

## **Development of Inflectional Morphology and Its Effect on Reading Comprehension in Marathi Speaking Children – A Preliminary Study**

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### **Abstract**

The purpose of the study was three fold: one, to investigate the developmental trend of inflectional morphemes, second, to study the relation between morphological awareness and reading comprehension and lastly, to compare the development of inflection between genders. Marathi is an inflected and an agglutinative language; where affixes are attached to the root morpheme altering the person, number gender and tense. Marathi has poly-morphemic words and free word order. Hence knowledge of inflection is highly critical for comprehension of Marathi sentences. Sixty participants, thirty males and thirty females, from Grade III and Grade IV, were assessed on morphological awareness by a judgment task. Reading comprehension was assessed by answering questions on a reading passage. Results indicated significant developmental trend in inflectional morphemes from Grade III to Grade IV. Case marker was significant predictor of reading comprehension in grade III. No significant difference was observed between genders. We conclude that awareness of morphological skills improves reading comprehension and children start to read with meaning. The findings of this study and previous research suggest inclusion of assessment of morphological knowledge in early reading evaluation and intervention. It may also contribute to the assessment and intervention of children with learning disabilities.

**Keywords:** Inflectional morphemes, Marathi, Morphological awareness, Reading comprehension.

## Introduction

In recent years, speech-language pathologists and linguists have taken keen interest in studying the effect of various aspects of development of language, which contribute to children's literacy development.

Phonological awareness, decoding skills and its association to word reading ability and reading comprehension has been studied widely in English, European and Indian languages (Gupta, 2004; Hulme & Snowling, 2009; Nag 2007; Nag & Sircar 2008; Prakash, Rekha, Nigam & Karanth 1993).

Morphological awareness is one area, which has received attention in the recent years. "Morphological awareness refers to children's conscious awareness of the morphemic structure of words and their ability to reflect on and manipulate that structure" (Carlisle, 1995). In other words, morphology is the aspect of language concerned with the rules governing change in word meaning.

Morphemes are categorized as free and bound morphemes. Free morphemes function independently and carry their own meaning. For example: cat, ball. Bound morphemes appear as a part of word in conjunction with root word or other bound morphemes. For example: 'boys', 'undeveloped'.

Bound morphemes are further distinguished as derivational and inflectional morphemes. Derivational morphology is concerned with words, which alter the grammatical category of the root morpheme. For example, *brightness* and *brighten* are derived from a single root morpheme, 'bright', altering the grammatical category to adjective and verb respectively. Inflectional morphology is concerned with words, which systematically marks the grammatical information on a root word. For example: *Looking*, *looked*, and *looks* are derived from a single root word 'look'. Here the category of the root word remained the same, namely verb, changing only the meaning. Inflectional morphemes include PNG markers, case markers and tense markers.

Morphological awareness is assessed by various methods, such as using purely oral tasks, written tasks or a combination of the two. It can also be assessed using judgment, production or decomposition tasks. In a judgment task, the participant has to decide about the correctness of a word but does not need to correct the word using morphological rules. However in a production task the participant has to decide on the appropriateness and correct the word using morphological principles (Kirby, Deacon, Bowers, Izenberg, Wade-Woolley, and Parrila, 2011).

Most studies exploring the relationship between morphological awareness and reading comprehension with younger children have typically focused on inflections, whereas those with older children have focused on derivations (Kirby, et al. 2011).

Use of morphemes to mark tense, gender, or number differs from language to language. In some languages they are placed at the end of words, while in others these appear in the middle of words. Studies have shown that morphology relates differently to reading and writing in different languages (Carlisle, 2010; Ku & Anderson, 2003; McBride-Chang et al, 2008).

Marathi is a highly inflected language with suffixes being attached to the root morpheme to denote change in person, number, gender, and tense. Case markers express relations between nouns and pronouns to other nouns, pronouns, verbs or other words in a sentence. In Marathi, there are eight cases, namely, nominative, accusative, instrumental, dative, locative, ablative, possession and vocative. These inflections give meaning to words in a sentence.

### **The Need for the Study**

Most of the research investigating the effect of awareness of morphology on reading abilities is on European, Chinese, Arabic and Japanese languages.

