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A PEEP INTO THE PAST

3.1 Introduction

For better understanding of study, it is necessary to review past work done, related to the study undertaken. The review helps to understand the research design of the problem on hand. At the same time it also acquaints the investigator with the limitations of the tools and procedure used by the past researchers as well as problems faced by them in carrying out the researches.

A peep into the past often avoids the risk of duplication of work that has already been accomplished by previous researchers. The review of past related literature provides theories, explanations and hypotheses available in formulating the problem, suggests, approaches, methods, tools and techniques appropriate to the problem, and locates data useful to the interpretation of the results and contributes to the general scholarship of the researchers.

With such understanding the present investigator tried to review the past work done on intelligence, Anxiety and need for achievement with special reference to its dependent variable.

For the sake of convenience, the review is divided into two broad groups namely the researches done in foreign countries and those done in India. They are described in the following paragraphs.

3.2 Researches done in Foreign Countries
3.2.1 Researches done on intelligence

The researches in the Foreign countries are legion. This suggests that they are particularly conscious of the levels in conceptual understanding in Mathematics and Intelligence of the pupils. This also suggests that they are concise of searching new devices to measure conceptual understanding in mathematics of the conceptual understanding material and Intelligence of pupils.

3.2.1.1 Study - 1

A comparative study of selected measure of Intelligence as predictors of First-Grade reading achievement in a culturally disadvantaged population by J.C. Hall (J.C. Hall, Ed.D., Temple Uni, 1969)

Purpose of the study

The question which this study endeavored to answer is what relationship exists between intelligence and achievement in reading specifically, among culturally disadvantaged Negro first graders. The significance of the study lay in its determination of the predictive validity of three well known, brief intelligence tests which minimize the need for verbalization.

Sample of the study

This investigation was carried out by using a sample of 46 Negro children between the ages of 5-8 and 7-3. These 46 first graders, all of whom had kindergarten experience, were drawn from an urban school district and could best be described as lower-class children. This sample was randomly drawn from 11 first grade classes in the two schools, which participated in this study of the 46 students 23 were boys and 23 were girls.
Procedure of the study

At the beginning of first grade, the Peabody picture Vocabulary Test, the Goodenough Haris Drawing Test, and Revised Visual Retention Test were administered to these 46 pupils. At the end of first grade three measures of reading achievement, the Informal Reading Inventory, the Daniels Word Recognition List, and the Stanford Achievement Test were administered to these same pupils. These three reading achievement tests yielded seven reading scores.

Analysis of the collected data included correlation of all variables, comparison of the difference between selected correlations and a multiple linear regression analysis through a step wise regression program.

Results and conclusions of the study

In term of the first hypothesis the correlations obtained between chronological age and the raw scores on the measures of intellectual functioning were insignificant, in fact, the correlations were practically negligible. This finding seems to be due to the restricted age range of the subjects who participated in this study.

As far as the second hypothesis is concerned, when the PPVT was correlated with the seven measures of reading achievement all of the correlations which were obtained were significant when the GHDT was correlated with the seven measures of reading achievement only the word recognition score of the IRI and the word study skills subtest score of the SAT showed a significant
relationship with the seven measures of reading achievement, in only two cases did these measures of intellectual functioning.

A test of the third hypothesis indicated that the difference between the correlations obtained between each measure of intellectual functioning and achievement in reading were not significantly different from each other.

A test of the fourth hypothesis revealed the fact that with exception of two measures of reading achievement the several measures of intellectual functioning combined correlated more highly with achievement in reading than any single measure. In summary, adding the several predictions by step-wise regression techniques increase significantly the correlation with reading. The R's are in the mid 50's except for that R with comprehension on the IRI which is in the mid 60's. These date show that between 25 and 36 percent of the variation in reading achievement scores may be explained by the verbally desaturated mental tests of these tests. The PPVT and the RVRT appear to be the most prominent contributors.

3.2.1.2 Study 2

A study of the Relationships Among Measures of Productive Thinking, Intelligence and Ninth-Grade Achievement - By J.E.Bowers² (J.E.Bowers, Ph.D., Uni.of Minnesota, 1966)

Purpose of the Study

The major purpose of this study was to examine relationships among measures of school achievement, intelligence and creative
thinking, and especially to test for interactive effects of intelligence and creativity upon academic performance. Torrance suggested that the findings of Getzels and Jackson, who showed equally superior mean achievement for highly intelligent and highly creative pupils, resulted because IQ is a threshold variable, that is a measure which determines performance below a critical threshold IQ value, but not above where other kinds of talent, notably creative ability, may become valid predictors of school success. This study also tested for sex differences in the prediction of ninth-grade achievement from creativity and IQ scores, examined the factor structure of the creativity measures compared the utility of IQ and creativity measures for predicting achievement at low IQ as well as high IQ levels, and tested whether the response set acquiescence relates to creativity.

**Tools of the Study**

Otis IQ estimates, percentile ranks on the IOWA tests of Educational Development and academic grades were obtained from school records.

**Procedure of the Study**

Two achievement criteria studied were ITED Composite percentile rank and ninth grade academic grade average. Mean IQ for the total group was 104, mean percentile rank score on the ITED Composite Scale was 59.

The experimental measures yielded seven task specific factors. Ten productivity measures were then developed for further analysis.

**Conclusion of the Study**

Both ITED score and academic grade correlated higher with IQ.
and productivity within the female group than within the male group for both sexes, ITED score was more predictable than academic grade because of sex differences in the means of the variables and the regression of academic grade on the predictors, males and females were treated separately.

A linearly weighted combination of the ten productivity measures was as effective as IQ for predicting academic grade. IQ was superior for the prediction of ITED score.

Three factor scores were estimated for each sex from the ten productivity measures. The first factor score, representing fluency, was the most valid predictor of achievement. Regression equations predicting achievement from IQ three productivity factor scores, and three moderator variables (interactive terms formed by multiplying each pupil's three productivity factor scores by his IQ) were superior to equations predicting the academic grades of males. The moderator equation showed that the regression of achievement on IQ decreased as productivity level increased; similarly the regression of achievement on productivity are both threshold variables. The effect may occur as a result of low achievement ceiling. Since standardized Tests and academic grade discriminate best at moderate rather than high ranges of talent. It may also depend upon the IQ level of the population studied, since "Curve grading" may affect the ceiling of the distribution.

Although productivity was shown to be a valid achievement predictor, much work needs to be done to standardize productive
thinking tasks. Consistent testing and scoring procedures and normative information must be developed before measures of productivity can be usefully applied in the classroom to supplement IQ as a measure of academic aptitude.

