CHAPTER III
III. METHOD OF STUDY

This section presents a brief outline of the design of the study, the sample; description of tests and the data collection procedure.

Design

The present research is a cross-sequential one. Seventy eight primary school children from Grades I and II were sampled for the investigation. There were 39 children from each of the grades. These children were studied over a period of three school years with repeated administration of a set of reading measures, metalinguistic awareness tests, a non-verbal intelligence test and verbal processing measures. Each child in the sample was covered with the first test between 4 to 6 months of the school year and subsequent tests were held after one year. As such children who were in Grade 1 at the beginning of the study were retested in Grades 2, 3 and 4 up to Grade 5. The data were collected between November, 1985 and January, 1989.

The design of the study is represented in Table 2.
Table 2

Design of the Study

<table>
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<th>Groups</th>
<th>Grades</th>
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<td>Age</td>
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<td>6-7</td>
<td>7-8</td>
<td>8-9</td>
<td>X</td>
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<tr>
<td>(n=39)</td>
<td>Age</td>
<td>X</td>
<td>6-7</td>
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<td>9-10</td>
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Sample

Children of two Municipal schools from the city of Cuttack in the State of Orissa were selected for the study. Schools were located close to the place of stay of the author which helped her in interacting with the children frequently. Both the schools were well established and have an average track record of academic performance. Each class was under direct supervision of a single class teacher throughout the academic session. During teaching in the school emphasis is generally laid on rote learning for the beginners.

All the children in the school had Oriya as their medium of instruction and only the students who had Oriya as their mother tongue were included in the sample for this study. Oriya is an officially recognised Indian languages and the linguafranca for the State of Orissa.

Two groups of children from Grades I and II were selected by random sampling method from among the students who had Oriya as their mother tongue. Each group, initially, comprised of 50 children (28 boys and 22 girls). Children from Grade I had a mean age of 5 years and 5 months (ranging between 5 to 6 years) and Grade II children had a mean age of 6 years and 4 months (ranging between 6 to 7 years). The grade I children had just started their first year of schooling and were getting acquainted with the reading instructions of the school and were interacting with alphabets for the first time. The older group had already completed one year of schooling. Since the study was spread over a period of four consecutive academic sessions, a few
students dropped out of the school due to transfer of their parents to other places. As such only 78 children (out of the initial sample of 100 children) remained in the sample at the time of final testing. The year wise dropouts of children were 3, 3, 4 and 1 for younger group and 2, 4, 3 and 2 for the older group in the year 1985-86, 1986-87, 1987-88 and 1988-89 respectively. The final sample of 78 children comprised of 20 boys and 19 girls in the younger group and 26 boys and 13 girls in the older group. Each child was given various tests on metalinguistic awareness, reading and verbal processing skills.

**Description of the Measures**

The present investigation used a number of tests on verbal processing skill, metalinguistic awareness, reading awareness and nonverbal intelligence. The tests, their administration and scoring procedures are described below.

**Reading measures**

Reading achievement was assessed by Graded reading comprehension test and reading awareness test.

**Graded Reading comprehension test in Oriya.** The Graded reading comprehension test in Oriya was developed by Mohanty and Sahoo (1985) for assessing reading comprehension on primary and middle school children (Grades 1 to 7). There are two passages for each grade level. The passages for grades 1 to 3 are followed by five questions each and those for remaining grades are followed by seven questions each. The passages and the questions are provided in two separate booklets. The children are instructed to read the passage carefully. No time limit for the scheduled reading is fixed. After the children finished reading of the passage,
comprehension questions about the story are asked. The passages are given in order from lower grade to the higher ones. If required on request by the child, the question was repeated. The test is stopped when the child fails to answer any of the questions from the passage. Each correct answer is given a score of 1 and a wrong answer a score of 0. Maximum score is 86.

This test was used in earlier study by Prakash (1987), Mishra (1986), Mohanty & Rout (1989, 1992).