Marathi, which is an Indo-Aryan language, is inflectional and agglutinative. It has verb (person, number, gender) and noun (case) inflections. Marathi words have high morpheme length because of inflections; primarily suffixes attached to the root morpheme, where the root

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morpheme does not alter. Secondly, Marathi has free word order. Hence knowledge of inflection is highly critical for comprehension of Marathi sentences (Bhosale, Kembhavi, Amberkar, Mhatre, Popale & Bhattacharya, 2011).

One of the few studies on Marathi-speaking, normally hearing children and hearing-impaired children studying in Grades V to VIII, investigated the developmental trends in phonological awareness and morphological knowledge and its association with reading comprehension (Adhyaru, 2004). Her study did not report significant developmental trends in phonological awareness and morphological knowledge. Secondly, she found morphological knowledge better predictor of reading comprehension than phonological awareness.

Nag and Snowling (2011) investigated reading comprehension, phonological skills, reading accuracy, vocabulary and inflectional knowledge in Kannada speaking children in primary and middle school years in the age group of 8.11 to 12 years. Their findings suggest that the knowledge of inflectional morpheme was one of the factors, which predicted reading comprehension along with phonological skills, vocabulary and reading accuracy. These authors have indicated a need for further research to understand the nature and development of inflections in Kannada and other Indian languages.

Thus, there is a dearth of information regarding the developmental trends in the acquisition of morphological knowledge in Indian languages in general and Marathi in particular. Hence the present study.

### **Aim & Objectives**

- 1) To study the development of inflectional morphemes between Grade III and Grade IV Marathi speaking children.
- 2) To study the relation between morphological awareness and reading comprehension.
- 3) To compare the development of inflectional morphemes among genders.

## Methodology

Sixty native Marathi speaking children comprising of 15 males, 15 females from Grade III and Grade IV each, studying in three Marathi medium schools participated in the present study. Consent was taken from the principals of the schools and confidentiality of information obtained was assured.

Assessment tools for morphological awareness comprised of an oral grammatical judgement task, which tested the children's awareness of PNG markers, tense markers and case markers. The participants had to indicate whether the sentence was grammatically correct or incorrect and further, correct the incorrect sentences orally.

The investigators of the present study developed two reading passages, based on the vocabulary and use of inflectional morphemes as reviewed in Grade III and Grade IV Marathi textbooks of *Balbharati*, Maharashtra State Board. The reading passage for Grade III comprised of 278 words and for Grade IV 350 words. Reading comprehension was tested using these reading passages. The participants were asked to read the passage silently and write answers to the six questions based on the passage.

The responses for the oral judgement and reading comprehension tasks were coded as '1' for correct and '0' for incorrect.

## Results

The descriptive statistics was calculated for tense markers, PNG markers, case markers and reading comprehension. MANOVA was done to study the effect between genders, and Grades. Pearson Correlation was calculated between variables.

Table 1 - Mean and SD values for Reading Comprehension (RC), Tense, Gender, Numbers (No) and Case Markers (CM) for Grade III subjects (1 denotes Grade III).

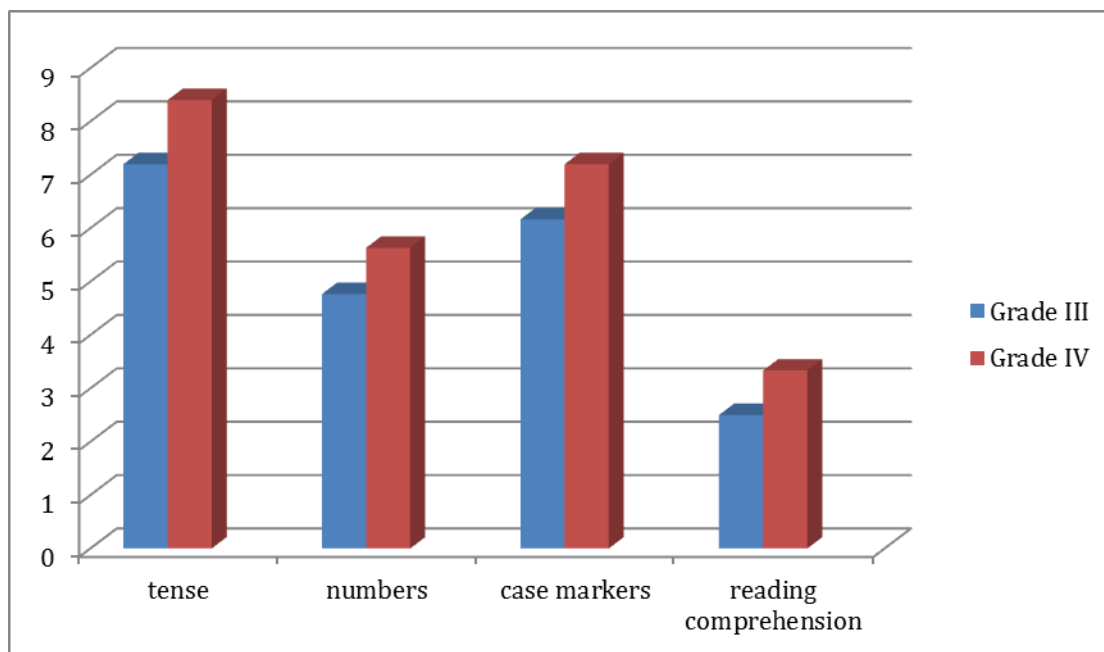
	Mean - Grade III	Std. Deviation	N
RC1	2.50	1.64	30
Tense1	7.20	1.90	30
Gender 1	1.50	0.51	30
No 1	4.77	1.25	30
CM1	6.17	1.44	30

