ALLOMORPHS IN MEETEILON (MANIPURI) MORPHOLOGY

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The paper is strictly based on the study of the distribution of various allomorphs in Meeteilon morphology in order to study the morphosyntactic nature of the word. Allomorphs can be distributed phonologically, morphologically and lexically. However, for Meeteilon there is only phonologically conditioned allomorphs. The classification of these allomorphs will be helpful in the segmentation of morphemes, morpheme identification, parts of speech tagging and other fields related to natural language processing by setting the phonological rule which accounts morphological alternation. Finally, an introduction to optimality theory approach has been applied in the final devoicing of the syllable.

Keywords: Meeteilon, Manipuri, allomorph, morphology

1. Introduction

Meeteilon (Manipuri) is the official language as well as the Scheduled Language of India. It is an agglutinating language where word formation is very prominent by means of affixation. In the classification of Tibeto-Burman (TB) languages of the Sino-Tibetan family, G. A. Grierson (1904) placed Meeteilon in Kuki-Chin proper separately. R. A. Shafer (1955, 1966, and 1974) placed Meeteilon in the Meitei branch of Kukish section. Paul K. Benedict (1972) classified it as language included in Kuki-Naga of Kukish section. Meeteilon shares some features of the Tibeto-Burman languages which includes phonemic tone, SOV word order, agglutinative verb morphology and tendency to reduce disyllabic forms to monosyllabic ones. In the study of Meeteilon based on the linguistic approach, modern linguists who worked with pure linguistic knowledge are Thoudam (1980,1991), Bhat and Ningomba (1997), Chelliah (1997), Chungkham (2000), Sapam Tomba (2000) etc. These pioneers contributed works on grammar namely, Thoudam's *Remedial Manipuri Grammar*, Bhat and Ningomba's *Manipuri Grammar*, Sobhana Chelliah's *A Grammar of Meithei*. They analyze the language following the descriptive model. Some other works contributing in the study of Meeteilon are: *A Study of Meitei Phonology* by Tomchou (1976), *Meiteilon Phonology with a supplement of Morphology* by Sonamani (1980), *Meitei Lonmit* by Ningomba (1992), *Manipuri Phonology* by Madhubala (2002), *The Case for Case* by Saratchandra Singh (2000) etc. As compared to the number of prefixes, suffixes are numerous. These suffixes have allomorphs which are phonologically conditioned.

1.1 Significance of the study

Word formation in Meeteilon is prominently based on affixation. Hence, it becomes necessary to identify the root of the word along with the suitable prefixes and suffixes which are added to it. This is the prerequisite step in conducting any natural language processing because some morphs may change its structure due to the neighbouring morpheme which are added to it. Because of agglutinating language, a string of affixes can be concatenated to the verb root leading to morphophonemic changes. The changes and the environment are necessary for setting the rules of grammar. Moreover, all the verbs in Meeteilon are bound in nature. They require affixes to form verbal noun (/-pə~-bə/[1]), adjective (/ə-/[2]) (Singh and Singh, 2002), adverb (/-nə/), negative (/-te~-de/) (Devi et al., 2019) and so on.

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[1] -pə~-bə is the nominalizing suffix used to nominalize the verbal root since all the verbs in Meeteilon are not free.

[2] The more function of the usages of the prefix /-ə/ is explained in the work done by Singh and Singh (2002) in their work 'Manipuri Adjective: A New Approach'.

1.2 Methodology

The first priority is the identification of all the possible affixes which are involved in the word formation process. Affixes could be derivational and inflectional. All the available roots in the language are collected using written text, newspapers, articles and other related works done in the language. The possible number of syllables a word can have is studied. As stated by Chelliah (1997:26) that words in Meeteilon can consist of stems or bound root with suffixes from one to ten. For instance, the word *ca-ɹəm-gə-də-bə-ni-ko-ne*, where ca is the bound root and the rest are the suffixes.