3.2.1.3 Study: 3

An investigation of the relationship among birth order intelligence, sex, biorhythm and academic achievement " By L.N.Iles (L.N.Iles, Ed.D.Loyola Uni, of Chicago, 1981)

Purpose of the study

The overall purpose of this study was to investigate the relationship among biorhythm cycle, sex, birth order, intelligence and academic achievement.

Sample of the study

Overall, seven hundred and thirty six lower socio-economic elementary school age students participated in this exploratory, correlational study. Five hundred and sixty student were randomly assigned to the original group sample, and one hundred seventy six lower socio-economic subjects were randomly assigned to the follow-up sample. The follow-up sampling procedure was employed to validate the findings from the original investigation.

Procedure of the study

Twelve null hypotheses were systematically examined in this study. Utilizing a step-wise multiple regression procedure, three of the four independent variables (birth order, sex, and
intelligence) were statistically related to the three levels of scholastic achievement measured by the Wide Range Achievement Test (regarding, spelling and arithmetic achievement).

Inconsistent findings concerning relationships were accounted for with an explanation concerning the heterogeneity of the sampling distribution with regard to level of power (Sampling size 560 for original group and 176 for follow-up) and the age variable.

Ten of the twelve null hypotheses under investigation were consistently rejected by findings rendered when tested against the original group sample. In both the original and follow-up studies, significant correlational relationship were established between the bio-cycles and spelling achievement scores; intelligence and reading achievement scores, and intelligence and arithmetic scores.

Findings of the Study

Findings related to the biorhythm variables lend some support to research in the area of biorhythm and rote task performance. However, no evidence was generated to support an overall relationship between the bicycles and educational achievement. This finding corresponds with the majority of limited citings in the literature relating biorhythm cycles and scholastic achievement. The age variable was found to be the most influential in its contribution or influence on the magnitude of change in the achievement scores.
Findings on the effect of ordinal position within the families (birth order) were minimal and as conflictual as the research cited to date.

3.2.2 Research Done on Anxiety

3.2.2.1 Study 4


Purpose of the Study

The purpose of the experiment was to determine if the insight oriented and systematic desensitization counseling methods would have different effects on the members of the study groups.

Sample of the Study

Subjects for this study were forty five students randomly selected from a class of ninety-five beginning data processing students enrolled of Monetary Peninsula college during the Fall semester, 1968.

Procedure of the study

All students were administered the Aikem Attitude toward mathematics scale as a pretest. During the semester, students demonstrating an anxiety toward mathematics were randomly assigned to experimental treatment groups each consisting of fifteen subjects one group was assigned to a counselor for
insight oriented counseling. The second group was assigned to a counselor for insight oriented counseling. The second group was assigned to another counselor for the systematic desensitization treatment and the third group served as the control with no counseling treatment.

After attending five counseling sessions the students were given the Aiken scale once more as a posttest. Difference scores were calculated by subtracting the posttest score from the pretest score. The difference scores were analyzed by using the Kruskal Wallis One Way analysis of variance by Ranks, a nonparametric statistical technique, to determine if a significant difference existed in the treatments. Further analysis included studying the differences in pairs of treatments. This was accomplished by subjecting the data to the Mann Whitney U Test. Differences were tested at the .05 level of significance.

Findings and Conclusions of the study

Findings of the statistical analysis led to the following conclusions:
1. No difference existed among the three experimental groups.
2. No difference existed among the pairs of treatments
3. The desensitization method appears to be a somewhat stronger procedure in reducing mathemaphobia predicated upon the number of positive gains achieved on the post test. These data however, maybe due to chance fluctuation in the sampling.

3.2.2.2 Study 5
The effects of certain Anxiety-Producing Techniques on Achievement Testing and motivation in High school Geometry classes By E.C.Beavers (E.C.Beavers, Ph.D, Oklahoma Uni., 1970)

Purpose of the Study

This was a study of the effects of anxiety types on achievement scores under two stress treatments. The study consisted of the administration of a standardized geometry test while studying not only sex differences but also reactions to test-taking situations, anxiety-arousal and normal testing conditions. The differential reactions of facilitators, debilitators, high affected, and low affecteds were determined.

Sample of the study

The subjects were eighty sophomore geometry students enrolled in a middle sized urban school.

Procedure of the Study

Each was then randomly assigned to one of the two treatments identification of the four personality types. The dependent variable was the score obtained on the geometry test. Both groups had the same test forms, the same class room and the same time period with the manipulative variable being the differential behaviour of the examiner to create the arousal of anxiety in the experimental group and to maintain the usual test-taking atmosphere in the control group.

The scores on the achievement test were then subjected to a four by two by two analysis if variance (anxiety types by sex by treatments). The three analyses produced statistically significant main effects: sex types and treatments. However, there were no significant interactions, either two way or three way. The question of why the low affected were shocked enough to
suffer lower scores in the experimental group can be answered theoretically by considering the general panic that followed instructions about lack of sufficient important to plan desensitization procedure immediately following the anxiety treatment (as was done in this study).

Conclusions of the study:

Major conclusions of this study are that differential reactions to test-taking anxiety do have a significant effect on achievement test performance that there were over-all statistically significant sex differences in performance (the boys scored consistently higher in every group comparison except between debilitors in the control group) and that high anxiety provocation significantly lowers scores for all four personality types. However, facilitators' mean scores were significantly higher for both experimental and control groups than the other types' mean scores (Disregarding sex). When scores were ranked highest to lowest in each type category, the scores in the control group (normal test-taking) were consistently and significantly higher than those in the experimental group.

3.2.2.3 Study: 6


Purpose of the Study

The purpose of this study was to investigate anxiety and
hostility perception as concomitants of test performance.

Sample & Tools of the Study

The sample of subjects for the study was drawn from the entire population of male freshman at Northwest Nazarene college. Only those students were excluded who failed to meet the following criteria.

1. First year freshmen
2. Age between 17 and 20
3. Not married
4. Completion of college placement exams including American College Test Scores (ACT)
5. United States born citizen
6. Scores on the TAQ failing in the upper or lower third of the distribution
7. High anxiety or low anxiety subjects having scores in the upper or lower third of the Hafner-Kaplan TAT hostility scale distribution

Procedure of the study

High and low anxiety subjects were defined as those with scores failing in the upper and lower third of the test Anxiety Questionnaire (TAQ) distribution. Their corresponding hostility levels on the Thematic Apperception Test (TAT) were determined independently by each of three criterion judges using the Hafner Kaplan TAT. These three criterion scores several as the final hostility score for each subject.