Table 2 - Mean and SD values for Reading Comprehension (RC), Tense, Gender, Numbers (No) and Case Markers (CM) for Grade IV subjects (2 denotes Grade IV).

	Mean - Grade IV	Std. Deviation	N
RC2	3.33	1.27	30
Tense 2	8.40	1.33	30
Gender 2	1.50	0.51	30
No2	5.63	1.40	30
CM2	7.20	1.27	30

A developmental trend appeared to be present in the acquisition of inflectional markers and reading comprehension. Participants from Grade IV showed better mean values on tense, number and case markers as compared to participants from Grade III.

Fig. I - Comparison of mean values for Tense, No, CM and RC in Grade III and Grade IV children



These findings were corroborated by the results of multivariate analysis, which indicated main effect for grades  $F = 4.17 (4, 53), p < .01$ . There was a significant difference present in between Grades III and IV for tense markers ( $F = 8.20, p < 0.05$ ); number markers ( $F = 6.22, p < 0.01$ ); case markers ( $F = 9.42, p < 0.01$ ); and reading comprehension ( $F = 4.01, p < 0.05$ ).

Table 3 - Correlation between morphological knowledge and reading comprehension in Grade III children.

		RC1	Tense1	Gender 1	No1	CM1
RC1	Pearson Correlation					
	Sig. (2-tailed)					
	N	3				
Tense1	Pearson Correlation	.31				
	Sig. (2-tailed)	.09				
	N	3	3			
Gender1	Pearson Correlation	-.22	-.28			
	Sig. (2-tailed)	.22	.12			
	N	3	3	3		
No1	Pearson Correlation	-.16	.28	-.13		
	Sig. (2-tailed)	.39	.13	.47		
	N	3	3	3	3	
CM1	Pearson Correlation	.41	.756	-.400	.21	
	Sig. (2-tailed)	.02	.00	.02	.25	
	N	3	3	3	3	3

\*. Correlation is significant at 0.05 level (2-tailed).

\*\*. Correlation is significant at 0.01 level (2-tailed).

Table 3 shows significant correlation ( $r = .417$ ,  $p < 0.05$ ) between case markers and reading comprehension. Number, tense and gender were not significantly related to reading comprehension.



Table 4 - Correlation between morphological knowledge and reading comprehension in Grade IV children.

\*

	RC 2	Tense 2	Gender	No 2	CM 2
RC 2 Pearson Correlation					
Sig. (2-tailed)					
N	3				
Tense Pearson Correlation	.04				
Sig. (2-tailed)	.83				
N	3	3			
Gender Pearson Correlation	.16	.00			
Sig. (2-tailed)	.39	1.00			
N	3	3	3		
No 2 Pearson Correlation	-.00	-.27	.02		
Sig. (2-tailed)	.97	.14	.89		
N	3	3	3	3	
CM 2 Pearson Correlation	-.02	.33	-.21	.29	
Sig. (2-tailed)	.91	.06	.25	.11	
N	3	3	3	3	3

Correlation is significant at 0.05 level (2-tailed).

\*\*. Correlation is significant at 0.01 level (2-tailed).

Table 4 shows no significant correlation between tense, number, case markers and reading comprehension.

The multivariate analysis indicated no significant difference between genders. The main effect for genders was  $F = 1.487 (4, 53), p < .219$ . No significant difference was found between genders in tense, number, case markers and reading comprehension.

