



A Computational Morphological Analysis of Marathi Negative Markers

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ABSTRACT

This paper aims to present the computational morphological analysis in the negation of Marathi using ruled base approach. Morphological analysis and generation are necessary steps in any NLP application for analyzing the given word and generator for generating word of stem and its features like affixes. It provides information about word semantics and the syntactic role of the stage in a sentence. Marathi grammarian has discussed on some amount of Marathi negation. This paper is attempting to discuss all the negation marker and suffixes in morphological analysis, through primary data collected from Marathi books and secondary data from several Marathi newspapers. The classified data is analyzed into stems and affixes for equally categorizes and the inflectional process has been treated separately.

INTRODUCTION

In linguistics, morphology is the identification, analysis and description of the structure of a given language's morpheme and other linguistic units, such as words, affixes. Morphological typology represents a method for classifying languages according to the ways by which morphemes are used in a language from the analytic that use only isolated morphemes, through the agglutinative (“stuck-together”) and fusional languages that use bound morphemes (affixes), up to the polysynthetic, which compress lots of separate morphemes into single words. While words are generally accepted as being with qualities the smallest units of syntax, it is clear that in most languages, if not all, words can be related to other words by rules. Negation pervades ontology, logic, metaphysics, mathematics, science, psychology and several other disciplines. Most of all it is a basic element of human thought and a universal feature of all languages. The addition of a negative element creates a contrast with positive statements. Negating a statement is like creating an opposite polarity in any domain. Negation interacts with all of them, creating several shades of meaning.

This paper presents the morphological analysis in Negation of Marathi, which is an official language of Maharashtra and co-official language of Goa states of Western India. It is an Indo-Aryan language spoken by about 73 million people as a per census of India 2001, ranking 19th in the list of most spoken languages in the world and fourth among the native speakers in India.

LITERATURE REVIEW



Many Marathi grammarians like Damle (1911), Walimbe (2010), etc. have written on Negation but did not give a descriptive analysis. Pandharipande, R. (1997), In the book *Marathi*, she has given the markers sense of negation in sentential level without the presence of negative markers but with plenty of examples. She has not given a complete morphological paradigm of negation, but basic information. Wali, K. and Dhongde, R. V. (2009) also discussed negation and have given a limited morphological analysis as negative auxiliary. Mhaskar, R. (2012), has discussed negation in contact situation but not fully described Marathi negation, though it is a comparative type of study. Nobody has given a complete morphological paradigm which could help for computational analysis.

Computationally, Bharati et al. (1998) suggested a paradigm based algorithm for morphological analysis for Hindi. In Hindi, the inflected forms of roots do not allow further attachment of any other suffixes. In contrast, in Marathi once the root is transformed into its inflected form it is followed by suffixes to show its agreement with the other words in the sentence. Some postpositions derive new words which themselves may undergo inflection and allow attachment of other suffixes. This makes the simple paradigm-based model proposed in this work unfit for Marathi morphological analysis (Bharati et al. 1998:5). Dixit et al. (2006) developed a morphological analyzer with the purpose of using it for spell checking. Though their analyzer successfully analyzes the words with a single suffix, its scope is restricted in the handling of only first level suffixes for simple word forms. Shambhavi et al. (2001) introduced Kannada morphology analyzer and generator by using a tree. Ramanathan et al. (2004) a lightweight stemmer



for Hindi. In this research, words conflate terms by suffix removal for information retrieval. Willet.P (2006) proposed the porter stemming algorithm for electronic library and information system. Zahurul, M.D. et al. (2009) developed a lightweight stemmer for Bengali for Bengali language spell checker. Qurat-Ul-Ain Akram and etal. (2009) Assas-band, an affix exception list based Urdu stemmer. It stems the Urdu words using lexical lookup method (Assas-band). Dinesh Kumar and Prince Rana (2010) developed design and development of stemmer for Punjabi. It uses a Brute Force algorithm for stemming the Punjabi words. Vijay Sundar et al. (2010) Introduced Malayalam stemmer for information retrieval. The finite state automata method is used to stem the Malayalam words. In these work researches have given morphological analysis of their respective languages and they have accounted paradigm of negation.