Those subjects with TAT scores failing in the upper and lower third of the Hafner-kaplan TAT hostility scale distribution constituted the final sample for this study.
After the selection of subjects on the basis of their anxiety and hostilities scores they were assigned to their appropriate anxiety-hostility level cells. Half of those subjects in each cell then were randomly drawn to become the control group; the other students were assigned to the experimental group. Both the experimental and control groups were given the class period version of the quantitative sub-test of the Iowa Test of Educational Development (ITED). The experimental group was given cues suggesting critical evaluation by school authority and the importance of their performance was emphasized. The control group was given standardized instructions with an emphasis on establishing rapport between the subject and the test administrator.

Separate hostility scale distributions were constructed for the high and low anxiety subjects and a test for the significance of difference between hostility means was conducted.

The experimental and control group data were subjected to analysis of covariance in order to make appropriate adjustments in the criteria means. American college Test (ACT) math standard scores (x), already on file in the college, were used as a control for the criterion ITED standard scores (y).

The analysis of covariance in this study involved the use of a three factor design to determine the effects of three variables in combination with each other for each of the eight separate groups.
Results of the study:

For those entering Male freshmen at Northwest Nazarene College in the full term of 1967-68 who were selected as subjects of the study on the basis of anxiety and hostility scores, there was no evidence of a significant difference between hostility scores made by high and low anxiety subjects on the Hafner-Kaplan TAT Hostility scale.

Moreover, the analysis of covariance indicated that there was no evidence of a significant difference between means mode by the eight groups on the ITED involving the variables high versus low-anxiety, high versus low hostility, and threat-versus non threat.

3.2.3 Research done on N-Ach

3.2.3.1 Study - 7

The Relationship Between Student Achievement Motivation and student Attributions for Examination Performance By K.Robert. 7 (Kovacs Robert Ph.D., Temple Uni., 1981)

Purpose of the Study

This study explored a variety of causes given by students to explain their own academic successes or failures. Previous research has shown that these casual explanations (or attributions) vary as a function of the subjects level of achievement motivation and the outcome experienced by subjects on
experimental tasks (Bar-Tal, 1978). The major focus of the present study was to determine whether student attributions about course examination performance are correlated with student achievement motivation.

The purpose of this study was to determine whether, using actual exam grades earned by the subjects and an expanded list of casual factors, a similar pattern of all attributional preferences would be obtained for a naturalistic academic experiences.

**Sample of the study**

Exam related attributions of 138 community college students were assessed with the Grade Attributions Questionnaire (GAQ) a 32 item 5 point rating scale that was constructed for this study.

**Procedure of the Study**

The items of GAQ can be classified according to the locus of stability dimensions of causality GAQ items covered key causal factors that are relevant to academic achievement (e.g. student's study and exam taking skills instructor effectiveness etc.) In addition to being asked to indicate "how important" each item was in determining their exam grades, students were also required to indicate "how much" of that item (e.g. effort) was characteristic of them. Thus, students provided a total of 16 attributional ("how important") responses and 16 matching informational ("how much") responses.

Four student "types" were identified on the basis of their level of achievement motivation (median split on Mehrabian scores) and exam grades (A or B Vs D or F): high n-Ach - high grade, high
n-Ach - low grade, low n-Ach-high grade, and low n-Ach - low grade.

Conclusions and Results of the study

Planned comparisons revealed that with exception of the low n-Ach-low grade student who showed a non significant preference in the predicted direction. Students significantly preferred internal over external attributions to account for both success and failure. However, the results did not reveal any preference by any student type on the stability dimension of causality. Thus, the findings of this study support Weiner's attributional model only insofar as the locus dimension is concerned.

Turning to exploratory issues, this study found several sex related differences in the ratings of informational items. Families rated their comprehension of the material, study skills, and effort higher than males.

This study also showed that exam grades account for most of the variance in the ratings of informational items. Higher grades were associated with higher perceived levels of comprehension academic skills and study effort.

3.2.3.2 Study - 8


Purpose of the study
The investigator studied adolescents of different races, socio economic backgrounds and sexes, and attempted to identify the components by which they arrive at their self-evaluations. The study attempted to assess specifically whether adolescents of varying backgrounds differ in their comparative levels of general and area-specific (i.e. school, home and peer) achievement motivation. It also investigated the question of whether adolescents are capable of maintaining differing levels of achievement motivation across the different areas of experience, and whether the capacity to do so varied with the race, socio economic status, and sex of the subjects.

Sample of the study

The study used a representative sample of 310 eight graders in the Champaign, Illinois, school system. Eight graders were chosen because they are believed to be old enough to understand the questions asked.

Procedure of the study

The data was analysed through the use of correlation, Analysis of variance, Factor Analysis and Multiple Regression Programs, in an attempt to identify group similarities and differences.

Findings of the study

The findings of the study indicated that there were significant differences on general measures of achievement motivation as well as on the area specific measure. That there were significant differences on EPPS measure by race (Whites higher) Sex (Males
higher) and social class (middle class higher). On the other hand, Castenell's measure reported significant differences by race (Blacks higher) and sex (males higher) only.

The findings also indicated that there were significant differences by race with SES controlled in school and home achievement motivation with Blacks scoring higher than Whites, that poor achievement motivation with Blacks scoring higher than Whites, that peer achievement motivation did vary significantly by race and sex with Blacks and Males, respectively, scoring higher than Whites and females, and that there were significant variation in the degree to which and order in which the area specific achievement motivation across both SES and race lines.

The significance of the study lies in suggesting that race and social class exercise a great influence on specific types of achievement behaviour. That adolescents of varying groups are capable of differentially discriminating across different areas of experience and that such difference may be explained as realistic adaption to historical and institutional factors. Finally, the significant negative correlation between the scores of Blacks on Castenell's Home measure and EPPS General measure suggests that the high value of collectivity within the black culture in confounded by traditional nations of individualism as being essential to achievement motivation.

3.2.3.3 Study 9

Personality correlates of Need Achievement in Academically Talented Male and Female Adolescents By L.T.Patrick 9 (L.T. Patrick, Ph.D. Masquette Uni., 1982)
Purpose of the Study

The delineation of relationships between selected personality characteristics and n-achievement is a logical area of investigation given the critical importance of motivation in contemporary society. However, little is known in regard to the personality dimensions which are correlates of need achievement. Females in n-achievement research are also a neglected area and females were investigated on an equal basis with males in this study.

Sample of the study

The subjects were seventy male and seventy six females adolescents. These students were enrolled in accelerated or Group -1 Sophomore, Junior, and Senior classes at Dwight D. Eisenhower High School in New Berlin Wisconsin. All of these students possessed grade point averages above 3.0 on a 4.0 scale.

