

Chapter 5 : MANIPURI MORPHOLOGY

Natural languages are very strange and a complex entity, every single one of them (notwithstanding objections from native speakers regarding them intuitively rather than from the vantage of linguistics) is different from the other. In typological classification of languages, linguists use to divide them in about 5 main types. It must be added however that hardly any language or family is purely of one variant.⁷The five types are designated as: isolating, agglutinating, inflecting, polysynthetic or incorporating, and Analytic languages.

Uralic languages, Turkish, Japanese, Quechua, Swahili, and Etruscan languages fall in the category of agglutinative language. Manipuri is also an agglutinative language. Like other agglutinative languages, Manipuri possesses a very rich and complex morphological word structure- exhibiting the characteristics of an agglutinative language. Morphemes are attached one after another to form different word forms from a root or stem which is a distinguished characteristic of agglutinative languages. Prefixes and suffixes play major role in the word formation process of the various word forms of the language.

The agglutinative nature of the language is well demonstrated with the word structure available in the language. From a single root or stem various word forms can be created by attaching a large number of morphemes. Concatenations of morphemes up to a maximum of ten numbers are traced in Manipuri words. A single word may be equivalent to a long English sentence. Let us consider the following word:

(5.1) চৎহনখিনবগীদমকতনিকো (*cəthənkhinəbəgIdəməktəniko*)

The above word has ten morphemes (one root and nine suffixes).

⁷ <http://www.u5d.net/Linguistics/8-types-of-languages.html> accessed on 18/3/2014

(5.2) চৎ/হন/খি/ন/ব/গী/দমক/ত/নি/কো (cət/hən/khi/nə/bə/gI/dəmək/tə/ni/ko)

The morphemes with their corresponding lexical category are shown below:

Table 5-1: Morphemes with lexical category

Morphemes	Lexical category
চৎ	Verb Root
হন	Causative
খি	Perfective
ন	Ergative
ব	Nominalizer
গী	Genitive
দমক	Emphatic only
ত	Emphatic
নি	Copula
কো	Endearment

The above word is equivalent approximately to the following English sentence:

(5.3) *For the sake of just to make (somebody) let go off from (some place)*

The current chapter contains some answers to the first objective of the present study. “an in-depth examination of the word forms for a new linguistic insights of Manipuri language from computational point of view for the purpose of morphological analysis”

The findings on Manipuri root words and affixes, and their combination possibilities have not been probably described before in such a detail. The need for an exact morphotactical scheme that is fine-grained enough for automatic analysis and generation of Manipuri words led to insights that cannot be found in any Manipuri grammar.

The partitioning into slots in the nominal and verbal word structures along with the identification of affixes meant for these word categories, as well as the different sub-

types of root categories and their particular morphotactical restrictions represent new knowledge about Manipuri.

The following sections elaborate the description of these findings.

5.1 MANIPURI MORPHEMES

Manipuri words are mainly constituted by three types of morphemes- roots, prefix and suffixes. Of which verbal roots can never stand as an independent meaningful word, whereas the noun roots are free and can be identified as a full-fledged word. There are also bound forms of noun roots in the nominal category; to be an independent word, these roots require prefixes to be attached to the nominal root. In case of verb roots it is a controversial matter that as to why these roots are designated as verb roots. For our purpose of the study we would refer to them as verb root for the simple reason that the words formed from these roots express action related meaning. Our study will not go for a discussion to consider them as verb root or simple root, rather would concentrate towards the morphological structure of the word composition. The language has only two types of word classes, viz. noun and verb class; other classes such as adjectives and adverbs are derived from verb roots by attaching a prefix or a suffix or both. The affixes for nominal and verbal categories are different as they serve different purpose. The three morphemes are discussed in detail in the subsequent sections. The following diagram shows the types of morphemes and their sub-categories:

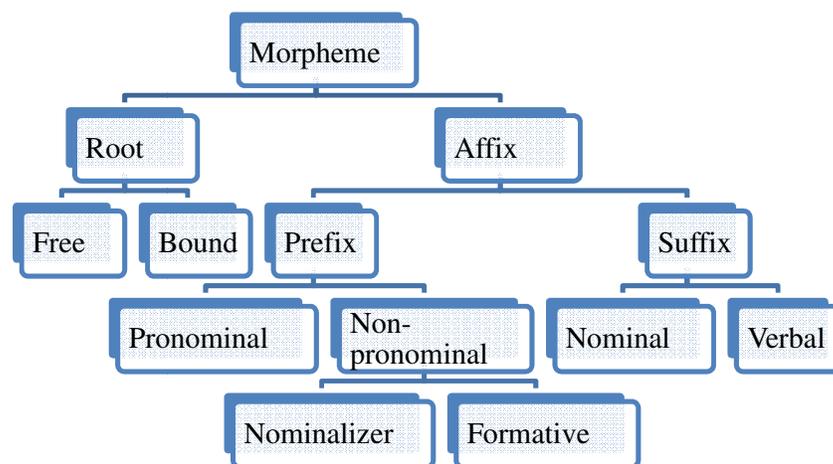


Figure 5-1: Types of morphemes (Source: Ch. Yashwanta Singh, 2000)

5.1.1 ROOTS

Manipuri language has two types of roots- free and bound. Bound roots are again classified into two groups: i) nominal bound roots and ii) verbal bound roots

Free roots: Nouns in the language are free roots. Some examples are:

(5.4) শম /səm (hair), ষণ /sən (cow), ঈশিং (water), শুমাং /sumaŋ (courtyard)

Nominal bound roots: These roots are converted to nominal category after a certain affix is attached to them; before attachment of the affix it does not have a proper meaning. Kinship terms, human body parts, and animal body parts are examples of nominal bound roots. Examples are:

Kinship terms:

(5.5) চে /ce (elder sister) of মচে/mæce (his/her elder sister),

(5.6) প়া /pa (father) of ইপ়া/məpa (my father),

(5.7) নে /ne (aunt, paternal) of ননে/ nəne (your aunt),

(5.8) বুং⁸/ buŋ (elder brother) of মবুং /məbuŋ (her brother),

(5.9) চন⁹/ cən (younger sister) of ইচন /icən (my sister)

All the roots in the above example require a pronominal prefix¹⁰ to be an independent meaningful word.

Some exceptional cases in the kinship terms are the loan words like:

(5.10) খুড়া/ khura (uncle, paternal), দাদা/dada (elder brother), etc.

And the compound words

(5.11) তাকৌ/tacou (elder brother), তামো/tamo (brother), etc.

Animal body parts:

⁸ buŋ is used to address an elder brother by a female

⁹ cən is used to address a younger sister by a male

¹⁰ See section 5.1.2 Affixes

Animal body parts in the language also constitute part of nominal bound roots in the language.

(5.12) চি/ci (*horn*) in মচি/mæci (*its horn*),

মৈ/meI (*tail*) in মমৈ/məmeI (*its tail*),

(5.13) তু/tu (*hair*) in মতু/mətu (*its hair*)

These roots require third person pronominal marker ম/ mə to be prefixed to give a complete meaning for the animal body part.

Some other miscellaneous roots are also nominal bound roots in the language. These roots like that of animal body parts require the third person pronominal marker ম/ mə to be prefixed.

(5.14) থৌ/ thou (*duty*) in মথৌ/ məthoU,

(5.15) কোল/ kol (*nest*) in মকোল/ məkol,

(5.16) রাক/rak (*breadth*) in মরাক,

(5.17) চেৎ/ cet (*piece*) in মচেৎ/ məcet

Verbal bound roots

As of the verb category, the language does not have any verbal word in free form. Even though we use the term verbal bound root, it is a controversial matter that whether these roots should be considered verbal or not. Considering the fact that the words formed from these roots after attaching affixes, expresses action related meaning, we go with the group of grammarians who opt to call them as verbal roots. Hereafter we refer to these roots as verbal roots in this study.

5.1.2 AFFIXES- SUFFIXES AND PREFIXES

Manipuri affixes are of two types: prefix and suffix. A root/stem can take only one prefix at the maximum, whereas the number of suffixes attached to a root/ stem can be many. A maximum of ten suffixes attached to a stem/ root is recorded in our study, as

cited in the starting of this chapter. The number of prefixes is comparatively less in comparison to the number of suffixes in the language.

Prefix: - Prefixes are used at word level as well as at the sentence level. However we will be concentrating on the prefixes that are used at the word level. Pronominal and non-pronominal are the two types of Manipuri prefixes (see figure 5-1). There are around 11 (eleven) prefixes in the language. Nominal bound roots take pronominal prefixes. The purpose of this prefixes are mainly for marking first, second or third person in case of kinship terms, personal pronouns and ownership in case of animal body parts. The following table shows the pronominal marker prefixes of the language.

