CHAPTER - III

METHOD

DESIGN

SAMPLE

TESTS

PROCEDURE
Chapter - III

METHOD

Design:-- As mentioned earlier, the present investigation is undertaken with a view to determine the influence of locus of control, as a personality trait, upon creative thinking and educational achievement across the subcultures and sociocultural background.

It may be readily observed that the research project contains three independent variables viz; (a) cultures (urban, rural and the tribal), (b) sociocultural background (advantaged, disadvantaged), and (c) locus of control (internal and external). It has two dependent variables such as creative thinking and educational achievement. Two subcultures, namely the urban and the rural, have advantaged and disadvantaged groups whereas the tribal culture forms only one group which may be taken as the disadvantaged group. Thus, there are altogether two advantaged and three disadvantaged groups. Each of the five groups has 30 ILC subjects and 30 ELC subjects. The design is presented in a tabular form below.

Table 1 The schematic presentation of designs under subculture, socioeconomic background, and locus of control.

<table>
<thead>
<tr>
<th>Subculture</th>
<th>URBAN</th>
<th>RURAL</th>
<th>TRIBAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEB</td>
<td>Advantaged</td>
<td>Disadvantaged</td>
<td>Advantaged</td>
</tr>
<tr>
<td>LC</td>
<td>ILC</td>
<td>ELC</td>
<td>ILC</td>
</tr>
<tr>
<td>No of subjects</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

SEB = Socioeconomic background, LC = Locus of control, ILC = Internal locus of control, ELC = External locus of control
 Altogether 488 subjects were selected from urban, rural, and tribal samples for the study. The subjects were all boys and reading in the 6th, 7th, and the 8th class. Their age level was between 10 to 13 years. The purpose of using such age and class of students was that it is easy for them to conceive the idea and answer locus of control and creativity tests. Secondly Miller (1961) used the locus of control scale with children between 10 to 13 years of age. Torrance (1962) reported difficulty in using the tests of creativity on primary and preprimary school children. Similarly Mehdi (1973) has recommended the use of the test of creative thinking from the middle school up to graduate level. He also has not recommended its use in the preprimary and primary level. However, there is the possibility of nonavailability of adequate number of students, specially Harijans and tribals in higher classes. There is stagnation and larger drop-out at the higher level of education (Rath, 1979) of such children.

While selecting subjects, their socioeconomic background (SEB) was taken into consideration. Some subjects in the urban and rural area were advantaged and some others were disadvantaged. All the subjects in the tribal area were disadvantaged. The criteria of selection under SEB were based on four principles viz; parental education,
annual income, caste and residence (Sahu, 1978; 1979; Samant, 1975). The idea has got support from findings of Whiteman and Deutsch (1968).

The advantaged children were selected from families whose parental education was above graduation, the total annual income Rs.6300.00 and above, and they are Brahmin by caste. Of course graduation in arts, science, commerce, law, engineering and medical were taken into consideration. The source of income was not only service but business, agriculture, and landed property. The rationale for accepting the high income level is that a class II government servant with minimum qualification of graduation begins his salary with Rs.525.00 per month. Thus, it becomes Rs.6300.00 per annum. On the other hand, disadvantaged children were selected from families whose parental education was upper primary or less, annual income Rs.2400.00 or less, and they were Harijans. The educational level for disadvantaged parents was fixed at the level of upper primary and below because it is expected that anybody might have got such education as the school is found in every street or in every village. Regarding the minimum income of a class IV employee of the government of Orissa gets Rs.200.00 per month while he begins his job. Thus, the annual income was Rs.2400.00. The source of income may be anything including service but the income has to touch the criterion.
The urban sample: The samples were drawn from the schools of the city of Cuttack. It is a commercial city in the state of Orissa and was the state capital for a pretty long time. About 2 lakh people from all walks of life live in this city. Out of the total population there are about 75 percent Hindus and the rest are Muslims, Christians and Sikhs. Economically there are rich and poor. Among Hindus there are high caste like Brahmins, Karanas, Khandayats, and low caste like Harijans are residents of the city.

192 subjects are selected from schools scattered over the city on the basis of socioeconomic background and living in the city for about three years minimum. There are 115 advantaged children. They are all Brahmin by caste. Income of the parent is Rs.6300.00 per annum and above. Parental education is is graduation or above. There are 77 disadvantaged children who are all Harijans. Income of their parents is below Rs.2400.00 and education is below primary level. Using locus of control scale two extreme groups such as 30 ILCs and 30 ELCs from advantaged and the same number of ILCs and ELCs among disadvantaged subjects were selected for the study of creativity.

