, whereas the vowels are produced without any obstruction. The obstruction may be total, resulting in a stop or partial; if it is partial, but such as to cause audible friction, the resultant sound is classified as a fricative. Typical stops are [p], [t] and [k]; typical fricatives are [f] [s]. Consonants are classified, on another ground as according to the place of articulation. According to place of articulation English consonants are bilabial, labio-dental, dental, alveolar, palatal, velar and glottal.

According to manner of articulation consonants are voiceless, voiced, plosives, fricatives, affricate etc. In the bilabial consonant sounds the lips are brought together, e.g. in [p], [b], [m]. Within separate groups the bilabial sounds are distinctive like [pen], [men], [pit], [bit] are different just for different bilabial sounds at the word initial positions. In the labio-dental sounds the lower lip is brought into contact with the upper teeth e.g. [f], [v]. Whereas [p], [b], [m] are stops, [f], [v] are fricatives. So they are different due to manner of articulation. In the dental sound the tip of the tongue is brought into contact with the upper teeth e.g. [t], [d], [n], [θ], [ð]. There can be utterances like /ten/ /den/ /near/ /there which vary due to meaning difference though they all take dental sounds at the beginning. In the same way, we get velar sounds like /k/ or

/g/ or fricatives. Their manner of articulation and place of articulation differ. So the functional aspect of contrast lies between phonemes. As far as phonemic analysis is concerned, 'functional contrast' may be understood as being restricted to distinctive function: i.e. the function of distinguishing one form from another. Thus multidimensional of consonants are shown through this Table.

An inventory of English consonants

Typical English consonants.

I Ostruents			
stops		Symbol	Examples
bilabial	voiceless unaspirated	[p]	happy, tap,
	voiceless aspirated	[p ^h]	pit
alveolar	voiced	[b]	bit, ruber, lob
	voiceless unaspirated	[t]	writer, hit
	voiceless aspirated	[t ^h]	tip
	voiced	[d]	dip, rider, bid
	voiced flap	[r]	writer, rider
			(North American English)
Velar	voiceless unaspirated	[k]	looking, tick
	voiceless aspirated	[k ^h]	kit
	voiced	[g]	game, muggy, dog
glottal	voiceless	[ʔ]	writer, hit (many British English varieties)
in affricates			
palato-alveolar	voiceless	[tʃ]	chuck, butcher, catch
	voiced	[(c)]	jug, lodger, fudge
		[dz][	
		j)]	

Iiii Fricatives			
labio-dental	voiceless	[f]	fun, loafer, stuff
	voiced	[v]	very, liver, dive
dental	voiceless	[θ]	thin, frothing, death
	voiced	[ð]	then, loathing, bathe
alveolar	voiceless	[s]	sin, icing, fuss
	voiced	[z]	zoo rising, booze
palato-alveolar	voiceless	[ʃ]	ship, rasher, lush
	voiced	[ʒ]	treasure, rouge
glottal velar	voiceless	[h]	hop
	voiced	[ch]	loch (Irish Eng. Sc Engl. Welsh Eng.)
II Sonorants			
Ili Nasal			
bilabial alveolar velar		[m]	ma, tummy, rum
		[n]	nod, runner, gin
		[ŋ]	drinker, thing
Iiii Liquids			
alveolar	*clear*	[l]	long, mellow
lateral	*dark*	[ɫ]	dull
alveolar	(velarised)	[ɹ]	run, very (also car, cart in rhotic varieties – e.g. Scottish English, North American English)
rhotic			
Ilii Glides			
palatal		[j]	yes
labial-alar		[w]	with

Table-5: The range of consonants typically found in English

So in characterizing the phonological structure of a language, the fundamental step is to describe the repertory of distinctive contrasts available to the speaker. The second step is to analyze the phonetic interrelationships of these contrasts.

There are some other phonetic features of comparison as follows.