Table 5-2: Pronominal prefixes

Prefix	Meaning	Example	Example Meaning
ই/ i	First person	ইমা/i-ma	My mother
ন/ nə	Second person	নচে/nə-ce	Your sister
ম/ mə	Third person	মবাই/məbaI	His brother-in-law

The syntax for using the pronominal prefix is

(5.18) *Pronominal marker prefix + Nominal Bound root*

Examples are:

(5.19) মমা/məma (his/her mother) → ম/mə (Third person pronominal prefix)+মা/ma (Nominal bound root)

(5.20) ইচা/ica (my son/daughter) → ই/i (First person marker)+চা/ca (Nominal bound root)

(5.21) নমৌ/nəmoU (your daughter-in-law) → ন/nə (Second person pronominal prefix)+মৌ/moU (Nominal bound root)

The non-pronominal prefixes in the language are meant to be prefixed to verbal roots. Depending upon the purpose of the prefix, the non-pronominal prefixes are divided into two types: nominalizing and formative prefix.

The following table shows the list of non-pronominal prefixes

Table 5-3: List of some non-pronominal prefixes

Prefix type	Prefix	Example	Meaning
Nominalizing	খু/khu	খু-চা/khuca	way/ mode of eating
	ম/mə	ম-চা/məca	*way/mode of eating
Formative	অ/ə	অ-ফ-ব/əfəbə	good
	ই/i, পং/pəŋ	ইচা-চাই, পংচা- চাদে, পুংথক-ত থকই	**These are used in reduplication of verb roots.
	চ/cə	চগুংনৈ	
	ত/tə	তগুপ-তগুপই	
	শুক/ shu	শুকথক-থকতে	
	খঙ/ khəŋ	খঙচৎ-চৎলি	

*ম/mə is context sensitive and may lose its meaning without context; here it may equally mean “his son/daughter”, ম/mə playing the role of third person singular number marker.

**uses of these prefixes are in various contexts and environments and are used to reduplicate the verbs, either completely or partially.

Nominalizing prefix: The খু/khu and ম/mə prefix under this category are used to nominalize the verbal roots by prefixing. However, the grammatical and semantic purpose of the prefixes is different. Both the prefixes can be attached to verbal roots; though the use of খু/khu is more productive and appropriate with or without context. Prefixation of ম/mə is significant in nominalizing the verbal roots in a context but loses its meaning without context. Moreover ম/mə is limited only to action verbs and is preferred to be used at the sentence level.

The syntax for using the non-pronominal prefix is as follows:

(5.22) *Non-pronominal prefix + Verb Root*

Examples are-

(5.23) খুথক/khuthək (way of drinking) → খু/khu (Non-pronominal prefix)+থক/thək(Verb root)

(5.24) খুতম/khutəm (way of learning) → খু/khu (Non-pronominal prefix)+ তম/təm(Verb root)

(5.25) মথক/məthək (mode of drinking) → ম/mə (Non-pronominal prefix)+থক/thək(Verb root)

(5.26) মতম/mətəm (mode of learning) → ম/mə(Non-pronominal prefix)+তম/təm(Verb root)

As shown in the above example, prefixing of ম/mə to the verb root create ambiguity at the word level semantically. So, instead of expressing “way/mode of”, this prefix may rather give a different meaning; and so the (5.25) and (5.26) will mean “on top of (something)” and “time” respectively.

Formative/ Attributive prefix

Formative prefixes in the language are many. Of which অ/ə prefix is used extensively for deriving adjectives from the verb roots along with nominalizing suffix ব/bə. The syntax for concatenation of অ/ə with the verb root is as follows:

(5.27) Formative prefix + Verb root + Nominalizer suffix

Examples are:

(5.28) অফব (অ/ə + ফ/p^hə + ব/bə)

The other prefixes under the formative category are used for the purpose of reduplication and will not be considered for discussion in this study.

Suffixes

Manipuri has inflectional as well as derivational suffixes. The number of prefixes is less as compared to the number of suffixes in the language. There are more than 60 Manipuri suffixes, the exact number, as well as the spelling of the suffixes exhibits a considerable variation across spellings and documentation and dialects. The word class decides the type of suffix it can take. Additionally, Manipuri has a small set of

particle suffixes. The position of these suffixes is at the end of the suffix sequence. The derivational suffixes include nominalizing, adjectival and adverbial suffixes that is concatenated to verb roots in order to derive noun, adjective, and adverbs respectively. Being an agglutinative language, the number of suffixes that can be attached to the root/stem of a Manipuri word is high, though only one prefix is allowed if it is present. Each time a suffix is added to the stem, meaning is also added and thereby the complexity of the process increases. In Manipuri most of the suffixes have allomorphs which make the job of analysis more challenging. For convenient analysis of the word forms, the Manipuri suffixes can be grouped into two types – i) nominal suffixes and ii) verbal suffixes. The following table shows the list of nominal suffixes.

Table 5-4: Nominal suffixes

Suffix Name	Suffix	Lexical meaning
Case Markers	ন/nə	Nominative
	ন/nə	Instrumental
	বু/bu	Accusative
	গী/gi	Genitive
	দ/də	Locative
	দগী/dəgi~তগী /təgi	Ablative
	গ /gə~ক/kə	Associative
Number	শিং/siŋ	Plural
	খোয়/khoy	Plural
Gender	আ/a(়)	Male
	ই/i(়ি)	Female
Connectives	গ/gə	With
	সু/su	Also
	নে/ne	And
Question marker	নো/no	Inquisitive
	রা/ra~লা/la	Interrogative
Particles	তি/ti~দি/di	Definitive/Particularization
	দু/du~তু/tu	Distal
	সি/si	Proximate Demonstrative
	মক/mək	Emphatic self

	দ (də)/ত(tə)	Exclusive (self)
	দমক/dəmək~তমক təmək	Emphatic only
	গীদমক/gIdəmək~কীদমক kidəmək	For only/ only for
Copula	নি/ni	Copula

Numbers of verbal suffixes, on the other hand, are much more than the nominal suffixes. The following table shows the verbal suffixes along with its allomorphs.

Table 5-5: Verbal suffixes

Suffix Type	Suffix Names/Allomorphs
Simple Aspect	ই/i~ঙি/ηi~মি/mi~পি/pi~লি/li
Progressive Aspect	রি/ri~লি/li
Perfect Aspect	রে/re~লে/le
Irrealis	গনি/gəni~কনি/kəni
Potential	গ/gə~ক/kə
Mood	নিং/niŋ
Imperative	ও/o, মো/mo, পো/po, ঙো/ηo, উ/u, মু/mu, পু/u, ঙু/ηu, য়ু/yu, রো/ro, লো/lo, রু/ru, লু/u
Deictic	র/rə, রু/ru, রক/rək~লক/lək, খি/khi
Intentive	কে/ke~গে/ge
Suggestive	সি/si
Concessive	সনু/sənu
Adverbial	ন/nə
Nominalizing	ব/bə~প/pə
Copula	নি/ni
Directional	সিন/sin~চিন/cin~জিন/jin, থোক/thok~দোক/dok~তোক/tok, খৎ/khət~গৎ/gət~কৎ/kət, থ/thə
Goal Centric	র/rə~ ল/lə, ম/mə, ঙ/ηə, প/pə
Destructive	খায়/khai~গায়/gai~কায়/kai, থৎ/thət~দৎ/dət~তৎ/tət, থেক/thek~দেক/dek~তেক/tek
Reciprocal	ন/nə

Together	মিন/min
Excessive	মন/mən~মল/məl
Causative	হন/hən~হল/həl
Reflexive	চ/cə~জ/jə
Honorific	বি/bi~পি/pi
Dubitative	দ/də~ত/tə
Endearment	কো/ko~চো/co
Habitual	কন/ kən~গন/gən
Superiority	হৎ/hət
Doubt	কুম/kum~গুম/gum
Evidential	লম/ləm~রম/ rəm
Obligation/ Probability	দৌ/dou~তৌ/tou
Perfective	খ/khrə
Prospective	ল/(lə)~র/rə
Necessity	ত(tə)~দ/(də)
Negative Marker1	রোই/roi~লোই/loi
Negative Marker2	ত/tə~দ/də
Negative Marker3	ত্র/trə~দ্র/drə
Negative Marker4	ত্রি/tri~দ্রি/dri
Negative Marker5	তে/t~দে/de
Negative Marker6	নু/nu
Negative Marker7	গুম/gum~কুম/kum
Continuation	হৌ/həw

5.2 WORD CLASSES

This section briefly discusses the major word classes of Manipuri language. Its internal word structure and constituent morphological elements are discussed from analysis point of view.

