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THE RELATIONSHIP BETWEEN ANXIETY AND READING
ACHIEVEMENT OF SIXTH GRADE BOYS AND GIRLS

A Thesis Submitted to the Graduate Division in Partial
Fulfillment of the Requirements for the
Degree of Specialist in Education

By 6719

Ruth O. Beer

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KANSAS STATE COLLEGE OF PITTSBURG

Pittsburg, Kansas

July, 1971

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ABSTRACT

Beer, Ruth O. (Specialist in Education Degree)
"The Relationship of Anxiety and Reading Achievement
of Sixth Grade Boys and Girls." Thesis directed by
Dr. Doris M. Sindt.

The purpose of the study was to examine the relationship of anxiety and reading achievement levels.

The study was concerned with the following questions:

1. Are the boys and girls who are achieving below their expected reading levels more anxious than those who are achieving above their reading levels?
2. Are the girls who are achieving below their expected reading levels more anxious than those who are achieving above their expected reading levels?
3. Are the boys who are achieving below their expected reading levels more anxious than those who are achieving above their reading levels?

Sixty-four boys and girls were chosen at random from the total population of 271 sixth grade students of the six elementary schools at Carthage, Missouri. These boys and girls were administered an anxiety test, an intelligence test, and a reading test.

The anxiety test results were compared to the expected reading achievement levels to determine if anxiety had an effect on the student's reading achievement.

Analysis of variance was used to determine whether or not each of the null hypotheses of the study were to be retained or rejected.

An analysis of the results obtained showed the following:

1. There were no significant differences in the anxiety means of the boys and girls.
2. Anxiety had little effect on the achieved reading levels of the boys and girls studied.
3. The boys tended to be less anxious than the girls.
4. The boys and girls had approximately the same average intelligence quotient.
5. The girls tended to score higher on reading achievement tests than the boys.

CHAPTER I

INTRODUCTION TO THE PROJECT

Statement of the Problem

Differences in ability among boys and girls in the public school systems have been of vital interest to school personnel for a long period of time. When attempts were made to design and provide an effective school program for all students, some of the reasons for differences in ability became apparent. In providing experiences from which all students might profit, it became necessary to consider particular differences in ability and special needs of individual boys and girls.

An area in which wide differences in ability is found and a concern of the present study, is the area of reading achievement. Much research has been carried out to determine the factors interferring with reading achievement. However, from the review of the literature, reported in the following chapter, it can be observed that only limited research has been devoted to the effects of various levels of anxiety on reading achievement.

Anxiety, as May observed, has exerted much pressure on boys and girls in learning situations. He has stated that anxiety can influence the child's educational progress and classroom performances (May, 1950). It is felt by the

writer that the present study needed to be carried out to determine the effect of anxiety on reading achievement.

Purpose of the Study

The primary purpose of this study was to examine the relationship of sixth grade students' levels of anxiety to their reading achievement. The differences between the levels of anxiety of sixth grade boys and sixth grade girls were also explored. A better understanding of the following questions was seen to result from these purposes.

1. Are the boys and girls who are achieving below their expected reading levels more anxious than those who are achieving above their levels?
2. Are the boys who are achieving below their expected reading levels more anxious than the boys who are achieving above their expected reading levels?
3. Are the girls who are achieving below their expected reading levels more anxious than the girls who are achieving above their reading levels?

Rationale for the Study

Success in reading is closely related to academic success in school. For example, Bond and Tinker found that general reading comprehension test scores were related significantly to achievement in each content subject except mathematics. They found that achievement in the subject content areas required proficient use of basic and special reading abilities (Bond and Tinker, 1957).

Sarason, et al., found that anxiety was not only negatively correlated with intelligence test scores but also with achievement. They found that the higher the anxiety levels of children, the lower the intelligence test scores would be and the lower the achievement levels (Sarason, et al., 1960).

The findings of studies mentioned above, the importance of reading achievement, and the effects of anxiety on achievement provided the rationale for the present study of the effects of anxiety on reading achievement.

Definition of Terms

In order to understand the terminology of some of the words used in this study, the writer defined the terms according to the usage and definition applied to the context of the investigation.

Mental Ability. For the purpose of this study, the definition of mental ability given in the Manual accompanying the Henmon-Nelson Tests of Mental Ability was used. It stated that intelligence tests were designed to measure "... those aspects of mental ability which were important for success in academic work and in similar endeavors outside the classroom (Lanke and Nelson, 1960, p. 2)."

It should be noted that the Henmon-Nelson Tests of Mental Ability, as most group tests measuring general mental ability, have much verbal content and as Cronbach

points out has "... considerable overlap with reading ability (Cronbach, 1960, p. 230)."

Anxiety. For this study it is assumed that anxiety can be measured from the number of "yes" responses made to a paper and pencil test designed by Sarason, et al. They considered anxiety as "an important factor in producing discrepancies between potentiality and performance (Sarason, et al., 1960, p. 2)."

In their rationale for the use of a questionnaire in assessing anxiety, Sarason, et al., proposed:

The most important consideration in using this type of instrument was that from our theoretical point of view anxiety was a conscious experience which, therefore, could be communicated to another person. ... we indicated that, in accord with Freud's presentation, anxiety could be described as an unpleasant or painful reaction with bodily concomitants of which the individual is aware. The individual may be unaware of the unconscious significances of the anxious reaction and may even be unable to relate the reaction to external factors. The important point is that he is aware of what to him is an unpleasant or painful state which is tinged with more or less vague anticipations of danger. Conceiving of anxiety as a conscious experience, it seemed to us appropriate to attempt to determine its occurrence by what is essentially direct questioning (Sarason, et al., 1960, p. 89).

Expected Reading Level. Expected reading level, as used in this study, was determined by a formula worked out by Bond and Tinker. They estimated the expected reading level by multiplying an intelligence quotient by the number of years in school. Then one year's reading achievement is added to the product. For example, a child, having an

intelligence quotient of 75, who had completed the first grade in school would have an expected reading level of 1.7. A child, having an intelligence quotient of 125, who had completed the first grade in school would have an expected reading level of 2.2 (Bond and Tinker, 1957).

