ORIGINAL RESEARCH PAPER

Volume-8 | Issue-5 | May-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

DEVELOPMENTAL TRENDS IN MORPHOLOGICAL CLOSURE AND MORPHEME LEARNING, IN ORIYA SPEAKING INDIVIDUALS; TYPICALLY DEVELOPING CHILDREN, ADULTS, CHILDREN WITH LEARNING DISABILITY AND PHONOLOGICAL ERRORS

Linguistics

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ABSTRACT

Morphological skills development in children is a basic link between cognitive language functions and literacy. Bowers and Kirby (2010) studied effects of morphological skills on literacy development in English speaking school children, they found that morphological instruction benefits learners; it brings particular benefits for less able readers; it is no less effective for younger students, and also it is more effective when combined with other aspects of literacy instruction. Similar results were also reported from studies done by Arnbak and Elbro (2000) that morphological training supports and enhances the development of meaning-oriented decoding strategies in reading and spelling. This study focused further on developmental trends in few morphological skills in Oriya speaking typically developing children of 3-12 years age, compared to adult group, children with Learning Disability of 7 to 12 years of age and a group of children of 7 to 12 years of age with phonological errors (without any anatomical & physiological abnormalities in oral structures). The result from this part-pilot data was used to construct a screening test to assess phonological and morphological abilities in Oriya speaking children. The results of sub tests are described in this paper are Morphological closure and Morpheme learning. The results were analyzed based on gender, age group, for each task. Relationship between mechanism for phonology and morphology could be established, as children with phonological errors also had morphological errors.

KEYWORDS

Morphological skills development, typically developing, Learning Disability, Phonological errors, Syllable identification, Syllable addition and substitution.

INTRODUCTION:

There has been a lot of studies on children's knowledge of morphology and morphemes in the child language literature (Berko-Gleason, 1958; Chomsky, 1976; Clark, 1981; Nicoladis, 2002, 2003), and it has been assumed that the mastery of morphological structure is important to vocabulary learning both for children and adults (Anglin, 1993; Nagy & Anderson, 1984), however, there has been relatively little research on children's ability to manipulate the morphological components of words and it's relation to their current or subsequent vocabulary development.

Acquisition of Morphology:

A child's early utterances lack a system of inflections; the child tends to adopt a single form for all contexts- either the root or the most frequent inflected form. One theory in the Chomskyan tradition (Radford, 1990) suggests that the grammar with which an infant is born lacks a morphological component, which develops later as part of maturation.

The speed with which inflections are acquired appears to be partly determined by whether there is a single form for each function.

Oriya language:

Oriya is an alphasyllabic language, one of the Indic group of the Indo-European family, branched off from Assamese-Bengali before Assamese and Bengali separated from each other (Pattanayak, 1966).

Oriya morphology:

Oriya is a syntactically head-final and morphologically agglutinative language. A number of morphemes carrying different grammatical functions get affixed to the nominal root to make a nominal form. The major affixing categories found in a nominal form are: numeral, classifier, quantifier, number marker, negation marker, qualitative affirmative marker, Case marker and postpositions. In Oriya, every morpheme is either a *base* or an *affix*, either prefix or a suffix.

Out of many approaches, one approach to Oriya morphology, is to treat morphology and morphemes as the basic rules involving the linguistic context, instead of as isolated pieces of linguistic matter. In context of semantics (Analysis of Meaning), the approach suggests that meaning is linked to segmented phonological units, with influences of tone and/or stress, and meaning of a morpheme with a given form varies with its immediate usage environment.

Oriya language is a moderately Synthetic language, containing definite synthetic features, such as the bound morphemes mark tense, number markers and gender. These are also called as Sub-morphemes, complementary morphemes or meta-morphemes, which are actually metamorphosis of morphemes. Having no virtual or standard inflectional morphology, Oriya language has a larger number of derivational affixes. Oriya language has a tendency to have a 2:1 morpheme-word ratio for commonly used words. On an average, there are many words in this language with 2 morphemes in it. Therefore, Oriya is said to possess morphology, since many words have internal compositional structure in terms morphemes.

Components of morpheme in Oriya:

Oriya has several components like base, derivational morpheme, allomorphs, homonyms, homophones.

Classification of morphemes in Oriya:

Stem, root, clitic, affix.

Compound words in Oriya:

Oriya compound words can be formed using different markers, coalescence or just simple compounds like Noun + Noun, Adjective + Noun, Noun + Adjective, Adjective + Adjective etc. Also, it has mixed morphemes like noun+bound+bound

OBJECTIVES, HYPOTHESIS:

The study aims at comparing the developmental trend of few morphological skills in typically developing children, children with Learning disability, and those with phonological errors. It also aims at understanding underlying processing at different stages and possible abnormality causing errors in output.

Hypotheses:

- There is no difference in performing the tasks for phonological skills in different age groups of children which can show developmental trend, and also not different from the adult group.
- There is no difference in performance between the typically developing children and children with Learning Disability and children with Phonological errors.

