CHAPTER III
REVIEW OF RELATED LITERATURE

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CHAPTER III

REVIEW OF RELATED LITERATURE

3.0.0 INTRODUCTION

To promote creativity and to understand its background properly it will be useful to study the past literature.

A survey of various bibliographic study is given by Deshmukh. According to him.

A review of various bibliographic studies of research on creativity indicates the generated interest of researchers in the field of creativity has recent origine. Till 1950 Guilford could find only 186 studies related to creativity out of 1.21000 titles listed in the index of the psychological abstract since 1927 (Guilford).”

Lynda Martin in her bibliography listed 996 references on investigations and other articles which appeared in psychological abstract during 1954-1965 (Martin 1968).

Razik gave another bibliographic study including French,


Italian and Russian titles which contains 4176 titles in the field of creativity which includes documents published from 1744 to December, 1964.

The first two issues of the Journal of Creative Behaviour described the status of research activity in the field of creativity. The following excerpt from it reflects the growing interest in the field.

"Approximately 1250 bibliographic entries on creativity have appeared in the last year and one half. A rough but dramatic indication of the explosion of literature on creativity is that in sheer bulk the research from January 1965 to June 1966 equals that of preceding five years and that again balances the work of the preceding 100 years. The number of relevant doctoral dissertations is a particularly good qualitative barometer of this interest and activity. About 300 such reports existed prior to 1965, in the last year and one-half almost 200 new dissertations have been recorded under diverse heading in a variety of disciplines."

3.1.0 PURPOSE OF THE RESEARCH REVIEW

Every investigator must know what sources are available in the field of inquiry and how many of them are worthy to be used, and where to be used.
In the field of education, the research worker needs up-to-date informations regarding his/her problem i.e. what has been thought and done so far in this particular area.

Good, Barr and Scates analyse the purpose of research review as:

- To suggest the method of research appropriate to the problem.

- To locate the data useful in the interpretation of results.

- To show whether the evidence already available solves the problem adequately without further investigation and thus to avoid the risk of duplication.

- To provide ideas, theories, explanations or hypothesis valuable in formulating the problem.

- To contribute to the general scholarship of the Investigator.

3.1.1 IMPORTANCE OF THE REVIEW

Reviews are considered important for the following reasons:

1. It gives the scholar an understanding of previous work that has been done.

2. The result of the review actually provide the data used in research.

3. It enables the researcher to know the means of getting to the frontiers in the field of problem.

4. It develops insight of the investigator. This gained information will save the researcher's time.

5. It helps in delimiting the research problem and in defining it in a better way.

6. It gives insight to the investigator in converting the tentative research problem to a specific one.

7. It alarms the researcher about the possibilities that have been over looked.

8. It provides an opportunity to gain insight into the methods, measures, subjects and approaches employed by other researchers workers. This in turn leads to significant improvement of a research work.

3.2.0 MEASUREMENT OF CREATIVE THINKING ABILITIES

3.2.1 METHODS OF MEASURING CREATIVITY IN EARLY CHILDHOOD PERIOD.
Many authors and research workers have tried to assess the creativity of a person at different levels. McCarty\(^5\) (1924) used drawing skills for this. Anderson\(^6\) (1927) used responses to ink-bolts and concrete observations, Rebot (1926) explored imagination and reasons for the period from childhood to adulthood.

Andrew made careful analysis of development of imagination at different age levels. According to him imagination starts declining before reason dies.

### 3.2.2 METHODS OF MEASURING CREATIVITY DURING THE CHILDHOOD PERIOD

To measure the creativity of any pupils at this stage is important. Colvin\(^7\) (1902) used compositions to measure the sense of humour, imagine power, feeling and perception.

Simpson\(^8\) (1922) used fifty sets of four small round dots representing the four corners of squares as the stimuli for drawing fluency, flexibility and originality.

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5. Stella Agnes McCarty, Children's Drawing: A Study of Interest and Attitudes, The William and Wilkins Co., Baltimore, 1924


7. S.S. Colvin. Invention Versus Form in English Composition; An Inductive study. Pedagogical Seminary, 1902-9-393-421.

Mayer (1906), Mearns (1931), Vernon (1948), Barron (1960), Wiltt (1959), Torrance (1962) and Ligon (1957) have also studied this period of childhood and puberty.

3.2.3 METHODS OF MEASURING CREATIVITY OF ADOLESCENT PERIOD

The available studies of this age group on creativity are mainly of 'Group-tests' having verbal responses thereon. Colvin\(^9\) (1962) has this kind of tests,

Getzels and Jackson\(^{10}\) (1958) prepared such tests based on word-association, uses of things, hidden shapes and tables.

McGuire, Hindman, King and Gennings\(^{11}\) (1961) prepared and adopted the Guilford tests including the three main features of the test viz., unusual uses, consequences and seeing problems.