Reading Grade Level Achievement. Reading grade level achievement was determined from the results of the Gates-MacGinitie Reading Test, Survey D, Grade 4-6. The vocabulary level, speed of reading, accuracy and comprehension scores were used in obtaining the reading grade level achievement.

HYPOTHESES

The following hypotheses were formulated for the purpose of investigating anxiety levels of sixth grade boys and girls and the extent to which this variable was related to the expected reading levels.

1. There was no significant difference between the levels of anxiety for those boys and girls who were achieving below their expected reading levels and those boys and girls who were achieving above.
2. There was no significant difference between the levels of anxiety for those boys who were achieving below their expected reading levels and those boys who were achieving above their expected reading levels.
3. There was no significant difference between the levels of anxiety for those girls who were achieving below their expected reading levels and those girls who were achieving above.

4. There was no significant difference between the levels of anxiety of boys and girls as determined by the scores obtained from the General Anxiety Scale For Children.

Summary

The purpose of this study, as presented in the Introduction, was to investigate the relationship between anxiety levels and reading achievement. Also to be investigated was the difference between the levels of anxiety of sixth grade boys and sixth grade girls.

High levels of anxiety have been found consistently to interfere with academic achievement.

The rationale for further investigation of the effect of anxiety on achievement, particularly reading achievement, was based on the limited amount of research carried out in the area. It can be noted that few investigations have been devoted to the study of the relationship between levels of anxiety and the levels at which children could be expected to read.

The following chapter presents a review of the literature relating to the various measures of intelligence and anxiety used in this study as well as the literature relating to anxiety and the effect of this variable on reading achievement.

CHAPTER II

REVIEW OF THE LITERATURE

The present study was carried out to determine the extent to which anxiety was related to reading achievement. Another concern of this study was to determine the extent to which sixth grade boys and girls differed in levels of anxiety.

Therefore the first section of this review will be limited to those studies which deal with the effects of various levels of anxiety on academic achievement. In the next section, a review of those studies relating to difference in levels of anxiety found among boys and girls will be presented. In the final section, the literature relating to the use, validity, and reliability of various measures used in the present study, will be reviewed. These measures include: The Henmon-Nelson Tests of Mental Ability, the Bond and Tinker Formula, the Gates-MacGinitie Reading Tests, and the General Anxiety Scale For Children.

The Effects of Anxiety on Academic Achievement

Some of the literature reviewed in this study dealt with the effects of anxiety on the student's academic achievement. Sarason, et al., carried out a direct study of low anxious children in the classroom. The anxiety of the children was determined by the "yes" scores on a

general scale of anxiety. He observed:

HA boys differed from LA boys in that they did not appear as academically adequate, showed less task orientation, and in relationships with the teacher manifested greater insecurity. HA girls differed from LA girls in that they seemed to have a stronger need for achievement, showed less "unintelligible" behavior, and contained fewer distractible individuals (Sarason, et al., 1958, p. 295).

Betts' study showed that anxiety and learning were closely related. He also found that anxiety was related to an individual's feelings and social-economic status. Betts found that reading was one of the most disliked school subjects. Anxious boys comprised from sixty to eighty per cent of the retarded reading population (Betts, 1957).

Palermo found that the "performance of anxious children would be inferior to that of nonanxious children in a learning situation which involved the presence of competing for correct responses (Palermo, 1956, p. 336)."

Haggard related in his study the following:

The characteristics common to high achievers were their self-confidence and assertiveness in facing new and difficult tasks; their abilities to master anxieties; and their ability to channel their emotional energies.....High achievers devoted themselves to intellectual accomplishment with vengeance.....Children experienced a mounting level of anxiety which apparently fed back to help them in their drive toward further accomplishment (Haggard, 1957, p. 401).

Key and Whiteside reported in their literature evidence of negative relationship between anxiety and achievement in school situations. They found that children who were anxious

displayed strong and reliable tendencies to be retarded more than one year in age, grade, and mental education (Key and Whiteside, 1930).

Castenada and McCandless found, that of the thirty computed relationships in their study between anxiety scores and various achievement areas, all of the relationships except two were in the negative direction of performances (Castenada and McCandless, 1965).

The major findings in the review literature of Dunns' study were:

As children grow older negative affects for school increases; lower-class children report greater school anxiety than middle-class children; and lower-class children report more positive affect for the social and the academic aspects of school than middle-class children (Dunn, 1968, p. 388).

Anxiety as a Function of Sex Difference

In reviewing the studies relating to levels of anxiety of boys and girls, few were devoted specifically to anxiety as a function of sex difference. Most studies were concerned with such variables as intelligence, social status, family relations as these variables related to anxiety.

However, Haggard, in his studies found that boys were more passive and more inhibited than girls in expressing their emotions and anxieties. He found that boys tended to do better than girls in speed reading and comprehensive tests. Girls, who were more anxious than boys, tended to excel on

the spelling and language tests (Haggard, 1957).

A comparative research by Kogan and Wallach reported boys tended to react to anxiety differently from girls. Boys tended to be more defensive than girls and seemed less likely to admit they were anxious. He also found that the tendency to take risks was more characteristic of boys than of girls (Kogan and Wallach, 1964).

One of the studies by Morrow and Wilson showed that some male underachievers were unable to function properly in the classroom because they sought thrills and excitement in their recreation and showed anxiety and hostility by seeking peers with similar negative feelings (Morrow and Wilson, 1961).

According to Perkins' study, some low anxious boys from the middle-class background perceived the world as unfriendly and unsympathetic. To them, schools were a threatening place and were unrelated to the lives they preferred to lead (Perkins, 1965).

In the functions of sex difference in anxiety, Sarason, et al., found the following:

Girls are more anxious than boys in the sense that there are more situations to which girls respond anxiously and/or that when they do experience anxiety it is a stronger response than in the case of boys (Sarason, et al., 1960, p. 252).