Methodology:

Subjects:

Table-1. Subjects in each group with description.

	Typically Developing Children								Adult	Children with Learning Disability				Children with Phonological Errors			
	Gr I-A	Gr I-B	Gr I-C	Gr I-D	Gr I-E	Gr I-F	Gr I-G	Gr I- H	Gr II	Gr III-E	Gr III-F	Gr III-G	Gr III-H	Gr IV-E	Gr IV-F	Gr IV-G	Gr IV-H

Age range	3-3;11	4-4;11	5-5;11	6-6;11	7-7;11	8-8;11	9-10;6	10;6-12	25-35	7-7;11	8-8;11	9-10;6	10;6-12	7-7;11	8-8;11	9-10;6	10;6-12
N	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

All participants met the following inclusionary criteria-
Oriya as their primary language (Limited Exposure to other languages)
No prior enrollment in speech or language intervention (Group III & IV-only diagnosed)

Normal hearing status
No history of neurological or psychological disorder
No oromotor problems as per an informal oral motor examination.
For Group I & II only- typical development of speech and language.
For Group I & IV- Satisfactory academic performance on the basis of teachers' reports.

Screening:
All participants were screened for typical language development, appropriate cognitive skills and intelligence. A screening questionnaire for speech, language and listening skills consisting of 'yes/ no', close ended questions was given to teachers and caretakers to confirm the absence of any deficits in speech, language and listening skills among children.

Sub-tests for assessing morphological skills:
Morphological Closure- The subjects had to guess the target word in a closure context. Stimuli taken constituted compound words and word pairs.

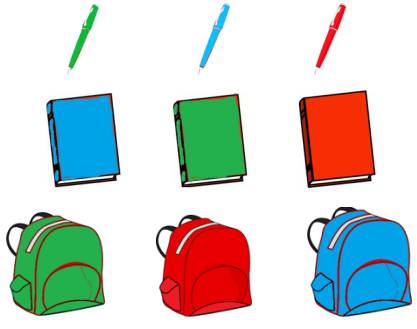
Demonstration items: surya- suryodaya, Chandra- chandrodaya
kalama- niLa- niLa kalama, kalama-nali- nail kalama
Morpheme learning analogy: It is the ability of individuals to learn newly introduced morphemes in very short span of time. 4 sub-tasks. Participants were trained in few sessions of morphological training to remember the names or morphemes representing the objects.

a) It used phonological and legal type morphemes construction of Adjective+Adjective+Noun form. (Noun being common in all utterances)
b) Non-word for both pre fixes and main words were taken to form compounds, without morphological training.
c) It used morpheme construction, which used the color & shape morphemes as previous task and real words.
d) It used real prefixes and a set of nonwords for compound formation.

Example Procedure: Non-existent word following phonological rules of languages were formed. Such as 3 for different colors, 3 for different objects. The stimuli included adjective (color)+ nouns. The task is to identify the object out of 4 pictures.

DEMONSTRATION:
meda, beli, sibu for colours red, blue, green; dabu, sela, jote for objects book, pen and bag. So, which one is meda dabu (blue book).

Test Plates for Morpheme Learning: for identification of the objects based on the newly formed morphemes.



Stimuli:
Initially, a word list was prepared by selecting words from standard textbooks of Oriya, (Chhabila abhidhaana, Sarala oriya abhidhaan, Taruna shabda kosha, Grantha Mandir, Word book-Direct approach series, Books for children published). The frequency of occurrence of phonemes and syllables were taken into consideration (from, Phonemic and morphophonemic frequency count in Oriya by Ahsok R. Kelkar). The initial word list was checked for familiarity by Speech Language Pathologists, Teachers, Linguists and other adults to make a final list for the main study. Few of the words from the list was used for this pilot study. As the sub-tests in this part of the pilot study aimed at finding out difficult skills, few using non-words, the familiarity was fixed at a base-line of fairly familiar.

Stimuli were different for each task. There was one or two demonstration item for each task, for the children to understand the task specific instructions.

Procedure:
The children and adults were instructed and tested individually, for each task. Demonstration items were presented, preceding the target stimuli.

For all sub tests, the productions of the participants were recorded using a tape recorder. Each correct response was given score '1 point', error response or no response were given 'zero'.

Statistical Analysis:
The data from Group II (adults) was taken to see when the typically developing children –Group I, achieve adult like skills. Performance by Group I (age matched) is compared to performance of Group III & IV. Means of the scores for different tasks were compared across the sub groups of Group I and that of adult group using post hoc analysis, which would suggest age group which scored similar to the adult group. ANOVA, post-hoc analysis and descriptive statistics were used to analyze the findings.

RESULTS & DISCUSSION:
It carried 10 stimuli with possible score of 10.

Table 2. Performance of children in all sub groups of Group I with adults on Morphological Closure, Means and SDs for Morphological closure.