Procedure of the study

To determine the relationships between the predictor variables and the criterion, the statistical procedures of stepwise multiple regression and double cross-validation were utilized. Ferguson's (1971) procedure for evaluating the significance of differences between correlation coefficients was employed along with the chisquare technique for determining if a relationship exists between the criteria of sex and need achievement. Supplementary analyses were also carried out utilizing factor-analytic procedures and the student's t-test.
Results of the study

The multiple regression analyses produced statistically significant R'S (P<.05) for the aggregate or combined population and the male and the female subsamples. However, the male regression statistics were found to be unstable. The factor analytic procedures suggested differences between the personality characteristics of need achievement for males and females. The results of the Chi-square technique and the student's t-test were not significant.

3.2.4 Researches done on Mathematical Concept and Mathematical Achievement

Many researches have been conducted on subject achievement. Mathematics is a core subject of secondary education. Some researchers have conducted researches on Mathematical concept and mathematical achievement and their correlation with some aspects (e.g. intelligence, personality, sex and SES etc.). The relevant studies of the foreign Researchers would now be presented.

3.2.4.1 Study 10

The relationship of Non-School Factors to Achievement in Reading and Mathematics By C.R. John (C.R. John, Ph.D., The Uni. of Michigan, 1981)
Purpose of the study

The purpose of this study was to investigate relationship between the non-school factors with achievement in reading and mathematics.

Sample:

The study sample consisted of 286 students enrolled in grades two through six. The sample was also partitioned into the following sub groups: boys and girls; students in the top and bottom ten percent levels of achievement; Students who have and have not repeated a grade; and students who like and dislike school.

Conclusions of the Study

1. Absentees; a critical mass effect is present in that vocabulary and math scores deteriorate significantly after 32 or more mean absences girls are absent significantly more than boys.

2. Family structure; Virtually no significant differences in achievement between groups from two parent and mother-only families.

3. Parent's Education; There are significant differences in reading and vocabulary favoring students with having one or more
years of college in the following groups; total sample, boys, non-repeaters, and students who like school. There are significant differences in vocabulary between the following groups who are, and are not from fathers with one or more years of college, boys and students who like school. Mother's education appears to be more significantly related to achievement than is father's education.

4) Residential Mobility; There are no significant differences in percentile achievement between any student groups with zero one and two or more school moves. There is a tendency for report card grades to decrease slightly as mobility increases. There are significant difference in report card grades for; the total sample; boys and students who like school.

5) Self concept; The top ten percent achievers (in mathematics) had significantly higher self concepts than the bottom ten percent achievers and the students who like school had significantly higher self concepts than the students who dislike school. There are moderate but significant correlations between self concept and achievement for the following groups; total sample: boys; non repeaters; and students who like school.

3.2.4.2 Study :11


Purpose of the Study
The purpose of this study was to research the effects of a specific instructional model called the Essential Elements of Instruction Model, which is often referred to as EEI, and its effect on mathematics achievement in elementary school grades.

Tools of the study:
The tools used were, Bloom's Mastery Learning Models, the Beginning Teacher Evaluation Study's Academic Learning Time Model and Rosenshine's Direct instruction Model.

Conclusions of the study:
(1) The EEI Model significantly affects scores on mathematics computation skills, mathematics application skills, and total mathematics achievement.

(2) Students from grades three, four and six treated with the EEI model achieve significantly higher scores in mathematics computation skills, mathematics application skills, and total mathematics achievement.

(3) Students from grades three, four and six treated with the EEI Model achieve significantly higher scores in mathematics application skills;

(4) Male and female students treated with the EEI Model achieve equally in mathematics computation skills, mathematics application skills and total mathematics achievement.
3.2.4.3 Study: A study of the sixth grade teacher's perceptions regarding selected mathematical concepts by D.R. O'Neil. (D.R. O'Neil, Ph.D. The Uni. of Iowa, 1971)

Purpose of the Study:

This study was concerned with sixth grade mathematics teachers and their perceptions regarding specific areas of sixth grade mathematical content indentified by student performance objectives. Initially, relationships among selected demographic variables were investigated.

Procedure:

The content strands chosen were, sets - numbers, Numerals, Operations and Properties, Numeration systems, Geometry Measurement, Mathematical sentences and Problem solving, Graphing and Functions and Probability and statistics. As noted above, each strand was analyzed according to teacher perception of mastery, Importance and Time.

Of forty-five comparisons made between pairs of the nine demographic variables, only two were significant at the .01 level. The two significant relationships were between sixth grade enrollment and number of sixth grade mathematics classes taught and between number of undergraduate semester hours of mathematics or mathematics education and sixth grade enrollment.

When the nine demographic variables were compared to the Mastery, Importance and Time variables of each content strand only four relationships significant at the .01 level were
observed. The first of these observed relationships was between the importance placed by teachers on the teaching of concepts of the measurement strand and number of graduate semester hours in mathematics or mathematics education. The third observed relationship was between amount of time spent by teachers on concepts from the Mathematical sentences and problem solving strand and district enrollment. The fourth significant relationship was observed between amount of time spent on concepts from the sets. Numbers - numerals strand and number of graduate semester hours of mathematics or mathematics education.

Conclusion of the Study:

The following general conclusions were drawn from the overall results:

1. Teachers' perceptions of student mastery levels, importance placed on specific content and amount of time spent on specific content were strikingly similar.

2. The responses of all teachers indicated the assignment of a greater degree of importance to traditional content generally was rated very important or important - New content was generally rated important or somewhat important.

3.3 Researches done in India

3.3.1. Researches Done on Intelligence

3.3.1.1 Study : 13

A study of the Relationship between Intelligence, Interest and

Purpose of the Study:
The present investigation aimed at studying the relationship between intelligence, interest and achievement in English and Science of high school students.

Sample of the study:
Standardisation sample for the test of interest in English comprised 1600 students of class X from seventeen institutions. While for the test of interest in science there were 1626 students of the same classes and institutions. Sample for the relationship study consisted of 560 students.

Tools of the study:
Intelligence was measured by the Jalota's Test of Mental Ability and achievement was measured by taking marks obtained in the U.P. Board Examination.

Results of the Study:
Results revealed that:
1. The reliability coefficients calculated by split half and test-retest methods for the test of interest in English were found to vary from 0.66 to 0.80, whereas in case of the test of interest in science, they varied from 0.68 to 0.82.
2. Validity indices for the first test ranged from 0.60 to 0.69, whereas in case of the latter, they varied from 0.66 to 0.70.
3. The relationship between interest and achievement in science (r=0.37) in the present study were not found to be so high that interest could be said to be the major predictor of achievement.
4. The relationship between intelligence and interest in English and that between intelligence and achievement in science were found to be significantly positive.

5. Interest and intelligence were found more or less equally correlated with achievement in English and with that in science.

6. Interest and intelligence were found to be related more with achievement than between each other.

7. The relationship of intelligence with achievement in English and that of intelligence and achievement in science were found nearly to be the same.