2. Morph, allomorph and morpheme

Morph is actually the written form of a morpheme. Or, in other word, it is a unit of grammatical form which realizes a morpheme. For instance, <rights> contains two morphemes that are expressed by two morphs <right> and <s>. A morph can be divided into two classes: lexical and grammatical morph. Lexical morph denotes the direct object, action, qualities and other pieces of real world. On the other hand, grammatical morph is used to modify the meaning of the lexical morph. The term morph is sometimes used to refer to the phonological realization of a morpheme. For example, the past tense morpheme [-ed] has various morphs. It is realized as [t] after voiceless bilabial plosive [p] as in *jumped*, as [d] after voiced alveolar lateral approximant [l] as in *repelled* and as [ed] after the voiceless alveolar plosive [t] as in the word like *rooted*. And, these morphs are called allomorphs. Hence, an allomorph is the variant forms of morpheme which has grammatical and lexical function according to the different environment. According to Bussmann (1996:17), allomorph can be described as concretely realized variant of a morpheme. The classification of morphs as allomorphs or as the token of a particular morpheme is based on similarity of meaning and complementary distribution: for example, [s], [z], and [iz] are considered allomorphs of the plural morpheme. Malmkjer (2002:356) says that when a morpheme is recognized by semantic and distributional criteria without its form being identical, it is referred to as an allomorph.

Fromkin, Rodman and Hyams (2003:276-282) states that English is not the only language that has morphemes that are pronounced differently in different phonological environments. Lieber (2009:158) states that allomorphs are phonologically distinct variants of the same morpheme. By phonologically distinct, it means that they have similar but not identical sounds. In English, an allomorph usually functions as the various morphemes or morphs to represent the plurality (if it is added to the noun), number (third person singular number if it is added to the verb) and possession (if it is added to a Noun Phrase). Crystal (1987:90) notes that variant forms of a morpheme are known as allomorphs. Allomorphs can be distributed phonologically, morphologically and lexically.

2.1 Phonologically conditioned allomorphs

This is a type of allomorphs which are considered to be regular and can be stated in terms of their phonetic environments. For instance, the plural morph /s/ in English has three allomorphs which are phonologically conditioned in the sense that it depends on final sound of the stem. They are: [s], [z] and [iz]. The plural morph /s/ is used for the word ending with voiceless consonant sound like /t/ in cats [kæts], /z/ is used for words ending in voiced sounds like dogs [dogz] and /iz/ is used for the word ending in voiceless post alveolar fricative/affricate as in judges [dʒʌdʒiz]. Hence, [s], [z] and [iz] are the plural allomorphs which are phonologically conditioned.

2.2 Morphologically conditioned allomorphs

Morphologically conditioned allomorphs are a type of allomorphs where the choice of allomorphs is conditioned by the morphological context. The best evidence of allomorphs being morphologically conditioned is found in the variant of English language suffixes in plural which exist in the words *children* and *oxen* to cite two examples. In these cases, the plural form of the word *child*, for example changes the root altogether (this is when sounds are realized as allomorphs) by adding the letter '*r*' to it in order to convert it into plural *children*. Hence, morphologically conditioned allomorphs are irregular as compared to phonologically

conditioned allomorphs and it can be predicted morphologically in a particular environment.

2.3 Lexically conditioned allomorphs

It is a condition where neither the phonological nor the morphological context can help to derive the choice of allomorphs and it has to be learnt for the particular word. For instance the English past participle {-en} is not applicable to every word as shown below:

Take-**en**	live-ed	give-**en**
	{-en}	
See-**en**	make-ed	live-ed

3. Allomorph in Meeteilon

There is no doubt that allomorphs should exist in every language. Meeteilon also exhibits allomorphs. Out of the three types of morphological alternation, the language exhibits only the phonologically conditioned allomorphs derivational and inflectional suffixes.

3.1 Derivational suffixes

The various derivational suffixes found in Meeteilon word formation are given below:

/-ləm/	'deictic'
/-lək/	'deictic/ progressive'
/-lu/	'deictic3'
/-lə/	'deictic4'
/-kʰə/	'definiteness/intensifier/progressive'
/-sin/	'directional1/repetition/ intensifier2'
/-kʰət/	'directional2/starting/ intensifier'
/-tʰə/	'directional3/progressive/ intensifier'
/-tʰok/	'completeness/intensifier'
/-tə/	'negation'
/-cə/	'reflexive/ request'
/-nə/	'reciprocal/reserved/ adverbial'
/-min/	'associative'
/-kən/	'habitual'
/-hən/	'causative'
/-pi/	'benefactive/ request'
/-mən/	'excessive'
/-kə/	'non-realization'
/-pə/	'nominalizer'
/-sə/	'suggestive'
/-kum/	'uncertainty/negative suggestion'
/-lə/	'perfective'
/-təŋ/	'isolation'
/-siŋ/	'plurality'

/-kʰoi/	'collectivity/plurality'
/-si/	'determiner1'
/-tu/	'determiner2'
/-ti/	'particularization'
/-su/	'inclusive'
/-mək/	'personification'

Let us discuss some of the suffixes with their allomorphs and environment.

