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# The Study of Distributed Morphology with Reference to the Mishing Verbal Inflection

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**Abstract**

The present research paper is a comprehensive analysis of Mishing verb inflection and its implementation in a DM-based Morphological Analyser. In this paper we try to sketch a descriptive idea of Mishing verbal inflection within the framework of Distributed morphology. For this we basically discuss the categories that are associated with the verb stems and the verb suffixes. Here, we are also put an emphasis to see how we can analyse a language in detailed including its producing morpheme. With this how does the framework of distributed morphology allows for morphology to work in tandem with syntax to analyse will draw processes of the DM-based Mishing Morphological Analyser. After all description this paper figure out the main postulating purpose behind this compositional study.

**Keywords:** Mishing language, Distributional morphology, Verbal inflection, Post syntactic morphological operations.

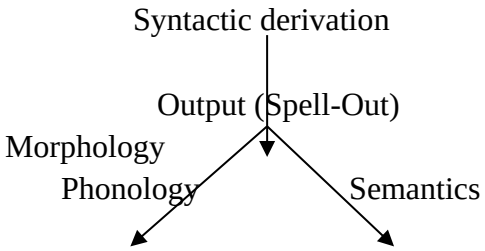
## 1.0 Introduction

This paper presents an analysis of verbal inflection in the Mishing language within the framework of Distributed Morphology. Mishing is a Tibeto-Burman language spoken by the Mishing people spatially distributed in upper Assam, mostly in the districts of Dhemaji, Lakhimpur, Jorhat, Sivsagar, Golaghat, Tinisukia, Dibrugarh. A few villages of the Mishing people are also in Arunachal Pradesh. In Assam there are nearly 5,87,310 speakers of Mishing. The basic word order of Mishing is SOV.

## 1.1 Distributed Morphology

Distributed Morphology (DM) is a theoretical framework that emerged in the early 1990s. The name is introduced in Halle and Marantz (1993, 1994), with important precursors including Halle (1990), Bonet (1991), Noyer (1997), and Pesetsky (1995). At a broad level, DM represents a set of hypotheses about the interaction among components of grammar: Morphology, in DM, is a part of the mapping from the output of a syntactic derivation to the input to the phonology, as sketched in (1):

(1) *Architecture*




DM is centred on two key hypotheses; both common in various parts of the literature-where DM claims novelty is in the synthesis of these two leading ideas under the architecture in (1):
(2) Syntax-all-the-way-down: The primary mode of meaningful composition in the grammar, both above and below the word-level is the syntax. Syntax operates on sub-word units and thus (some) word-formation is syntactic.

(3) Late Insertion / Realization: The pieces manipulated by the syntax (*functional morphemes*) are abstract, lacking phonological content. The pairing of phonological features with the terminals of the syntax (*vocabulary insertion* or *exponence*) happens post-syntactically, in the mapping from syntax to phonological form (PF).

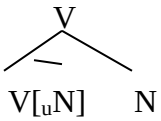
**1.2 Merge, Fusion, Fission and Improverishment**

In this section we mentioned some post syntactic morphological operations that used in Distributed morphology.

**1.2.1 Merge**

Merge is a syntactic operation that projects the lexical items into a new object and then giving rise to hierarchical structure. It only applied when constituents are triggered by selectional features as follows:

(2)



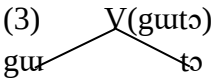

**1.2.2 Fusion**

While merger keeps two terminal nodes and clauses, then it allows insertion of two different vocabulary items. Likewise, fusion takes two terminal nodes that are two structurally adjacent and fuses them into a single one; that causes the insertion a single vocabulary item. For example, in English T and AGR fuse and this new node realizes all visible inflection (-s, ed)

### 1.2.3 Fission

The operation fission is the opposite operation of fusion, the fission splits one terminal node into two: each new terminal node will be assigned an exponent. For example, in Mishing gɯ-tɔ is a fission of the verb gɯ "go" and imperative particle tɔ which means "come in". The syntactic structure of this element is as below:

(3)




### 1.2.4 Impoverishment

Impoverishment in a post syntactic operation by which one or more morphosyntactic feature are deleted, they result less mark form.