4.4 Vowel Length:

Vowel length is an important factor to draw comparison. For example the pronunciation of English sit/sit/ is short in length but seat/si:t/ is long. They are different not only in length but also in meaning. On the other hand, in Bengali শীত /ʃit/ and শীত /ʃi:t/ are not different in meaning even if we consider them long. So in Bengali sounds length does not play any role even in the case of cardinal vowels but for English sounds length plays an important role. Though Bangla has some long vowel sounds in pronunciation i.e. ঈ = ঐ, উ = ঊ etc. which do not change the meaning. They are commonly transliterated in English with short sounds like /u/ and /i/ respectively. i.e. /পুরবী/ /purabi/. That's why, the spellings of /বাংলা একাডেমী/, /শিশু একাডেমী/, /সোনালী ব্যাংক/ cannot follow this rule. If we change them, we will get two forms of spelling; the original and an alternative e.g. বাংলা একাডেমি vs বাংলা একাডেমী. So this difference between হ্রস্ব ই or short /i/ and দীর্ঘ ঈ or long /i:/ can be considered redundant in Bengali. Moreover in Bangla consonants we have some short symbols known as 'faula' (স), 'Saar' (ৎ) and karr' (র্) used when they are added to other consonants like কল্যাণী, বাংলাদেশ, পানি etc. Moreover, Bangla consonants are not articulated without vowel sounds. Every consonants take vowel sounds if we go for underlying system like ব (ব + অ), মা (ম + আ). Similarly in English 'b' is 'b + i/e', m 'e + m'. So, inspite of having some differences between them there lies sameness or similarity. Here Bengali or English is somehow influenced by each other.

4.5 Minimal pairs:

In the analysis of a language the discovery of minimal pairs constitute the most decisive way to determine what the phonemes of a language are, often near-minimal pairs present enough proof for phonemic status. The words in each

pair have different meanings and it varies by only a single sound. Two words that differ by only a single sound constitute a minimal pair. Minimal pairs are valuable in the identification of the significant sounds i.e. the phonemes of a language. The minimal pairs like pit [pit] and sit [sit], pun [pan] and sun [san], [sʌn] or seep [sip] or cease [sis] are examples of distinct phonemes of English and not allophones of the same phoneme. In the case of /s/ and /p/ they are distinct phonemes of English and not allophones of the same phoneme. Articulatory descriptions of /s/ and /p/ show that these two phonemes differ in both place and manner of articulation. To take another example, /s/ and /b/ differ from one another not only in place and manner of articulation but also in voicing.

CHAPTER FIVE

Research Findings

The major concern in this chapter is to focus on the findings based on the research questions discussed in the earlier chapter. From the comparative study of the phonemic systems of Bengali and English we find that the later have similar sounds for all the consonant sounds in Bengali, though the frequency of occurrence of these sounds varies in the two languages. In this regard it is important to keep in mind that the sounds of human language are more than just sound. The “p” of pin is exploded with a puff of air following it, where as the ‘p’ of capture is not. Those two sounds are quite different as mere sound. But in English they are the “same” because they function as the same unit in the sound system of English. Since as the functioning units they represent the single phoneme, in English the difference is redundant but in Bangla it is distinctive. The amazing thing is that normal speaker of a language uses this complex system of contrasts with great speed and the greatest use. An English speaker may not be aware of the difference between Bangla word /pal/ পল and /p^hal/ or /ফল/. Moreover a Bengali speaker may try to find out difference between /pen/ and /p^hen/. Actually the adult speaker of one language cannot easily pronounce language sounds of another even though he has no speech impediment and what is even more confusing; he cannot easily hear language sounds other than those of his native language, even though when he suffers from no hearing defects. So the first problem lies in aspiration.

5.1 Key Findings:

From the discussion of the previous chapters and the research questions stated above the following key findings have been stated below:

- Aspiration is redundant in English but distinctive in Bengali. Since it is redundant in English in certain case if possible we can suggest avoiding it by the foreign speakers in certain circumstances with a view to

simplifying the process or overcoming the problems of understanding speech by a Bengali listener. Voiced sounds are not aspirated and so there remains a close tie between voicing and aspiration in English what is not found in Bengali. Moreover, aspiration depends on context sensitive rule in English but not in Bengali. Because it is not normally found in every position of sounds in English as we find in Bengali. Since aspiration is considered to be redundant in English, it is mainly found in word initial position but since distinctiveness in aspiration is found in Bengali sounds, it is found in every positions of it.