The rural sample: Subjects on rural sample were drawn from some village High schools situated under one police station and one revenue block in the district of Puri (Orissa).
The schools are scattered over the block and each school is situated in one village. A village contains houses which are made in rows or in groups known as Sahi or Basti. The uniqueness is that Sahis are made mostly according to caste. If one Sahi contains Brahmins known as Brahman Sahi, the other one is Karan Sahi, Teli (Oil man) Sahi. And as such, there is Harijan Sahi where Harijans live together. Of course, there are subcastes among Harijans like Hadi, Bauri, Pana, Kandara who have their own Sahis. But students in the school are from different castes, subcastes, business families, farmers, rich and poor who read together.

186 subjects were selected on the basis of socioeconomic background out of which 118 were advantaged. They are all Brahmin by caste. Income of their parents are above Rs. 6300.00 and education is above graduation. There are 68 disadvantaged children. They are all Harijans. Income of their parents are below Rs. 2400.00 and education below primary level. It was observed that their parents were residents of the village for some generations to which they belong. Administering the locus of control scale on both advantaged and disadvantaged children the extreme scored subjects such as 30 ILCs and 30 ELCs were selected from each of the SEB groups.
The tribal sample: The tribal subjects were reading in tribal schools in the district of Phulbani, situated in the tribal belt of Orissa. They are residents of the locality where the school is situated. Most of them belong to one tribal sub-group known as Kandha. Tribals have no village or street. There are scattered houses over mountains and hills. Agriculture is their main profession. They sell agricultural crops and forest products. Their food is the rice, root, fruit, and leaf of some forest plants, raw or boiled meat. The most essential food and drink is the country-liquor.

Since parents of tribal children in Phulbani district are devoid of landed property, higher income and/or education, the idea of getting advantaged group of children was abandoned. 110 boys belonging to disadvantaged group from different tribal schools of Phulbani district were chosen for the study. Out of them there were 30 ILCs and 30 ELCs from two extremes.

The subject selection is summarized as follows. From a large number of school boys, between the age group of 10 to 13 and reading in the classes between 6 to 8 in urban, rural, and tribal areas selected for the study.

The urban and the rural subcultures had advantaged and disadvantaged children whereas the tribal culture had only disadvantaged ones. On the basis of locus of control scale two extreme groups of subjects viz; ILCs and
ELCs were selected. There were 30 ILCs and 30 ELCs in each of the subgroups of the urban, rural and the tribal groups. Care was taken to control the schooling effect while selecting schools. The situation of the school, its furnitures, teaching aids etc. are almost the same. Some teachers are trained graduates, graduates, trained intermediates, and some are trained matrics in each school.

Tests:

(1) Locus of control: The locus of control scale which was used in this experiment was originally used by Bialer and Cromwell (1960), Miller (1960, 1961). Then Bialer (1961) modified the scale and used it for mentally retarded children. It is a self explanatory questionnaire. It is designed to tap the personality trait as to what extent an individual perceives himself in control of self with environmental events or at the mercy of external forces. The scale has 24 items. Each item has two alternatives to answer i.e. 'yes' or 'no'. A subject has to read each question carefully. If he considers his answer would be "yes" or mostly "yes", he has to mark ( a tick mark - ✓) his answer in the "yes" column. If he thinks the answer should be "no" or mostly "no" he has to put a tick mark in the "no" column. There are some questions, for example, to indicate whether the person is controlled by self or by external forces. The first item is "Can you usually do something about it when someone gets mad at you?" Another item is "When nice things happen to you, is it only good luck?"
Similarly "Do others usually make you do what they want to do?"

Scoring: Items 1, 2, 7, 8, 9, 10, 11, 12, 14, 15, 19, 20, 23, and 24 when answered "yes" are in the internal direction. All other items when answered "no" are in the internal direction. Thus, total scores, correctly answered in the above direction indicated internal locus of control (ILC) scores for the subject. Higher the obtained score, greater is the locus of control in the internal direction. Depending on the split for dichotomization a person securing higher scores comes under the ILC group and who secures lower scores comes under the group of external locus of control (ELC).

Reliability and validity: The test-retest reliability of the Oriya version of locus of control scale is obtained (Appendix - II). A correlation is also found out between locus of control scale and intellectual achievement responsibility scale (Crandall, Katkovosky, and Crandall, 1965) as an evidence of validity. These results are given in the next chapter.

(2) Creative thinking: The test of creativity was used by Guilford (1959), Torrance (1962). Mehdi (1973) collected some aspects from Guilford and some from Torrance and developed a test battery in India. The test battery of Mehdi (1973) is used in this experiment. The important aspect of creative thinking is the divergent
thinking. In order to measure it both verbal and non-verbal tests of creative thinking are used in the present project.

(a) Verbal test - The verbal test of creative thinking consists of three subtests such as consequences, unusual uses, and new relationships.

