

Plural Markers in Typical Children Speaking Hindi

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Abstract: Language development is a gradual process encompassing phonology, morphology, semantics, pragmatics, and syntax, which finally allows the child to express grammatical meaning. Morphological development, especially number marking, is essential for the morphosyntactic competence of Hindi-speaking children. This study examined the development pattern of plural markers in typical children speaking Hindi aged 3.0-4.11, 5.0-6.11, and 7.0-8.11 years ($n = 60$). The plurals were elicited using a structured procedure with 10 different plural items. The lowest score was 0 for incorrect responses, and the highest was 1 for correct responses. One-way ANOVA revealed a statistically significant age-related difference in the overall plural accuracy ($p < .001$), with progressive improvement across the groups. The youngest group (3.0-4.11 years) demonstrated emerging plural competence, while children aged 5.0-6.11 years revealed a substantial integration of grammatical rules, and children aged 7.0-8.11 years performed at a near-ceiling level. Overall, these findings provide a systematic developmental trajectory for plural acquisition in Hindi, showing early emergence, significant increase in overall accuracy in preschool, and high proficiency by middle childhood. The results compile normative data for each of the three age groups, providing information for the morphosyntactic assessment of Hindi-speaking children.

Keywords: Plural marker, Hindi-speaking children, Morphological development, Morphosyntax, Gender agreement, Number marking, Inflectional morphology.

1. Introduction

Language development is an integrative process through which children acquire the rules of phonology, lexicon, semantics, and morphosyntax for their mother tongue simultaneously. One of the earliest and most prominent morphosyntactic categories to be developed in child language is grammatical number, which involves grammatical marking of plurality through inflectional morphology. The acquisition of the plural markers, morphemes that change the form of the noun to denote the concept of 'more than one,' has been extensively researched in English and some European languages (Berko, 1958; Brown, 2009), but in-depth analysis of this particular area in Indian languages, specifically Hindi, has remained limited.

Hindi, an Indo-Aryan language, is the first language of more than 528 million people (Census of India, 2011). Hindi has a complex inflectional nominal system wherein plural marking is conditioned by gender (masculine or feminine), case (direct or oblique), and phonological shape of the noun stem (Kachru, 2006; Koul, 2008; Singh & Sarma, 2010). While English uses a single, somewhat opaque plural suffix (-s/-es), Hindi shows a variety of plural allomorphs: -e, -ẽ, -yã, and a null morpheme, whose selection follows intricate morphophonological rules. Therefore, Hindi plural morphology constitutes a uniquely revealing domain for examining the interplay of form-frequency, input-driven learning and grammatical knowledge in the development of language.

From a clinical standpoint, it is imperative to establish normative data on morphosyntactic development for Hindi-speaking children. Currently, Hindi-speaking children in India cannot be administered age-appropriate language-specific morphosyntactic assessment tools by SLPs. As there are no norms in place, clinicians use translated tests or benchmarks developed for English-speaking children; thus, increasing the risk of under-identifying language delay or over-identifying typical children as delayed (Kaur *et al.*, 2017). This can have significant implications when



assessing children with suspected Delayed Language Development (DLD), Autism Spectrum Disorder (ASD) or Intellectual Disability (ID), as morphosyntactic deficits may present as the primary clinical symptoms.

Within the Indian research panorama, the study of grammatical morphemes acquisition has been applied broadly only to Dravidian languages (Kannada, Malayalam, Tamil, and Telugu), and research in these languages has all concluded that there are a number of significant trends in acquisition across age groups (Prasad & Prema, 2013; Murali & Kumaraswamy, 2015; Sreelakshmi *et al.*, 2015). Some dedicated research base is also slowly evolving for Hindi morphosyntactic development.

Recent investigations also suggest that this language-specific complexity leads to divergent acquisition paths. For instance, (Pareek, 2022) demonstrated that overt case marking influences learning of oblique plural forms relatively early in Hindi. Conversely, (Maitreyee & Saxena 2023) concluded that this complex morphosyntax is learned based on the statistical structure of the input rather than via simple default mechanisms.

Using the Hindi version of the Language Assessment, Remediation and Screening Procedure (H-LARSP), (Priyadarshi *et al.*, 2016) demonstrated that morphosyntactic markers for number, gender, agreement, and case are acquired at systematic time points. Their findings indicate predictable progression and stabilization of morphosyntactic markers in typical children speaking Hindi.