Except nouns, the language does not have a distinct word class. The choice of affixes attached to a word form is due to the word class of the word form under consideration. Depending on the different characteristics features of groups in a word class, a word class is divided into different sub-categories. Each sub-category is

specified with unique and distinguished morphological word structure. Because of their varied morphological characteristics and constituent morpheme elements, it is important to discuss them from analysis point of view.

Classification of Nouns: Depending on the presence or absence of some characteristic features, nouns are classified into free forms, personal pronouns, demonstrative pronouns, kinship terms, wh-words, cardinal numbers, ordinal numbers. The features like stem final segment, number, gender, form, honorificity, augmentative/diminutive and vocative case are considered while grouping the nouns. Manipuri nominal words are comprised of common nouns, personal pronouns, wh-words, kinship terms, flora and fauna, materials and artifacts, cardinal and ordinal numbers, etc. Manipuri common nouns are mostly free standing. The class can be divided into two main categories: 1) simple and 2) compound. Simple nouns can again be sub-divided into two categories: free and bound. Schematic diagram of the division is as shown below:

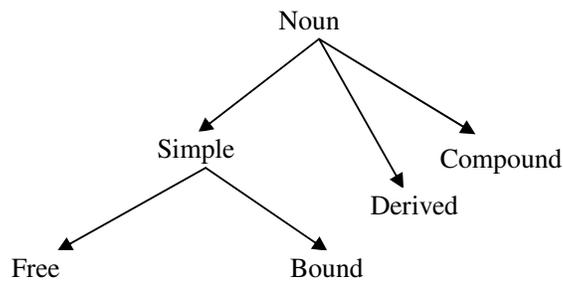


Figure 5-2: Types of nouns

Free nouns: Free nouns can be identified without any prefixation or suffixation. In Manipuri noun is the only word class that has word with independent existence. Free nouns can be grouped into two groups: animate and inanimate nouns. Both of them inflect for number, case marker, but the inanimate nouns do not have gender agreement. Some examples of free animate nouns with their morphological tags are given below:

Table 5-6: Free animate nouns with some inflected forms

Morphological tag	Man	Priest/local doctor	Thief
+NOUN+MASC+SG	নুপা/nupa	মাইব/maibə	হুরানব/huranbə

+NOUN+MASC+SG+PL	নুপাশিং/nupasinq̣	মাইবশিং/maibəsiŋ̣	হুরানবশিং/huranbəsiŋ̣
+NOUN+MASC+SG+GEN	নুপাগী/nupagi	মাইবগী/maibəgi	হুরানবগী/huranbəgi
+NOUN+FEM+SG	নুপী/nupi	মাইবী/maibi	হুরানবী/huranbi
+NOUN+MASC+SG+NOM	নুপান/nupanə	মাইবন/maibənə	হুরানবন/huranbənə

The corresponding transducer for the above word forms is given below:

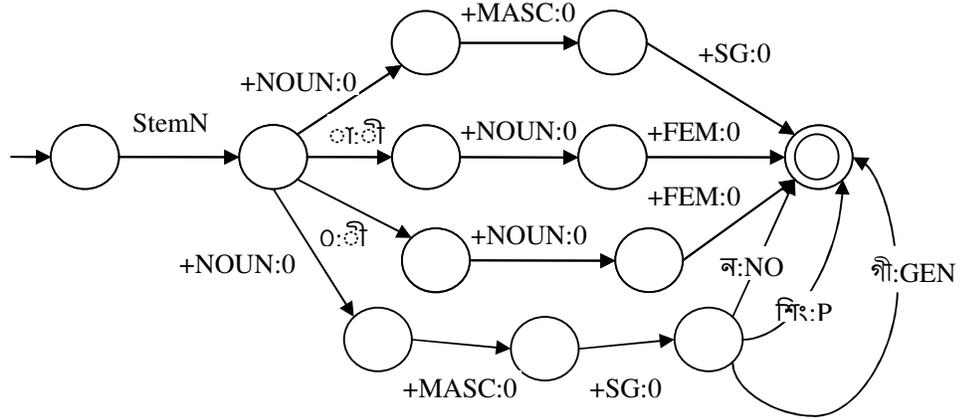


Figure 5-3: FST for free animate nouns with gender and some case markers

Bound nouns: The nominal bound roots in Manipuri are limited in number. Kinship terms, animal body parts, etc. forms this category. Examples from kinship terms are

(5.29) পা/pa(bound root) → (father), মা/ma(bound root) → (mother), চে/ce(bound root) → (sister),

(5.30) নে/ne(bound root) → (aunt), নো/naw(bound root) → (younger sister/brother)

An attachment of a personal pronominal marker to the roots of kinship terms gives complete meaning to these nominal bound roots, as in:

(5.31) ই+পা/i+pa (1^{st} person pronominal prefix+bound root) → (my father),

(5.32) ম+মা/mə+ma (3^{rd} person pronominal prefix+ bound root)) → (his/her mother),

(5.34) ন+চে/nə+ce (2^{nd} person pronominal prefix + bound root) → (your sister),

(5.35) ই+নে/i+ne (1^{st} person pronominal prefix + bound root) → (my aunt),

(5.36) ন+নাও/nə+naw(2nd person pronominal prefix + bound root) → (your younger brother/sister), etc.

The following table shows some examples of nominal bound roots from kinship terms with personal pronominal markers and some case markers.

Table 5-7: Bound roots from kinship terms with pronominal markers

Morphological tags	Grandmother	Mother	Son/daughter
1P+NRoo+NRB+SG	ইবোক/ibok	ইমা/ima	ইচা/ica
1P+NRoo+NRB+PL	ইবোকশিং/iboksiŋ	ইমাশিং/imasiŋ	ইচাশিং/icasiŋ
1P+NRoo+NRB+SG+GEN	ইবোককী/ibokki	ইমাগী/imasiŋ	ইচাগী/icasiŋ
2P+NRoo+NRB+SG	নবোক/nəbok	নমা/nəma	নচাহোয়/nəca
2P +NRoo+NRB+PL	নবোকশিং/nəboksiŋ	নমাশিং	নচাশিং
2P +NRoo+NRB+SG+GEN	নবোককী/nəbokki	নমাগী/nəmagi	নচাগী/nəcagi
3P+NRoo+NRB+SG	মবোক/məbok	মমা/məma	মচা/məca
3P+NRoo+NRB+PL	মবোকশিং/məboksiŋ	মমাশিং/məmasiŋ	মচাশিং/məcasiŋ
3P +NRoo+NRB+SG+GEN	মবোককী/məbokki	মমাগী/məmagi	মচাগী/məcagi

The following FST can analyze and generate the kinship terms and their forms illustrated in the above table 5-7:

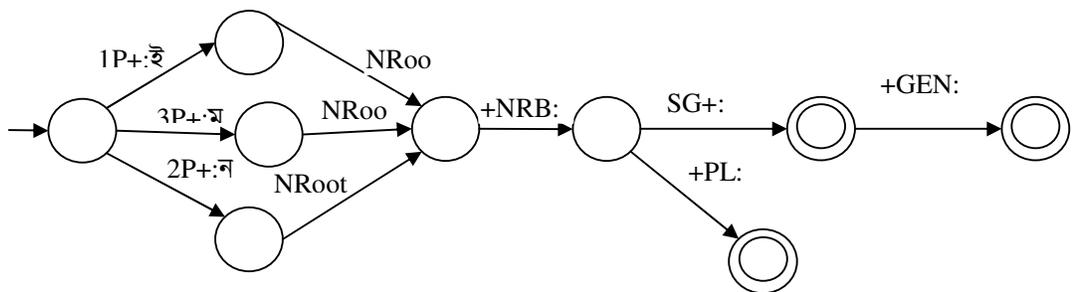


Figure 5-4: FST for kinship terms with pronominal markers and some case markers

Animal body parts forms another group of nominal bound roots. They require the third person pronominal prefix ম/মə to be attached, to qualify to be a nominal category word. Some examples are:

(5.37) $\text{ꯃ} + \text{ꯃ} / \text{ꯃ} / \text{m}\text{ə} + \text{kho}\eta$ (3^{rd} person pronominal prefix + bound root) \rightarrow (its leg)

(5.38) $\text{ꯃ} + \text{ꯃ} / \text{ꯃ} / \text{m}\text{ə} + \text{sa}$ (3^{rd} person pronominal prefix + bound root) \rightarrow (its body)

Pronouns

In Manipuri the anaphors/ pronouns forms a distinct category in the noun class. Pronouns are used in grammatical classification of words to refer to a closed set of lexical items that can substitute for noun or noun phrase. Pronouns in Manipuri occur either in free as well as in bound forms. They may be divided into personal, reflexive, demonstrative, indefinite and interrogative pronouns.