### 1.3 Linguistics Background of Verbal Inflection

The standard form of a verb is to indicate an action or a state of being. A verb typically denoted the expression of inflection with tense, aspect, and mood and in some languages, it is also inflected for person. Likewise, in the Mishing language verbs inflected for three-tier distinction, viz, present, past and future. They are marked by suffixation. Tense markers are directly suffixed to the verb stems if there does not involve any aspect markers. However, if there is any aspect marker, it invariably precedes the tense marker. The tense markers are not terminal suffixes; person markers invariably are added to them. While the past and the future tenses in Mishing are marked by suffixation, the present tense is marked by the absence of any overt suffixation which is generally expressed as {ø}.

### 1.4 Source of Data

This present study is based on primary data. The data used in this study was collected from Mishing native speakers from the area of Gogamukh of Dhemaji district, Assam. The data was collected through interview and use of questionnaires.

### 2.0 Inflections Marked on Mishing Verbal Roots

The inflection on Mishing verbs appear as suffixes as shown in the examples in 4-8. In all the examples present tense, past tense, progressive aspect, perfective aspect, and future tense are marked on the verbs using suffixes. Mishing has dual *number* system; the plural is marked with *lɯ*, but it's lexical. However, there is no *gender* marker. The *person* is marked on the verb only for *2nd person, future*:

(4) bɯ apin dɔtɔ

| | | |
|---|---|---|
| bɯ | apin | dɔ-tɔ |
| 3SG | rice | eat-PRS |

"He/she eats rice."

(5) ŋə kedikɔ dɔkan

| | | |
|---|---|---|
| ŋə | kedi-kɔ | dɔ-kan |
| I | mango-ACC | eat-PST |

"I ate the mango."

(6) rambu kedikɔ dɔladun

| | | |
|---|---|---|
| ram-bu | kedi-kɔ | dɔ-la-dun |
| Ram-NOM | mango-ACC | eat-PROG-EXST |

"Ram is eating the mango."

(7) sitabu kedikɔ dɔtɔbɔ

| | | |
|---|---|---|
| sita-bu | kedi-kɔ | dɔ-tɔ-bɔ |
| Sita-NOM | mango-ACC | eat-PST-ASP |

"Sita has eaten the mango."

(8) bɯlɯ apin dɔje

| | | |
|---|---|---|
| bɯlɯ | apin | dɔ-je |
| 3PL | apin | eat-FUT |

"They will eat rice."

The order in which the primary verbal elements of Mishing arrange themselves is Verb-Tense-Aspect. The order for those inflectional categories for Mishing verbs is given below.

(9) Template for Verbal Inflection

Main Verb > Tense > Aspect

The Table 1 below is a list of the various verb forms for the 3rd person, singular for different kinds of verbal roots as a sample of the kinds of inflections that are found in Mishing.

| Verbs → | dɔ<br>'eat' | tə<br>'drink' | rə<br>'buy' | ted<br>'sit' | pamunsu<br>'fight' | lɔt<br>'cut' |
|---|---|---|---|---|---|---|
| Habitual Present | dɔtɔ | tətɔ | rətɔ | tedtɔ | pamunsutɔ | lɔtɔ |
| Perfective Aspect | dɔtɔbɔ | tətɔbɔ | rətɔbɔ | tedtɔbɔ | pamunsutɔbɔ | lɔtɔbɔ |
| Progressive Aspect | dɔladun | təladun | rəladun | tedladun | pamunsuladun | lɔladun |

| | | | | | | |
|---|---|---|---|---|---|---|
| Past | dɔkan | tɔkan | rɔkan | tedkan | pamunsukan | lɔkan |
| Future | dɔje | tɔje | rɔje | tedje | pamunsuje | lɔje |

Table 1: Inflections marked on Mishing verbal roots

That the number is lexical, the person is marked only for *2nd person, future* and that there is no gender marker in Mishing can be shown with a set of examples below:

10. (a) ŋɔ dɔ-je
I eat-FUT
'I will eat.'