(Kaur *et al.*, 2017) specifically investigated the development of person, number, and gender (PNG) inflectional markers in Hindi-speaking children aged 4 to 6 years. Their findings revealed that plural marking began to emerge around 4 years of age and showed greater refinement by 6 years, with accuracy increasing across successive age groups. These findings suggest an age-related progression in plural acquisition; however, they also underscore the need for more focused investigations isolating plural morphology across defined developmental stages which appear to be limited at present.

Thus, this study sought to begin gathering normative data on plural morphology acquisition in typical children speaking Hindi. Adopting a cross-sectional design with three age groups from 3.0 to 8.11 years, the present study focused on two main research questions: (a) Is there a significant difference in the overall scores for plural accuracy among three different age groups (3.0-4.11, 5.0-6.11, and 7.0-8.11 years of age); and (b) Do children make significant age-related gains in plural morphology acquisition? The results are expected to contribute to the growing body of normative morphosyntactic data for Indian languages and provide baseline information for assessment of Hindi-speaking children.

2. Methodology

2.1 Aim

The aim of the present study was to examine age-related plural acquisition in typical children speaking Hindi across three age ranges (3.0-4.11 years, 5.0-6.11 years, and 7.0-8.11 years).

2.2 Objectives

The present study had the following goals:

1. To compare overall plural accuracy scores across the three age groups.
2. To determine whether there is a statistically significant improvement in plural acquisition with increasing age.

2.3 Participants

Sixty typical children speaking Hindi from a private school at Bhopal, Madhya Pradesh aged 3.0 to 8.11 years, participated in the study. Typical development was confirmed by school and teacher reports prior to informal screening for speech, language, hearing and cognition by the investigator. Participants in this study were all monolingual Hindi speakers from the same region to control dialectal variation. Participants were divided into three groups with 20 participants in each.



Group 1: 3.0 - 4.11 years (20 participants)

Group 2: 5.0 - 6.11 years (20 participants)

Group 3: 7.0 - 8.11 years (20 participants)

Stimuli used: Depicted in table 1 below:

Table 1. Stimuli used to elicit children's responses

Code	Target Stimuli	Expected Response
S1	ek ladkaa → do	ladke
S2	ek bachchaa → do	bachche
S3	ek darwaazaa → do	darwaaze
S4	ek kitaab → do	kitaabẽ
S5	ek kursee → do	kursiyã
S6	ek ped → do	ped
S7	ek pen → do	pen
S8	ek aadmi → do	aadmi
S9	ek seb → do	seb
S10	ek phool → do	phool

2.4 Procedure

Data were collected in a quiet and distraction-free environment within the child's school setting. Each child was assessed for plural morphology in a single session lasting approximately 10-15 minutes through a structured elicitation task. The stimulus set consisted of 10 singular noun forms representing different plural categories. Each stimulus was presented orally by the investigator in singular form (e.g., *ek ladkaa*). The examiner then prompted the child to provide the corresponding plural form using a structured cue (e.g., *do hue to kya bologe?*). No feedback regarding correctness was provided to avoid influencing the responses. Each response was scored using a binary scoring system:

1. 1 = Correct plural form
2. 0 = Incorrect response

Partial responses or partially correct morphological forms were scored as incorrect to ensure scoring consistency.

2.5 Ethical Considerations

Prior to data collection, ethical clearance was obtained from the institutional authorities. The parents or legal guardians of all the children who participated in the research were provided with an explanation of the study, and their written informed consent was obtained. Additionally, verbal assent was obtained from each child prior to administering the elicitation tasks, and data collection was carried out in coordination with school authorities.

3. Results

The present study was designed to examine the age-related differences in the acquisition of plural morphological forms in typical children speaking Hindi across three different age groups ranging from 3.0-4.11 years, 5.0-6.11 years, and 7.0-8.11 years. The normality of the data distribution was checked by performing the Kolmogorov-Smirnov and Shapiro-Wilk normality tests. Since the data were normally distributed, the quantitative data were expressed as mean, SD, and 95% CI.



Table 2. Mean total plural accuracy scores and ANOVA results across three age groups of Hindi-speaking children: For age group 3.0-4.11 years (n = 20), the mean = 5.70, SD = 1.03, and 95% CI = [5.22, 6.18]; for age group 5.0-6.11 years (n = 20), the mean = 8.90, SD = 1.02, and 95% CI = [8.42, 9.38]; and for age group 7.0-8.11 years (n = 20), the mean = 9.70, SD = 0.47