Table 5-8: Free and bound forms of Personal Pronouns

Person	First Person	Second Person	Third Person
Free form	ꯃ/əy	ꯃꯃ/nəŋ	ꯃ/ma
Bound form	ꯃ/i	ꯃ/nə	ꯃ/mə
Extended form	əyhak/ꯃꯃꯃꯃ	nəhak/ꯃꯃꯃꯃ	məhak/ꯃꯃꯃꯃ

It can be observed from the above table that the first person pronoun take the free form irrespective of the context. Bound forms of personal pronouns are the prefixes used to mark first, second, and third person markers and they are used in case of kinship terms only.

The free forms of pronouns of the above table 5-8 can be represented by the following FST:

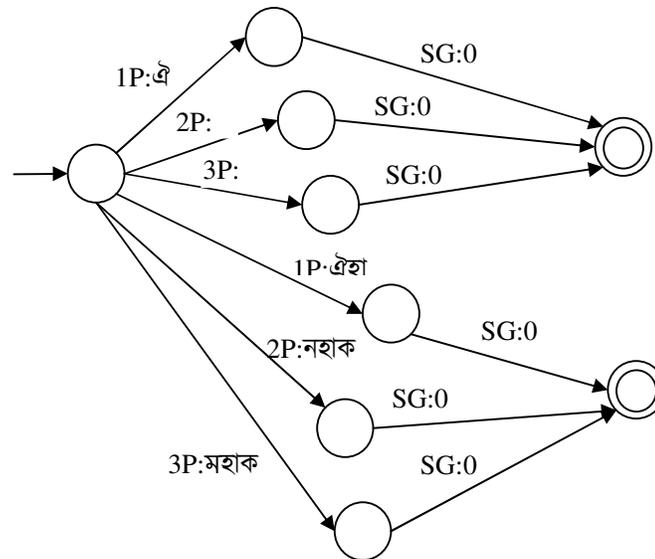


Figure 5-5: FST for free and bound form Pronouns

Personal pronouns in Manipuri behave differently in matters of suffixation from other nominal categories in the language. They exhibit certain idiosyncratic features which are specific to them only. Suffixes cannot be attached to personal pronouns in a straightforward way. The following table shows the idiosyncratic features of the three personal pronouns while attaching three suffixes, viz. the plural marker খোয়/khoy, locative দ/də, and genitive গী/gI. Say for example, free form of first person ঐ/əy takes খোয়/khoy, i.e. -খোয়/əy-khoy whereas bound forms of the second and third person take the plural marker as ন-খোয়/nə-khoy and ম-খোয়/mə-khoy.

Table 5-9: Idiosyncratic features of attaching suffixes to Personal Pronouns

	First person	Second person	Third person
Plural form	əy-khoy/ঐ-খোয়	nə-khoy/ন-খোয়	mə-khoy/ম-খোয়
Dual form	ইবানি/ibani	নবানি/nəbani	মবানি/məbani
Attaching Locative(də)	əy-ηon-də/ঐ-ঙোন-দ	nə-ηon-də/ন-ঙোন-দ	mə-ηon-də/ম-ঙোন-দ
Attaching Genitive(gi)	əy-gi/ঐ-গী	nə-ηgi/নং-গী	ma-gi/মা-গী

Demonstrative Pronouns

Manipuri uses two determiners – proximate সি/si and distal দু/du. The proximate determiner indicates to denote the object being referred to as is near or known to the speaker or topic of conversation and the distal determiner indicates something (person or object) which is not present at the time of speech. Demonstrative pronouns are based on these two determiners, i.e. অসি/əsi and অদু/ədu, where অ/ə is the formative/attributive prefix.

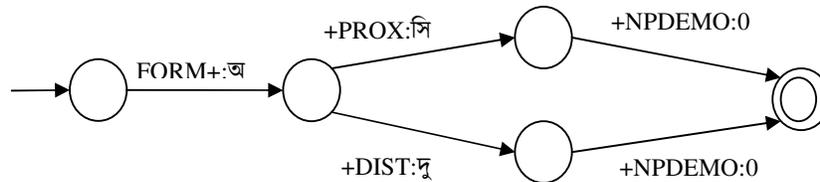


Figure 5-6 FST for Demonstrative Pronoun

Wh-words: The wh-words of Manipuri expresses a person’s lack of knowledge about a particular element and is denoted by using the element kə resembling the English wh occurring in who, what, where, when, etc. This set of words has their own function and has a set of suffixes that follows the wh- element, the most prominent one being the suffix “no” such as in কনা-নো/kəna-no (who is it, etc.). The following table shows the derived forms of these words.

Table 5-10: Some wh-words with derived forms

wh-words (derived forms)	English meaning	Remarks
ক-না/kəna	who	Can take all the case suffixes like common noun. Can appear as nominal modifier.
ক-রি/kəri	what	
ক-রম(ব)/kərəm(bə)	which (one)	Requires infinitive marker ব/bə or adverbial marker to occur after it
ক-রম(ন)/kərəm(nə)	how	
ক-দায়/kəday	which	Can take case suffixes directly. Does not appear as nominal modifier
ক-দোম(দ)/kədom(da)	where to (direction)	Used in locational sense.
ক-য়া/kəya	how much	Bears adverbial meaning
ক-য়াম/kəyam	how much	Related to verb য়াম/yam
কৈ-দৌব/keIdoubə	why, what for	Followed by infinitive suffix ব/bə, and the root ঙৈ/ŋeI
কৈ-দৌঙৈ/keIdouŋeI	when	

The wh-elements take no prefixes though; it takes an optional suffix “no” at the rightmost position.

Derived nouns: Derived nouns are formed by affixation. This is done by prefixation to the verb roots or by suffixation to the verb roots.

By prefixation of ম/mə and খু/khu: The syntax is

ম/mə+ Verb Root

খু/khu + Verb Root

By suffixation of nominalizer suffix ব/bə to verb roots. The syntax is:

Verb Root + ৰ/ব

The nouns derived from the verb roots are called verbal nouns. Verbal nouns behave the same way like other nouns whether in terms of the type of morphemes it can be attached with or in terms of morpheme ordering rules.

Compound nouns: Compound nouns are formed by combination of one or more nouns with nouns, or verb roots. The following are the possible combination of nouns and verb roots to form compound nouns:

a) *Noun + Noun*

(5.39) চাক/*cak* (rice) + শং/*səŋ* (shade) → চাকশং (kitchen)

(5.40) ঘুম/*yum* (house) + ফম/*fəm* (place) → place of house

b) *Noun + Verb Root*

(5.41) ৰা/*wa* (word) + হং/*həŋ* (ask) → ৰাহং

(5.42) পাউ/*paw* (news) + কুম/*khum* (answer) → পাউকুম (reply)

c) *Noun + Noun + Noun*

(5.43) নোং/*noŋ* (rain) + কুব/*cubə* (fall) + থা/*tha* (month) → নোংকুথা (Rainy season)

Augmentative and diminutive morphemes are also attached to nouns to form compound nouns. e.g.

d) *Noun + Augmentative (jaw~caw)*

(5.44) পুক/*puk* (belly) + চাও/*caw* (big) → পুকচাও (big belly)

e) *Noun + Diminutive (naw)*

(5.45) থোং/*thon* (door) + নাও/*naw* (small) → থোংনাও (window)

Verb class: As such Manipuri does not have a distinct verb class. It does have verb roots from which words of this category are derived by attaching verbal suffixes in an appropriate manner. Of all the categories, the verbal category words present a very rich and complex morphological word structure. Both inflectional and derivational morphological phenomena are observed in the verbal morphology of the language. Inflectional morphology is the study of how inflections or attachment/deletion of

morphemes to a word's most basic form, changes meaning, without changing the class of the word. Here the word class does not change due to the attachment/deletion of inflectional affixes to/from the base word. Derivational morphology, on the other hand, may or may not change the category of the word after attachment/ removal of derivational affixes, but makes changes in the internal word structure semantically.