NEGATION OF MARATHI

Negation is a common and important phenomenon in the world languages. Marathi has नाही *nāhī* and the particle न *n* for negation. Indo-Aryan languages share the surface word-order with adverbs, negation particles appear in the preverbal position or as a particle.

The addition of a negative element creates a contrast with positive statements. Negating a statement is like creating an opposite polarity in any area. Negation interacts with all of them, creating several shades of meaning.



Negation is expressed at both sentential and basic stages. Sentential negation is expressed by a variety of negative verbs, some of which as auxiliaries.

Marathi has a tendency of AUX deletion. Marathi has singular and plural conjugations of negation auxiliaries with gender, number and person agreement. त *t* is a plural marker for negation. स *s* is a second person marker and च *ts* as a conformation maker in the present, past and future tense.

Examples: *nāhī-ts* suffix

मुंबईकरांना टोलमुक्त नाहीच. (Loksatta. 1st Nov 2015. Page no. 1)

mumba īkarānnā ṭ olmukta nāhī ts

‘Mumbai people exempted from toll.’

Past negative Aux + े *e* (pl)+ च *ts*(conformation maker)

बार बंद नव्हतेच. (Loksatta. 16th Nov 2015. Page no. 1)

bār band nwhatets

‘Bar was not closed’

धोनिसेबत मतभेद नव्हतेच. (Maharashtra Times. 9th Nov 2015. Page no. 1)

dhonisobat matbhed nwhate ts

‘There was no dissension with Dhoni.’



Affixes in Negative forms of आहे *āhe*. In present tense negation marker is नाही *nāhī*, नये *naye* and नव्हे *nwhe*.

Examples:

त *t* pl suffix

च *ṣ* suffix

Present negative नाही *nāhī*+, नव्हे *nwhe* + नये *naye* + त *-t* (pl).

Present negative नाही *nāhī*+, नव्हे *nwhe* + च *-ṣ* (conformation maker)

स्मिता वेडी नाही

smitā we ḍ ī nāhī

‘Smita is not mad’

‘वर्षा’ बंगल्यावर दिवाळीचे फटाके नाहीत

‘varṣā’ banglyāwar diwālīṣe phaṭāke nāhīt

‘varsha’ Diwali crackers are not there in bungalow.’

मोदी ‘पीएम’ होऊ नयेत अशी त्यांची इच्छा होती. (Sakal. 29th Oct 2015. Page no. 1)

modī ‘pīem’ hoū nayet aśī tyāntī itṣhā hotī.

‘They do not want Modi to become PM.’



महिलांनी उतेजक कपडे घालू नयेत. (Loksatta. 21st Jul 2012. Page no. 1)

mahilānī utedzak kapade ghalū nayet

‘Women should not wear enticing clothes.’

शपथ नव्हे अग्निपथ. (Maharashtra Times. 31st Oct 2014. Page no. 1)

śapath nawhe agnipath

‘This is not my owe, this is my path of difficulties/ fire’

दादरी मधील ते गोमांस नव्हे तर होते मटण. (Sakal. 9th Oct 2015. Page no. 1)

dādri madhīl te gomans nawhe tar hote ma ṭ aṅ

‘In the Dadri is not beef meat it was hircine meat’

Present Tense Negation Analysis:

Present tense Negation analysis Followed by Number and Person.

General rules:

नाही *nāhī* <stem>

नाही *nāhī* < sg 1st> < sg 2nd> < sg 3rd> < pl 1st> < pl 2nd> < pl 3rd >

त *-t* < pl 1st> < pl 2nd> < pl 3rd>

स *-s* < sg 2nd>



Analysis of present tense negation and conformation marker च ष.