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		To compare across the age groups - ANOVA results		Post hoc analysis by Bonferroni test	
				Lower Bound	Upper Bound	F value	p		p
3 - 4.11 years	20	5.70	1.031	5.22	6.18	115.548	< .001	3 - 4.11 years VS 5 - 6.11 years	< .001
5 - 6.11 years	20	8.90	1.021	8.42	9.38			3 - 4.11 years VS 7 - 8.11 years	< .001
7 - 8.11 years	20	9.70	0.470	9.48	9.92			5 - 6.11 years VS 7 - 8.11 years	.017
Total	60	8.10	1.946	7.60	8.60				

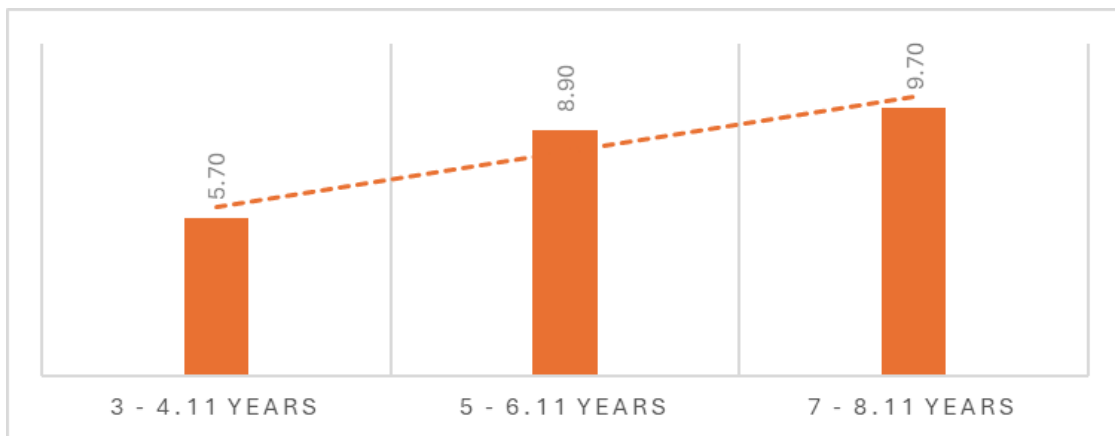


Figure 1. Mean plural accuracy scores across three age groups of Hindi-speaking children (3.0-4.11, 5.0-6.11, and 7.0-8.11 years)

To assess whether there are significant differences in the acquisition of plurals in different age groups, a One-Way Analysis of Variance (ANOVA) was conducted. The ANOVA results showed a highly significant difference in the mean accuracy of plural acquisition in the three age groups, as presented in Table 2 and Figure 1: $F(2, 57) = 115.548, p < 0.001$.

4. Post Hoc Analysis

Bonferroni post hoc comparisons were performed to examine pairwise group differences.

1. 3.0-4.11 vs 5.0-6.11 years: $p < 0.001$ (Highly Significant)
2. 3.0-4.11 vs 7.0-8.11 years: $p < 0.001$ (Highly Significant)
3. 5.0-6.11 vs 7.0-8.11 years: $p = .017$ (Significant)



These findings indicate that:

1. Children aged 5.0-6.11 years performed significantly better than those aged 3.0-4.11.
2. Children aged 7.0-8.11 years performed significantly better than those aged 3.0-4.11.
3. A statistically significant improvement was observed even between the two older groups (5.0-6.11 and 7.0-8.11 years).

5. Discussion

The present study aimed to investigate the acquisition of plural forms of Hindi nouns in children aged 3.0 to 8.11 years who speak Hindi as their primary language. The selected children were grouped according to age into three groups: 3.0-4.11 years, 5.0-6.11 years, and 7.0-8.11 years. The data indicated a clear, statistically significant, age-related progression in the acquisition of the plural morphology of Hindi nouns.

Children aged 3.0-4.11 years demonstrated emergent plural competence but with considerable variability among individuals, indicating that at this stage of development children are still developing the ability to understand and use plural morphemes. This finding is consistent with the observations of (Kaur *et al.*, 2017), indicating that children in the 36-51 months age range were still developing the ability to use and understand plural morphemes, as evidenced by their errors with number and agreement, reflecting their gradual morphosyntactic development.

Children aged 5.0-6.11 years demonstrated a significant increase in their accuracy of using plural morphemes in comparison with 3.0-4.11-year-old children. The remarkable accuracy in 5.0-6.11-year-olds suggests a rapid refinement of plural rules in the preschool period reflecting a transition from early emergence to later mastery. This is consistent with (Kaur *et al.*, 2017) who pointed out that plural morphemes in Hindi begin to appear by 4 years of age and have become well-established by 6 years of age.