Literature Related to Various Measures

The measurements used in this study were the Henmon-Nelson Tests of Mental Ability, the Bond and Tinker Formula, the Gates-MacGinitie Reading Tests, and the General Anxiety Scale For Children. The following will include a review of the studies which established the validity and reliability of these measures.

From this review it can be determined from the results of the studies that girls tend to admit to being anxious more readily than boys and tend to have higher mean scores on anxiety measures. However, in most studies in this section and the preceding one, it was shown that high anxiety levels among boys did affect performance.

Validation of the Henmon-Nelson Tests. In the construction of the Henmon-Nelson Tests of Mental Ability, great care was exercised in the choice of items to insure validity. The Henmon-Nelson Tests of Mental Ability were validated with other tests and proved to be useful as measures of mental ability. Lamke and Nelson stated in their literature that some of the most common uses for the Henmon-Nelson Tests of Mental Ability were for classification and better understanding of students, for supplementing teacher's estimates of students, for vocational and educational guidance, entrance examinations, and for evaluation procedures (Lamke and Nelson, 1960).

The Henmon-Nelson Tests of Mental Ability were described by Shaffer as scholarly examples of the best test construction and efficient instruments for testing (Shaffer, 1959).

The Henmon-Nelson Tests of Mental Ability were attractive tests and two forms for three batteries were provided for grades 3-6, 6-9, and 9-12. Administration for giving the tests required about thirty minutes. The tests were easy to score and economical in cost.

Super reported that the Henmon-Nelson Tests of Mental Ability were classified as single-score group tests. These group tests had an advantage over individual tests by having social stimulation, competition, safety of numbers, group examples, and external standardized conditions (Super, 1962).

In Lefever's rationale for the Henmon-Nelson Tests of Mental Ability, it was stated that, if a single predictor of school success was needed which required less than a class period for administration, these tests should be used. These revised tests showed an improvement over the earlier editions. They were greatly improved in the format, manual, validity, and standardization. These tests offered reliable help in predicting success in academic subjects (Buros, 1959).

According to Lefever, concerning the Henmon-Nelson Tests of Mental Ability:

Evidence for congruent validity is presented in the form of correlations with several well-known tests of intelligence. The median coefficient for all levels is .76 and the range is .50 to .84 (Buros, 1959).

These tests were used in this study to secure the intelligent quotient to determine how well each child was expected to read.

Reliability of the Henmon-Nelson Tests of Mental Ability.

The Henmon-Nelson Tests of Mental Ability are timed tests. Although it is a timed test, the thirty minutes required for administration permitted practically all of the students to complete the items on the tests.

Odd-even reliability coefficients ranging from .91 to .95 were reported and related data for each grade and forms were obtained. This method used correlated scores on the even-numbered items with the scores on the odd-numbered items (Lamke and Nelson, 1960).

The scores on both forms of A and B were made into intervals or grade points. The results were expressed in raw score units, with the standard error of score as a meaningful indicator of reliability for the Henmon-Nelson Tests of Mental Ability.

Bond and Tinker Formula. The ways of assessing expected reading levels of students, according to Bond and Tinker, depended upon the calculation based on the years in school and the intelligence quotient. The Bond and Tinker formula was the intelligence quotient multiplied by the grade in school plus one. The one was added because the child started to school at grade one and after in school a year was at grade two. The data from Bond and Tinker's literature indicated

that the relationship between intelligence and reading achievement was probably the best formula that existed at the present. The Bond and Tinker data were secured from a random selection of classes in a large midwestern city. The classes were measured at the middle of the fifth grade with the Stanford-Binet Intelligence Tests and the Gates Reading Survey Tests. The average reading ability of the 379 children measured was grade 5.5 and the average intelligence quotient was 105. The reading expectancy levels of various intelligence quotients were compared with the reading achievements of the groups in the fifth grade. The comparison between the observed reading achievement scores of children at various intelligence quotient levels and the expected reading levels were similar (Bond and Tinker, 1957).

Validation of the Gates-MacGinitie Reading Tests. The Gates-MacGinitie Reading Tests were the new edition of the Gates Tests which were standardized in 1965 to replace the Gates Primary, the Gates Advanced, and the Gates Reading Survey Tests. Included in the new Gates-MacGinitie Tests were several series for all grades from kindergarten to grade twelve (Gates and MacGinitie, 1965).

The Gates-MacGinitie Reading Tests contained items and norms based upon a 1964-65 nationwide sample of approximately 40,000 students in thirty-eight communities. These tests yielded grade standard scores and percentile scores. They provided an effective program for measuring group and

individual reading achievement scores. These tests were easy to administer, score, and interpret. The Gates-MacGinitie Reading Tests, Survey D, Form 1 were used in this study.

The tests for grades 4-6 contained accuracy, vocabulary, speed, and comprehensive materials. The time limit for the Survey D form required fifty minutes. The direction for the tests were clear and concise. The subtests followed the pattern of increasing in difficulty with each item.

Evidence of validity for the Gates-MacGinitie Reading Tests was very limited because the tests were relatively new. However, a few early studies were available. Farr and Anastasiow, for example, reported that when the contents of the Gates-MacGinitie Reading Tests were compared to the objectives of reading, the tests seemed to be an adequate measure of these objectives (Farr and Anastasiow, 1969).

Reliability of the Gates-MacGinitie Reading Tests. The reliability of the Gates-MacGinitie Reading Tests were computed by the split-half procedure and the test retest procedure utilizing different forms of tests. Reliability was reported for each subtest at every grade level. The reliabilities of the subtests were high enough that the scores a student received on one form of the test on one day was likely to be the same as the scores he would receive on another test form the same day.

The corrected split-half reliabilities, ranging from .88 to .96, were based on the odd-even division of items.

Reliability coefficients were not reported for the Speed and Accuracy subtests because such coefficients were meaningless for these highly speed tests (Gates and MacGinitie, 1965).

The Gates-MacGinitie Reading Tests were used in this study to determine the reading grade level of each student in the random sample. The reading levels were then compared to the expected reading levels.