Affix attachment to verb roots are of the form:

Prefix (optional) + Verb Root + Suffix/suffixes

Prefixes may or may not be attached to a verb root. A verb stem is derived by attaching nominalizer suffix $\text{ব/}b\text{ə}$ to the verb root as in

(5.46) $\text{তৌ/}t\text{ou} + \text{ব/}b\text{ə} \rightarrow \text{তৌব/}t\text{oub}\text{ə}$

Suffixes used by Manipuri verbs can be divided into four categories (Singha, Yaswanta, 2000). They are: aspect markers, the be verb, modality (negative markers), and other suffixes known as D.suffixes.

Verb roots are not complete in meaning; their exact forms are derived by affixation of the aspect markers, modality and the D.suffix to the verb roots.

Verb Root + aspect/modality marker \rightarrow verb

Examples are:

(5.47) $\text{চ/}c\text{at}$ (root) + $\text{রে/}r\text{e}$ (perfect aspect) \rightarrow $\text{চরে/}c\text{are}$ (have eaten)

(5.48) $\text{চ/}c\text{at}$ (root) + $\text{লো/}l\text{o}$ (imperative marker) \rightarrow $\text{চলো/}c\text{atlo}$ (go)

Classification of verbs

There are two types of verbs in Manipuri: transitive and intransitive. Intransitive verbs are made transitive by suffixing the causative suffix $\text{হন/}h\text{ən}$ to the intransitive. However in our study we would give more emphasis on three types of verbs in the language on the basis of semantics: action, process, and stative. This classification is important as there are variations in the type of affixes they take on certain environments.

Action verbs They are associated with the meaning of some act/deed performed semantically. List of some action verb stems are:

(5.49) য়েক-পা *yek-pə* (to draw)

(5.50) চাৎ-পা *cət-pə* (to go)

(5.51) পাই-বা *pai-bə* (to fly)

Process verbs: Process verbs are the verbs that specify the meaning of a continuing act or deed. Examples are:

(5.52) সাত-পা *sat-pə* (to bloom)

Stative verbs: The group of verbs that specify the meaning of the state of being at something are stative verbs.

Examples are:

(5.53) ৰঙা *being red*

(5.54) ডাঙা *being big*

Adjective class:

Manipuri does not have the category of adjectives; and the semantic adjective equivalents in other languages like English have verbal morphology (Tikaram Poudel, 2008). In familiar languages like English, the bases that translate as adjectives fall in the category of verbs in Manipuri language and are derived from these bases following certain strict and predefined rules. The formation of adjectives is guided by various rules following different morphosyntactic structures in the word pattern. A group of affixes is used to form Manipuri adjectives following the adjective morphotactics. For every word form of adjective the nominalizer suffix *বা(ব)~পা(pə)* is essential as the rightmost suffix and the formative prefix *অ/ə* is required when there are no morpheme at all in between verb root and the nominalizer suffix. The following table shows the affixes with their category:

Table 5-11: Affixes used in adjective formation

Affix #	Affix Name (with its allomorphs)	Affix Type	Category
1	অ (ə)	Prefix	Formative
2	ব(bə)/~প(pə)	Suffix	Nominalizer
3	রক(rək) /~ লক (lək)	Suffix	Inceptive
4	ন (nə)	Suffix	Nominative
5	লি(li)~রি(ri)	Suffix	Progressive
6	কন(kən) ~ গন (gən)	Suffix	Habitual
7	র(rə)~ ল (lə)	Suffix	Prospective
8	খ (khrə)	Suffix	Perfective
9	কাই(kai)~ গাই (gai)	Suffix	Destructive
10	রম((rəm)~লম(ləm)	Suffix	Evidential
11	রু(ru)~লু (lu)	Suffix	Deitic
12	ক(kə) ~গ (gə)	Suffix	Potential
13	খি (khi)	Suffix	Perfective
14	খৎ(khət)~কৎ(kət)~গৎ (gət)	Suffix	Directional
15	থোক(thok)~দোক (dok)~তোক(tok)	Suffix	Directional
16	শিন(sin)~জিন(jin)~চিন(cin)	Suffix	Directional (inward)
17	রোই(roi)~লোই (loi)	Suffix	Negative Marker 1
18	ত(tə)~দ(də)	Suffix	Negative Marker 2
19	ত(tə)~দ(də)	Suffix	Dubitative
20	ত্র(trə)~ দ্র(drə)	Suffix	Negative Marker3
21	ত্রি(tri)~দ্রি(dri)	Suffix	Negative Marker 4

The most popular way of forming adjectives is to add the formative prefix অ/ə and the nominalizer suffix to the verbal base of the language. The following describes the rules that are followed while forming adjectives:

Rule 1) Formation of adjective by adding the formative prefix and nominalizer(NZR) 'bə'~'pə' to monosyllabic verb bases(VR). The general syntax for the rule is-

Formative + Verb Root + Nominalizer → Adjective

Some examples are:

(5.55) $\text{আ}a + \text{ব্ৰাং}w\text{a}\eta + \text{ব/}b\text{a} u \rightarrow \text{অব্ৰাংব/}\text{əw}\text{a}\eta\text{b}\text{ə} \text{উ/}u$ (tall tree)

(5.56) $\text{আ}a + \text{কপ/}k\text{əp} + \text{প/}p\text{ə} \text{ə}\eta\text{a}\eta \rightarrow \text{əkəppa} \text{ə}\eta\text{a}\eta$ (crying child)

The following FST represents the rule 1 for adjective formation:

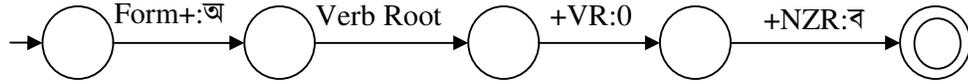


Figure 5-7 FST for adjective formation

It is observed that addition of formative prefix without the NZR suffix is not considered to be a complete form of a Manipuri word.

Rule 2) There are exceptional cases where the formative prefix is not required to be added to the verb base, however addition of the NZR suffix is essential. This rule is applicable when the root is a polysyllabic verbal base. See the following example:

(5.57) $\text{নুংশি/}nu\eta\text{si} + \text{ব/}b\text{a} \text{m}\text{ən}\text{ə}m \rightarrow \text{নুংশিব মনম/}sweet\ smell$

(5.58) $\text{হৰাউ/}h\text{ə}r\text{a}w + \text{ব/}b\text{a} \text{n}\text{u}m\text{it} \rightarrow \text{হৰাউব নুমিৎ/}joyful\ day$

It can be noted here that the addition of formative prefix ə is possible only to monosyllabic base and not to polysyllabic bases.

The rule 2) above is classified as the following:

Rule 2.1) Sufficing the negative marker (NM) $\text{tə}\sim\text{də}$ to the verb base and followed by the NZR ($\text{bə}\sim\text{pə}$) the formative prefix (ə) is no more required to form adjectives.

Examples are:

(5.59) $\text{চাঁ}ca(VR) + \text{দ/}d\text{ə}(NM) + \text{ব/}b\text{a} (NZR) \text{cak}$ চাদব চাক/ *uneaten rice*

Rule 2.2) The formative prefix (ə) is not required if the verb root is immediately followed by an aspect marker (AM) which is again followed by a nominalizer (NZR).

Such as

(5.60) $\text{ই}i (VR) + \text{রি/}ri (AM) + \text{ব/}b\text{a} (NZR) \text{m}\text{ə}y\text{ek} \rightarrow \text{ইরিব ময়েক/}written\ script$

The following FST can analyze the above adjective word:

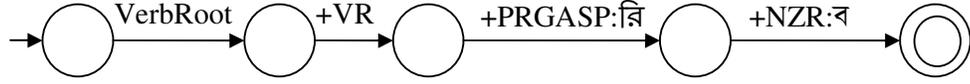


Figure 5-8 FST for analysis of adjective <ইরিব>

Rule 2.3) When the verb root is attached with the nominative suffix $nə$ (MN) and is followed by the nominalizer then the prefix ə is not required to form adjectives.

(5.61) তুম/tum (VR) +ন/nə (MN) + ব/bə (NZR) ka তুমনব কা/ Sleeping room

Adverb class

Adverbs are derived from verb roots with the suffixation of the adverbial suffix $n/nə$ to the verb roots. The syntax is

Verb Root + Adverbial suffix → *Adverb*

Examples are:

(5.62) চৎ/cat + ন/nə → চৎন/catnə

(5.63) শক/sək + ন/nə → শকন/səknə

The adverbial $n/nə$ is used with all the three types of verb roots, viz. action, process and the stative. Manipuri adverbs can be of five types; they are: adverbs of manner, durative adverb, adverb describing time, adverb of quantity and reduplicative adverb. Manner adverbs use the adverbial suffix to the stative verb roots. Durative adverbs use the suffix $দুন\sim\তুন$ to the action and process verbs. Time adverbs refer to two lexical items – 1) indicating past time, i.e. $উরাং$ (yesterday), $নহাল$ (day before yesterday), $হাকুম$ (last year), $উসাই$ (last moment), etc. There are three quantity adverbs in the language, they are: $হেনন$ (excessively), $রাৎন$ (in less) and $য়ামন$ (very). Reduplicative adverbs are formed by suffixing $লপ\sim\রপ$, $লি$, $মি$, $পত$, $ফত$, $বু$, to the verb root and a repetition of the suffixed word.