8. A combination of intelligence and interest was a better predictor of achievement in English and in science than either interest or intelligence alone.

3.3.1.2 Study: 14

Effects on Intelligence of Birth Order and Sex By H.G. Desai


Objectives of the study:

The objective of the study was to find out whether the future generation would be intellectually superior or inferior as a result of family planning.

Sample and Tools of the Study:
The 1971 study was conducted on a small sample of 383 subjects (223 boys and 160 girls). The subjects were administered Desai Bhatt verbal Intelligence Test and Dhavsar Non-verbal Intelligence Test, both in Gujarati. The first six birth orders were taken into consideration for analysis.

**Findings of the Study:**

The findings were:

1. The third-born boys had the highest verbal I.Q., significantly higher than that of the first-born and the second born boys. The boys in the fourth, fifth and sixth birth orders did not excel the first-born and the second born.

2. The first born and and the second born girls had significantly higher verbal I.Q. than the third-born girls who, infact, had the lowest verbal I.Q. The girls in the fourth, fifth and the second-born.

3. The girls in no birth order excelled the third-born boys, but the first born and that the second born girls excelled the first born and the second born boys in verbal intelligence.

4. The third-born boys tended to have the highest non-verbal I.Q. through they were significantly higher than the second born boys only.

5. The girls in all birth orders had almost similar non-verbal I-Q.
3.3.1.3 Study: A comparative study of self-concept of High and Low Achievement and Intelligence Groups of Students of class Tenth in Urban schools of Bareilly. By K.L.Sharma.


Objectives of the Study:
The main objectives of the study were:

1. To find out the relationship between any two of the four main variables, namely intelligence, socio-economic status (SES), academic achievement and self-concept.

2. To find out the relationship of academic achievement, intelligence, SES and self-concept, namely aspiration, confidence, emotionality, inferiority, physical appearance and the withdrawing tendency in various groups.

3. To find out the inter-correlations among different variables.

4. To examine sex differences in various groups.

5. To predict self-concept on the basis of intelligence, SES and achievement.

6. To predict achievement on the basis of six areas of self-concept in combination with either intelligence or SES factor in the controlled high and low achieving groups.

7. To predict self-concept on the basis of its six areas in high and low achieving groups sex-wise.
Sample of the Study:
The study was conducted on a sample of 1,427 students (690 male and 737 female) of class X whose age ranged from 14 to 18 years.

Findings of the Study:
The findings of the study were:

1. Intelligence showed strongest relationship with achievement but the relationship between intelligence and self-concept was not significant in extreme intelligence groups.

2. SES showed weak positive relationship with intelligence.

3. Students having high intelligence also had high self-concept achievement and SES and students having low intelligence had low self-concept, achievement and SES.

4. Intelligence showed strong relationship with six areas under self-concept and achievement, intelligence made high positive and significant contribution.

5. SES did not show strong relationship with self-concept and other variables. In the low intelligence group it was negatively correlated.

6. Achievement showed highest relationship with intelligence.

7. Self-concept showed high positive and significant relationship with achievement and intelligence.
8. Boys were found to be superior to girls in all areas on self-concept.


Aims of the Study:

The major aim of the study was to clarify the nature of relationship among creativity, intelligence and school achievement and especially to test for interactive effects of intelligence and creativity upon achievement in different school subjects. It also examined the Getzels Jackson Effect besides testing Anderson's ability gradient theory in terms of the existence or otherwise of the maximum and minimum intelligence thresholds.

Samples of the Study:

A random sample of 400 urban pupils (200 boys and 200 girls) drawn from a dozen schools located in Guntur and west Godavari districts of Andhra Pradesh was used in this study.

Tools of the study:

Torrance Test of Creative Thinking (TTCT) both verbal and figural batteries which were translated into Telugu provided the measure of creativity. While Cattell's Culture Fair Intelligence Test (CFTT), Scale 2, Form B provided the measure of
intelligence. Achievement was based on two successive school examination marks in five subjects.

Findings of the Study:

The main findings of the study were:

1. There were no sex differences in intelligence, figural creativity and achievement in Telugu, general science and social studies, significant sex differences in verbal creativity and achievement in English and mathematics were found in favour of girls. The performance of either sex was better on the verbal than on the figural TTCT.

2. The average correlation between intelligence and verbal TTCT \((r=0.21)\) was not only significant but was also higher than that between intelligence and figural TTCT \((r=0.10)\). Those correlations were higher for girls than for boys. Further, the correlations between verbal TTCT and school achievement were as high as those between intelligence and school achievement.

3. The hypotheses of interaction between intelligence and creativity as they affected school achievement were not supported in 34 out of the 35 sets of 7x3 factorial analysis of variance. There was a significant disordinal interaction between intelligence and figural elaboration although no definite trend in their effect on the English language was noticed.

4. The main effects of both intelligence and creativity were significantly in 33 out of the 35 analysis of variance involving
intelligence, verbal and figural creativity measures and school achievement and the form of relationship was such that intelligence and creativity tended to be additive and more or less linear in their effect on school achievement.

5. There was no evidence for the existence of maximum or minimum intelligence thresholds and neither Anderson's ability; gradient theory nor Cicirelli's modification of it was supported.

6. Getzels-Jackson Effect was confirmed by the non-significant difference in achievement between the high intelligence and high verbal creativity groups despite significant differences in their intelligence and verbal creativity. But in the case of the high intelligence and high figural creativity groups the evidence for the Getzels-Jackson Effect was rather weak. The achievement of the high intelligence and high verbal creativity group in different school subjects was significantly higher than that of the high intelligence and high verbal creativity groups.

3.3.2 Research Done on Anxiety

3.3.2.1 Study

A study of Anxiety and Achievement Motivation in Relation to Academic Achievement, Sex and Economic Status by J.P. Gupta.17

(J.P. Gupta, Ph.D. Edu. Luc. Uni. 1978)

Purpose of the study:

The purpose of the investigation was to explore the realms of anxiety and achievement motivation and to find out the relationship between them with respect to six, academic achievement and economic status.
Sample and Tools of the Study:
The sample consisted of 360 students (180 boys and 180 girls) randomly drawn from classes IX and X. Personality Inventory by Dutta was used for the assessment of anxiety and sentence completion Test by Mukherjee was used for the measurement of achievement motivation.

Findings of the Study:
The main findings of the study were:
1. The low anxiety group had higher mean achievement motivation than the high anxiety group but the differences were not statistically significant.
2. Girls were significantly more anxious than boys.
3. Boys were more achievement motivated than girls.
4. In the case of boys there was negative relationship between anxiety and achievement motivation.
5. Students from higher socio-economic classes showed lower level of anxiety.
6. Students having higher academic achievement showed lower level of anxiety.
7. Correlation between anxiety and achievement motivation in the case of all the groups having low academic achievements was negative irrespective of socio-economic status.
8. In the case of groups belonging to low economic status but
having upper academic achievement, correlation between anxiety and achievement motivation was negative.