The period of adolescence is typical and specific one and that's why creativity can be more or less affected during

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the period. Most of the studies pertaining to this period tell that there is a decline in imaginative power in seventh and eighth grades. Thereafter it has steady growth in the adolescent period.

Colvin and Mayer\textsuperscript{12} (1962) show peek in this skill during sixth grade and decline in the seventh and eighth grades. Mearne\textsuperscript{13} (1958) reported that creativity declined in the sixth grade than it rose in upper classes when the subjects were in adolescent period.

3.2.4 METHODS OF MEASURING CREATIVITY IN ADULTHOOD PERIOD

As the studies mainly adopted were on small children and adolescents there is paucity of experiments on adults. Yet from the available experiments it is found that in twelfth grade there is a little increase (as against the decrease in adolescence) during this period in the creative thinking of an adult.

Lehman\textsuperscript{14} (1953) believed that creativity grew in thirties.


and declines slowly thereafter. The quality of production is found
decreasing as the age advances.

The above stage-wise experiments show that there is
increase and decline in creative writing and creative thinking.
There is an increase up to a fixed level and during adolescent
period there is a decrease in it. But once again in upper standards
there is a considerable increase which in turn decreases in the
period of adulthood. We can summarize from this, that we can't
predict definitely the rise and fall of creative thinking ability
of typical population unless we have a systematic experiment of
research on it.

Some of Indian researchers have tried to do work in the
field. Following are some important studies:

Study : 1 : B. K. Passi 15

" An exploratory study of creativity and its relationship
with Intelligence and Achievement in school subjects at Higher
Secondary Stage ".

The aims were (i) to develop a battery of tests of creativi-

15. B.K.Passi. An Exploratory Study of Creativity and its
Relationship with Intelligence and Achievement in School
Subjects at Higher Secondary Stage. Unpublished Ph.
D. Thesis in Education submitted to Punjab University,
Chandigadh, 1972.
ivity and (ii) to explore the relationship between creativity on the one hand and variables of intelligence, scholastic achievement, sex, residential background and age on the other.

Multi-stage random clustered design of sampling was employed to pick-up the sample from the population of a students of Grade IX, X and XI of the Punjab, Haryana and Union Territory of Chandigarh. Different tools viz., questionnaire for personal data, the thinking done of your own check list, the Ravan's standard progressive matrices, the Jalota's group test of general mental ability, School records for scholastic achievement and the Pass's test of creativity were used to collect the data.

The different sub-tests included in the battery are (i) the seeing problems test, (ii) the unusual test, (iii) the test of inquisitiveness, (iv) the square puzzle test and (v) the block test of creativity.

The split-half coefficients for three verbal tests had a median r of 0.80. Test-retest reliability coefficient for the six tests of creativity ranged between 0.68 and 0.77. Factorial validity of the tests against factors viz., verbal and non-verbal creativity ranged from 0.305 to 0.745. Percentile norms for all the six tests were established.

The major findings were as follows:
i. Creativity scores were normally distributed among higher secondary students.

ii. Intelligence and creativity are two different constructs. Also creativity is a multi-factor construct having verbal and non-verbal factors.

iii. Residence, grade and intelligence contributed significant variance for the criterion variable of creativity.

iv. Girls were superior to boys in non-verbal creativity and boys were superior to girls in verbal creativity.

v. The significant developmental trends of creativity scores along grade were observed from grade IX through XI.

vi. Urban students were found to be significantly better than rural students.

vii. Scholastic achievement was found to be significantly influenced by the effects of sex, residence, grade, creativity and intelligence.

viii. The double talented single talented and non-talented groups were found to have significantly different mean achievement score - difference in favour of talented groups.
Study 2: Jha S.K. An Analysis of Certain Dimensions of Creativity.

The main purpose of a study was to explore, and analyze certain personality dimensions and to obtain some personality profiles of creative persons in order to draw a sample of highly creative persons the nomination method was adopted. For this purpose, information was collected from the list of winners of National Awards of the erstwhile Bombay State, the Times of India Dictionary and year-books, India, who is who the film fair files, list of the recipients of Bharat Ratna and Padam Bhushan National Awards. This resulted into a preliminary list of 166 persons either from Gujarat or Maharashtra. This list was sent to judges drawn from University professors and renowned professionals. The judges suggested eighty-eight more names of highly creative persons. The judges also ranked these 254 persons for their creativeness. The final selected sample consisted of sixty six creative persons. Out of sixty-six data of only thirty-five persons could be collected. Data on a questionnaire having eighty statements were collected. The data were further supported by a self-data-card filled by the respondents. The data were subjected to factor

analysis by employing centroid method. The main findings of 
the study were related to the following four factors:

i. The first factor emerged with the description of the creative person as having rational optimism, high age strength realistic and healthy attitude towards life, openness to experience, assertive, self-confidence and tendency for self actualization.

