Chapter-IV

METHOD AND PROCEDURE

In order to study the creative talent among intellectually gifted and average children in relation to socio-psychological variables, these subjects were identified on the basis of I.Q. and marks in the previous examination.

Significance of differences between the means of creativity scores of the total sample of intellectually gifted and average children and also among groups based upon sex and birth order were determined.

Then, bi-variate correlational analyses were done to find out the relationship between the criterion measures of creativity and predictor measures of socio-economic status (total samples and high average and low socio-economic groups) and adjustment (social, emotional and educational) for the intellectually gifted and average children and the significance of difference between the correlations was worked out.

SAMPLE

Multistaged stratified randomization technique of sampling was used in the present study. As it was not
possible to cover the entire school population of the state of Punjab, the sample was drawn from high/senior secondary schools of six district headquarters, three district headquarters from each of two administrative divisions of Punjab - Ludhiana, Patiala and Faridkot from Patiala division and Jalandhar, Amritsar and Hoshiarpur from Jalandhar division. Further, two or three schools were selected randomly from each district headquarters. In order to ensure wider applicability of findings, boys and girls of 9th and 10th class were taken from government as well as privately managed recognised high and senior secondary schools. Schools from only urban areas were selected because of the significant urban-rural differences due to press on creative abilities.

Initially, 1141 students were administered intelligence test on the basis of which 712 students (311 intellectually gifted with IQ above 120 and marks in the previous examination above 60% and 401 intellectually average with IQ between 90 & 110 and marks in the previous examination between 45% & 55%) were selected for the sample of the present study. But, later on, some students had to be dropped from the sample because of their absence in the subsequent testing sessions or because of non-availability of complete data about them. So the final sample comprises
542 students (230 intellectually gifted and 312 intellectually average). District headquarters from which the sample was drawn have been shown in Fig. 4.1.

TOOLS USED

The following tools were used to collect data:

1. JALOTA AND SINGH's GROUP TEST OF GENERAL MENTAL ABILITY (1982)

The revised version of the Group Test of General Mental Ability by Jalota and Singh (Punjabi version) was used to identify intellectually gifted and average children because this test in Punjabi language has been standardised and widely and satisfactorily used on the Punjab school population (Gakhar, 1975; Toong, 1982; Behal, 1982; Kaile, 1987). It is a group test and easily available.

The test with 100 items arranged in ascending order of difficulty is to be completed in twenty minutes and yields a composite score. It consists of seven sub-tests, number series, analogies and classification having 20 items each and inferences, following directions, opposites and synonyms having 10 items each. All these sub-tests, except the 'number series' and 'following directions', consist of multiple choice form. In the sub-test 'number series', the
FIG. 4.1 MAP OF PUNJAB SHOWING DISTRICT HEAD QUARTERS INCLUDED IN THE STUDY
subjects are required to find the rule according to which the numbers have been arranged and in the sub-test 'following directions', the subjects are directed to carry out some instructions in order to find out the correct answer to the problem.

The authors claim the test to be highly reliable and report the lower limit for the test retest reliability to be equal to 0.991 and the odd-even reliability to be equal to 0.93. Validating against school examination marks, the validities range between 0.413 and 0.500.

TORRANCE'S TEST OF CREATIVE THINKING, FORM A (1966)

Tiwari (1983) observed, "One of the bottlenecks in creativity research in India, perhaps, is the paucity of sound creativity measuring tests". A few tests of creativity, developed and standardized in India, are available (Passi, 1971; Chauhan and Tiwari, 1974; Mehdi, 1974, 1976). However, studies concerning their reliability and validity in different regions of the country are rare. Torrance's Test of Creative Thinking - TTCT (Verbal, form A) was selected for the present study as it has a wide applicability in different cultural set ups, including Indian conditions and reliability and validity indices on the population out of which the sample of the present study
has been selected are reported to be satisfactory (Raina, 1969; Gakhar and Luthra, 1974; Gakhar, 1972; Behal, 1982; Toong, 1982; Vasesi, 1985).

Torrance's Tests of Creative Thinking (TTCT) are in four batteries of test activities, namely, verbal form A and equivalent alternate verbal form B; and figural form A and parallel figural form B. In the present study, the use of verbal form (A) of the battery has been made for measuring creativity.