(i) Consequences test - This test is from the model Guilford's "consequences test" and Torrance's "Just suppose activity". It includes familiar things which are presented in the form of hypothetical situations. It contains three questions viz; "What would happen if man can fly like birds?" "What would happen if your school has wheels?" "What would happen if man does not have any need for food?" The subject had to write as many consequences as he could, within the time specified i.e. 7 minutes per item in the space provided for it.

(ii) Unusual uses test - The basic idea of this test comes from Guilford's "Brick uses test". The test contains very common things like water, a wooden stick, and a piece of stone as stimuli. The subject has to write as many novel, interesting, and unusual uses as he can, for each item within 5 minutes time. The responses would indicate his personal and retrieving experiences.

(iii) New relationships test - The idea of new relationships comes from Mednick (1962, 1964) who pointed out that creative thinking is forming new combinations and
associations between two objects. This test, therefore, contains articles of daily use with which the subject is quite familiar. The subject has to think the relationships between two dissimilar objects. There are pairs of words like tree-house, chair-ladder, and air-water. He has to write as many novel and interesting relationships as possible between two objects of each pair. He is provided with 5 minutes time for each pair and sufficient space to write.

Scoring - The creative ability is measured by fluency, flexibility, and originality. These are traits, as pointed out by Guilford (1959), which are related to divergent thinking or creativity.

Fluency - It refers to the quality of output. When asked to produce as many items as one can do, some subjects produce many more items than what others do. The relevant and unrepeated ideas are counted as number of responses. Irrelevant and repeated answers are to be struck off in each item. Thus, total number of "correct" answers are the fluency score for the item.

Flexibility - It is the ability of the individual to produce variety of ideas which differ in approach and trend. If responses belong to one approach or trend then the subject gets one flexibility score. If there are many, for example ten approaches, the flexibility score is ten. Subject's responses are categorized and total number of categories can give the flexibility score.
Originality - Originality can be known from the unusualness and clever responses, remote associations and relationships. From responses on each item the uncommon responses are chosen and the originality weight is given according to the statistical process. The more uncommon the response the higher is the originality weight. It is calculated in the following manner. If a response has been given by 1% to .99% of the subjects, it will get an originality weight of 5. Thus response between:

- Less than 1% the originality weight is 5,
- 1% to 1.99% 4,
- 2% to 2.99% 3,
- 3% to 3.99% 2,
- 4% to 4.99% 1,
- 5% and above 0.

A scoring sheet is prepared to calculate originality according to the statistical principle.

Reliability and validity:- Verbal tests of creative thinking such as consequences test, unusual uses, and new relationships are Indianised in Hindi (Mehdi, 1973). The Hindi version of the test is translated into Oriya, the mother tongue of subjects (Appendix - IV). The test - retest reliability of the test battery in Oriya form is given in the next chapter. However the reliability coefficients are given by Mehdi (1973) Which are as follows: fluency = .945, flexibility = .921, originality = .896, and total creativity = .959 (N = 31).

Validity of the verbal test battery determined by Mehdi (1973) are as follows: Fluency = .40, flexibility = .32 originality = .34, total creativity = .39 (N = 300).
(b) Nonverbal test - The nonverbal test of creative thinking consists of three subjects such as picture construction, incomplete figures, triangles and ellipses.

(i) Picture construction - It contains two geometrical figures viz; a semicircle and a rhombus. The subject has to draw a complete and elaborate picture using each one as an integral part. While drawing the picture the subject can turn the page in any direction he likes. The activity takes 10 minutes to complete 2 pictures.

(ii) Incomplete figures - This test is introduced from the Gestalt school of thoughts which was to set up individual tension. There are six line drawings which could be made meaningful pictures. Ten minutes time are allowed to complete all the six pictures.

(iii) Triangles and ellipses - Keeping in view Torrance's parallel lines and circles test the present tests of triangles and ellipses are introduced here. This test contains 3 triangles and 3 ellipses. The subjects is required to make meaningful pictures on the basis of the given stimuli. Total time is allowed 10 minutes to complete six pictures.

Scoring - The creative ability through nonverbal test is measured by elaboration and originality.

Elaboration - Each figure gives a meaning. This is the primary and minimum response to the picture. When there
are ideas more than minimum in the picture those are scored for elaboration. In order to score the figure the test booklet is to be turned around. Then it can be known exactly what the subject has drawn. All the abstract ideas, if any, are to be scored. Thus, the total elaboration score consists of one for the primary response plus one each for all the additional new ideas.

Originality - Originality is represented by uncommonness of a given response. The originality weight is given to each response according to the following principles. Response between:

- Less than 1% the originality weight is 5,
- 1% to 1.99% " " " " 4,
- 2% to 2.99% " " " " 3,
- 3% to 3.99% " " " " 2,
- 4% to 4.99% " " " " 1,
- 5% and above " " " " 0.