ii. The second centroid was bi-polar factor having high positive loadings with religious dedication, religious mystical, fatalistic and faith in supernatural powers, whereas it had negative loading with practical, non-religious, outspoken and self confident.

iii. The third centroid was also a bipolar factor having high positive loading with mystical intuitive guidance from innerself—whereas it had negative loading with nonmystical, industrious, exerting and extrovert behaviours.

iv. The fourth bipolar centroid was positively loaded with self-expression, openness to experience, flexible value orientation and negatively loaded with fixed value orientation, methodical, social, extrovert and sensational type of behaviours.
Study 3: Gupta A.K. A study of the Relationship of Creative
with self-concept among the school going children of 12+ in Jummu
city.

The main objective of the study was to find out the relation-
ship between creativity and self-concept among the school going
children of the age group 12+ in Jammu city. The sample consisted
of 1000 boys and girls. To measure creativity a verbal and non-
verbal battery of MIER test of creativity which was constructed
and standardized by the investigator was used. The statistical
techniques used were mean, median, S.D., ; skewness, kurtosis,
significance of the difference between group means, correlation
and factor analysis. The main conclusions of the investigator
were as follows:

1. There was no empirical evidence on the theoretical frame
work given by self-theorists like Allport, Rogers and
Maslow

2. The results highlighted the importance of having higher
and healthier self-concept and higher self-acceptance as
important personality characteristics conducive to higher
creativity whether verbal or non verbal.

A.K. Gupta. A Study of Relationship of Creativity with
self-concept among the school going children of 12+ in
University, 1977.
iii. Highly creative individuals were found to possess higher self-concepts and high self acceptance both of which were conducive to better adjustment and positive mental health.

iv. The intimate relationship between creativity and self indicated by contrasted group analysis could not be substantiated by high correlation between the two variables possibly because of scatter caused by the middle 46% group.

v. The existence of two independent dimensions of creativity verbal and non-verbal was verified.

vi. Creativity yet presence of a common factor between the two was not born out by the results.

Study 4: Joshi R.J. A Study of Creativity and Some Personality traits of the Intellectually Gifted High School Students.

The study was conducted to fulfill the following objectives
(i) to locate intellectually gifted children from the secondary schools, (ii) to study sex differences in creativity and personality traits of the intellectually gifted high school students.

traits of the gifted children. (iii) to study differences in creativity and personality traits of the gifted children with respect to their age, (iv) to study the creative ability of these gifted students by relating creativity with intelligence, achievement and personality traits and (v) to offer some suggestions based on these findings.

The study employed descriptive correlational survey method of research. The sample was drawn from six district of Gujarat State, namely, Baroda, Ahmedabad, Broach, Kaira, Panchmahals and Surat. The pupils were randomly drawn from standard VII to XII of twenty three secondary schools of the above six districts with age ranging from 12 to 19 years. Out of the variable populations of 8,216 pupils only 3,503 pupils were administered the Desai-Bhatt group test of Intelligence. The pupils with I.Q. 120 and above were termed as gifted children. A total of 1002 pupils were found to be gifted. The Torrance's Creativity Test and the Cattell's 16 Personality Factor Test were administered to these pupils. At the end of the study the dropouts brought down the sample to 935. Annual examination marks were treated as achievement scores of the pupils. Statistic techniques used were item statistics, T-scores, t-test, r and F test. Following were the important findings of the study:

i. Giftedness was the most effective contribute to all types of creativity scores.
ii. Age was an important correlate of creativity at fifteen year age level.

iii. None of the main effects of I.Q., age and sex upon the personality factor A (Cycolthymis Versus Schizothymis) was significant.

iv. Giftedness was a significantly contributing factor to personality factor B. (General Intelligence versus Mental Defect) in all cases.

v. Giftedness was contributing to emotional maturity in case of boys.

vi. Giftedness, sex and age did not contribute significantly to surgency.

vii. There was low positive significant correlation between intelligence and all types of creativity scores.

viii. Almost all creativity scores had low positive correlation with achievement scores in all school subjects except English.

ix. There was no significant correlation between different creativity scores and different personality traits except in factor B. (General Intelligence Versus Mental Defect)
factor G (Character of super ego strength versus lack of rigid internal standards) factor I (Premia versus Harria) factor L (Pretension versus Relaxed security), factor Q (Radicalism versus Conservatism of Temperament), factor $Q_3$ (High self-sentiment formation versus poor self sentiment formation), and factor $Q_4$ (high energetic tension versus low energetic tension).

Study 5: Kaur R. A Study of Creative Thinking of IX grade boys in relation to their problems and adjustment.