Conjunction

Conjunctions are another word class in Manipuri. They have limited in number as compared to other classes in the language. The purpose of conjunction is performed by two types of conjunction forms: conjunctive suffixes and conjunctive particles. Conjunctive suffixes are suffixes and are attached to nouns. On the other hand the conjunctive particles are made up of independent words.

The conjunctive suffixes are:

গ~ক, গ.....গ, সু.....সু, নে.....নে

Conjunctive particles are words in Manipuri. Around twenty such particles are identified in Manipuri. Some examples are:

অমসুং or অমদি	(and)
অদুদগী	(then)
অদুগ	(and)
অদুবু	(but)
অদুন	(so)
নত্রগ	(either or)
নত্রবদি	(if not
নত্রদবু	(if it is not so)
তৌইগুমবসুং	(but)
মরমদি	(because)
মরমদুন	(therefore)
মতুংদ	(after)

5.3 MANIPURI MORPHOTACTICS/ MORPHOSYNTAX

The morpheme ordering rules in the word structure of a language is called morphotactics or morphosyntax of the language. It is an essential task to gather the rules while performing morphological analysis of any language. The hardest challenge in our current study was to collect enough information on Manipuri morphotactics for the implementation. There is no grammar that provides listing of

suffix sequences or possible combinations detailed enough for a computational linguistic tool.

For the purpose we select each individual affix at a time and check for combinations of the affix with other affixes in the language. This way we perform permutation and combination of the morphemes in the language. In this task, I have the advantage of being a native speaker of the language. The findings were of enormous interest. Each suffix in the set of suffixes in Manipuri has a set of predecessor as well as successors.

Table 5-12: Morphotactics Of Verb Suffixes

Suffix Type	Morphological Tag	Predecessor	Successor	Final Morpheme?
Simple Aspect	SASP	VR	Particles	Yes
Progressive Aspect	PRGASP	VR	Nominalizing	Yes
Perfect Aspect	PASP	VR	Nil	Yes
Irrealis	IRASP	VR	Nil	Yes
Mood	MOOD	a) VR b) Directional c) Reciprocal d) Causative e) Reflexive f) Honorific g) Superiority	a) Aspect b) Negative c) Deictic d) Concessive e) Adverbial f) Nominalizer g) Excessive h) Causative i) Habitual j) Doubt	No
Negative	NG	a) VR b) kə~gə (before nu)	a) Suggestive <i>si</i> (after <i>gum~kum</i>) b) Nominalizer <i>bə</i> (after ত & দ)	No, in case of ত~দ, কুম~গুম, else yes
Imperative	IMP	a) VR b) Honorific c) Deictic d) Directional e) Goal centric f) Destruction g) Reciprocal h) Causative i) Reflexive j) Superiority k) Suffix- ləm, rəm, ηəm, pəm	a) Endearment	Yes

Deictic	DCT	a) VR b) Mood c) Nominalizer d) Directional e) Destruction f) Reciprocal g) Causative h) Reflexive i) Honorific j) Superiority	a) Aspect b) Mood c) Negative d) Imperative e) Intentive f) Suggestive g) Concessive h) Nominalizing i) Copula j) Goal centric k) Destruction l) Reciprocal m) Habitual n) kum~gum o) ləm~rəm (after rək and khi)	No
Dubitative	DUBT	a) Potential	a) Nominalizing b) Interrogative	No
Intentive	INT	b) VR c) Mood d) Deictic e) Suggestive f) Directional g) Goal-centric h) Destruction i) Reciprocal j) Causative k) Reflexive l) Honorific m) Superiority n) Suffix- ləm	c) Interrogative	Yes
Suggestive	SUGG	a) VR b) Negative c) Deictic d) Directional e) Goal centric f) Destruction g) Reciprocal h) Causative i) Superiority j) Honorific k) Suffix- kum~gum	a) Intentive b) Endearment c) Reported suffix <i>ne</i> as copula d) Interrogative	Yes
Concessive	CONC	a) VR b) Mood c) Negative <i>tə~də</i> d) Deictic e) Directional f) Goal centric g) Destruction h) Reciprocal i) Causative j) Reflexive k) Honorific	Particles	Yes

		l) Superiority m) Suffix- ləm~rəm, ηəm, pəm		
Adverbial	ADV	a) VR	Nil	Yes
Nominalizing	NZR	a) VR b) Aspect c) Mood d) Negative e) Deictic f) Directional g) Dubitative h) Destructive i) Reciprocal j) Excessive k) Causative l) Reflexive m) Honorific n) Habitual o) Superiority p) Suffix-Kum~gum, ləm	All the suffixes applied to nominal category	Yes
Copula	COP	VR	Endearment	Yes
Directional	DIR	a) VR	a) Aspect b) Mood c) Negative d) Imperative e) Deictic f) Intensive g) Suggestive h) Causative i) Nominalizing j) Goal centric k) Reciprocal l) Together m) Excessive n) Causative o) Reflexive p) Honorific q) Habitual r) Suffix- kum~gum, ləm	No
Goal Centric	GOA	a) VR b) Mood c) Deictic d) Directional e) Destructive f) Reciprocal g) Excessive h) Causative i) Reflexive j) Honorific k) Superiority l) Suffix- ləm	a) Aspect b) Mood c) Negative d) Imperative e) Intensive f) Suggestive g) Concessive h) Nominalizing i) Copula j) Reciprocal k) Suffix-kum~gum	No
Destructive	DEST	a) VR	a) Aspect	No

e			<ul style="list-style-type: none"> b) Mood c) Negative d) Deictic e) Imperative f) Intensive g) Suggestive h) Concessive i) Adverbial j) Nominalizing k) Copula l) Goal Centric m) Reciprocal n) Excessive o) Causative p) Reflexive q) Honorific r) Habitual s) Suffix- kum~gum, ləm 	
Reciprocal	RECI	<ul style="list-style-type: none"> a) VR b) *Directional c) Deictic d) Negative e) Deictic f) Goal Centric g) Destructive h) Together i) Causative j) Reflexive k) Honorific l) Superiority 	<ul style="list-style-type: none"> a) Aspect b) Mood c) Negative d) Deictic e) Intensive f) Suggestive g) Concessive h) Adverbial i) Nominalizing j) Copula k) Directional l) Goal Centric m) Excessive n) Causative o) Reflexive p) Honorific q) Habitual r) Suffix- kum~gum, ləm 	No
Together	TOG	<ul style="list-style-type: none"> a) VR b) Directional c) Destructive 	<ul style="list-style-type: none"> a) Reciprocal 	No
Dubitative	DUBT	<ul style="list-style-type: none"> a) Potential 	<ul style="list-style-type: none"> a) Nominalizing 	
Excessive	EXC	<ul style="list-style-type: none"> b) VR c) Mood d) Deictic e) Directional f) Destructive g) Reciprocal h) Honorific i) Reflexive j) Habitual k) Superiority 	<ul style="list-style-type: none"> b) Aspect c) Negative d) Nominalizing e) Goal Centric 	No
Causative	CAUS	<ul style="list-style-type: none"> a) VR b) Mood c) Deictic d) Directional 	<ul style="list-style-type: none"> a) Aspect b) Mood c) Negative d) Imperative 	No

		e) Goal Centric f) Destructive g) Reciprocal	e) Deictic f) Intensive g) Suggestive h) Concessive i) Nominalizing j) Goal Centric k) Together l) Honorific m) Habitual	
Reflexive	REFL	a) VR b) Directional c) Reciprocal d) Destructive	a) Aspect b) Mood c) Negative d) Imperative e) Deictic f) Intensive g) Concessive h) Nominalizing i) Copula j) Goal Centric k) Causative l) Habitual m) Suffix- kum~gum, ləm~rəm	No
Honorific	HON	a) VR b) Directional c) Destructive d) Causative e) Superiority	a) Aspect b) Mood c) Negative d) Imperative e) Deictic f) Intensive g) Suggestive h) Concessive i) Nominalizing j) Copula k) Goal Centric l) Reciprocal m) Excessive n) Causative o) Suffix- কুম/Kum~গুম/gum, লম/ləm~রম/rəm	No
Endearment	END	a) Command marker b) কো/co before কো/ko	Nil	Yes
Habitual	HAB	a) VR b) Mood c) Directional d) Destructive e) Reciprocal f) Reflexive g) Superiority	a) Aspect (No progressive) b) Mood c) Negative d) Concessive e) Nominalizing f) Goal Centric g) Reflexive h) Kum~gum, ləm~rəm	No
Superiority	SUP	a) VR	a) Aspect b) Mood c) Negative d) Imperative e) Deictic	No