A scoring sheet is prepared to calculate originality according to the statistical principle.

Reliability and validity: A nonverbal test battery creative thinking consisting of picture construction, incomplete figures, triangles and ellipses was Indianised in Hindi language (Mehdi, 1973). It was prepared in Oriya (Appendix-V). The test-retest reliability of the Oriya form of the battery is calculated. However Mehdi (1973) has obtained some reliability scores which are as follows: elaboration = .932, Originality = .947, total creativity = .946 (N=50). His validity scores are elaboration = .346, originality = .329, and total creativity = .385 (N=50).
(3) Educational achievement: School examination marks are considered here as educational achievement (Ed Ach). Three school examinations Viz: two annual and one half yearly examination marks are taken together. Again a student has appeared in eight subjects in each examination. But marks of some specific subjects such as English, Oriya, mathematics, general science and social studies (history and geography) are taken into consideration. These are the subjects in which all the students have appeared and marks are available. The marks of 5 subjects in 3 examinations are added together. The percentage of the total marks are considered as the score of educational achievement for each student.

Reliability and validity: DeCecco and Crawford (1977), Vernon (1959) have pointed out that intelligence is the best predictor of educational achievement. With this idea in view a correlation coefficient was obtained between educational achievement and Raven's Progressive Matrices.

Procedure:
The study was started from the urban areas. Ten schools were selected in the city of Cuttack. The experimenter himself went to each school. He selected Brahmin and Harijan boys who were reading in the 6th, 7th, and 8th class. It was the only way to select a few and avoid the rush. An identification
form (Appendix - I) was given to each student so as to give information about their socioeconomic background (SEB). The procedure later followed in 8 schools in the rural area and 5 schools in the tribal area.

Socioeconomic background (SEB) - In order to record subject's socioeconomic background (SEB) each student has been asked to fill up a blank proforma. It contained the blanks to fill up his name, name of the school, class, roll number, age in years, caste and sub-caste, and some information about his father. He had to write his father's name, designation (if in service), business, or profession, monthly income, and educational qualification. The last column in the card was years of living in a particular place. All the questions were asked in Oriya, the mother tongue of the subject (Appendix - I). Statements given by students were verified with that of their teachers and with some parents.

Locus of control (LC) - As described earlier, subjects were selected as advantaged and disadvantaged in the urban and rural areas. There were only disadvantaged subjects in the tribal area. They were given printed locus of control questionnaires (Appendix - II) in their respective class rooms. Since it was self-explanatory they answered it without any difficulty. However, the test administrator was going round the class rooms to avoid any inconvenience faced by the subject. There was no time limit for answering it therefore they were taking their own time to complete the task.
Scoring - Responses were evaluated according to the principle described earlier. Then the results were analysed.

Creative thinking - Verbal and nonverbal test booklets were prepared in Oriya from the Hindi version made by Mehdi (1973). Pilot trials were taken with the booklet. The experimenter being a judge examined the answers. Accordingly he modified the tests and adapted for Oriya children.

Verbal test of creative thinking was administered first. The printed booklet in Oriya Language (Appendix-IV) was distributed in the classroom. Each student got a copy of it. The instructions are printed there. But in order to motivate students and to make them interested towards the study the instructions were read out in the classroom. The test administrator enquired if they had any doubt. Then they were allowed to write.

During the experiment the experimenter was timing each activity. He instructed when one activity would be over and another one would begin. Thus, the subjects were allowed 21 minutes for the first activity, 15 minutes for the second, and 15 minutes for the third activity. At the end, subjects were given 5 minutes time to complete any incomplete task left behind or any additional work he could wish to do.
Nonverbal test was administered the next day. (Appendix V)
Printed booklets were distributed among students when they were in the classroom. Each subject was supplied with a pencil and a rubber for drawings in the nonverbal task. Although instructions in general and in specific for each activity were printed in Oriya, yet the test administrator read out them loudly. He then clarified the doubts, if any. Each activity was taking place according to the schedule. At the end of the activity five minutes time were given to them to complete any incomplete task or any additional work they could wish to do.

Scoring — Verbal test has three activities such as consequences, unusual uses, and new relationships. Each activity was scored as fluency, flexibility and originality. The responses were then analysed independently without being added together. Nonverbal test has three activities too. They are picture construction, incomplete figures, and triangles and ellipses. Each activity was scored as elaboration and originality. These score of responses were analysed independently. The factor validity of nine factors in verbal test and six factors in nonverbal test were obtained. Since those were significantly high, all the scores of each subject were added together and total scores with means and standard deviations were calculated.

Educational achievement (Ed Ach) — Examination marks were obtained from the marks register of the school. The total marks of three examinations in five subjects were converted into percentage. It was then analysed according to the plan.