The study aimed at the following objectives:

i. to determine the relationship of composite creativity and different dimensions of creative thinking i.e. fluency, flexibility, originality and elaboration with adjustment of the students;

ii. to find out the relationship between creativity and adjustment at different levels high, average and low of these two variables.

iii. to determine differential problem areas of high and low creative students. A randomly selected sample of 200 IXth grade boys, drawn from three boys higher secondary

schools of Patiala city, from the sample of the study.

The Torrance Test of Creative Thinking (figural form [A]) were used to measure creativity. The test used for measuring their adjustment was the Asthana's Ajustment Inventory in Hindi. The students problem check list developed by the Central Bureau of Educational and Vocational Guidance, Delhi (Hindi version) was employed to study their problems. The data were analysed by employing t-test and product moment technique. The following were findings:

i. The relationship between creativity and adjustment was negative but very low and insignificant.

ii. Creativity and adjustment were insignificantly related at their different levels.

iii. The high and low creative students did not on the whole, significantly differ in their problems. Only sociopsychological relations area has emerged as the problem area differentiating the two groups, the high creative encountering significantly more problems in this area that the low creatives on the remaining problem areas no significant differences were observed.

Study 6: U.S. Khire. Creativity in Relation to Intelligence and Personality Factors.

The main objectives of the study were:

i. to find out the characteristic of creative thinking,

ii. to find out the relationship between creativity and intelligence; and

iii. to study the personality characteristics of creative persons.

The sample for the study consisted of 1054 boys of grades VII through XI of a single school. A battery of creativity tests patterned after Guilford and Wallach and the Raven's Advanced Progressive Matrices were used to measure creativity and intelligence respectively. These formed independent variables. The dependent cognitive and non-cognitive measures included the scores on the Bennet's Mechanical Comprehension Test, School marks, interests regarding academic subjects games and hobbies, student's rating of peers and teachers and the scores on the Beruruter's Personality Inventory. For the upper extreme groups - first twenty five on creativity and the first twenty five on intelligence - some more measures were obtained which included scores on the instruments such as the Bell's school inventory, the pasadena pupil Judgement Test, the speed of verbal thinking an indirect sentence completion test, the self perception test. The personal data sheet, your expectations about your child (for mothers), and the teacher ratings. Nine top most creative students were further studied through home visits and interviews. The statistical technique employed comprised means, standard deviations, analysis
of variance, chi-square test, t-test correlation and factor analysis.

The following were some major findings:

i. The chosen variables of creativity—abilities of fluency, flexibility and originality of thinking or redefinition and elaboration remained closed to each other, and at the same time further from intelligence.

ii. At the age of 13, creativity did not increase linearly just like intelligence.

iii. Above 1.2 S.D. distance on the positive side on intelligence; scale, creativity showed zero correlation with intelligence.

iv. Creativity had lower correlation with aptitude of mechanical comprehension and higher with scholastic performance as compared to intelligence.

v. Poor quality of academic performance was directly related to low intelligence and high quality with high creativity; and

vi. The high creativity, low intelligent students found that all teachers were more or less alike.
Study 7 : Mehdi Baquer. Development of Battery of Tests for Identifying Creative Talent at the Primary and Middle School Stages.

The present study was an attempt for developing a battery of tests for identifying creative talent at the primary and middle school stage. The battery consisted of two tests namely, the verbal test of creative thinking and non-verbal test of creative thinking.

The verbal test included four sub-tests, namely consequences test, unusual test, similarity test and product improvement test. Three types of activities were used for non-verbal test of creative thinking namely picture construction activity, incomplete figures activity and triangle and ellipses activity.

The final forms of the tests were administered to a sample of 300 urban and 175 rural pupils studying in class VII and VIII. The percentile in classes VII and VIII were established for verbal test of creative thinking.

The findings of the study were:

i. The items in each activity correlated high with the total activity scores and indicated that the items in each activity were internally consistent.

ii. There was significant high degree of relationship between the activities of non-verbal test of creative thinking and the total creativity score. The correlation ranged from 0.634 to 0.941 for urban and 0.312 to 0.850 for the rural sample.

iii. The inter-correlations among the three activities were found to range from 0.303 to 0.477.

iv. The test-retest reliability coefficients for elaboration, originality and total creativity score were found to be 0.932 to 0.947, respectively.

v. The validity coefficient against the teacher ratings for elaboration, originality and total creativity score for urban and rural students were 0.180, 0.862, 0.806 and 0.761 and 0.646, 0.741 respectively.

vi. The test-retest reliability coefficient for the verbal test of creative thinking were found to be 0.945, 0.921, 0.960 and 0.959 for fluency, flexibility, originality and total creativity score respectively.

vii. The reliability of the total creativity score was found to be 0.959 for verbal test of creative thinking.
viii. The validity coefficient for fluency, flexibility, originality and total creativity score were found to 0.40, 0.32, 0.34 and 0.39 respectively which were significant beyond 0.01 level.