			<ul style="list-style-type: none"> f) Intentive g) Suggestive h) Concessive i) Nominalizing j) Goal Centric k) Reciprocal l) Excessive m) Causative n) Honorific o) Habitual p) Suffix- Kum~gum q) Evidential ləm~rəm 	
Doubt	DOUBT	<ul style="list-style-type: none"> a) VR b) Mood c) Negative d) Deictic e) Intentive f) Nominalizing g) Directional h) Goal Centric i) Destructive j) Reciprocal k) Causative l) Reflexive m) Evidential-ləm~rəm 	<ul style="list-style-type: none"> a) Suggestive 	Yes
Evidential	EVI	<ul style="list-style-type: none"> a) VR b) Mood c) Deictic d) Directional e) Goal Centric f) Destructive g) Reciprocal h) Causative i) Reflexive j) Honorific k) Superiority 	<ul style="list-style-type: none"> a) Aspect b) Negative c) Imperative d) Intentive e) Suggestive f) Concessive g) Nominalizing h) Goal Centric i) Destructive j) Reciprocal k) Excessive l) Superiority m) Doubt 	No
Continuation	START	<ul style="list-style-type: none"> a) VR b) Directional c) Destructive d) Reciprocal e) Causative f) Reflexive g) Honorific 	<ul style="list-style-type: none"> a) Aspect b) Negative c) Suggestive d) Doubt e) Nominalizer f) Concessive 	No

We represent the morphotactics of each morpheme separately so that a clear picture can be seen for each morpheme participating in the morphological word structure. As for example, the FSTN for the morphotactics of Aspect marker suffixes is as shown below:

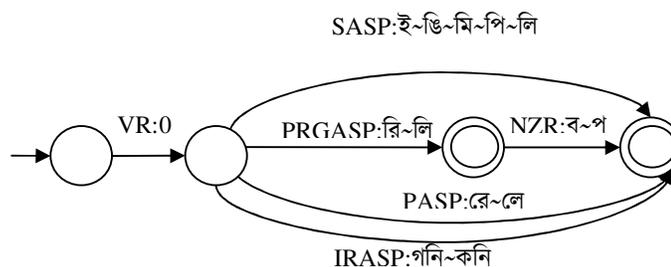


Figure 5-9: An FST for aspect suffix

On some accounts the active, process and stative verbs have choice of suffixes, we have presented a general morphotactics most prevalent and applicable to the whole class of verbs.

Regarding nouns, as we have seen that there are many varieties of nominal category (discussed in the preceding sections) in the language, it is not possible to present the nominal morphotactics of the language which is common to all the varieties. However the following table shows the general morphotactics of nominal category most prevalent to common nouns (both animate and inanimate category), personal pronouns, demonstrative pronouns, etc.

Table 5-13: Morphotactics of nominal suffixes

Suffix	Morphological Tag	Predecessor	Successor	Final Morpheme?
Nominative	NOM	a) Noun Stem (Animate) b) Number	a) Connectives-Also b) Connectives-And c) Accusative d) Copula e) Interrogative f) Definitive particle g) Emphatic self h) Exclusive self i) Emphatic only	Yes
Instrumental	INSTR	a) Noun Stem (inanimate) b) Number	a) Connectives b) Accusative c) Copula d) Interrogative e) Definitive particle f) Emphatic self g) Exclusive self Emphatic only	Yes

Accusative	ACC	a) Noun Stem b) Number	a) Nominative b) Copula c) Interrogative d) Definitive particle e) Exclusive self f) Emphatic only	Yes
Genitive	GEN	a) Noun Stem b) Number	a) Accusative b) Locative c) Ablative d) Associative e) Connectives-With f) Connectives-Also g) Connectives- And h) Interrogative i) Definitive particle j) Distal particle k) Proximate Demonstrative particle l) Emphatic self-particle m) Emphatic only- particle n) Copula	Yes
Locative	LOC	a) Noun Stem b) Number	a) Connectives-With b) Connective-Also c) Connectives-And d) Accusative e) Associative f) Interrogative g) Definitive/Particulari- zation h) Emphatic only i) Exclusive (self) j) Copula	Yes
Ablative	ABL	a) Noun Stem b) Number	a) Accusative b) Connectives-With c) Connective-Also d) Connectives-And e) Interrogative f) Definitive Particle g) Distal Demonstrative h) Emphatic self i) Exclusive (self) j) Copula	
Associative	ASS	a) Noun Stem b) Number	a) Nominative b) Accusative c) Genitive d) Connectives-Also e) Connective-And f) Interrogative g) Definitive Particle h) Emphatic self-Particle i) Exclusive self-Particle j) Emphatic only	

			k) Copula	
Number	NUM	a) Noun Stem	a) Case Marker b) Connectives	Yes
Gender	GEN	a) Noun Stem (animate) b) Number	a) Case Marker b) Number c) Connectives d) Interrogative e) Copula	Yes
Connectives-With	CON-W	a) Noun Stem		Yes
Connectives-And	CON-AN	a) Noun Stem		Yes
Connectives-Also	CON-AL	a) Noun Stem		Yes
Interrogative	INTR	Noun stem	Nil	Yes
Inquisitive	QM	Noun stem (particularly) Wh-words	Nil	Yes
Copula	COP	Noun Stem	Nil	Yes

5.4 MANIPURI MORPHOPHONOLOGICAL VARIATION/ ALTERNATION RULES

A word's pronunciation can be sensitive to morphological factors. The morphological compositions of words are its constituent morphemes. The process employed for various morphological words are juxtaposition, affixation, compounding, reduplication, etc. During the process of word formation through these processes various morphological elements or morphs come together and various morphophonemic adjustments or changes take place. Morphophonemic variation is characterized by two signposts—it tends to occur at morpheme boundaries and it involves sounds that are associated with separate phonemes. The study of these phenomena is known as morphophonemics. Morpheme concatenations are general phenomena for different Manipuri word forms formed by affixation and compounding. In this language morphophonemic change occurs at the morpheme boundary and may be realized in different environments and conditions depending on the sound patterns of the adjoining morphemes. When the same morpheme has more than one form (or allomorph), it is a general practice to often seek to set up a single underlying representation for the morpheme and to formulate rules that will derive the appropriate pronunciation for any particular context.

The changes found in Manipuri are discussed below one by one¹¹:

Voicing Assimilation Rule (VA Rule)

Syllable initial voiceless unaspirated stops are voiced between voiced segments.

Its applications are:

- 1) When the nominalizer suffix প/pə is suffixed to a verbal root that ends in a voiced segment. Examples are:

পা/pa + ব/bə → পাব/pabə (to read)

থোং/thonɣ + ব/bə → থোংব/thonɣbə (to cook)

ফু/phu + ব/bə → ফুব/phubə (to beat)

But when the root does not end with a voiced segment, the initial stop of the nominalizer suffix প does not become voiced, as in the following example:

লাক/lak + প/pə → লাকপ/lakpə (to come)

চৎ/cat + প/pə → চৎপ/catpə (to go)

লোৎ/lot + প/pə → লোৎপ/lotpə (to hide)

কপ/kəp + প/pə → কপপ/kəppə (to cry)

The regular expression to capture the above two environments is

(PR1) ব->প || [পাকাতাৎ] _; **!Nominalizer**

- 2) When the case marker genitive suffix কী/kI, associative ক/kə and locative ত/tə is applied to a verbal root that ends in a voiced segment. Example are:

মী/mI + কী/kI → মীগী/mIgI (of the man)

¹¹ Rules discussed here are taken from Manipuri Grammar(Ch. Yashwanta Singh, 2000).

মহাক/məhak + কী/kI → মহাককী/məhakkI (his)

থা/tha + গী/gI → থাগী/thagI (of the moon)

The regular expression to capture the rule is

(PR2) গী -> কী || [ক|ৎ|প] _ ; ! Genitive

(PR3) দ -> ত || [ক|প|ৎ] _ ; ! Locative

(PR4) গ -> ক || [ক|প|ৎ] _ ; ! Associative

(PR5) বু -> পু || [কা|পাতাৎ] _ ; ! Accusative

Deaspiration Rule (D Rule)

Deaspiration rule applies when the directional suffixes – thok or khət are suffixed to verb roots which begin with an aspirate. i.e.