General Anxiety Scale For Children. Considerable research, according to the reviewed literature, had been done with the use of the General Anxiety Scale For Children. Sarason, et al., found that anxiety was a conscious experience that could be measured by a paper-pencil test which they developed, the General Anxiety Scale For Children. This scale dealt with the general characteristics of anxiety found in elementary school children. Among Sarason's results, it was reported that significant negative correlations were found between test anxiety and performance on achievement tests; and that anxiety increased in degrees during the elementary grades (Sarason, et al., 1960).

The General Anxiety Scale For Children was administered to a great number of children along with the Test Anxiety Scale for Children to compare the answers and scores. Sarason, et al., presented summaries of many studies which established sufficiently the validity of these two tests (Sarason, et al., 1960).

Grames, Hoffner, and Quast report that a correlation of .79 for boys and .78 for girls was found between the Child Manifest Anxiety Scale and the General Anxiety Scale For Children. The results of their study tended to indicate that these two tests were measuring a similar variable, anxiety (Grames, et al., 1965).

There were many case presentations in this review of literature in which anxiety was determined as a factor influencing behavior. Cases differed in many respects regarding family, age, and anxiety. Therefore, it was difficult to relate these cases to the present study.

Summary

The most apparent limitation of this study in the review of the literature was the lack of published studies concerning the anxiety of children compared to the expected reading achievements.

The writer did not find studies comparing anxiety to the results of the Henmon-Nelson Tests of Mental Ability scores or to the Gates-MacGinitie Reading Tests grade levels.

On the basis of the literature researched, it was assumed for the purpose of this study that sufficient validity and reliability had been established for all measures used, the Henmon-Nelson Tests of Mental Ability, the Bond and Tinker Formula, the Gates-MacGinitie Reading Tests, and the General Anxiety Scale For Children. Because of the lack of additional

information in literature concerning the measurements, this review tends to be somewhat limited.

Also it was found that anxiety had great effects on the academic achievements of elementary children. The anxiety of students was closely related to the feelings and status in their classrooms. It was found that boys tended to show less anxiety on tests of anxiety than girls.

CHAPTER III

METHODOLOGY OF THE INVESTIGATION

In this investigation, anxiety and its effect on reading achievement was examined. Another aspect of the study was to determine if girls and boys differed in the tendency to be anxious. In this chapter, the methodology used in this investigation will be presented. A description of the sample and the various measures used in the study is reported. Then this is followed by a description of the procedures for collecting and analyzing data.

Selection of the Sample

The sample in this investigation was a relatively small group of boys and girls chosen to represent sixth graders in general. It was obtained from the Carthage R-9 Public Schools by drawing randomly from the 271 sixth grade students enrolled there.

The names of the 271 boys and girls from six different elementary schools were listed separately in alphabetical order. Numbers were chosen from a table of random numbers from Elementary Statistical Methods by William A. Neiswanger to select thirty-four boys and thirty-four girls from the list.

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Selection of Measures Used

Measures used in this investigation were the General Anxiety Scale For Children, the Henmon-Nelson Tests of Mental Ability, the Bond and Tinker Formula, and the Gates-MacGinitie Reading Tests.

General Anxiety Scale For Children. The General Anxiety Scale For Children was selected from the two widely used scales which purport to measure levels of anxiety in children. Research has shown these tests tend to measure the same variable. The reason for selection of the General Anxiety Scale For Children over the Children's Manifest Anxiety Scale was that sex differences were found using the General Anxiety Scale For Children, but not when using the Children's Manifest Anxiety Scale (Sarason, et al., 1960).

The General Anxiety Scale For Children is made up of forty-five questions which purports to measure anxiety if the question is answered in the affirmative.

The items of General Anxiety Scale For Children, as in another test by Sarason, et al., Test Anxiety Scale for Children, were selected by the following guidelines:

1. A "yes" answer to a question should, on the face of it, be an admission of behavior which is experienced as unpleasant. Put in another way, a "yes" answer should not indicate behavior which a child would regard as desirable or reflecting a happy state of affairs.

2. A question should contain the element of anticipation of dangerous or painful consequences.
3. There should be questions involving bodily reactions in test and testing situations.
4. There should be a sampling of reactions to a variety of test-like situations (Sarason, et al., 1960, p. 90).

Henmon-Nelson Tests of Mental Ability. The Henmon-Nelson Tests of Mental Ability, Form A for grades 6-9, developed by Tom A. Lamke and M. J. Nelson, is made up of 90 five choice items arranged in order of increasing difficulty. Vocabulary, sentence completion, logic selection, disarranged sentences, interpretation of proverbs, verbal analogies and arithmetic reasoning are among the types of items found on the Henmon-Nelson Tests of Mental Ability. These measures were selected because they yield a single score and a valid estimate of intellectual ability and are relatively easy to administer.

Bond and Tinker Formula. Zintz reports that the formula derived by Bond and Tinker gives a practical and more accurate estimate of expected reading level than others found in the literature. For this reason it was selected to use in this study. This formula of years in school times the intelligence quotient plus 1.0 yields the expected reading level (Zintz, 1966).

Gates-MacGinitie Reading Tests. The Gates-MacGinitie Reading Tests Survey includes a Vocabulary subtest with fifty

items which measure the student's ability to choose the best synonyms; a Comprehensive subtest which consists of twenty-one paragraphs with the selected words; and the Speed and Accuracy subtests with thirty-six items to check speed and correctness of silent reading. The subtests of Comprehension and Vocabulary attempt to measure the students reading power while the Speed and Accuracy subtest measure a somewhat different trait.

These tests were selected to measure the relationship of the reading levels with the results of the reading tests, to determine the effect of anxiety on the reading scores, to compare the anxiety scores of the boys with the anxiety scores of the girls, and to provide the results of the findings to the six elementary schools.

Procedure for the Collection of Data

The sixty-four boys and girls of the sixth grade were chosen at random from the Carthage R-9 School District in Jasper County, Missouri, and tested.