9. In the case of groups belonging to low economic status and having middle academic achievement, correlation between anxiety and achievement motivation was positive.

3.3.2.2 Study : 18


**Aims of the Study :**

The study aimed at investigating the relationship of creativity, intelligence and general anxiety separately among the high and the low achieving students in Science, Commerce and Arts.

**Sample of the Study :**

The stratified random sampling technique was used to draw a sample of 600 cases (200 from each stream) for comparing the high and the low academic achievers of arts, commerce and science on creativity, intelligence and general anxiety and to find out inter variable coordination between creativity, intelligence and general anxiety. In all, 400 students (200 from each sex) for comparing the high and the low achievers sex wise and 300 students (100 from each stream) for formulating regression equation for predicting academic achievement were randomly selected from the secondary schools of Rajasthan.

**Tools of the Study :**

The tools used for the collection of data were Mehdi's Test of creativity, a verbal Test of creativity constructed by the
Investigator, Raven's standard Progressive Matrices and Sinha's General Anxiety Scale. Critical ratio was employed to analyse the data analysis was also presented through graphs.

Findings of the study:

The findings of the study were:

1. The high achievers in arts were higher on the level of creativity than the low achievers in arts.

2. The high achievers in commerce were higher as regards the level of creativity than the low achievers in that stream.

3. The high achievers in science were higher on the level of creativity than their low achieving counterparts.

4. The high-achieving boys in arts had a higher creativity than their low-achieving counterparts. The high achieving girls in arts were significantly higher on the level of creativity than the low achieving girls.

5. The high achieving boys in science were higher on the level of creativity than their low achieving counterparts. The high achieving girls in science were higher on the creativity level than their low achieving counterparts.

6. The high achievers in arts were higher in their level of intelligence than the low achievers.

7. The high achievers in commerce were higher in their level of intelligence also.
8. The high achievers in science were higher in intelligence than the low achievers.

9. The high-achieving boys in arts were definitely higher in the level of intelligence than their low-achieving counterparts.

10. The high-achieving girls in arts were higher in the level of their intelligence than their low achieving counterparts.

11. Intelligence and creativity were statistically correlated among the high achievers in science and commerce and the low achievers in arts.

12. Intelligence and General anxiety exhibited no relationship in any of the stream's or level of achievement except the low achievers in science.

13. Creativity and General anxiety were related in the case of the low achievers in commerce and science only.

14. The science students were more creative intelligent and low in general anxiety than their counterparts in other streams. The arts students were low in creativity and intelligence but high in general anxiety. The science students exhibited more creative talent and low general anxiety.

3.3.2.3 Study : 19

The Role of Anxiety in Learning and Academic Achievement of Children By K.I. Pandit.


Purpose of the Study :
The purpose was to study the role of anxiety in academic learning and achievement of school boys of Grade -V. The major hypothesis was that an overall negative relationship exists between anxiety and other independent variables.

Sample and tools of the study

The sample consisted of 145 grade V boys in the elementary school in Delhi. The CIE Group Test of Intelligence (11-12) and the adaptations of four anxiety scales (MAS, GASC, TASC, AASC) were used. Two questionnaires, one seeking information about socio-economic status and the other regarding the relationship of the subjects with their respective parents and siblings and the demands which the parents impose on them with regard to their academic achievement an observation schedule and achievement tests in Hindi and mathematics were also prepared and used.

Findings of the study

The important findings were:

1. Anxiety bore a negative relationship with learning and academic achievement.

2. Subjects having less anxiety were found superior in learning and achievement, irrespective of the task difficulty, to those having more anxiety.

3. High learners and achievers were more anxious than low learners and achievers in motivating content situations.
4. When anxiety was experimentally induced, lowest anxiety group showed a significant improvement in achievement in the retest while the highest anxiety group showed poor performance in the retest.

5. Subjects with low intelligence and the high anxiety did not improve in achievement up to the expectation as a result of induced anxiety.

6. Better achievement did not act as reinforcement in improving achievement at high anxious low achievers.

7. Anxiety interfered with the retention of learning.

3.3.3 Research done on N-Ach

3.3.3.2.1 Study: 20

A study of Need Achievement in Relation to Creativity, values, level of aspiration and anxiety By S. Saxena.


Objectives of the study

The study was conducted:
1. To find out the nature and extent of relationship between n-Ach and creativity, values the level of aspiration and anxiety.

2. To find out the sex difference in n-Ach as regards creativity, values, the level of aspiration and anxiety.

3. To establish regression equation for n-Ach using creativity, values the level of aspirations and anxiety as predictors.

Sample and Tools of the study

The study was conducted on a sample of 300 male and 300 female students of classes IX and X selected from different schools of Agra city from Science and Art faculties only. The tools used were the Achievement Motivation Test (Prayag Mehta) Verbal Test of Creative Thinking (Mehdi), Level of Aspiration Test (Shal and Bahargava) and the Sinha Anxiety Scale. An ex post facto design was adopted.

Findings of the study

The following were the main findings of the study:

1. Correlation between N-Ach and creativity was significant among the subjects of high and low creativity levels.
2. The religious value was positively related and the health value negatively related to n-Ach in the case of boys and the democratic value was positively related and the hedonistic value negatively related to n-Ach in the case of girls.

3. For the total sample the religious value was positively related and the hedonistic value negatively related. For other values relationship was not significant.

4. Regarding sex differences for various values there were significant differences in the democratic and the power values. For the other values there were no differences.

5. Boys and girls having high and low value scores did not differ significantly on n-Ach of values did not affect n-Ach.

6. There was relationship between n-Ach and the level of aspiration.

7. Sex differences were significant as far as the level of aspiration were concerned; boys and girls having high level of aspiration differed significantly regarding n-Ach scores whereas those having low level of aspiration did not differ significantly regarding n-Ach on the total sample also, the difference in the level of aspiration and n-Ach was not significant.

8. There existed no significant relationship between n-Ach and anxiety.

9. Sex differences between n-Ach and anxiety were significant the subjects having high and low anxiety did not differ significantly on n-Ach.
10. Values, creativity, anxiety and the level of aspiration were predictors of n-Ach for both boys and girls separately.

3.3.3.2 Study:

Task performance as a function of n-Achievement, Anxiety and Creativity among male and female adolescents By A.P.Sheel


Objectives of the study

The objectives of the investigation were:

1. To determine and study the characteristic influences of the three components of creativity, need achievement and anxiety on task performance (TP) in three need achievement conditions of male and female adolescents.