च ष < sg 1st> < sg 2nd> < sg 3rd > < pl 1st > <pl 2nd > <pl 3rd >

तच -*tats* < pl 1st > <pl 2nd > <pl 3rd >

General rules:

नय *nay* <stem>

नये- *nay-e* <Masc sg 1st> <Fem sg 1st> <Masc sg 2nd> <Fem sg 2nd > <Masc sg 3rd> <Fem sg 3rd> <Nut sg 3rd> <Masc pl 2nd> <Fem pl 2nd> <Masc pl 3rd> <Fem pl 3rd> <Nut pl 3rd>

नये-त *nay-et* <Masc pl 2nd> <Fem pl 2nd> <Masc pl 3rd> <Fem pl 3 rd> <Nut pl 3rd>

General rules:

नव्ह *nwh* <stem>

नव्ह- *nwh-e* <Masc sg 1st> <Fem sg 1st> <Masc sg 2nd> <Fem sg 2nd> <Masc sg 3rd> <Fem sg 3rd> <Nut sg 3rd> <Masc pl 1st > <Fem pl 1st> <Masc pl 2nd> <Fem pl 2nd> <Masc pl 3rd> <Fem pl 3rd> <Nut pl 3rd>

नव्ह-च *nwh-ets* <Masc sg 1st> <Fem sg 1st> <Masc sg 2nd> <Fem sg 2nd> <Masc sg 3rd> <Fem sg 3rd> <Nut sg 3rd> <Masc pl 1 st > <Fem pl 1st> <Masc pl 2nd> <Fem pl 2nd> <Masc pl 3rd > <Fem pl 3rd> <Nut pl 3rd>

Past tense negation marker नव्हतो *nawhto*.



Example:

बार बंद नव्हतेच.

b ā r band nwhate ts

‘Bar was not closed’

धोनिसोबत मतभेद नव्हतेच

dhonisobat matbhed nwhate ts

‘There was no dissension with Dhoni.’

Affixes in Negative forms of नव्हता *nawhtā*.

Past tense Negation analysis Followed by Gender, Number and Person.

General rules:

नव्हत *nawht* <stem>

नव्हतः *nawht-a* <Nut sg 3rd >

नव्हत-ो *nawht-o* <Masc sg 1st> <Masc pl 1st> <Fem pl 1st>

नव्हत-े *nawht-e* <Fem sg 1st> <Masc pl 2nd > <Masc pl 3rd> <Nut sg 3 rd>

नव्हत-ी *nawht-ī* <Fem sg 1st> <Fem sg 2nd> <Fem sg 3rd> <Nut pl 3 rd>

नव्हत-ा *nawht-ā* <Masc sg 2nd> <Masc sg 3rd> <Masc pl 2nd>



नव्हत-ास *nawht-ās* <Masc sg 2nd>

नव्हत-ात *nawht-āt* <Masc pl 2nd>

नव्हत-ेत *nawht-et* <Masc pl 2nd>

नव्हत-ीस *nawht-īs* <Fem sg 2nd>

नव्हत्-यात *nawht-yāt* <Fem pl 2nd>

नव्हत्-या *nawht-yā* <Fem pl 2nd> <Fem pl 3rd>

Analysis of past negation with conformation marker च ष.

नव्हत-ोच *nawht-oṣ* <Masc sg 1st> <Masc pl 1st> <Fem pl 1st>

नव्हत-ेच *nawht-eṣ* <Fem sg 1st> <Masc pl 3rd > <Nut sg 3rd>

नव्हत-ीच *nawht-īṣ* <Fem sg 1st> <Fem sg 2nd> <Fem sg 3rd> <Nut pl 3rd>

नव्हत-ाच *nawht-āṣ* <Masc sg 2nd> <Masc sg 3rd ><Masc pl 2nd > <Fem pl 3rd >

नव्हत्-याच *nawht-yāṣ* <Fem pl 3rd >

The particle न *n* also function as a vowel change to negate verb.

And future negation marker is नसेल *nas-el*. But in the future tense negation is

नसेल *nas-el* as well future tense असेल *asel*.

Eg. असेल *as-el* > नसेल *nas-el*, etc.



कामे होत नसतील, तर तरतूद कशाला?. (Sakal. 23rd Jun 2015. Page no. 1)

kāme hot nastīl, tar tartūd kaśālā?

‘Why such provisions, if such works cannot be completed?’

आपण नसू तेव्हा हे जग तितकेच सुंदर असेल. (Maharashtra Times. 1st Aug 2012. Page no. 1)

āpan nasū tewhā he džag titke ts sundar asel.