Study 8: B. Kaul. Construction and standardization of a test to identify creative children in the age range of 14 to 16 years.

The study was undertaken to develop and standardize a test of creativity for children in the age group of 14 to 16 years.

The test consisted of five sub-tests viz., (i) Sentence Completion Test, (ii) Uses Test, (iii) Creative Writing Test, (iv) Consequence Test and (v) Problem Solving Test.

Item analysis was done after administering the test to a sample of 350 subjects. The sample for the preparation of norms consisted of 1000 students from the different schools of Delhi. For the present test decile norms and standard score norms were established.

The reliability of the test by using test-retest method was found to be 0.75 (N=100). The present test gave a correlation

coefficient of 0.72 with the Torrance Test of creative thinking. 0.13 (N=70) with a teacher's rating scale, and 0.26 (N=50) with the Ravan's Standard Progressive Matrices. The test also correlated high with Shanker's on the spot painting and writing test.


The aim of the study was to compare quantitatively significant differences between high creative and low creative groups of students on certain measures of cognitive abilities, personality, manifest anxiety, academic achievement and socio-economic status. It was hypothesized that high and low creative groups would differ from each other with regard to certain cognitive abilities, personality characteristic, socio-economic status and sex.

Along with a battery of tests for measuring cognitive abilities and personality characteristics, the Minnesota Tests of Creative Thinking and Kuppuswamy's Socio-economic status scale were used to collect the data. The other tools like the Jalota's Group Test of General Mental Ability, the Edwards Personal Preference Schedule, and the Taylor's Manifest Anxiety Scale were also used. The

Minnesota test of Creative Thinking were administered to a sample of 500 students of classes VIII, IX and X of seventeen schools from three educational zones of Rajasthan to select high and low creative groups. These groups consisted of ninety and eighty five students with about equal number of boys and girls. F-test, t-test and correlational technique were used for the analysis of data.

The study revealed the following findings:

i. The high creative sub-groups scored significantly higher than the low creative sub-groups on all four dimensions of creativity on the Minnesota Tests of Creative Thinking.

ii. A comparison of the high creative males with the low creative males elicited significant differences between group I.Q. means. Mean performance of the high creative females and the low creative females also revealed significant difference between group. A positive but not significant 'r' of 0.102 was recorded between the scores of Jalota's group Test of General Mental Ability and the Minnesota Tests of Creative Thinking. In the case of the low creative r was -.123 which was not significant.

iii. The high creative students record significantly higher than the low creative ones with respect to academic achievement.
iv. The high creative subjects exhibited greater achievement, autonomy, dominance, change and endurance than the low creative subjects.

v. The high creative females were higher in change and endurance than the high creative males, but the latter were higher in heteroseculuality.

vi. The high creative females were significantly higher than the low creative females on achievement, autonomy, dominance, change and endurance, but the latter were characterised by difference order, affiliation, succorance and heteroseculuality traits.

vii. The high creative males showed greater achievement, autonomy, dominance, change, endurance and aggression than the low creative males.

viii. The low creative males exhibited greater difference and heteroseculuality.

ix. The low creative females scored significantly higher than the low creative males on achievements, dominance, change and endurance.

x. The low creative group manifested significantly great anxiety than the high creative group.

xi. A comparison of high creative males with the low creative males elicited significant differences.
xii. In both the cases it was the low creative who manifested anxiety.


The objectives of the investigation were:

1. to construct and standardized a test of creativity,
2. to establish the reliability and validity and norms of the test of creativity;
3. to study the relationship between creativity and sex intelligence and achievement of students and
4. to study the relationship of creativity with educational, recreational social and vocational aims of the students.

The samples were drawn at different stages in accordance with their purpose. The preliminary draft of the creativity test was administered to 370 students of various secondary schools of South Gujarat. The final form of the test was administered to 960 students drawn from various standards VIII to XI of secondary schools of Surat, Valsad, Bharuch and Dangs Districts. Reliability of test was established by test-retest method, split-half method and validity by internal consistency of the items, factorial validation and validation against teacher's rating, Passi's and Mehdi's tests of creativity.