Reading awareness test. This test is used to assess the children's knowledge about reading. The test consists of a set of questions in Oriya which were developed following a similar questionnaire in English (Paris & Myers, 1981) and was used in the author's earlier study (Mishra, 1986), Prakash (1987) and Rout (1989, 1992). This metacognitive interview involves children's knowledge in three general areas: evaluation of the reading task and one's own abilities (evaluation), application of different strategies in reading (planning) and ability to use and direct one's own efforts in reading comprehension (regulation). Four questions following Likert scale method were also included. There are 18 questions altogether. The children are instructed to listen to the questions carefully and answer what they exactly do while reading a passage and understand the meaning of the same. The children's response to each question is recorded verbatim.

Metalinguistic Measures

The battery of metalinguistic awareness tests can be broadly categorised under four headings, that is, tests of phonological
awareness, word awareness, syntactic awareness and pragmatic awareness. The tests will be described separately under these headings.

Phonological Awareness. To assess the children's phoneme awareness, "strip a letter" and "verbal similarity" tasks were given.

Strip-a-letter. This task involves syllabic segmentation skill. The task consists of 10 three-syllable Oriya words, each having a simple two syllable word embedded within (Appendix XI). The words are verbally presented one at a time and the child is asked to identify the embedded word by stripping off a letter/syllable out of the three syllable word presented to him/her. The task chiefly focuses on the segmentation skill as well as some problem solving /comprehension ability. For example, the Oriya word KABATA (door) has three syllables in it. By removing the syllable "KA" from the word KABATA, another new word, that is BATA (ROAD) emerges. The Oriya version of the test was used by Prakash (1987), Mishra (1986) and Rout (1994). A score of 1 is given for a correct answer and 0 for a wrong answer. Maximum score in this test is 10.

Verbal Similarity test. This test purports to measure phonological awareness of the child. It consists of ten sets of two pairs of words each (Appendix X). One of the pairs is phonologically similar having one or two common syllables in it. All the words are presented orally and the pair of words having similar syllables are randomly presented in the first/second position. The child's task is to identify the pairs which are phonologically more similar than the other pairs of the set. The
task of attending to sound has been made more difficult by making the other pairs of words semantically related. For example, Bata-Ghata and Surya-Chandra. Here the first pair of sounds are similar having "ata" at the end of the words and the second pair is semantically related, that is Sun and Moon, but does not sound similar. Each correct judgement of phonologically similar pair is credited with a score of 1. Maximum score in this task is 10. The Oriya version of the test was used in an earlier study by Prakash (1987) and Mishra (1986).

**Word awareness.** Symbol substitution and word creation tasks were administered to assess word awareness.

**Symbol Substitution task.** This test shows the subject's awareness of word-referent relationship. The test tries to assess the children's understanding that words are symbols ascribed to objects without any implicit meaning and can be replaced by another word without altering any of the properties of the object. The test is similar to the one used by Ben-Zeev (1977). Oriya version of the test was used earlier by Mohanty and Babu (1980), Prakash (1987) and Mishra (1986). The child is required to substitute one meaningful word for another without changing the original sentence form. For example, the investigator with the help of a toy aeroplane says to the child that suppose we call this as FROG, then what will you call this one (showing the toy aerodynamic). If the child agrees that it can be called as "frog", then the next question follows "Can a frog fly?". Correct answer is "yes". In this task, chiefly the subject has to take the substituted word as a mere unit or symbol within a code
system. The test consists of nine sentences (Appendix XII). Each correct response is given a score of 1 and wrong response 0. The maximum score is 9.