- Voicing is distinctive both in Bengali & English. All vowels in English are voiced but both voiceless & voiced consonants are present in English.
- From the prosodic analysis of nasality we get these findings of nasality in Bengali. In Bengali, A sequence of vowels is either all nasal or all oral; there is no mixing of nasal and oral as in $\bar{v}\bar{v}$ or $\bar{v}v$ sequence. There is no nasal- oral contrast next to nasal consonants in Bengali. Every oral Bengali vowel has a nasal counterpart and there are no more nasal consonants than voiced obstruents. There is some morphophonemic interchange between nasal vowels and nasal consonants in Bengali. All nasality is distinctive in Bengali. On the other hand, nasality is contextual in English or does not have any role in creating meaning change between words it is termed as redundant for it. Here lies the difference between Bengali and English.
- In the Bengali language both of the double sounds reflect in utterance as in /বাজ্জ/, /গাট্টা/ but in most of the English sounds both of the same sounds of double letters don't take their utterance as in ball, call, abbess, fall, Cigarette etc. In Bengali the double words are necessary part but in English they are unnecessary parts.
- In standard Bengali there are as many as 20 plosive sounds as against 6 in English, namely /p/, /b/, /t/, /d/, /k/, /g/. In Bengali, they are not at all

aspirated. Aspiration is distinctive in Bangla but redundant in English. Moreover English does not have corresponding aspirated sounds of Bengali 'ch' (ছ) and 'jh' (ঝ). Bengali speakers often confuse 's' with 'sh'. Most often they utter 's' /ছ/ for 'sh' (শ) or become unable to draw a distinction between /tʃ/ চ and /dz/ or জ and [jh] ঞ. Because in Bengali there are three letters for these sounds like (শ, ষ, স) but in English only one /s/ sounds. So it may seem to be redundant to English speakers. As for this problem a Bengali speaker face problem to realize the difference between J and Z. They often substitute J for Z; so ziro (zero) is heard as jiro beza (bazan) as bajan. Standard Bengali has no affricate sound which compares well with those of English. It has ছ (c), চ (ch), জ (j) ঞ (Jh) which are more plosives than affricates.

- Vowel length is non-variant and so redundant to distinguish the meanings of words. In Bengali vowel length depends on emotional states, intonation or gesture. It is phonetic rather than phonemic. In English this vowel length plays important role as it is distinctive there. So 'fill' or 'feel', 'see' or 'sea' are different words though uttered as same. This again creates problems for Bengali learners to guess the distinction between the words which seem to be same to them. Foreigners again face difficulties in identifying the difference between হ্রস্ব [ɪ] and দীর্ঘ (i) in Bengali.
- As for Bengali, sounds are distinctive when they create meaning difference as in Kada (mud) and Káda (weeping). Since in English these types of different nasalization are not present, it is redundant in English.
- Actually Bengali has more syllable structures than in English, more double words continued as redundant as in হাতাহাতি, খেয়েদেয়ে, বাতাবাতি, হাভহাভি, পড়ালেখা etc. Such types of words are not visible in English.

When a foreigners starts to learn Bengali, it seems to be very difficult for him to pronounce the words and write the language. It may be taken that consonant, consonant vowel (CCV) and other different combination patterns of Bengali are also problem area to English.

- It was found that phonemes are the smallest units of sounds which cannot be broken down into other units.
- **Are the features independent or dependent?**

If we give answer of the following question we will find that both from the 'phonological level' and phonetic level the distinctive feature as discussed by Chomsky and Halle feature [+ high] would contradict [+low]. Also some features or combinations of features imply specific signs of other feature in the same bundle, as exemplified by [+vocalic] implying [+sonorant]. Thus we find that some of the features are dependent. The phonological dependencies within this set of features are paralleled by phonetic similarities. Thus the class of [-consonantal] incorporating vowels & glides must have much in common with the class of [+ vocalic] incorporating vowels and liquids. In other words "vocalic" is almost the negative of the consonantal feature. So we can resort to the minimal claim of Chomsky and Halle that features should be at least partially independent according to general features the distinctive units are justified depending on the general characteristics, vocalic characteristics, applied characteristics, rule based characteristics, non-vocalic character and rhythmic characteristics. Trubetzkoy formed on phonemic opposition rather than the consideration of phoneme as the smallest units of sounds. According to Harvard features only twelve units can be sufficient to define all the phonemes of the world. But it was found that we need to consider more aspects for defining all of them.