	I-A	I-B	I-C	I-D	I-E	I-F	I-G	I-H	Gr II
Mean	5.1	5.7	5.8	7.1	8.9	9.8	9.9	9.9	10
SD	0.737	0.674	0.788	0.737	0.567	0.421	0.316	0.316	0

Table 3. Means & SDs of typically developing children, children with Learning Disability, and children with phonological errors, on Morphological Closure task.

	I-E	III-E	IV-E	I-F	III-F	IV-F	I-G	III-G	IV-G	I-H	III-H	IV-H
Mean	8.9	4	7.3	9.8	5	8	9.9	5.1	8.1	9.9	6.4	8.1
SD	0.567	0.816	0.674	0.421	0.816	0.816	0.316	0.875	0.737	0.316	1.074	0.875

Morphological closure scores indicated a developmental trend, where typically developing children reached the complete adult form after crossing 8 years of age, though very significant changes were observed at 6 years onwards with each year. The standard deviation showed a decrease in variability as age increased. The scores obtained from children with phonological errors were observed to be higher than that of children with Learning disability, and very near to the scores of typically developing children, though there was significant difference in both scores. This may account for a possible underlying mechanism differences among the children with phonological errors.

Morphological Learning using Analogy:
Table 4. The performance of children in all sub groups of Group I with that of adults, Means and SDs, for Morphological Learning.

	I-A	I-B	I-C	I-D	I-E	I-F	I-G	I-H	Gr II
Task A	2.8 (0.788)	3.9 (0.737)	4.2 (0.632)	6.5 (0.849)	7.6 (0.699)	8.1 (0.875)	9.3 (0.823)	9.8 (0.421)	10 (0)
Task B	4.4 (0.843)	4.9 (0.737)	6.3 (0.674)	7.3 (0.483)	7.8 (0.632)	8.5 (0.527)	9.7 (0.483)	9.8 (0.421)	10 (0)

Task C	4.7 (0.674)	5.2 (0.632)	6.7 (0.674)	7.5 (0.707)	8.1 (0.567)	8.6 (0.516)	9.1 (0.737)	9.6 (0.516)	10 (0)
Task D	5.1 (0.737)	5.6 (0.516)	7 (0.666)	7.7 (0.674)	8.2 (0.632)	8.8 (0.421)	9.4 (0.516)	9.9 (0.316)	10 (0)

Table 5. Means & SDs of typically developing children, children with Learning Disability, and children with phonological errors.

	I-E	III-E	IV-E	I-F	III-F	IV-F	I-G	III-G	IV-G	I-H	III-H	IV-H
A	3.5 (1.08)	4 (0.816)	4.9 (0.875)	6.2 (1.032)	5.7 (0.674)	7 (1.054)	7.2 (0.632)	7.8 (0.421)	3.5 (1.08)	4 (0.816)	4.9 (0.875)	6.2 (1.032)
B	4.7 (0.823)	5.3 (0.674)	5.8 (0.632)	6.8 (0.632)	6.4 (1.074)	7.7 (0.948)	8 (0.816)	8.1 (0.737)	4.7 (0.823)	5.3 (0.674)	5.8 (0.632)	6.8 (0.632)
C	4.9 (0.875)	5.5 (0.707)	5.9 (0.737)	6.9 (0.737)	6.7 (0.948)	8 (0.816)	8.1 (0.875)	8.3 (0.948)	4.9 (0.875)	5.5 (0.707)	5.9 (0.737)	6.9 (0.737)
D	5.3 (0.823)	5.9 (0.737)	6.4 (0.699)	7.2 (0.788)	7 (0.666)	8.3 (0.674)	8.4 (0.699	8.6 (0.843)	5.3 (0.823)	5.9 (0.737)	6.4 (0.699)	7.2 (0.788)

This task was aimed to check the capability of subjects to learn use of morphemes. It was evident that in all groups including children with Learning disability and Children with phonological errors. Children achieved adult like scores after 10 years 6 months of age.

Scores of Task B, which involved morpheme construction using newly learnt morphemes and real words, showed that children did not obtain adult like pattern even by 12 years of age. .

When compared with the scores obtained from the children with Learning disability (Group III) and that of children with phonological errors (Group IV), it was seen children with phonological errors in younger groups showed significantly higher scores than children with learning disability, but significantly poorer scores than typically developing children of same age. The age related changes were not drastic, and actually presented peculiar changes, reaching for scores of other groups at some age levels.

SUMMARY & CONCLUSION:

Speech & Language intervention is subject based, dependent on language exposure and requires standard testing system in the same language. This study gives a base to formulate a standard test to assess morphological skills in Oriya speaking individuals. Basing on the scores, a child of any age can be traced to his morphological skill level to estimate his academic achievements or difficulties in future. This study gives a base to formulate a standard screening test to assess phonological and morphological skills in Oriya speaking individuals.

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