(b) ŋɔlɯ dɔ-je
we eat-FUT
'We will eat.'

(c) nɔ dɔ-laŋ
you(sg) eat-FUT
'You will eat.'

(d) nɔlɯ dɔ-laŋ
you(pl) eat-FUT
'You will eat.'

(e) bɯ dɔ-je
3SG eat-FUT
'He/she will eat.'

(f) bɯlɯ dɔ-je
3PL eat-FUT
'They will eat.'

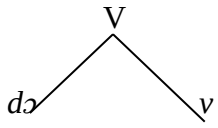
As evident from the data taken only the 2nd person future is marked on the verb.

**3.0 Verbal Inflection of Mishing in Distributed Morphology**

The main idea of Distributed Morphology is that the terminal nodes of a structure are ordered into hierarchical structures at the stage of SS by some syntactic operations. Where these nodes cover a complexity in semantic and syntactic features but lack with any phonological content. After syntax, the nodes may create deviations as the result of various morpho-syntactic operations like marge, fusion, fission and etc, at the level of morphological structure. And phonological content is realized at PF through vocabulary insertion to these changed terminals. This produces the phonetic form of the utterance and the surface structure of a word or phrase through sequential derivation. There are two kinds of terminal nodes available at syntactic structure. The first kind of terminal node is typically filled by root entries. Root entries contain phonological and semantic features but no grammatical category features. They acquire a category

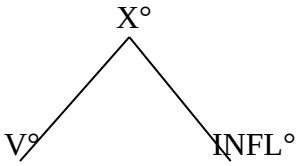
only after insertion into the syntactic structure. For example, the root terminal combines with the category head as shown in (11) below to produce a V that represents the verb *dɔ* 'eat'.

(11)




Evidently, in simple declaratives in Mishing, the main verb and inflectional features form a morphological unit, as in (12) - a verb, such as *ad-kan* 'wrote.'

(12)




An important line of study within DM seeks to propose a theory of possible mismatches. For this, an operation of Morphological Merger has been appealed to. Various formulations have been offered; one such is (13) below:

(13) *Morphological Merger*

A syntactic complementation relation: [ X° YP ]
may be realized in the morphology as an affixation relation:
X affixed to Y, the head of YP: [[ Y ] X ] or [[ X [ Y ]]

Merger in (12) reconstitutes Chomsky's *Affix-Hopping* as a morphological operation. Since Mishing inflectional morphology is exclusively suffixing, while syntactic complementation is head-initial, combining INFL as an affix to the verb will necessarily result in a suffix, and the appearance of INFL 'hopping' across the verb.

**3.1 Realization and Underspecification**

As in other realizational frameworks, a central role in DM is accorded to underspecification of vocabulary items. A well-worn example of underspecification is provided by the English present tense inflection (of main verbs). The English vocabulary contains the following two items, which are candidates for realizing in INFL node in (12).

(14) Vocabulary of English (fragment)

a. [ 3SG, PRES ] ⟺ s
b. [ PRES ] ⟺ Ø

The formal statements of vocabulary items are tantamount to rules of exponence and as such, two general principles of rule interaction are operative in their application.

For Mishing verbs, the agreement morphology in the *simple future* is illustrated as following: Mishing future tense: *gɯ* 'to go'

| PERSON | SINGULAR | PLURAL | |
|---|---|---|---|
| 1st | gɯ-je | gɯ-je | |
| 2nd | gɯ-laŋ | gɯ-laŋ | *[2FUT]* ⟺ *-laŋ* |
| 3rd | gɯ-je | gɯ-je | |

As found, the verb has got inflection for 2nd person.