Table 1: Allomorphs of the deictic1 suffix {-ləm}

Allomorph	Environment	Example
{-ləm}	after /t/ and /n/	cət-ləm-de 'didn't go'
{-ɹəm}	after vowel sounds	pi-ɹəm-de 'didn't give'
{-pəm}	after /p/	təp-pəm-me 'slow'
{-məm}	after /m/	təm-məm-me 'learnt'
{-ŋəm}	after ŋ	təŋ-ŋəm-bə 'tasted'
{-əm}	after /k	kək-əm-me 'cut'

There are different semantic parameters which help to differentiate deictic suffixes from one another. They are (i) motion or orientation of the event (ii) place of occurrence of the event and the relative position of these two (events preceding or following the motion or orientation) (Chungkham, 2000:36). The next immediate suffix after the deictic 1 suffix could be negative suffix (-te~-de), perfective suffix (-me) or nominalizer suffix (-pə ~-bə) to make a complete word. Although due to agglutinating nature of the language, it can be further extended.

Table 2: Allomorphs of the deictic2 suffix {-lək}

Allomorph	Environment	Example
{-lək}	after /k/, /t/ and /n/	cik-lək-pə 'bite'
{-ɹək}	after vowel sounds	na-ɹək-pə 'sick'
{-pək}	after /p/	nəp-pək-pə 'stick'
{-mək}	after /m/	jom-mək-o 'do the packing'
{-ŋək}	after /ŋ/	həŋ-ŋək-pə 'asked'

The nominalizer suffix -pə is the only suffix that can follow all the allomorphs since the final ending sound of all the allomorphs is /k/ that is

voiceless plosive, otherwise the imperative suffix -o or -u can be used.

Table 3: Allomorphs of the deictic3 suffix {-lu}

Allomorph	Environment	Example
{-lu}	after /t/, /k/, /p/ and /n/	hat-lu-bə 'to kill'
{-ɹu}	after vowel sounds	i-ɹu-bə 'to take a bath'
{-pu}	after /p/	kəp-pu 'cry' (Imperative)
{-mu}	after /m/	tum-mu 'sleep' (command)
{-ŋu}	after /ŋ/	coŋ-ŋu 'jump' (command)
{-u}	after /k/	jek-u 'draw' (command)

{-lu} is a command suffix which denotes the event away from the speaker, performing the event at some other place but here the event follows the motion. The required condition is that it needs to be followed by the nominalizer /pə/ or /-bə/ to show the action took place in some other place as for instance *hat.lu.bə* 'to kill someone somewhere' and *i..ɹu.bə* 'to take a bath at some other place' as shown in the table 3. The other condition is the conversion into command with the suffixation of command marker to the verbal root such as /-pu/ in /kəp.pu/, /-mu/ in /tum.mu/, /-ŋu/ in /coŋ. ŋu/ and /-u/ in /jek.u/ as shown in the table 3.

Table 4: Allomorph of the perfective suffix {-lə}

Allomorph	Environment	Example
{-lə}	after /t/, /l/ and /n/	pət-lə-bə 'withered'
{-ɹə}	after vowel sounds	ca-ɹə-bə 'eaten'
{-pə}	after /p/ and /k/	cəp-pə-bə 'to cut'
{-ŋə}	after /ŋ/	jeŋ-ŋə-gə 'by looking at'
{-ə}	after /k/	hek-ə-bə 'plucked'
{-mə}	after /m/	kʰum-mə-bə 'covered'

Meeteilon words cannot end with the perfective suffix *-lə* as the meaning is not complete. It always requires nominalizer *-pə~-bə* after the suffix as shown in table 4.

The directional suffix /-sin/ is used for indicating inward direction. It has three allomorphs {-sin}, {-ɹin} and {-cin}. Where {-ɹin} and {-cin} cannot apply, {-sin} is used. Some of the observation encountered during the study is that in the example in table 5 *hai-ɹin-bə* 'to push inward', {-ɹin} is used after the verbal root *hai* 'to push'. However, if the word is *wai-sin-bə* 'to run into someone', the application of {-ɹin} is rejected. It required detailed study.