A schedule of appointments with each group of boys and girls was given to the administrator of the six schools. The schedule included an hour a day for two days with each elementary school.

The General Anxiety Scale for Children and the Henmon-Nelson Tests of Mental Ability were administered to the boys

and girls the first day followed by the Gates-MacGinitie Reading Tests the second day. Collection of data began November 19, 1970, and ended December 22, 1970.

Procedure for Analysis of Data

After all testing was completed, the expected reading level for each of the boys and girls was calculated by using the Bond and Tinker formula.

The expected reading levels and the reading achievement scores obtained on the Gates-MacGinitie were compared. Those boys and girls whose reading achievement grade level was two months or more below their expected reading level were considered as reading below their expected reading level. Those boys and girls whose reading achievement grade level was two months or more above their expected reading level were considered as reading above their expected reading level.

Analysis of Variance. Analysis of variance has become the most commonly used technique for testing the significance of differences between means (Appendix B). For this reason, it was selected to test the various hypotheses in this study.

The F-ratio is the particular statistic used for the test of significance in analysis of variance. The F-ratio is evaluated by entering the F-table with the appropriate number of degrees of freedom. For this study, if the F-ratio obtained equaled the table value at the .05 level, the hypothesis was rejected, and a significant difference

in mean score was determined to exist. If the F-ratio obtained was less than the table value at the .05 level, the null hypothesis was retained and no significant difference in the mean was found.

The scores and results of the testing, along with an interpretation of these findings, were recorded and given to the teachers and administrators of each of the six elementary schools.

Under and Over Achievement in Reading

The anxiety score for boys and girls which fell either below or above the mean score for each group was determined. Boys and girls whose anxiety score was above the mean were considered as High Anxious. Boys and girls whose anxiety score was below the mean were considered as Low Anxious. The anxiety scores of these High Anxious and Low Anxious boys and girls were compared with under and over achievement in reading. Underachievement was defined as reading two or more months below their expected reading level. Overachievement was defined as reading two or more months above their expected reading level.

Procedure for Testing the Various Hypotheses

Hypothesis 1. There was no significant difference between the levels of anxiety for those boys and girls who were achieving below their expected reading levels and those boys and girls who were achieving above their expected reading levels.

The differences between the means of anxiety scores obtained on the General Anxiety Scale For Children for those boys and girls whose reading achievement level was two or more months below their expected reading level and for those boys and girls whose reading achievement level was two or more months above their expected reading level were tested for significance by analysis of variance.

Hypothesis 2. There was no significant difference between the levels of anxiety for those boys who were achieving below their expected reading levels and those boys who were achieving above their expected reading levels.

The differences between the means of anxiety scores obtained on the General Anxiety Scale For Children for those boys whose reading achievement level was two or more months below their expected reading level and for those boys whose reading achievement level was two or more months above their expected reading level were tested for significance by analysis of variance.

Hypothesis 3. There was no significant difference between the levels of anxiety for those girls who were achieving below their expected reading levels and those girls who were achieving above their expected reading levels.

The differences between the means of anxiety scores obtained on the General Anxiety Scale For Children for those girls whose reading achievement level was two or more months below their expected reading level and for those girls whose reading achievement level was two or more months above their

expected reading level were tested for significance by analysis of variance.

Hypothesis 4. There was no significant difference between the levels of anxiety of boys and girls as determined by the scores obtained from the General Anxiety Scale For Children.

The differences between the means of anxiety scores obtained on the General Anxiety Scale For Children for boys and for girls were tested for significance by analysis of variance.

Summary

The purpose of the study was to investigate the relationship between anxiety and reading achievement and to determine if boys and girls differ in the tendency to be anxious.

The subjects used in this study were sixty-four sixth grade students enrolled in Carthage Elementary Schools during the fall semester, 1970.

The various measures used in the study were the Henmon-Nelson Tests of Mental Ability, the Bond and Tinker Formula, the Gates-MacGinitie Reading Tests, and the General Anxiety Scale For Children.

The procedure for collection of the data was reviewed. This included the testing procedures, the calculating of the expected reading levels, and determining those boys and

girls whose reading achievement was below or above their expected reading levels.

Analysis of variance was proposed as the method appropriate for testing the various hypotheses.

The following chapter presents the findings of this study and an analysis of these findings.

CHAPTER IV

ANALYSIS OF THE DATA

In the first part of this chapter the results obtained from the various measures will be reported and discussed. This discussion will be followed by a review of the results obtained in the testing of the hypotheses.

Results Obtained From Various Measures

The General Anxiety Scale For Children was given to the boys and girls of the six elementary schools in Carthage, Missouri. The total "yes" responses to the forty-five questions asked on the General Anxiety Scale For Children indicated the level of anxiety for the students. A copy of the questions on the General Anxiety Scale For Children was placed in Appendix D.

The results of the anxiety test showed that the girls had a higher mean score than the boys. The girls had a mean score of 30.6. The boys had a mean score of 22.7. The anxiety scores for all sixty-four boys and girls are reported in TABLES I and II.

It was found that fifty-five percent of all the high anxious students were performing below their expected reading levels and forty-four percent were achieving above their expected reading levels. Seventy-two percent of the high

anxious boys were reading below their expected reading levels and twenty-seven percent were reading above their expected reading levels.

Scores obtained on the Henmon-Nelson Tests of Mental Ability showed that the boys had an average intelligence quotient of approximately 106.2 while the girls showed an average of 105.8. The intelligence quotients on the Henmon-Nelson Tests of Mental Ability were used with the Bond and Tinker formula to predict the expected reading level of each boy and girl. After this calculation of the expected reading level was made, the scores were compared to the test results of the Gates-MacGinitie Reading Tests. The intelligence quotients and the expected reading levels of each boy and girl are found in TABLES I and II. The intelligence quotient was multiplied by 5.3 grade level, plus one year in school. Tables in Appendix A show these expected reading levels of each boy and girl who participated in this study.