Torrance's Test of Creative Thinking, Verbal, form A (1966) consists of seven activities - asking questions about a picture, guessing causes about the event pictured, guessing consequences of the event, thinking ideas for improving a product, thinking unusual uses of cardboard boxes, asking unusual questions about cardboard boxes and thinking possible consequences of an improbable event.

The first three activities (ask and guess) centre around the stimulus of a picture - picture of a boy seeing his shadow in water. The subjects are required to pen down as many questions as they can to know what is happening in the picture (activity I) and give possible causes of the action shown (activity II) and possible consequences of what is taking place in the picture (activity III). The first activity concerns the subjects' ability to become sensitive
to what is unknown and second and third activities judge the subjects' ability to formulate hypotheses concerning cause and consequence. Each of these activities is to be completed in five minutes. Activity IV - product improvement - permits the subjects to regress in the service of the ego and enables them to play with ideas that they would not dare express in a serious task. They are asked to suggest unusual and interesting changes in the toy elephant so that children may have more fun in playing with it. Ten minutes are given for his activity.

Activity V - unusual uses of cardboard boxes - manifests a direct modification of Guilford's 'brick uses test', wherein bricks have been replaced by cardboard boxes. It is a test of ability to free one's mind of established way of thinking. Within a time limit of ten minutes, the subjects are required to list as many interesting and unusual uses of cardboard boxes as they can.

Activity VI - unusual questions about cardboard boxes - is considered an essential 'divergent power' for creativity. Here the subjects are asked to write down as many unusual questions about different aspects of cardboard boxes as they can within five minutes.

In the last activity - just suppose - a high degree of spontaneity is expected from the subjects who are
confronted with an improbable situation (clouds with strings) and asked to predict the possible outcomes from the introduction of a new or unknown variable. This activity, again, requires five minutes for its completion.

In the Norms Technical Manual, Torrance (1966) claimed to have obtained high levels of inter-scorer and intra-scorer reliabilities of the test. He reported mean correlation for inter-scorer reliability ranging between 0.86 to 0.99 and made a mention of the fact that a number of test-retest reliability studies of the test had been conducted. Using the same subjects thrice for different testings of 'ask and guess' activities, Mackler (1962) obtained reliability coefficient of 0.82 between first and second testing, 0.89 between second and third testing and 0.84 between first and third testing; with 'unusual uses' activity, he obtained reliability coefficients of 0.61, 0.62 and 0.72 for fluency, flexibility and originality between first and second testing, 0.75, 0.74 and 0.64 between second and third testing and 0.65, 0.71 and 0.60 between the first and third testing. Goralski (1964) obtained test-retest reliability coefficients of 0.82, 0.78, 0.59 and 0.83 for fluency, flexibility, originality and total creativity respectively. Dalbec's (1966) study reported test-retest reliability coefficients of 0.59 for fluency, 0.75 for
flexibility and 0.73 for originality aspects of creativity. Using alternate forms design, Wittoch (1973) reported coefficients of correlation 0.93, 0.84 and 0.88 for fluency, flexibility and originality measures respectively for 118 fourth, fifth and sixth grade subjects with a test-retest interval of two weeks.

Reliability studies of the test conducted in India have also yielded similar results. Raina (1969) in his study found the inter-scorer reliability of total score of verbal creativity to be 0.84. Gakhar and Luthra (1974) with twenty-two students as subjects from fifth and ninth grades reported the following test-retest reliability coefficients for different activities of the test, interval between the first and second test being two weeks.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Activity</th>
<th>Fluency</th>
<th>Flexibility</th>
<th>Originality</th>
<th>Total creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ask-and Guess I</td>
<td>0.83</td>
<td>0.73</td>
<td>0.77</td>
<td>0.83</td>
</tr>
<tr>
<td>2</td>
<td>Ask and Guess II</td>
<td>0.85</td>
<td>0.69</td>
<td>0.47</td>
<td>0.79</td>
</tr>
<tr>
<td>3</td>
<td>Ask and Guess III</td>
<td>0.74</td>
<td>0.70</td>
<td>0.74</td>
<td>0.76</td>
</tr>
<tr>
<td>4</td>
<td>Product Improvement</td>
<td>0.79</td>
<td>0.72</td>
<td>0.67</td>
<td>0.82</td>
</tr>
<tr>
<td>5</td>
<td>Unusual Uses</td>
<td>0.72</td>
<td>0.67</td>
<td>0.46</td>
<td>0.72</td>
</tr>
<tr>
<td>6</td>
<td>Unusual Questions</td>
<td>0.92</td>
<td>-</td>
<td>0.91</td>
<td>0.83</td>
</tr>
<tr>
<td>7</td>
<td>Just Suppose</td>
<td>0.66</td>
<td>0.72</td>
<td>0.60</td>
<td>0.60</td>
</tr>
<tr>
<td>Total Test:</td>
<td></td>
<td>0.84</td>
<td>0.83</td>
<td>0.82</td>
<td>0.92</td>
</tr>
</tbody>
</table>