Table 5: Allomorphs of the directional/ repetition morpheme {-sin}

Allomorphs	Environments	Examples
{-sin}	after vowel sounds and /ŋ/	ləŋ-sin-bə 'to throw something inside'
{-ɹin}	after diphthong /ai/, voiced sound, aspirated sound of the verbal root	hai-ɹin-bə 'to push inward' hum-ɹin-bə 'to keep inside' tʰəm-ɹin-bə 'to put inside'
{-cin}	after /p/, /t/, /k/	hap-cin-bə 'to put inside' hut-cin-bə 'to enter inside' tʰək.cin-bə 'to drink'

Table 6: Allomorphs of the benefactive/requestive morpheme {-pi}

Allomorphs	Environments	Examples
{-pi}	after voiceless stops	kək-pi-bə 'to cut for someone'
{-bi}	after voiced sounds	hai-bi-bə 'to ask for someone'

The allomorphs -pi ~ -bi act as a homophonous suffix. As for instance,

(1) tʰək-**pi**-ge
    drink-BEN-NRLZ
    'To drink for oneself'

(2) təu-**bi**-ju
    work-REQ-HON
    'Please do the work'

(3)　təu-**bi**-jo
　　　work-REQ-IMP (Command)
　　　'Please do the work'

In the first example, if -*pi* is followed by -*ge*, it implies that the action is acted upon the speaker only. The requestive form can be made by suffixing -*ju* or -*jo* (as shown in examples 2 and 3). The difference lies in the fact that -*ju* is used for elderly person and -*jo* is used for younger person.

Table 7: Allomorph of the intensifier/ directional suffix {-kʰət}

Allomorphs	Environments	Examples
{-kʰət}	after voiced sound	cau-kʰət-pə 'to get enlarged'
{-gət}	after /ŋ/	kʰuŋ-gət-pə 'to collect something from the bottom'
{-kət}	after /t/	sit-kət-pə 'to seep upward'

The phonological condition of the occurrence of /-kʰət/ is somewhat similar with that of /-sin/, /-gət/ is similar with that of /-ɟin/ and /-kət/ with that of /-cin/. The allomorph /-gət/ in the above table is due to the preceding sound /ŋ/. The actual verb root is *kʰun* 'to collect something upward'. The final /n/ sound is assimilated to /ŋ/ because of the following sound /g/.

3.2 Inflectional suffixes

Inflectional suffixes in Meeteilon can be studied under two headings: Noun Inflectional suffix or nominal suffix and verb Inflectional suffix or verbal suffixes.

3.2.1. Noun inflectional suffixes

Noun inflectional suffixes are those suffixes which are mainly attached to the noun. The various noun or nominal inflectional suffixes are given below:

/-nə/　　'agent/comparative/instrumental'
/-pu/　　'patient'
/-kə/　　'associative1'
/-ki/　　'genitive / benefactive'
/-tə/　　'location/time/objective/goal/possessor /cause/experience'
/-ne/　　'associative2'

/-la/　　'interrogative'
/-ni/　　'copulative'

NB: Allomorphs cannot be studied from the nominal suffixes.

3.2.2 Verbal inflectional suffixes

The various suffixes which are added to the verbs are given below:

/-i/　　　'realization'
/-i/　　　'progressive2'
/-e/　　　'perfective'
/-kəni/　'non-realization + copulative'
/-loi/　　'negative non-realization'
/-u/　　　'command'
/-kə-nu/　'negative command'
/-ra/　　'interrogative'
/-te/　　'negative non-realization'
/-kʰo/　'prohibitive/progressive'

Table 8: Allomorphs of the realized suffix {-i}

Allomorphs	Environments	Examples
{-i}	after /k/ sound	kək-i 'cut'
{-ɹi}	after vowel sound	təu-ɹi 'doing'
{-li}	after /t/ and /n/ sound	hat-li 'killed'
{-pi}	after /p/ only	kup-pi 'to place the lid'
{-mi}	after /m/ only	tʰum-mi 'sweet'
{-ŋi}	after /ŋ/ only	jaŋ-ŋi 'light'

Meeteilon doesn't have tense. Rather, it has aspect which is used to describe the degree of progress or completion of the action. For the illustration the realized suffix or the simple aspect marker /-i/ is taken. The allomorphs /-ɹi/ and /-li/ can perform two functions that is the function of simple aspect and the other function being the progressive.

Table 9: Allomorphs of the perfective suffix {-e}

Allomorphs	Environments	Examples
{-e}	after /k/	hek-e 'plucked'
{-ɹe}	after all vowel sounds	ka-ɹe 'burnt'
{-le}	after /t/ and /l/	pət-le 'withered' pel-le 'satisfied'
{-pe}	after /p/	nop-pe 'weak'

{-me}	after /m/ only	jom-me 'packed'
{-ŋe}	after /ŋ/ only	həŋ-ŋe 'asked'

The morph to become an allomorph needs to be semantically the same in a particular environment. So, the morphs /-ləm/, /-ɹəm/, /-pəm/, /-məm/ and /-ŋəm/ (as shown in Table-1) are all allomorphs of the morph /-ləm/ which are phonologically conditioned to indicate the function of deictic. Similarly, /-lək/, /-ɹək/, /-pək/, /-mək/ and /-ŋək/ (as shown in Table-2) are all phonologically conditioned allomorphs of the morph /-lək/ which refer to deictic or progressive action. This clearly indicates that Meeteilon has lots of allomorphs which constrain the affix concatenation process, the affixes and their environments need to be understood.