‘Even when we do not exist, even then the world be equally beautiful’

‘This world remains equally beautiful, even after our existence’

Future tense Negation analysis Followed by Number and Person.

General rules:

नस *nas* <stem>

नस-ेल *nas-el* <sg 1st> <sg 3rd>

नस-ूं *nas-ū* <pl 1st>

नस-शील *nas-śīl* <sg 2nd>

नस-ाल *nas-āl* <pl 2nd>

नस-तील *nas-tīl* <pl 3rd>

In future tense conformation negation marker च *ts*.



म्हातारपणाच्या खुणा नसतीलच (डॉ. सतीश पत्की)

mhātārpaṇātsyā khuṇā nastīlats (dā satīś patkī)

‘There are no signs of age old (Dr. Satish Patki).’

Future negative नसतील nastīl + च -ts (conformation maker)

General rules:

नस *nas* <stem>

नसेल-च *nas-el-ts* <sg 1st> <sg 3rd>

नस-ू-च *nas-ū-ts* <pl 1st>

नस-शील-च *nas-śīl-ts* <sg 2nd>

नस-ाल-च *nas-āl-ts* <pl 2nd>

नस-तील-च *nas-tīl-ts* <pl 3rd>

Imperatives:

The first person negative hortative नको *nako* ‘do not do X’ is placed after his main verb, which is in the imperative.

मी जा-ऊ नको ? / मी नको जा-ऊ / मी नको का जा-ऊ?

mī jā-ū nako? / mī nako jā-ū? / mī nako kā jā-ū?

‘Shouldn’t I go?’ ‘Don’t you want me to go?’



आपण त्या कविता म्हण-ऊ या नको.

āpa ṅ tyā kawitā mha ṅ -ū yā nako.

‘Let we don’t sing those poems.’

General rules:

नक *nak* <stem>

नक-ने *nak-o* <Masc sg 1st> <Fem sg 1st><Masc pl 1st> <Fem pl 1st > <Masc sg 2nd>
<Fem sg 2nd> <Masc sg 3rd > <Fem sg 3rd> <Nut sg 3rd> <Masc pl 3rd > <Fem
pl 3rd > <Nut pl 3rd>

नक-ं *nak-ā* <Masc pl 2nd> <Fem pl 2nd>

नक-नेस-*nak-os* <Masc sg 2nd> <Fem sg 2nd> <Nut sg 2nd>

The first person negative hortative नको *nako*. With conformation marker च ङ.

गुणवतेसाठी ‘ग्रेडेशन’ पद्धती नकोच. (Lokamat. 24th Oct 2015. Page no. 1)

guṇwates ā ṭ h ī ‘greḍeśan’ paddht nakoṅ

Talent for gradation method

for talent not gradation method

Gradation is not a method to assess talent

For the talent the gradation methods are not



शाळा देऊ नकाच. (Maharashtra Times. 21st Jul 2015. Page no. 1)

śālā deū nakā ts

Do not give School

General rules:

नक *nak* <stem>

नक-ोच *nak-ots* <Masc sg 2nd> <Fem sg 2nd> <Masc sg 3rd > <Fem sg 3rd> <Nut sg 3rd> <Masc pl 3rd > <Fem pl 3rd > <Nut pl 3 rd>

नक-ाच *nk-ats* <Masc pl 2nd> <Fem pl 2nd>

CONCLUSION:

From the above analysis/ discussion, it is understood or understandable that the morphological processing improves the recovery performance for Marathi Language. An important observation is that the suffixes in Marathi can also contribute to the semantics of the document and hence improves the retrieval performance.

The current morphological analysis does not handle derivational morphology. In Marathi, derivational morphology is a very productive way of forming words. Handling derivational morphology can also increase the system performance. This paper presented a highly accurate morphological analysis of negation in Marathi which is very efficiently finds the Root word of a given word and recognizes the Gender of the sentence with the inputs.



त is plural suffix, नव्हे is present tense negation, but when त attached with नव्हे than is past tense negation, past tense suffix according to GNP. च confirmation marker, but confirmation marker is not all time possible, when is conform think that time use confirmation marker.

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