The major outcomes and findings of the study were as follows:

i. The investigation resulted in a battery of tests of creativity consisting of two tasks verbal (12 items), and nonverbal (4 items).

ii. Factor-wise test-retest reliability coefficient of correlation ranged between 0.68 and 0.89.

iii. The coefficient of correlation between the test and Passi's test was found to be 0.77 and factor-wise coefficients ranged between 0.62 and 0.82.

iv. Factor-wise validity was also found out the coefficients of correlation were found to be ranging between 0.72 and 0.91 for the urban sample and between 0.69 and 0.52 for the rural sample.

v. The coefficients of correlation between creativity and intelligence and achievement were not statistically significant.

vi. The urban boys scored significantly higher mean creativity score than their counterparts in the rural areas and the urban girls scored significantly higher mean creativity score than their counterparts in the rural areas.
The objectives of the investigation were:

i. to study the relationship between the creative factors (Fluency, Flexibility, Originality, and Elaboration) and Socio-economic status of students;

ii. to study the incidence of creativity and compare its pattern among rural and urban students;

iv. to make longitudinal study of creativity and find out its relationship with various levels of formal education.

The population of the investigation constituted students of both sexes from Class VIII and X of government high schools and from intermediate colleges of Kumaun division. The sample was selected from twenty-five institutions on the basis of the stratified random sampling technique comprising

25. R.C. Pandey. A Study of Creativity as Related to Rural-Urban Background, Sex, S.E.S. and formal education (with special reference to the high school student of Kumaun Division) Ph.D. Psychology, Kumaun University, 1981.
400 students of Class VIII rural boys (RB=60) Rural Girls (RG=30) Urban Boys (UB=46) Urban Girls (UG=50) and class X (RB=75, RU=50, UB=39, UG=50) students were classified into high SES and low SES groups with the help of median point of their income distribution. The data were analysed by calculating mean, SD, critical ratio test and correlation. A socio-economic scale and a creativity test were used to collect data.

The main findings of the study were:

1. Though creativity and socio-economic status were not related, a positive trend was noted in the case of the upper socio-economic. The various factors of creativity were also not related with SES.

2. There was no significant difference between the mean creativity scores of the boys and girls.

3. In class VIII students, there was no significant sex difference on creativity scores. Similarly among Class X no sex difference appeared in respect of the various factors of creativity except elaboration.

4. There was evidence of significant difference between the mean creativity scores of the samples of rural and urban students (except fluency and flexibility).
5. Significant difference was also identified between UB and RB as well as between UG and RG students of classes VIII and X when compared on their mean creativity scores.

6. In general the urban student's scored higher than their counterparts.

*Study 12: Mishra A. Construction and Standardization of Test of Creativity.*

The study attempted to develop an accurate test of creativity both verbal and non-verbal forms and standardize it on the students of Grades VIII and IX. The test was constructed on the lines of Guilford's scheme of classification of cognitive abilities and measure factors viz., fluency, flexibility, originality and elaborations. An attempt was also made to validate the test with intelligence in order to see whether any relationship existed between them. The hypotheses formulated were:

1. The distribution of the scores of creativity based on the creativity measures was normal for the total sample of the study.

ii. Low relationship existed between creativity and intelligence.

iii. There existed a significant difference between the high and low individuals in the degree of extroversion measured through E scale of MPI.

iv. The high creative individuals had a higher score on introversion and a low score on extroversion.

The verbal test of creativity was planned to include four sub-tests viz., unusual uses, consequences test, product improvement and the similarity test. Non verbal activities as picture construction, picture object synthesis and picture completion were included and were measured for factors like fluency, flexibility, originality and elaboration. For the tryout 100 sub-tests of both the sexes studying in Stds. VIII and IX were chosen from the government school of Jodhpur in order to accomplish the objective of finding out discrimination power and internal consistency of each of the items of both the items of both the verbal and the non-verbal tests. However for the entire study a sample of 496 students of Stds. VIII and IX of both the sexes studying in government school of Jodhpur was taken. The age of the subjects ranged from 12.5 to 15.6 years. The extent of accuracy and the appropriateness of items to the behaviour domain were determined on the basis of the judgement of the experts having conceptual clarifications of the trait components to be measured. The discrimination
power and internal consistency of each item in the test were found out. Test-retest reliability coefficients of the factor scores and total creativity scores for both the verbal and the non-verbal tests were found to be considerably high ranging from 0.64 to 0.92 which were significant at 0.01 level. Reliability coefficients for both the verbal and the non-verbal tests were found to be ranging from 0.63 to 0.92 which were significant at 0.01 level. The validity coefficient between both the verbal and the non-verbal tests and the test of creative thinking developed by Baquer Mehdí were found to range from 0.32 to .77. The factorial validity coefficients for the verbal and the non-verbal tests were found to be ranging from 0.30 to 0.89. Norms, percentile rank values and t-scores were also established.

Study 13 : Dharmangadan M.A. Creativity in School Children : An Analytical Study. The study was intended:

1. To adopt the Torrance test of creative thinking for use with school children in Kerala and

2. to determine the relationship between creativity and intelligence temperament motivation and certain selected environmental factors.