4. Approaches of optimality theory in Meeteilon morphology

Optimality Theory was introduced by Alan Prince and Paul Smolensky in 1993 as a framework for linguistic analysis. It was developed as a response to a "conceptual crisis at the center of phonological thought" (Prince & Smolensky 1993:1). René Kager (1999) gave a very useful introduction to the theory. Later, the theory was substantially expanded by John J. McCarthy (2002). Initially, it was meant for phonology only, but later it was applied in morphology, syntax and semantics as well. It is based on constraints rather than rules.

4.1 Markedness constraints

"It is an abstract property, referring to the unusualness or difficulty of a sound or process". (Odden, 2005:325).

For example, in the contrast /p/:/b/ in English, /b/ is characterized by the presence of voicing, while /p/ lacks voicing. In the contrast /pʰ/: /p/ in Thai, /pʰ/ has aspiration, while /p/ lacks it.

This shows that the unmarked form is the normal or the general meaning understood by people. The role of Markedness is to impose the requirement on the structural well-formedness of the output candidate neglecting the semantic opposition. Some of the typical Markedness Constraints are:

(i)   NOCODA: Syllables are open.

(ii)   *VNASAL: Vowels must not be nasal.
(iii) *VORALN: Before a tautosyllabic nasal, vowels must not be oral.
(iv) VOP: No obstruent must be voiced
(v)   *VOICED-CODA: Coda obstruents are voiceless.

4.2 Faithfulness constraints

It attempts to make the output identical to the input. Some of the common faithfulness constraints are discussed below:

(i)   IDENT-IO (F): Correspondent segments in input and output have identical values for feature (F)
(ii)   IDENT-IO (voice) the specification for the feature [voice] of an input segment must be preserved in its output correspondent.
(iii) IDENT-IO (nasal) Correspondent segments in input and output have identical values for feature [nasal].
(iv) IDENT-IO (Place) The specification for place of articulation of an input segment must be preserved in its output correspondent.
(v)   MAX-IO: Input segments must have output correspondents. ('No deletion')
(vi) DEP-IO: Output segments must have input correspondents. ('No epenthesis')

Let us discuss final devoicing at the end of the syllable in Meeteilon. This is just an introduction to Optimality Theory in the language where it is taken up as an initial stage. It is explained in Table 10. The input word is made of two syllables *kʰut* 'hand' + *top* 'add'> *kʰu.dop* 'ring'. The geminated /t/ in *kʰut* and *top* are merged and changed into /d/. The possible candidates are *kʰu.top, kʰu.dob, kʰu.dʰob, kʰu.tʰob*.

Table 10: Devoicing at the end of the syllable

-kʰu+top > /kʰu.dop/	*VOICED-CODA	IDENT_IO (voice)
➝ a. kʰu.dop		
b. kʰu.dob	*!	*
c. kʰu.dʰob	*!	*
d. kʰu.tʰob	*!	*

The constraints are supposed to be universal but it is the ranking that are subject to language specifics. In the above tableau, it is shown that the

Markedness Constraint *VOICED-CODA outranks Faithfulness Constraint IDENT_IO (voice). Candidate *a* is the optimal candidate as it satisfies both the constraints. This same situation is true for Central Kurdish (Hamid, 2014), Dutch (Berendsen, 1983) and German (Grijzenhout, 2000). But this may not be true for every language, as for English IDENT_IO (voice) »*VOICED-CODA.

5. Conclusion

From the above study, it is observed that Meeteilon has rich allomorphs which are phonologically conditioned. The allomorphs are responsible for the morphophonemic changes. The present study will become helpful not only in the identification of morpheme but also to set rules for their distribution in various environment which will later become useful in the morphological analysis of the language, one of the main objective of Natural Language Processing. It is observed that Meeteilon allomorphs are mostly found in the suffixes which take the function for deictic, progressive, directional, perfective and realization. And finally, an introduction to Optimality Theory approach was applied in Meeteilon in order to show that *VOICED-CODA dominates IDENT_IO (voice) in the final devoicing at the end of the syllable.

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