**Word creation task.** This task is similar to the one used by Mohanty and Mohanty (1980) and later by Prakash (1987) in his study on Oriya speaking children. It consists of ten sentences in Oriya using different root verb forms in the sentences along with its appropriate subjects (Appendix XII). A nonword or an incongruent verb is suggested for each root verb. The child is required to substitute the suggested new ones in place of the existing meaningful root verbs either as it is or with appropriate modifications without changing the given subjects while reconstructing the new sentences and yet maintain the correct grammatical structure of the sentence. For example, the investigator has to scribble overlapping circles on a paper before the child and tell him that this action "Gareiba" (in Oriya), the root verb in the sentence will be called as "Chaiba" (a nonword). They are to substitute "Chaiba" (the nonword) for "Gareiba" (the meaningful root verb) in its appropriate form and then to read out the new sentence so as to keep the sentence grammatically correct as well. For example, the experimenter says, "yesterday, he was drawing the circles like this. What did he do yesterday?". (Chauthila, the latter is the correct response in Oriya). Correct response received a score of "2". Partially correct sentence, that is the response that used "do" with the verb form without correcting the grammaticality of the sentence is assigned a score of "1". Maximum possible score is 20.
Syntactic awareness. Synonymy and acceptability tasks were used to assess the subject's knowledge about syntax or form awareness.

**Synonymy Judgement.** Synonymous sentences refer to those sentences whose meaning is same but differ in their (surface forms as contrast to the identical sentences in which both their surface and deep structures are same). On the contrary, nonsynonymous sentences differ both in their superficial forms and meaning. Synonymy judgement task requires the ability of the child to reflect both on the form as well as meaning. The test consisted of ten pairs of sentences--five synonymous and five nonsynonymous (Appendix XIV). The children are told that they will be presented with two sentences. They have to compare the second sentence with the first one and examine if the meaning of the second sentence is exactly same as the first, even though the form of the second sentence may be different and say whether the second sentence is correct or wrong along with justification to the given answer. This test in Oriya is similar to the one used by Hakes (1980) and was used by Prakash (1987), Mishra (1986) and Rout (1994) among Oriya speaking children. Each correct judgement with justification is given a score of 2. Each correct judgement without justification is given a score of "1". Maximum possible score in this task is 20.

**Sentence acceptability judgement.** The purpose of this test is to measure form awareness. The present test in Oriya is similar to the one employed by Hakes (1980) and used earlier by Prakash (1987), Mishra (1986). There are twelve sentences of which -
six were acceptable and six unacceptable forms (Appendix XV). The unacceptable forms contain scramble sentences, anomalous sentences, etc. The children are instructed to give their judgement regarding the correctness or incorrectness of the sentences along with justification to the given answer. Each correct judgement with justification is given a score 2. Correct judgement without justification is given a score of 1 and incorrect judgement is given a score of 0. Maximum score in this task is 24.

**Pragmatic Awareness.** Referential communication and message inconsistency tasks were employed to measure pragmatic awareness.

**Referential Communication.** This test is a modified form of a similar test used by Cosgrove and Patterson (1977, 1988) among Oriya speaking children. The task consists of six visual pictures and each picture is provided with three descriptions, i.e. adequate, partially adequate and inadequate descriptions explaining what is represented in the visual picture (Appendix XVI). The children are instructed to observe the pictures carefully and then to identify the sentence from among the three descriptive sentences spoken aloud the one that best represents the picture. Each adequate response is given a score of 2, partially adequate response that is describing some portion of the picture is credited with 1 and inadequate response a score of 0. The maximum score in this task is 12.

**Message Inconsistency.** This task evaluates the children's ability to give consistency/inconsistency judgements regarding a message. This test in Oriya follows similar task employed by Tunmer, Nesdale and Pratt (1993) and used by Prakash (1987) and in
the author's earlier study (Mishra 1986). The present test consists of eight sets of three statements each (Appendix XVII). In the first four sets, the first two sentences form the premises of an argument which is followed by a concluding third sentence that may or may not be an appropriate deduction of the earlier two premises. The children are required to judge whether the third sentence is logically consistent or inconsistent with the first two. In the remaining four sets, the first sentence is always correct followed by two sentences, one of which is appropriate and the other is inappropriate deduction of the first one. The children are instructed to point out which one among the two deductions is correct. They are also required to justify their answers in all the sets. Each correct judgement is credited with a score of 1 and the maximum score in this task is 8.

**Raven's Coloured Progressive Matrices (RCPM)**

RCPM widely used as a test of nonverbal intelligence has been used in this study as a measure of abstract reasoning. The test followed the procedure of the manual.