The Gates-MacGinitie Reading Tests scores showed that the girls were achieving at a somewhat higher reading level than the boys. The average reading achievement grade level for boys was 6.4 and the girls' average reading achievement grade level was 7.10. The reading achievement grade level of each boy and girl is found in TABLES I and II. The reading grade level on the Gates-MacGinitie Reading Tests was found by averaging the scores of the Accuracy, Vocabulary, Comprehension, and Speed Tests. The high anxious

TABLE I

TEST RESULTS FOR THE SIXTH GRADE BOYS OF
CARTHAGE R-9 SCHOOLS ADMINISTERED IN NOVEMBER, 1970

General Anxiety Scale for Children	Gates-MacGinitie Reading Tests	Henmon-Nelson Tests of Mental Ability	Expected Reading Level
Score	Grade	I. Q.	Grade
37	4.10	1.04	6.5
25	7.4	1.17	7.2
18	5.3	1.01	6.4
20	3.5	.98	6.2
32	6.5	1.17	7.2
31	3.8	.99	6.2
7	4.10	.95	6.0
24	7.1	1.25	7.6
10	6.0	.96	6.0
24	5.5	1.04	6.5
34	10.3	1.19	7.3
19	10.10	1.23	7.5
24	5.11	1.18	6.4
32	10.3	1.19	7.3
32	5.1	1.07	6.6
27	4.4	1.08	6.7

TABLE I - continued

TEST RESULTS FOR THE SIXTH GRADE BOYS OF
CARTHAGE R-9 SCHOOLS ADMINISTERED IN NOVEMBER, 1970

General Anxiety Scale for Children	Gates-MacGinitie Reading Tests	Henmon-Nelson Tests of Mental Ability	Expected Reading Level
Score	Grade	I. Q.	Grade
25	8.6	1.21	7.4
11	4.0	.80	5.2
10	4.1	1.13	6.9
14	5.1	1.01	6.4
16	7.1	1.13	6.9
20	7.10	1.20	7.4
27	5.2	1.04	6.5
21	3.5	.89	5.7
36	5.9	.99	6.2
13	4.11	.87	5.6
21	11.9	1.27	7.7
27	7.10	1.17	6.2
22	6.5	.75	6.0
17	4.5	.89	5.7
37	5.0	1.08	6.7

High Anxious Boys = 72% below Expected Reading Levels
High Anxious Boys = 27% above Expected Reading Levels

TABLE II

TEST RESULTS FOR THE SIXTH GRADE GIRLS OF
CARTHAGE R-9 SCHOOLS ADMINISTERED IN NOVEMBER, 1970

General Anxiety Scale for Children	Gates-MacGinitie Reading Tests	Henmon-Nelson Tests of Mental Ability	Expected Reading Level
Score	Grade	I. Q.	Grade
39	3.10	.91	5.8
36	8.3	1.10	6.8
27	6.6	1.12	6.9
37	10.2	1.11	6.9
32	6.11	.97	6.1
32	5.6	.79	5.2
32	10.1	1.08	6.7
34	5.7	.88	5.7
22	11.5	1.24	7.6
29	9.8	1.22	7.5
37	5.0	1.00	6.3
32	3.4	.83	5.4
32	6.3	.97	6.1
27	4.3	.86	5.6
31	6.10	1.15	7.1
37	6.3	1.09	6.8
28	6.8	1.02	6.4

TABLE II - continued

TEST RESULTS FOR THE SIXTH GRADE GIRLS OF
CARTHAGE R-9 SCHOOLS ADMINISTERED IN NOVEMBER, 1970

General Anxiety Scale for Children	Gates-MacGinitie Reading Tests	Hemmon-Nelson Tests of Mental Ability	Expected Reading Level
Score	Grade	I. Q.	Grade
28	7.4	.93	5.9
35	6.9	.99	5.2
27	6.1	1.18	7.2
39	9.9	1.18	7.3
25	11.2	1.28	7.8
28	4.10	.88	5.7
17	11.2	1.13	6.9
37	9.8	1.17	7.2
42	5.4	.99	6.2
24	11.2	1.25	7.6
36	5.5	1.00	6.3
29	5.2	1.08	6.7
33	6.3	1.01	6.4
28	8.2	1.18	7.3
18	7.0	1.17	7.2
21	8.0	1.20	7.4

High Anxious Girls = 39% below Expected Reading Levels

High Anxious Girls = 61% above Expected Reading Levels

girls had better achievement scores in reading than the boys. There were thirty-nine percent of the high anxious girls reading below their expected reading levels and sixty-one percent were performing above their expected reading levels. These results helped to answer some of the questions asked in Chapter I. These data showed that the high anxious girls had higher reading achievements than the high anxious boys.

Testing the Null Hypotheses

The following four hypotheses of the study were tested for significance of differences of mean by the analysis of variance.

Hypothesis I. The first null hypothesis, stating that there was no significant difference between the levels of anxiety for those boys and girls who were achieving below their expected reading levels and those boys and girls who were achieving above their reading levels, was retained. There was no significant difference between the means. The obtained values were smaller than the table values. There were twenty-two boys and girls who achieved below their expected reading levels. The anxiety mean for the underachieving group of sixth graders was 26.32. There were thirty-one boys and girls who achieved above their expected reading levels. The anxiety mean for the overachieving students was 28.06. There were eleven students achieving at the

expected reading level and their anxiety mean was 20.91. The tables showing these calculations are found in Appendix C.

Hypothesis II. The second null hypothesis, stating that there was no significant difference between the levels of anxiety for those boys who were achieving below their expected reading levels and those boys who were achieving above their expected reading levels, was retained. There was no significant difference between the means. There were seventeen boys who were achieving below their expected reading levels. The mean anxiety of these underachievers was 23.83. Nine boys with a mean anxiety of 23.66 were in the over-achieving group. The calculations for this hypothesis are found in Appendix C.

Hypothesis III. The third null hypothesis, stating that there was no significant difference between the levels of anxiety for those girls who were achieving above their expected reading level, was retained. There was no significant difference in the anxiety means. There were seven underachieving girls and their anxiety mean was 33.43. There were twenty-two overachieving girls and their anxiety mean was 29.90. These data are found in Appendix C.