- It was proved that two languages can possess similar properties of phonetic units i.e. sounds but there may be found difference in the systematic arrangement from the functional point of view.
- There lies difference between the surface system and the underlying meaning. Sounds may occur in different form from a single entity as /p/ sounds for [p], [p^h] and [p'] indicate the underlying /p/ in the same way, water, ice and vapour represent scientific symbol H₂O. H₂O can occur in various forms in specific environment but the entity is static. The various forms are redundancy if they cannot change meaning, if so it will be distinctive.
- Study of minimal pairs, dissection of natural classes of sounds, syllables, stress or intonation all are important to identity redundancy and distinctiveness.
- Mastery of Bengali script is virtual in learning first to distinguish and pronounce the sounds unique to the language.
- The fundamental contrasting units of a language are not the phonemes but the features that make up the phonemes or the 'stress' or 'intonation' through which they are uttered. Stress is very important here. It can change the basic pattern of sound. As when the word 'import' is pronounced with the first syllable sounding stronger than the second, it is represented as 'noun' to the hearer. For the second part more stress, it is heard as verb. In the same way 'intonation' or pitch of the voicing can change meaning. So in the case of distinctive feature theory phonological aspect plays important role. For example we get three plural stops in English (s/ /z/ /ɪz/). It has been argued by Pinker and Prince in 1988 that the basic shape of the plural morpheme is /z/ and that all variations are just due to phonological rules of English.

- Two sounds may be superficially rather similar but belong to different phonemes. We demonstrate these phoneme categories by identifying words that are identical except for the choice of the phoneme. These are called minimal pairs. For example, English /e/ and /i/ must be phonemes because these can form minimal pairs such as in 'led' and 'lid', the difference is due to the substitution of the vowel sounds /e/ and /i/. And it is the only thing that keeps the words separate.
- Phonemic units should be understood by each member of a phonetic contrast. A phonemic contrast is any sound contrast which in the language in question can be used as means of differentiating intellectual meaning. Phonemic contrast between /ক/ and /খ/ in Bengali as between the words /কাল/ and /খাল/ reproduces two different words of meaning. Though they are minimal pairs as except /ক/ and /খ/ the other part are same, they are phonemes. So the phoneme is the minimum feature of the expression system of a spoken language by which one thing that may be said is distinguished from other thing which might have been said. For example 'pill' and 'bill' differ only in one phone. Here /p/ is voiceless and /b/ is voiced.
- In English the feature of voicing plays two important roles as such:
 - (i) It plays a crucial role in the statement of phonological regularities such as the plural rule.
 - (ii) It is minimally distinctive in that it serves to distinguish phonemes such as /z/ and /s/ in minimal pairs such as /zip/ and /sip/. In general, then, the significance of phonetic features of human language are those that play a crucial role in the statement of phonological rules and distinguish phonemes from another. Because of the latter function these features are commonly called

distinctive features.

The phoneme /k/ in English is a voiceless velar stop. But in fact it is not always velar. Under certain circumstances /k/ is articulated with the body of the tongue making contact with the root of the month at the point where the hard palate joins the velum producing a palatal or post palatal /k/. For example, whenever /k/ is followed by the tense vowel /i/ or the glide /j/, /k/ has a pre-velar articulation. In words such as key /ki/ or cute /kjut/, k is pre-velar.