The test has been validated in terms of content validity, construct validity, concurrent validity and
predictive validity by involving subjects of different age groups and educational levels; and Torrance (1966) seems to be satisfied with the results of validity studies as is evident from his description given in Norms Technical Manual. In India, studies by Gakhar (1975), Behal (1982) and Gakhar and Kaile (1983) have established factorial validity of the test.

Socio-Economic Status Scale by Kulshrestha (1987)

This scale is specially prepared for urban population by Kulshrestha. It contains 20 items in all. This scale can be administered individually as well as in the groups. The information may also be collected through simple interviews, observation or by direct questions. The scale has transparent scoring key for easy and simple scoring.

It collects information regarding the following component variables: (a) Parental and siblings occupation, (b) Parental and siblings' general education, (c) Parental and siblings' technical education, (d) Economic indicators, (e) Cultural indicators and psychological indicators.

The reliability of the scale was determined by the test-retest method. The scale was administered on 100 subjects of Bikaner city at two different times with an interval of 10 days. The coefficient of correlation was
found to be 0.87. The validity of the scale was also calculated by comparing the scale with Dr Kuppuswamy's and Pandey's socio-economic status questionnaire. The coefficient of correlations were found to be 0.57 and 0.89 respectively.

Adjustment Inventory for School Students by Sinha and Singh (1972)

It was used to measure the adjustment level of intellectually gifted and average students. The inventory contains 60 items, 20 items in each of the three areas of adjustment - emotional, social and educational. The inventory is highly reliable. Split half reliability of emotional, social and educational aspects is 0.94 and 0.96 respectively and test-retest reliability is 0.96, 0.90 and 0.93 respectively. Validated against ratings by the Hostel Superintendent, the validity was 0.51. There is no time limit for answering it. Ordinarily, an individual takes 10 minutes in doing so.

Questionnaire to Know the Birth Order

The questionnaire has two parts. Part (a) calls for information regarding the subject's number of brothers, number of elder brothers and number of younger brothers and in part (b) information conveying the subject's, number of
Collection of Data

Prior to administration of tests in a school, the investigator sought the cooperation of the District Education Officers, heads of the school and the class teachers. For ensuring the cooperation of students, attempt was made to create a testing rapport. Subjects were told that the results of the tests would be kept confidential.

All the tests were administered in three sessions. In the first session, the subjects were administered Jalota and Singh's Group Test of General Mental Ability. In the second session, on the next day, the Torrance's test of Creative Thinking (verbal, form A) was administered. In the third session, on the same day after break, the Adjustment Inventory for School Students by Sinha and Singh and Socio-economic Status Scale by Kulshreshta was administered. Last of all, the subjects were asked to fill up the questionnaire to know their birth order. Strict supervision was done in order to ensure that the subjects did not take one another's help in giving responses.

STATISTICAL TECHNIQUES USED

The following statistical techniques were used for analysing the data:
Conversion of raw scores of all the twenty measures of verbal creativity, obtained from the seven activities of the test, into T-scores was done with mean 50 and SD 10 for obtaining total scores on different dimensions of creativity (fluency, flexibility and originality) along with total creativity.

Descriptive statistics i.e. mean, median, standard deviation, skewness and Kurtosis were used to examine the nature of distribution of scores.

Pearson's coefficient of correlation technique was used to find out the relationship of creativity with socio-economic status and adjustment.

Critical ratios were obtained to find out the significance of difference between the means and coefficients of correlation.