Hypothesis IV. The fourth null hypothesis, stating that there was no significant difference between the levels of anxiety of boys and girls as determined by the scores obtained from the General Anxiety Scale For Children, was retained. There was no significant difference in the anxiety means.

The thirty-one sixth grade boys of the Carthage R-9 Public Schools had an anxiety mean of 22.74, while the thirty-three girls of the same schools had an anxiety score of 30.64. These data are found in Appendix C.

Other Conclusions

There was some evidence in this study to show that there was a relationship between intelligence and anxiety. Although there was no significant difference found between the means, a graph of the anxiety scores and the intelligence quotients was made to show the comparisons together and separately in subgroups. The comparisons are shown in Appendix E.

These data were presented graphically to indicate the spread of scores made by the sixth grade boys and girls. The boys' anxiety scores tended to cluster nearer the smaller anxiety scores and were more in the upper and lower left quadrants. This showed that the boys tended to be less anxious than the girls whose anxiety scores leaned more to the higher anxiety number and were in the upper and lower right quadrants.

Summary

The results of this study of the measures were presented in this chapter. The relationship between anxiety and the expected reading levels was determined. In testing the

hypotheses the data indicated that anxiety, as measured by the General Anxiety Scale For Children, had little effect on the reading achievement.

CHAPTER V

SUMMARY AND CONCLUSIONS

The summary of the study will be presented in the first part of this chapter. The conclusions which were drawn from the analysis of data will be presented in the second part. Finally, the limitations and implications for further research will be cited.

Summary of the Study

The purpose of this study was to consider the relationship between boys' and girls' anxiety levels and under and overachievement in reading. Sixty-four boys and girls were chosen at random from six elementary schools. During the fall semester of 1970 three tests, General Anxiety Scale For Children, Henmon-Nelson Tests of Mental Ability, and Gates-MacGinitie Reading Tests, were administered to the subjects and the results were noted.

Expected reading levels were determined through the use of the Bond and Tinker formula. The expected reading levels were found by multiplying the intelligence quotient obtained on the Henmon-Nelson Tests of Mental Ability by 5.3, the grade level, at the time of testing, and then adding one grade level.

The degree of under and overachievement in reading was determined by comparing the expected reading levels with the

reading achievement scores obtained on the Gates-MacGinitie Reading Tests. Those boys and girls whose reading achievement was two months or more below or above their expected reading level were used in the analysis of data. The formulas used in the study and the tables, which present the results, were placed in Appendix A.

The first null hypothesis, stating that there was no significant difference between the levels of anxiety for those boys and girls who were achieving below their expected reading levels and those boys and girls who were achieving above their expected reading levels, was retained.

The second null hypothesis, stating that there was no significant difference between the levels of anxiety for those boys who were achieving below their expected reading levels and those boys who were achieving above their expected reading levels, was retained.

The third null hypothesis, stating that there was no significant difference between the levels of anxiety for those girls who were achieving below their expected reading levels and those girls who were achieving above, was retained.

The fourth null hypothesis, stating that there was no significant difference between the levels of anxiety of boys and girls as determined by the scores obtained from the General Anxiety Scale For Children, was retained.

Conclusions

This study showed that anxiety as measured by the General Anxiety Scale for Children had little effect on the reading achievement grade level as measured by the Gates-MacGinitie Reading Tests. The girls tested in the study, as has been shown by previous research, tended to be more anxious than boys. It can be noted also that girls had a somewhat higher reading achievement results.

The boys and girls used in this study had approximately the same mean intelligence quotient, the boys having a slightly higher mean in the intelligence quotient.

Limitations and Implications

Anxiety, as a variable, which might affect reading achievement in this study was assessed by the General Anxiety Scale For Children. Although this measure purports to assess general behavioral characteristics in children, a measure, such as the Test Anxiety Scale for Children, might measure a type of anxiety which would be related to reading achievement (Sarason, et al., 1960).

A limitation of this study was the criterion of four months reading achievement which was used to designate those children whose reading achievement was above or below their expected reading levels. This spread of four months in reading achievement levels may not represent a significant

difference in achievement. This observation is based on the fact that children who are considered in remedial reading programs frequently are a year and a half retarded in reading achievement. It is assumed that anxiety might be a factor to be considered when a child is underachieving by as much as a year or more below his expected reading level.

It would seem profitable in further research of the effects of anxiety on reading achievement to use other measures of anxiety and a larger sample. Since this study showed no significant difference between those children reading two months below and above their expected reading levels, a study employing the same methodology as the present one, using as subjects boys and girls who were considered for remedial reading, might demonstrate the effects of anxiety on reading achievement.

Within the framework of these limitations, this study has presented additional evidence to the literature concerned with the effects of anxiety on school achievement.

APPENDIXES

APPENDIX A
EXPECTED READING LEVELS

BOYS' EXPECTED READING LEVELS CALCULATED BY THE
BOND AND TINKER FORMULA

Intelligence Quotients From Group Tests		Years in School	Plus 1 Grade	Expected Reading Level
1.04	X	5.3 = 5.5	+1 =	6.5
1.17	X	5.3 = 6.2	+1 =	7.2
1.01	X	5.3 = 5.4	+1 =	6.4
.98	X	5.3 = 5.2	+1 =	6.2
1.17	X	5.3 = 6.2	+1 =	7.2
.99	X	5.3 = 5.2	+1 =	6.2
.95	X	5.3 = 5.0	+1 =	6.0
1.25	X	5.3 = 6.6	+1 =	7.6
.96	X	5.3 = 5.0	+1 =	6.0
1.04	X	5.3 = 5.5	+1 =	6.5
1.19	X	5.3 = 6.3	+1 =	7.3
1.23	X	5.3 = 6.5	+1 =	7.5
1.18	X	5.3 = 5.4	+1 =	6.4
1.19	X	5.3 = 6.3	+1 =	7.3
1.07	X	5.3 = 5.6	+1 =	6.6
1.08	X	5.3 = 5.7	+1 =	6.7