2. To study the first and the second order interactions for deeper understanding of the problem in view.

3. To study the further break up of private interactions.

Sample and Tools of the study

The sample comprised male and female students studying in first year and second year arts and science faculties belonging to middle socio-economic status within an age range of 15 to 18. The final sample consisted of 120 students selected out of 640 units of the first stage sample. The task performance in all the three conditions of need achievement was assessed by scrambled word task test the tools used for the measurement of need
achievement, anxiety and creativity scores of the subjects were assessed through the Achievement Motivation Test (Rao), IPAT Anxiety Scale Questionnaire (Cattell and Schier), and Verbal Test of Creative Thinking (Mehdi).

Findings of the Study

The findings of the study were:

1. Need achievement had an important and significant positive relation to task performance among both male and female adolescents. It was the high need achievement which favoured task performance.

2. Need achievement conditions relaxed (R), neutral (N) and aroused (A) were found to have task performance pattern like RNA. This pattern was common at high and low levels of fluency and originality as well as at high and low levels of anxiety.

3. Task-performance of Male Ss having HH level of n-achievement and test anxiety was better than Ss of HL, LL and LH level of n-achievement and test anxiety similarly, Ss having LH level had better performance than LL and HL levels of n-Ach and test anxiety.

4. The success of Male adolescents on task performance was influenced by their anxiety levels. High anxiety Ss had better task performance than high anxiety Ss. Anxiety was dependent either on fluency or on originality. It was found that Ss having high fluency, flexibility, originality and creativity had better...
task performance than Ss who were low in these qualities. Similar pattern was obtained for male and female Ss in relaxed neutral and aroused condition.

5. Creativity, independent, of anxiety was found to promote task performance in RNA condition among female Ss and in neutral aroused condition among male Ss but it was independent in R condition in the case of male Ss. Fluency, dependent on n-Ach, promoted task-performance among male Ss but among female Ss it was independent of n-Ach. Promoted task performance in RNA condition, originality independent of n-Ach promoted task-performance among female Ss in RNA condition.

6. Anxiety, independent of n-Ach promoted task-performance among female Ss in RNA condition but among male Ss it was dependent on n-Ach while promoting task-performance in RNA condition.

3.3.3.3 Study: 22

Need Achievement of Adolescents and their Relationship with Parents by P. Prakash.


Purpose of the Study

This was a study of the need achievement of adolescent boys at different levels of SES and intelligence and their relationship with parent.

Sample of the study
It was conducted on a sample of 816 school going urban adolescent boys in the age group 15 classified into different levels of SES, upper middle (N = 224), lower middle (N = 386), upper lower (N = 206), and on the basis of intelligence, superior (N = 60) above average (N = 109), average (N = 386), below average (N = 261).

Tools of the Study

The classification for SES was done on the basis of the scores obtained as per socio-economic status scale. Questionnaire (Kapoor) and for intelligence on the basis of the scores obtained in the culture Fair Intelligence Test (Cattell and Cattell). The other tools used in the study were Parivarik Sambandh Suchi (Sherry and Sinha) and Achievement Motivation Test (Mehta) Parent-Child relationship were expressed in the form of mother-acceptance, concentration and avoidance father-acceptance concentration and avoidance.

Findings of the Study

The study revealed:

1. There existed no relationship between the need achievement and the acceptance and concentration aspect of parent-child relationship. There was a significant low negative correlation between the n-Ach of adolescents and the avoidance aspects of parent-child relationship.

2. The n-Ach scores seemed to be alike for upper middle and
lower middle groups of SES whereas significant differences existed between the n-Ach of upper middle and upper lower strata.

3. The adolescent boys of upper middle stratum were more accepted by their fathers than the boys of upper lower and lower middle strata, for the rest there existed no significant difference regarding the father acceptance.

4. No significant difference were found between the adolescent boys (UM and UL groups) regarding their feeling of concentration while the reverse was true for UM and LM strata and also for LM and UL strata.

5. With regard to the avoidance aspect of PCR, lower middle and upper middle strata did not seem to differ significantly but the reverse was true regarding the upper middle and upper lower strata.

6. Very low but statistically significant correlations (Negative and positive) between the need achievement and each aspect of parental attitude at different levels of SES excepting father-acceptance at lower middle stratum. There was no correlation between the n-Ach and each aspect of parental attitude between upper-middle and upper lower strata; father avoidance was an exception to this.

7. Regarding intelligence levels of different groups, it was found that there existed no difference as far as n-Ach was concerned with the superior level. For below average group significant differences existed between average, above average
and superior groups in n-Ach. Superiors differed significantly from above average and below average groups in parental acceptance while the boys of other categories did not differ in parental acceptance among themselves.

8. Regarding mother concentration, there existed no significant difference regarding this aspect of parental attitude in all categories of adolescents. Regarding father avoidance there was no significant difference in the groups excepting below average boys who differed significantly from their counterparts the same was true about parental avoidance significant positive relationship existed between the n-Ach and parental acceptance in the case of average boys while avoidance was negatively related with N-Ach in the case of below average group other aspects of parental attitude were not significantly related with n-Ach. There was no correlation between the n-Ach and each aspect of parental attitudes between groups excepting superior and above average and superior and below average regarding mother acceptance and parental-acceptance.

9. Significant positive relationship was found between the n-Ach and each of the predictor variables. i.e.SES and intelligence.

3.3.4 Researches Done on Mathematical Concept and Mathematical achievement

Many researches have been conducted on subject achievement. Mathematics is a core subject of primary education. Some researchers have conducted researches on mathematical concept and
mathematical achievement and their correlation with some aspects (e.g., intelligence, personality, sex and SES etc.). The relevant studies of the Indian Researchers would now be presented.

3.3.4.1 Study: 23

A study of the Development of Mathematical Concepts in school going children By K.J. Jabbal

(K.J. Jabbal, Ph.D., Edu., Gor.Uni., 1981)

Purpose of the study

The main purpose of this investigation was to study which of the mathematical concepts were easily formed in the children of class VI. The mathematical concepts and generalizations, the formation of which were studied, were thought to be essential for learning mathematics in class VI and age difference on the development of mathematical concepts was also seen.

Tools and sample of the study

The group test for Intelligence by Tandon was adapted and a Test for observing Mathematical concept formulation was constructed by the researcher.

Three hundred boys and 250 girls from institutions situated in rural and urban areas were chosen by the stratified cluster sampling technique.

Results of the study

The results of the analysis were:
1. Correlation coefficient between intelligence and mathematical concept formation was 0.90

2. F - ratios revealed that sex had no effect on mathematical concept formation.

3. Locality and age were found to have significant effect on concept formation. Students Senior in age secured better marks. The effect double and triple interaction was not found to be significant.