The tests used in addition to the Torrance Test of Creative Thinking (TTCT) were the Standard Progressive Matrices Test of General Mental Ability (Verbal Form A), Personality Inventory (George, Mathew and Nair), Inventory of Motivational Traits (George and Mathew) and Personal Data Blank. The Torrance Test of Creative Thinking (TTCT) was first tried out on a small sample of thirty-six and then standardized on a small sample of thirty-six and then standardized on a second sample of 300 secondary school pupils. The relationship studies were done on a third sample of 631 secondary school pupils. The statistical technique used included the calculation of means and SD and testing the significance of difference between means, calculation of difference between means, calculation of product moment coefficients of correlation and partial correlation of three-way analysis of variance and co-variance.

The results of the study were as follows:

I. On the basis of the findings of the study the Torrance Test of Creative Thinking was adopted for secondary school pupils of Kerala by making the necessary changes in content and instruction for taking the test. A new scoring guide was also prepared.

ii. The inter-measure correlation values obtained between the eight measures of the tests justified the use of composite scores but the correlation values obtained between the two forms of the test figure and verbal.
however did not suggest their reduction to a single score.

iii. Sex, age and location differences were seen in the performance of the sample but the interaction between the variables had no effect on the performance.

iv. Moderately high reliability coefficients were obtained for the whole test with the reliability of the figural part being higher than the verbal part.

v. The validity of the test, established by correlation of the performance of the sample with three independently chosen highly creative groups was found to be adequate for the use of the test for research purposes.

vi. Intelligence, both verbal and non-verbal was found to correlate highly with creativity and sex differences were significant. Intelligence was therefore partialled out in all further analysis which was done separately for boys and girls.

vii. None of the temperament traits and motivational traits showed any consistent relationship with creativity when intelligence was partialled out.

viii. The relationship between the different components of the SES index and creativity indicates a differential pattern.
ix. The birth order had significant relationship with verbal creativity only.

x. The family size showed only weak relationship with creativity.

xi. The relationship of the components of study habits and reading habits to creativity indicated a differential pattern.

xii. Extra curricular activities showed no relationship to creativity when quantified in two ways except for girls who exhibited leadership qualities.

xiii. Economic aspirations and educational aspirations were related to creativity for girls.

xiv. Vocational aspiration was related to figural creativity for girls only.

xv. Girls who chose unconventional vocations were found to be highly creative.

Study 14: Vora I.A.  A Study of Creative Thinking Ability as a Function of Intelligence, Parental Behaviour and Radicalism.

The objectives of the study were:

1. to study the main effect of intelligence on creative thinking ability;

2. to study the parental behaviour on creative thinking ability;

3. to study the main effect of radicalism on creative thinking ability;

4. to study the interaction effects of pairs between intelligence and parental behaviour, intelligence and radicalism;

5. to study the interaction effects among the three independent variables intelligence, parental behaviour and radicalism on creative thinking ability.

The sample consisted of 170 students of standard VII comprising both sexes of semi urban schools. The tools used were:


2. J.Z. Patel's General Ability Test was used for intelligence.

3. CRPBI revised by Saxena was used for parental behaviour and
iv. A.S. Patel's Test was used for Radicalism scale. The design employed was 2x2x2 Factorial Design.

The main findings of the study were:

i. Radicalism is highly significant. Persons with this trait of personality have high C.T.A.

ii. Parental behaviour scores to be totally ineffective. The main effect of intelligence is also ineffective to certain extent.

iii. The interaction effect of the first order and second order are also not significant.

Study 15: I.A. Vora A Study of Creative Thinking Ability as a Function of Achievement, General Ability and Neuroticism.

The main objectives of the study were:

i. to study the main effect of achievement on creative thinking ability.

ii. to study the main effect of general ability on C.T.A.

iii. to study the main effect of Neuroticism on C.T.A.

iv. to study the Interactive effects of between the pairs of achievement, general ability, and neuroticism on C.T.A. and

v. to study the interaction effects among achievement, general ability and neuroticism.

The sample consisted of 150 students of standard VII consisting students of both sexes belonging to a semi urban area schools. The tools used were:

II. Prayag Mehta's Thematic Apperception Tests (T.A.T.)
III. J.Z. Patel's General Ability Test to find the general ability and
IV. A.S. Patel's Test was used to measure neuroticism.

The main findings were:

I. People with high level of achievement could also be of high level of creative potential.
II. The effect of general ability on C.T.A. is ineffective.
III. Persons having high level neuroticism are less creative, and
IV. The interaction effects of the first and second order are totally insignificant.