Correct response to each item is given a score of 1, the maximum score for the test being 36. There is no time limit and each child is given as much time as he requires to answer all the problems in the test.

**Verbal Processing Measures.**

Tests like semantic association (verbal opposites) associative learning test and automatic word processing tasks were used to assess the verbal processing skill in children.

**Verbal opposites (Semantic association).** This task is similar
to the test by Baker and Leland (1967). In the present task in Oriya there are 32 familiar (both abstract and concrete words, nouns and adjectives) taken from the Grade 4 text. High frequency words from the text were selected. Words are printed on a sheet of paper and each word is read to the child one after another. The child is instructed to give an associated antonym to the stimulus word. For example, opposite word of "Good" is "bad". When the child fails to provide an opposite and gives words similar in sound or gives such a response as "not black" or "not fair", no credit is given but the child is reminded that he is required to give the opposite each time. The test was used earlier by Sahoo (1987). Each correct response is credited with a score of 1. Colloquial terms are also given credit. Maximum score is 32.

**Associative Learning task.** This test is an adoption from the Van Wagenen's (Van Wagenen, 1954) Reading Readiness scale. Sahoo (1987) has used this associative learning task in Oriya as a verbal processing measure to compare good and poor readers. The present study used the test developed by Sahoo (1987). The task consists of 5 meaningful words written on a piece of paper. The child is instructed to see these words without uttering them. Then the examiner says 5 pseudowords one by one and the child is required to associate and remember each of the pseudoword with the corresponding meaningful word serially. In this way the examiner tells the words twice and the child is asked to utter and remember the same words by viewing the list with him. When the child fails to associate the correct word, he/she is prompted. The score is the number of trials to criterion i.e. to
memorise all the pairs of words correctly.

**Automatic word processing test.** This test is similar to the picture-word interference task used by Rosinski, Golinkoff and Kuksch (1975) which was constructed to assess the automaticity of word processing. The Oriya version of the test was used by Sahoo (1987). The test material consists of a sheet of paper of 16.5 x 28 cm size divided into 20 cells of equal size. In each cell there is one line drawing representing some nouns selected from high frequency words in the texts from Grade 1 through Grade 4. The line drawings are drawn in the cells in random order. There are two conditions in the test to be followed:

a) A picture-only condition, in which the line drawings appear alone.

b) A Stroop condition, in which nonmatching words of high frequency are superimposed upon the drawings.

In both the conditions, students are required to name the pictures without reading the words and time taken is recorded. The time taken for naming the pictures alone is subtracted from the time taken to name the pictures in the stroop condition. The difference in time is considered as the measure of automatic word processing.
Procedure

The tests were administered in the school premises. For the administration of the tests on the school children due permission was obtained from the headmasters of both the schools and quiet rooms in the schools were arranged for the purpose. Two graduates were trained for administration of the tests. The teachers were very cooperative in sparing the children for the study. Before administration of the tests, special effort was made to make the children comfortable through informal conversation regarding their names, parents, school and friends etc. Children were encouraged to perform at their best in the tests. Care was taken to ensure that the children had understood the instructions clearly and all enquiries by the student were encouraged and clarified. The first round of tests commenced on the first week of November, 1985, and all the tests were completed by January, 1989. Each year children were individually tested in three to four sessions. Each session was limited only to the school hours and continued for about 45 to 60 minutes which varied depending on the willingness of the children. The total testing time for a child was around 160 minutes in a school year. The order of administration of the tests was randomised and they were given one at a time to each child between 4 to 6 months of the school year. The same children were studied over a period of three school years with repeated administration of the sets of reading measures, metalinguistic awareness tests, a nonverbal intelligence test and verbal processing measures. As such, the children in Grade 1 at the beginning of the study were retested in Grades 2, 3 and 4 and those in Grade 2 were retested each year
up to Grade 5. At the end of each session the children were provided with some incentives like chocolates, pencils, etc. children took keen interest in tests and were very cooperative.