3.3.4.2 Study : 24

Some factors related to Under Achievement in Mathematics of Secondary School Students By K.K.Iyer 24
(K.K.,Iyer Ph.D., Edu., Ker Uni. 1977)

Purpose of the study

The investigation was designed to identify a broad group of causal factors related to under achievement in Mathematics.

Samples of the study

The study was conducted on a representative sample of 862 subjects selected from a representative educational level. Standard IX of the secondary schools of the Trivandrum District of Kerala.

Tools of the study

The tools used were ; Two aptitudinal Criteria, a verbal
group test of intelligence, a non verbal group test of intelligence and a standardized test of mathematics were administered to the subjects.

Findings of the study

The major findings of the investigation were:

1. Out of the fourteen personality variables selected ten variables were most effective in discriminating between all the achievement pairs, viz. over achievers (OA) and normal achievers (NA) and normal achievers and under achievers (VA) and over achievers and under achievers. The most effective variables were self-reliance, sense of personal freedom, feeling of belonging withdrawing tendencies, nervous symptoms, social skills, school relations, community relations, general anxiety and test anxiety.

2. The variable which was the least effective in discriminating was antisocial tendencies.

3. None of the fourteen personality variables was able to discriminate between the three achievement pairs, viz. over-achievers and non over achievers (NOA) and non under achievers (NUA) and under achievers.

4. None of the fourteen personality variables discriminated between normal achievers and discrepant achievers (DA).

5. Out of the eleven non-personality variables five variables (Sex, age, cast, parental profession and parental education) were associated with all the three achievement levels.
6. There was significantly a greater number of over achievers among the high intelligence group than among the low intelligence group.

3.3.4.3 Study: 25

Some affective correlates of Mathematics Achievement of Secondary School Students By K. Soman 25

Aims of the study:

The study aimed at investigating the overlap of certain affective variables with cognitive outcomes in mathematics achievement. The major hypotheses of the study was that within an unselected group of secondary school students, there would be significant relation between mathematics achievement (cognitive domain) and each of the affective variables selected.

Sample of the study

The study was conducted on a representative sample of 628 students attending Std.IV in secondary schools selected from three representative geographic areas of Kerala.

Procedure of the study

The study was designed with fourteen affective variables (belonging to one basis personality dimension adjustment) treated as independent variables and mathematics achievement in the cognitive domain as the dependent variable. The proportionate stratified sampling technique with adequate representation given
to categories like school efficiency, sex and rural-urban residence was used in obtaining the sample product moment coefficient of correlation, test of significances and factor analysis were the major statistical techniques used in this study.

Findings of the Study

The major findings of the study were:

1. All the selected fourteen variables were not significantly correlated with Mathematics achievement.

2. Personal adjustment variables and anxiety variables had considerable influence on mathematics achievement, with probably small exceptions for certain sub-samples.

3. In the case of boys, eleven variables correlated significantly with mathematics achievement whereas for girls only four variables showed significant correlations.

4. The patterns of correlations obtained for boys and girls showed some remarkable differences.

5. The correlations obtained for girls indicated certain patterns which were dissimilar to those of boys.

6. The correlations for the rural group and the urban group also showed some variation in their patterning. For the rural group, ten affective variables significantly correlated with mathematics achievement. As against this, for the urban group only six variables correlated significantly with mathematics.
7. More affective variables were seen to possess the ability to discriminate between the extreme achievement pairs (high with low achievers) as against the more approximate pairs.

8. The dominant personality factor for the over-achievers was individual adjustment.

3.3.4.4 Study: 26

A Comparative study of certain Personality Variables Related to over Normal and Under Achievement in Secondary School Mathematics By M. Somasundaran. 26
(M. Somasundaran, Ph.D. Edu. Calicut Uni. 1980)

Aims of the study

The aim of the study was to identify certain important variables related to achievement in Mathematics in General and discrepant achievement in particular among the secondary school pupils in Kerala. Achievement in Mathematics was the dependent variable and sixteen personality variables of the adjustmental-temperamental dimensions were the independent variables.

Sample and Tools of the study

The sample consisted of 123 over-achievers, 601 normal achievers and 106 under achievers. An achievement test in mathematics constructed for the purpose, the personality scales standardized at the Kerala University and a general data sheet served as tools. Product moment coefficient of correlation and t-test were used in the analysis of the data.
Findings of the Study

The major findings of the study were:

1. The personality variables, namely, social standards, introversion, family relations, social skills, self-reliance, antisocial tendencies (freedom from), and community relations, had significant positive relationship with achievement in mathematics while the variables of general anxiety, test anxiety and masculinity had negative relationship.

2. While the variables of the sense of personal worth sense of personal freedom and feeling of belonging did not correlate with discrepant achievement levels in Mathematics, all the other twelve variables had significant relationship with the same.

3. All variables except the sense of personal worth, sense of personal freedom, withdrawing tendencies, community relations and test anxiety discriminated between the unselected groups of over and normal achievers. However, when the groups of over-achievers and normal achievers were equated on the basis of sex, age, place of residence, school category and parental education, occupation and income, no significant difference between the mean scores of these groups could be noted with respect to any of the personality variables.

4. Personality variables of social skills, test anxiety, general anxiety, school relations, self-reliance, masculinity, antisocial tendencies (freedom from) and nervous symptoms (freedom from) discriminated between the unselected groups of over-achievers and under-achievers.
5. The variables which discriminated between the unselected groups of normal and under achievers were social standards introversion and family relations. In the case of the equated groups the variables of sense of personal worth, introversion and social standards showed significant discrimination between the normal and the under-achievers.

6. All personality variables except the sense of personal worth, sense of personal freedom, withdrawing tendencies (Freedom from) and community relations discriminated between over-achievers and non-over achievers.

7. The variables of social skills, nervous symptoms (freedom from) and masculinity showed significant discrimination between normal achievers and non-normal achievers.

8. The variables of social standards, introversion, family relations, test anxiety and community relations discriminated between under-achievers and non-achievers.

3.4 Differentiation of this study

The earlier researchers carried out have taken up Intelligence, Anxiety, n-Ach. Mathematical concept and mathematical achievement variables separately. Some of these researches have been done abroad and some in India very few researches have been conducted in Gujarat.

Moreover these studies have been carried with univariate or bivariate design, having no knowledge of the interactive effects. Further, a composite and comprehensive study has been warranted with intelligence anxiety, n-Ach and some
demographic variables in a factorial design. No such work has been done so far in Indian setting. Therefore the investigator conducted the investigation selecting students of 8th standard.

This investigation aims at checking the conclusions of the earlier researches and arriving at new conclusions.
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