3.4.0 RELATED STUDIES

3.4.1 SCHOLASTIC ACHIEVEMENT AND C.T.A.

This is an important correlate of creativity. It has importance from the practising teacher's point of view as it is
a belief of the teachers that high achievers are high intellect and high creatives also. But Getzels Jackson\textsuperscript{30} study (1959, 62) that high creative students and finds that they did not differ on measures of scholastic achievement. Torrance\textsuperscript{31} did not find any significant difference in the academic achievement of highly creative and highly intelligent students. (Torrance, 1960, Yamamoto (1964)\textsuperscript{32} concluded from his study that there is a distinct relationship between creative ability and success in school learning. Passi\textsuperscript{33} (1972) observed the low relationship between creativity and achievement. Thurstone\textsuperscript{34} (1953) had given variety of reasons why creativity and achievement may not be related. On the contrary, he hinted at the possibility of detrimental effect of creativity on scholastic achievement. Some of the Indian studies failed to find significant relationship between

\begin{itemize}
\item K. Yamamoto. The Role of Creative Thinking and Intelligence in High School Achievement. Psychological Reports (Vol. 14) 783-89.
\item B.K.Passi. op. cit.
\item L.L.Thurstone. "A Psychological Discusses the Mechanism of Thinking". In the nature of Creative Thinking, New York : Industrial Relations Institute, 1953.
\end{itemize}
creativity and achievement. (Pathak\textsuperscript{35}, 1955, Parmesh\textsuperscript{36}, 1973, Sandhu\textsuperscript{37}, 1979).

3.4.2 C.T.A. AND SEX

To understand relationship between creativity and sex has been very important from the point of society. As in recent age both the sexes go shoulder to shoulder to share all the social responsibilities. There are three contradictory trends observed.

- Males are higher in creative thinking.

There are several reports supporting the superiority of male in creative thinking. Kelly\textsuperscript{38} (1965) and Middents (1968) observed males scoring higher than females on non-verbal creativity measures in their samples of schools and college students respect-

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-ively. Strauss and Strauss\textsuperscript{39} observed boys were significantly more highly creative than girls in American and Indian students populations. They further find that the gaps were wider in Indians than Americans, probably that may be due to the degree of cultural and social uplift in America.

Raina and Prakash both with independent data collected from different parts of the country found that boys excelled girls on practically all of the verbal creativity tests. They further observed that the Indian girls face many restrictions in family and society and find no opportunity for free expression of their ideas and views.

The above findings have shown that boys are more creative than girls.

\textbf{FEMALES HIGH IN CREATIVITY}

There is another group of researchers who conducted superiority of Females Yamamoto (1960) found that girls were high on creativity than boys Razik observed the females outstanding males in their creative ability on four out of six tests of creativity. The sample included the students from College of Education, Agriculture, Engineering and Applied Arts. Another study was conducted by Goyal (1973) on Indian sample of teachers

training college students and found girls markedly superior on verbal fluency and flexibility than boys as measured with Torrance Test of creative thinking.

SIMILARITY OF SEXES

Above studies were either in favour of male or in favour of female. Several investigations involving samples ranging from elementary school children through high school to college students have indicated that there are no sex differences in creativity.

Hussain and Hussain\textsuperscript{40} did not find significant differences with respect to fluency, flexibility and elaboration between the means of both male and female school children. Most of the adult studies have failed to locate any sex difference. Goyal\textsuperscript{41} (1973) studying 200 male and 300 female in B. Ed. students drawn from different training college employing both verbal and non-verbal Torrance Tests of creative thinking could not find any difference on non-verbal factors of creativity and verbal originality. Raina\textsuperscript{42} observed no sex difference in creative thinking.

\textsuperscript{40} M. Hussain and Hussain, Q. Cultural Roles, sex difference and Creativity, Educational Trends 1975. 10-2. 141-45.


Most of the studies referred to above on the topic make it clear that there are diverse findings with regard to the sex difference in creativity.

3.4.3 C.T.A. AND PERSONALITY VARIANCES

After reviewing available literature it can be said that research in the area of creativity and personality is still in infancy in India. Raina M.K. in his research work observed that the high creative students exhibited greater achievement, autonomy, dominance, change and endurance than the low creative subjects.

Goyal studied personality traits of creative children at the middle school stage of Patiala using his C.T.A. test. He concluded that the creative pupils at the middle school stage possessed a higher level of energy, they were more introverts and more independent in both thought and action, had open minds, could tolerate ambiguity and entertained opposing values.

Recently Parmesh conducted the study employing Wallach-Kogan tests for creativity measurements and he concluded that the

43. Raina M.K. Ibid.
the high creative individuals are neither significantly more or less introverted than the low creative individuals. The high creative individuals are not significantly different from the low creative individuals in the level of anxiety and neuroticism. The high creatives are significantly high in ego-strength than the low creative individuals. The high creative differed significantly from the low creative on theoretical and aesthetic values.