The near ceiling performance exhibited by the 7.0-8.11-year-old children indicated highly consistent and skillful use of plural morphemes. This indicates that the morphophonological rules related to pluralization of Hindi nouns are well established by the time a child reaches the middle of childhood. Integration of these rules is consistent with the other aspects of morphosyntactic growth which have been documented by (Priyadarshi *et al.*, 2016) who found that Hindi grammatical markers moved steadily toward stabilization.

These findings also align with (Prasad & Prema 2013) who found an age-related increase in both accuracy and frequency of production of morphological markers among Kannada-speaking children. Support from multiple studies provides converging evidence that developmental morphological achievements seem to be a reliable feature of Indian language acquisition across a variety of languages for all types of markers.

The results of the present study indicate that Hindi plural morphology displays a systematic developmental pattern that is evident in children during the early preschool years, is refined at around age 6 years, and stabilizes after this age. The results contribute valuable age-wise normative data that are essential for assessment and differential diagnosis in Hindi-speaking pediatric populations.

6. Summary and Conclusion

The present study investigated the acquisition of the plural morpheme in typical children speaking Hindi aged 3.0-8.11 years. A total of 60 participants completed a structured elicitation procedure that assessed plural morphology using 10 elicitation items. One-way ANOVA found an age-related difference that was highly significant in overall plural morphosyntactic abilities. The youngest group (3.0-4.11) showed early plural morphosyntactic abilities with lower accuracy compared to the older age groups. Markedly increased accuracy was observed in the second age group (5.0-6.11), indicating improved plural morphosyntactic ability. The oldest age group (7.0-8.11) had an almost ceiling level of accuracy and very low variability for overall plural morphosyntactic ability.

Based on qualitative observations during the elicitation task, it appeared that younger children might master invariant plurals before gender-based, more morphologically complex plurals. However, statistical confirmation of this specific trajectory requires further investigation with a broader, balanced stimulus set. Overall, the data clearly indicate an age-related progression of acquiring plurals in Hindi, ranging from early emerging competence through



continued growth to near mastery by middle childhood years. The data provide important normative reference values for clinicians.

7. Clinical Implications

The normative data generated by the present study carry various clinical implications. The low mean accuracy score of 5.70/10 in the Group I children (3.0-4.11) indicates that while the development of plural morphemes is ongoing and variable in this age range, a child below the age of 4 should not be referred for a morphosyntactic evaluation simply on the basis of plural inaccuracy unless there are issues in other areas of morphosyntax as well.

The steep improvement by Group II children (5.0-6.11) to a mean of 8.90/10 suggests that by school going age, the children should be performing at a relatively high level of accuracy (about 8/10 or 9/10 correct plural forms). A child in this age range who continues to perform below 8/10 on comparable stimuli warrants further investigation.

Finally, the near ceiling performance of the Group III children (M = 9.70/10) shows that plural morphology should be essentially acquired in typical children between 7 and 8.11 years. Persisting difficulties with plural morphological production at these ages, would certainly warrant clinical investigation. These performance expectations at particular ages address the gap identified by (Kaur *et al.*, 2017) regarding the absence of available normative Hindi morphosyntactic data for clinical use.

The present data also have implications for intervention. The finding that the most significant plural morphological growth occurs during the 5-6 years period suggests that this may be an optimal age window to target the development of the plural morpheme in children with language impairments (e.g., children with DLD or other language disorders). Intervention goals for Hindi-speaking children with atypical language development could focus on targeting plural morphology intensely during the school year corresponding to 5-6 years of age.

8. Limitations

The present study used a small set of elicited stimuli with few unevenly distributed plural categories (five invariant, three masculine, and two feminine plural forms), which may not fully capture the range of plural forms found in natural settings. Although overall age-related trends were clearly identified, differences in acquisition across plural categories warrant further quantitative study. Moreover, the sample size and its derivation from a single school, while sufficient for statistical comparison, restrict broader generalization to other Hindi dialects. Additionally socioeconomic and literacy variables were not examined.

9. Future Directions

Research in this area should include larger, more diverse sample sizes through multi-region studies, which will help establish better normative databases for the acquisition of plurals in Hindi. Further, a larger stimulus set encompassing all plural forms of the Hindi language should be incorporated to enable category-wise analysis of plural acquisition. In addition, longitudinal studies would provide a better measure of how grammatical rules are integrated over time. Further exploration of the impact of phonological complexity and frequency effects on the acquisition of Hindi plurals is also needed. Investigating children with language disorders compared to those without would provide additional support for establishing clinical cutoff criteria based on normative data.

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Yes

Conflict of interest

The Author's declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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