CHAPTER SIX

Summary & Recommendations

In the preceding chapters, we have discussed the distinctive feature theory, the phonemes of Bengali and English and comparative analysis of redundancy and distinctiveness in them. This chapter presents the summary, conclusions and recommendations based upon the theoretical analysis of phonetics and phonology. Systematic structuring of sounds are significant enough to signal difference between the surface system and the underlying meaning. Phonological rules may be ordered with respect to one another, the first applicable rule applying to the underlying form to produce a derived form, the subsequent rules applying in turn to successive derived forms until the last applicable rule produces a surface form. The surface form is the basis of a word's pronunciation. Two words, for example, two dialects of a language may contain some of the same rules but if we apply them in a different order, they will produce different surface form for different pronunciation. In the same way different languages can have the same sounds. We can structure them differently in their sound systems. English and Bangla have the three sounds [p], [p^h] and [b] in their inventories. In English unaspirated [p] and aspirated [p^h] are allophones of one phoneme /p/, where as [b] belongs to a different phoneme. By contrast, in Bengali, aspirated [p^h], unaspirated [p] or phoneme [b] all are distinct phonemes as they all can create words of different meaning. We know that the phoneme is an abstraction here. Generally, the simplest symbol out of the symbols used to represent the allophones is designated to indicate the phonemes. For example, [p^h] and [p] are allophones of the same phoneme /p/ in English. When they are not allophones of the same phoneme as in Bengali they can create meaning distinction. Thus we get redundancy in English in case of the use of such allophones as in the words [p^hen] and [pen]. We have come to know that redundancy lies in aspiration and nasalization in

English but not in Bengali. To sum up, we can say that when a group of sounds or phones of similar phonetic nature occupy various places that do not contrast or overlap, they are in complementary distribution. Since allophones are the predictable variants of a phoneme, they do not change the meaning of a word, and may occur in phonetic contexts different from one another. When they do not change the meaning they are redundant. In a different circumstance as when they change meaning they are considered to be distinctive as aspiration, nasalization or voicing are distinctive. All these differences generally create problems for Bengali learners even in case of English learners learning each other's languages.

Recommendations:

From the discussion above we notice that there are problems occurred for redundancy and distinction in the use of languages. Because of these problems the foreign speaker cannot isolate sounds that are the same but different due to their underlying phonological difference. Here lies the importance of mutual sharing or adaptability to face two different languages. Actually with a view to achieving the end both controlled practice and communicative practice as being complementary can be exploited in the class room. Moreover linguistic elements, such as phonemes, word formation, sentence construction etc. activities can be organized rule wise and implemented in a process possessing different stages. For example, to teach some particular phonemes, first of all, we have to exhibit the phonemes and explain how they are articulated by which organ, whether they are separate phoneme or allophones of the same phoneme, what is their actual meaning or usage in the languages.

In addition, Words of colloquial Bangla and English should be studied together to get a clear idea or to be competent in using them. As there are many redundant parts in two languages studied here the researchers should aim to

sort out the more unnecessary parts in both of the languages with a view to exclude them or acknowledge their existence as unnecessary.

Moreover one should gather proper knowledge on redundancy or distinctiveness from the theories of the famous phoneticians. The proper knowledge of redundancy and distinctiveness can act as important tool here. For the sake of minimizing the distance between the two languages we can focus importance on more distinctive units feature than redundant units. As Bangla has introduced lots of sounds from different sources or it has a rich history of its own, it got some non-variant words, more diphthongs as in English 8 (eight), Bangla 18, more sounds as allophones ন, ণ, শ, ষ, ঙ, ঝ, র, ড়, ঢ়, more plosives as 20 in Bangla, only 6 in English more complexities are occurring. Subsequent generation can take steps to simplify the speech pattern — by reducing the redundant part and introducing the distinctive part as fundamental. Same is the view for English speakers. English speakers can come out of their dialectical variation in utterance as aspiration, nasalization, rhotacism, stress, intonation, etc. in speech for the sake of simplifying their speech. The comparative study of redundancy and distinctiveness of the two languages in the present research has been able to do so.

In conclusion, we can say that one may be able to compare the nominal groups between the two languages but one cannot generalize from these two comparisons. One has to study more deeply on redundancy and distinctiveness in the two languages.

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