The following example shows the application of this rule:

ফিং/fiŋ + গৎ/gət + প/pə → ফিংগৎপ/fiŋgətpə (become short tempered)

থোন/thon + গৎ/gət + প/pə → থোনগৎপ /thongətpə (resurface upward)

ফেং/fen + গৎ/gət + প/pə → ফেংগৎপ/fenɡətpə (started to clean out)

শু/su + দোক/dok + প/pə → শুদোকপ/sudokpə (to wash out)

থিন/thin + দোক/dok + প/pə → থিনদোকপ/thindokpə (to pierce out)

Regular expression for the deaspiration rule is as follows:

(PR6) খৎ -> গৎ || \$ [ফ|ভ|থ|ধ|ঝ|খ|ঘ] _ ;

(PR7) থোক -> দোক || \$ [ফ|ভ|থ|ধ|ঝ|খ|ঘ] _ ;

Trilling Rule (T-Rule)

The alveolar ল/lə becomes a voiced alveolar trill র/rə in the intervocalic position. Its application is observed in the prefixation of first, second and third person pronominal markers (ই, ন, and ম).

(PR8) ল -> র || [ই|ন|ম] _ ;

Another application of this rule is seen when progressive aspect marker লি/li and লে/le are suffixed to a stem with a final vocalic segment.

(PR9) লি -> রি || [প|ত|ক|ম|ন|ঙ|থ] _ ;

(PR10) লে-> রে || [প|ত|ক|ম|ন|ঙ|থ] _ ;

(PR11) রু -> লু || [প|ত|ক|ম|ন|ঙ|থ] _ ;

(PR12) রক -> লক || [প|ত|ক|ম|ন|ঙ|থ] _ ;

(PR13) রম -> লম || [প|ত|ক|ম|ন|ঙ|থ] _ ;

Velar Stop Deletion Rule(VS-D Rule)

The voiceless velar stops that occur before laterals are deleted. So the ক/kə of থোক/thok and দোক/dok is deleted with the suffixation of the directional suffix রক/rək.

Such examples are:

থোক/thok + রক/rək +প/পə → থোক/tho + রক/rək +প/পə → থোরকপ/thorəkpa

(PR14) রক -> লক || [থোক|দোক] _ ;

It is to be noted here that the trilling rule (T-Rule) follows after this VS-D rule.

Gemination Rule (G-Rule)

Gemination takes place when syllabic consonants ন, ল, ম, প, and ঙ are followed by vowels.

The application of this rule is seen when the aspect marker ই/i, imperative marker ও/o, উ/u, and experiential evidence enclitic এ/e is suffixed to a verbal root ending with a consonant. Here are some examples:

কপ/kəp + ই/I → কপপি/ kəppi (cries)

থম/thəm + ই/I → থমমি/thəmmi (puts)

তোঙ/ton + ই /i → তোঙঙি/tonni (boards)

য়েন/yen + ও/o → য়েলনো (distribute, command)

থোঙ/thon + উ/u → থোঙঙু/thonnu (cook, command)

(PR15) [ন|ল] → {ললি} || _ ই ;

(PR16) ম → {মমি} || _ ই;

(PR17) প → {পপি} || _ ই ;

(PR18) ঙ → {ঙঙি} || _ ই;

(PR19) [ন|ল] → {ললি} || _ ও ;

(PR20) ম → {মমো} || _ ও;

(PR21) প → {পপো} || _ ও ;

(PR22) ঙ → {ঙঙো} || _ ও;

(PR23) [ন|ল] → {ললু} || _ উ ;

(PR24) ম → {মমু} || _ উ;

(PR25) প → {পপু} || _ উ ;

(PR26) ঙ → {ঙঙু} || _ উ;

Gemination and voicing assimilation rule applies in the same environment. They cannot be applied one after another. So to avoid bleeding each other, they can be differentiated on the basis that germination rule be applied to syllable final consonants whereas the voicing assimilation rule be applied to syllable unit consonants.

Diphthongization Rule (DP Rule)

The diphthongization rule applies when the simple aspect marker suffix ই/i or when the imperative marker উ/u or রৌ/ro is added to a directional suffix ending in a vowel.

Examples are:

ফু/phu + র/rə + ই/i → ফু/phu + রৈ/rəy

খ/khə + ল/lə + ই/i → খল/khə + লৈ/ləy

(PR27) র -> রৈ || _ ই ;

(PR28) ল -> লৈ || _ ই;

(PR29) ম->মৈ || _ই;

(PR30) প -> পৈ || _ই;

Diphthongization rule does not apply where the glottal stop insertion rule applies.

Epenthesis Rule (E Rule)

The epenthesis rule is applied to mostly personal pronoun forms, as for example when the locative suffix দ/də is attached to the first, second and third person pronoun forms; an element ঙ্গোল is inserted to the nominal root.

ঐ/əy + দ/də → ঐঙ্গোলদ

নং/nə + দ/də → নঙ্গোলদ

মা/ma + দ/də → মঙ্গোলদ

The regular expression is

(PR31) [...] -> {ঙ্গোল} || [ঐ|নং|মা|ম|ন] _ দ;

This rule must be followed by a rule that must delete the ঙ্গ of second person নং and া of third person মা. The rule is as below:

(PR32) ঙ্গ -> [...] || ন _{ঙ্গোল};

(PR33) া -> [...] || ম _{ঙ্গোল};

Other rules applicable to personal pronouns are:

(PR34) {ঐহাক} -> ঐ || _ দ ;

(PR35) {নহাক} -> ন || _ দ ;

(PR36) {মহাক} -> ম || _ দ ;

Epenthesis rule is also required after the rules PR14-PR25 to remove the vowels.

(PR37) ই-> [...] || [{মি}|{লি}|{পি}|{ঙি}] _;

(PR38) ও-> [..] || [{{মো}}|{{লো}}|{{পো}}|{{ঙো}}] _;

(PR39) উ-> [..] || [{{মু}}|{{লু}}|{{পু}}|{{ঙু}}] _;

Rules for Negative marker suffixes applicable to conjunct characters are

(PR40) দ->ত ||রক|লক_; ! **Negative suffix** দ(də)~ ত(tə)

The following are some rules to handle conjunct characters in the word structure.

(PR41) দ্বি->ত্রি||খৎ|থোক|দোক|তোক|কৎ_;

(PR42) দ্ব->ত্র||খৎ|থোক|দোক|তোক|কৎ_;

It is to be noted that rule ordering is equally important to get the correct effective result of the application of the rule in the suitable morphological environment.

5.5 MORPHOLOGICAL AMBIGUITY

Morphological structure/interpretation is usually ambiguous. This ambiguity can occur in three forms-

A) Part-of-speech ambiguity: The same surface form is interpreted in many possible ways in different syntactic contexts. An example in English is-

book (verb), book (noun)

Instances of such words in Manipuri are many.

থৌ/duty (noun) and থৌ/drive (verb)

তৌ/a type of grass (noun) and তৌ/do (verb) and তৌ/dig (verb)

B) Morpheme ambiguity: The same morpheme can be interpreted differently depending on its position in the morpheme order.

+দ (locative suffix) and +দ (Negative Suffix)

+ঙম (doubt) and +ঙম(like)

Segmentation ambiguity: Word can be legitimately divided into morphemes in a number of ways. A word when segmented in different ways, may lead to different lexical interpretations. Such ambiguity in Manipuri language are:

দগী- ablative may be realized as two suffixes- দ-locative and গী –genitive

গনি-irreleis may be realised as two suffixes- গ- potential and নি- copula

5.6 LINGUISTIC INSIGHT

The discussion in the present chapter presents an insight to the morphological phenomena occur in the word structure of Manipuri language. The requirement for the implementation of a language model for morphological analysis with the help of finite state techniques undoubtedly called for such an examination of the linguistic insights of the language in question. We have presented various types of morphemes, their position in a word structure with respect to other neighboring morpheme elements, word classes and their respective sets of affixes, morphophonemic alternation within word structures, and three types of ambiguities.

We have discussed most of the morphological phenomena which are essential for the development of a Manipuri language model for morphological analysis for a probable natural language processing application. By observing at the various levels of complexities exhibited by Manipuri language at the morphological level, the current chapter can be concluded with the statement that the thorough examination of Manipuri word forms is essential and the morphological description presented here definitely gives a new linguistic insight for computational processing of morphological analysis.