## **Discussion**

The purpose of this study was to investigate the development of inflectional morphemes between Grade III and Grade IV Marathi speaking children. Towards this, the investigators of the study used a judgement task, which has been used in earlier research successfully (Kirby et al 2011). Secondly to study the relation between morphological awareness and reading comprehension, the investigators used reading passages based on the Grade levels of the participants. Finally the study compared the development of inflectional morphemes among genders.

A developmental trend appeared to be present in the acquisition of inflectional markers and reading comprehension. Participants from Grade IV showed better mean values on tense, number and case markers as compared to participants from Grade III. (Fig.1). These results are in accordance with the findings of Kirby et al (2011) who did a longitudinal study on children from Grade I to Grade III and used word analogy task.

Adhyaru (2004) has cited number of studies in Indian languages, primarily Kannada, where metalinguistic ability was found to improve with age. (Bhise, 2002; Prema, 1997; Vasanta, Sastry & Maruth, 1995 as cited in Adhyaru, 2004). These studies have reported that children between the ages 4 to 11 years showed improvement in their ability to make judgements about morpho-syntactic tasks.

The findings of the present study are contrary to the findings of Adhyaru (2004), who did not see a significant developmental trend. The difference could be attributed to the difference in grade level of the participants, (Grade III and IV in the present study, whereas Grade V to VIII in Adhyaru's study). It could be argued that the inflectional morphemes develop at an earlier age and are constant after that.

Thus a clear developmental trend was seen in the acquisition of inflectional morphemes and reading comprehension from Grade III to IV.

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Secondly, this research project looked at the relation between the morphological awareness and reading comprehension. In Grade III, case markers were significantly correlated with reading comprehension whereas tense, gender and number inflections were not related.

The findings of this study are similar to the results obtained by Carlisle (1995), Kirby, et al. (2011), and Mahony, Singson and Mann (2000). Kirby (2011) noted that morphological awareness measured in Grade III was a powerful predictor of reading ability, compared to morphological awareness measured in earlier grades.

In contrast, Roman, Kirby, Parrila, Wade-Woolley, & Deacon, (2009) did not find an increase in relation between morphological awareness and reading. This difference could be attributed to the fact that Roman et al's findings were for grade IV to VIII. The present study did not find a statistically significant correlation between morphological awareness and reading comprehension in Grade IV. One explanation is that the relationship between the two is stronger through earlier grade levels and is constant once the development of inflectional morpheme has peaked. Perhaps the development of derivational morphemes continues in later years.

Differences in findings of relation between morphological awareness and reading comprehension have been documented by Deacon and Kirby, (2004); Roman, et al, (2009). There may be several reasons for the variability in results. The age of the participants varied across studies. Secondly the parameters of morphological awareness and of reading ability, which were included, differed and were not well specified. For example most of the studies reviewed have not differentiated between various inflectional markers as done in the present study. But the present research did not include derivational morphemes which were included some of the earlier studies.

This research makes it clear that if investigators want to fully understand children's reading abilities, we need to understand their sensitivity to the morpho-syntax of their language.

Lastly the investigators studied the difference in development of inflectional morphemes between genders and did not find a significant difference between male and female participants. This finding is similar to the results obtained by Adhyaru (2004). The other studies reviewed have not investigated the gender differences.

### **Summary and Conclusions**

The present study shows a distinct developmental trend in inflectional morphology. Secondly the study shows influence of awareness of case markers on reading comprehension. The awareness of morphological skills improves comprehension and children start to read words with meaning.

The findings of the present investigation give us some preliminary information about the development of inflectional morphemes in Marathi language and their relationship with reading comprehension. The findings also give directions for future research. The development of derivational morphology and its effect on reading may be explored in future research in Marathi. To get a complete measure of morphological awareness, both inflections and derivations should be included. Similarly other factors, such as phonological awareness, cognitive abilities, oral language skills, and vocabulary, which may also contribute to reading comprehension, should be considered in future investigations. Reading comprehension is the only domain studied in the present study. Other domains of reading, such as speed, accuracy could be included in the future research.

The findings of this study and previous research suggest inclusion of assessment of morphological knowledge as a part of standard language and literacy assessment battery and intervention. This may help in identifying children who may be at risk for developing reading difficulties later. Inclusion of morphological awareness in elementary school curriculum may help children to understand word structure and meaning relationship at an earlier age.

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