### 3.1.1 Vocabulary Insertion and Readjustment Rules

The insertion of verbal affixes and auxiliaries can be understood in terms of vocabulary items (both root and affixal) given below in Table 2. The symbols *Vī, Ve, Vā, Vũ* denote different vowel endings of verbal roots. The vocabulary items compete for insertion at the terminal nodes, and are chosen based on their feature specification. The auxiliary insertion entries in Table 2 insert auxiliaries while all other entries insert suffixes at the terminal nodes. Mishing verb roots may end in a consonant or in a vowel. These are illustrated in Table 2:

| Verbal Roots → <br> Affixation ↓ | Vowel | Consonant |
|---|---|---|
| [+ability] | *-kindak* <br> as in <br> *ŋɔ mɔkindak* <br> 'I can cook.' | *-kindak* <br> as in <br> *ŋɔ adkindak* <br> 'I can write.' |
| [+Negative] | *-ma* <br> as in <br> *bɯ iskulpɔ gɯma* <br> 'He does not go to school.' | *-ma* <br> as in <br> *rambu kedi lɔtma* <br> 'Ram did not cut the mango.' |
| [+imperative] | *-tɔ* <br> as in <br> *gɯtɔ* <br> 'Come in.' | *-tɔ* <br> as in <br> *tedtɔ* <br> 'Sit down.' |

Table 2: Verbal inflections in Mishing

### 3.1.2 Rules for Irregular Roots

The phonological changes that occur as a result of the association of the verb stem and a suffix can be explained using the rules given above. However, there are cases when stems undergo

some modifications that cannot be explained phonologically as in suppletive or irregular forms. The irregular behaviour of certain verb stems in Mishing is accounted for as shown below.
The realization of the verb *gɯ* 'go/come' in habitual present is *gɯkaI]* instead of *gɯtɔ* as seen in other verbs. Similarly, the verb *lagi* 'want' is formed differently than the other verbs. The morphemes for simple past, present and future are *–kan, -tɔ and je* respectively. But the verb forms for 'want' are as follows:

| | Past | Present | Future |
|---|---|---|---|
| want | *lagidagai* | *lagidag* | *lagije* |

Thus, it is observed that the past and present forms of the verb take two quite different realizations suffixed with *–dagai* and *–dag.*

The analysis presented is a comprehensive one and is expected to describe a limited number of grammatically acceptable forms of the Mishing verbs. The analysis economises on the descriptive classes that are generated and relates roots and affixes in an unambiguous and complete way. It is also expected that any new root that enters the language can also be treated straightforwardly with this account which attempts to capture native speakers' intuitions about the formation of verbal forms.

**4.0 Implementation Of Mishing Morphological Analyzer**

The DM-based Morphological analyser uses a set of ordered contextual rules to isolate and extract the suffixes from a given word form. The internal processes of the DM-based morphological analyser are shown in Figure 1. The rules are applied from right to left iteratively until no suffixes remain and only the base root, which is identified from the root lexicon, is left. Readjustment rules apply wherever applicable to produce the correct root which is then matched with the incorporated root-list to determine a match or matches. The three distinct steps that are used in the analyzer are as follows:

(15) Morphological Analyzer
(a) Stemming
(b) Root formation and lexicon look up
(c) Morphological analysis

The system produces a detailed morpheme analysis for each word and provides the root, the grammatical category, the inflectional class and the feature values associated with the word. The system also produces a detailed morphological analysis for each morpheme that constitutes the word form. The sample output format of the system is given in 16.

(16) Input Token: X/Y/Z
Possible Root 1: class: category: suffix: morphemes (morpheme1, morpheme 2, .... ):
Morpheme analysis (morpheme 1, morpheme 2, … )
Possible Root 2: category: suffix: morphemes (morpheme1, morpheme 2, .... ):
Morpheme analysis (morpheme 1, morpheme 2, … )

The internal processes of the DM-based morphological analyser are shown in Figure 1 with an example as following:

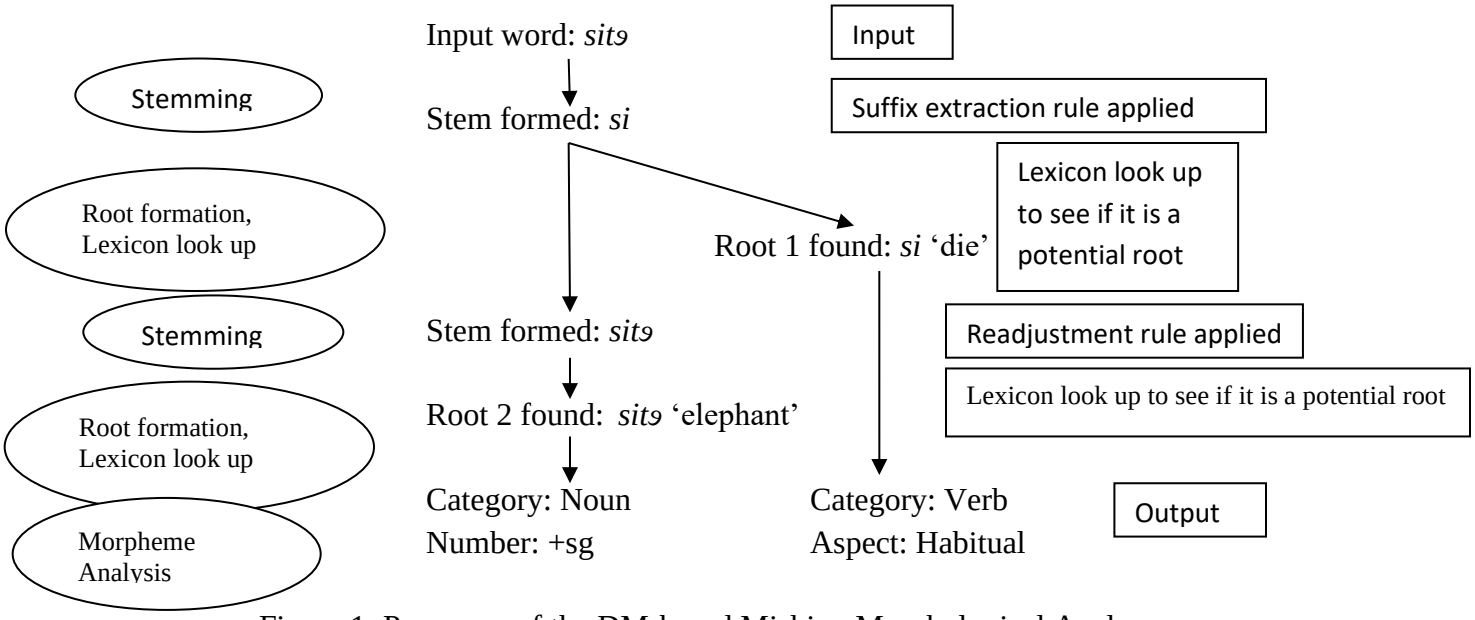



Figure 1: Processes of the DM-based Mishing Morphological Analyser

**5.0 Conclusion**

In this paper, we have presented a comprehensive analysis of Mishing verb inflection and its implementation in a DM-based Morphological Analyser. The system was able to analyze both regular and irregular verb forms. The system failures were driven primarily by external factors. The output of the system is quite detailed as it produces morpheme analyses for both root and suffixes for a word form. This analysis can easily be done in the reverse to generate verbal forms as well. Distributed Morphology allows for morphology to work in tandem with syntax (so a parser based on this system can easily incorporate the analyzer) and at the same time allows for the quirks of morphology to be dealt with in specific ways (fusion, fission etc).

DM at its core comprises a framework of assumptions for thinking about the grammar as a whole and the interaction of its parts. The Morphology part of the name stresses an emphasis on facts traditionally seem as the purview of morphology the shape of words. The Distributed part of

DM highlights the contention that the grammatical knowledge of pieces of words is not monolithic, but enters the grammatical computation at various points in various ways. The traditionally conceived Lexicon is replaced by three lists:

(36) (i) a list of the abstract morphemes that are the building blocks of syntax,
(ii) a list of vocabulary items that spell out morpho-syntactic structures, and
(iii) a list of the idiosyncratic meanings of individual pieces in particular contexts.

The key assumptions of this theory are that syntax is the primary engine of composition-i.e., that word-formation is part of the syntax, and that morphology is realizational, specifically post-syntactic.

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