BOYS' EXPECTED READING LEVELS - continued

Intelligence Quotients From Group Tests		Years in School	Plus 1 Grade	Expected Reading Level
1.21	X	5.3 = 6.4	+1 =	7.4
.80	X	5.3 = 4.2	+1 =	5.2
1.13	X	5.3 = 5.9	+1 =	6.9
1.01	X	5.3 = 5.4	+1 =	6.4
1.13	X	5.3 = 5.9	+1 =	6.9
1.20	X	5.3 = 6.4	+1 =	7.4
1.04	X	5.3 = 5.5	+1 =	6.5
.89	X	5.3 = 4.7	+1 =	5.7
.99	X	5.3 = 5.2	+1 =	6.2
.87	X	5.3 = 4.6	+1 =	5.6
1.27	X	5.3 = 6.7	+1 =	7.7
1.17	X	5.3 = 5.2	+1 =	6.2
.75	X	5.3 = 4.0	+1 =	5.0
.89	X	5.3 = 4.7	+1 =	5.7
1.08	X	5.3 = 5.7	+1 =	6.7

GIRLS' EXPECTED READING LEVELS CALCULATED BY THE
BOND AND TINKER FORMULA

Intelligence Quotients From Group Tests		Years in School	Plus 1 Grade	Expected Reading Level
.91	X	5.3 = 4.8	+1 =	5.8
1.10	X	5.3 = 5.8	+1 =	6.8
1.12	X	5.3 = 5.9	+1 =	6.9
1.11	X	5.3 = 5.9	+1 =	6.9
.97	X	5.3 = 5.1	+1 =	6.1
.79	X	5.3 = 4.2	+1 =	5.2
1.08	X	5.3 = 5.7	+1 =	6.7
.88	X	5.3 = 4.7	+1 =	5.7
1.24	X	5.3 = 6.6	+1 =	7.6
1.22	X	5.3 = 6.5	+1 =	7.5
1.00	X	5.3 = 5.3	+1 =	6.3
.83	X	5.3 = 4.4	+1 =	5.4
.97	X	5.3 = 5.1	+1 =	6.1
.86	X	5.3 = 4.6	+1 =	5.6
1.15	X	5.3 = 6.1	+1 =	7.1
1.09	X	5.3 = 5.8	+1 =	6.8
1.02	X	5.3 = 5.4	+1 =	6.4

GIRLS' EXPECTED READING LEVELS - continued

Intelligence Quotients From Group Tests		Years in School	Plus 1 Grade	Expected Reading Level
.93	X	5.3 = 4.9	+1 =	5.9
.99	X	5.3 = 4.2	+1 =	5.2
1.18	X	5.3 = 6.2	+1 =	7.2
1.18	X	5.3 = 6.3	+1 =	7.3
1.28	X	5.3 = 6.8	+1 =	7.8
.88	X	5.3 = 4.7	+1 =	5.7
1.13	X	5.3 = 5.9	+1 =	6.9
1.17	X	5.3 = 6.2	+1 =	7.2
.99	X	5.3 = 5.2	+1 =	6.2
1.25	X	5.3 = 6.6	+1 =	7.6
1.00	X	5.3 = 5.3	+1 =	6.3
1.08	X	5.3 = 5.7	+1 =	6.7
1.01	X	5.3 = 5.4	+1 =	6.4
1.18	X	5.3 = 6.3	+1 =	7.3
1.17	X	5.3 = 6.2	+1 =	7.2
1.20	X	5.3 = 6.4	+1 =	7.4

APPENDIX B
ANALYSIS OF VARIANCE

ANALYSIS OF VARIANCE

$$\text{Total Sum of Squares} \text{-----} SS = fd^2 - \frac{(fd)^2}{N}$$

$$\text{Between Sum of Square} \text{-----} SS_B = \frac{(fd)^2}{N} + \frac{(fd)^2}{N} - \frac{(fd)^2}{N}$$

$$\text{Within Sum of Square} \text{-----} SS_W = fd^2 - \frac{(fd)^2}{N}$$

$$\text{Means of the Sum of Squares} \text{-----} \overline{SS} = \frac{Bg}{df} \text{ and } \frac{Wg}{df}$$

$$\text{F-ratio} \text{-----} F = \frac{\text{Between } \overline{SS}}{\text{Within } \overline{SS}}$$

APPENDIX C
HYPOTHESES PROBLEMS

HYPOTHESIS I PROBLEM

Anxiety Scores of Boys and
Girls Below Expected Read-
ing Levels

Scores	f	d	fd	fd ²
42	1	15	15	225
39	1	12	12	144
37	3	10	30	300
36	1	9	9	81
32	1	5	5	25
31	1	4	4	16
29	1	2	2	4
28	1	1	1	1
27	3	0	0	0
24	2	-3	-6	18
21	1	-6	-6	36
20	1	-7	-7	49
17	1	-10	-10	100
14	1	-13	-13	169
13	1	-14	-14	196
10	1	-17	-17	289
7	1	-20	-20	400
<u>579</u>	<u>22</u>		<u>-15</u>	<u>2053</u>

N = 22 AM = 27 M = 26.32

Anxiety Scores of Boys and
Girls Above Expected Read-
ing Levels

Scores	f	d	fd	fd ²
39	1	12	12	144
37	3	10	30	300
36	1	9	9	81
35	1	8	8	64
34	2	7	14	98
32	3	5	15	75
31	2	4	8	32
29	1	2	2	4
28	3	1	3	3
27	3	0	0	0
25	2	-2	-4	8
24	1	-3	-3	9
22	2	-5	-10	50
21	2	-6	-12	72
20	1	-7	-7	49
19	1	-8	-8	64
17	1	-10	-10	100
13	1	-14	-14	196
<u>870</u>	<u>31</u>		<u>-33</u>	<u>1349</u>

N = 31 AM = 27 M = 28.06

HYPOTHESIS I PROBLEM - continued

Summary Table for the Analysis of Variance - F-ratio				
Source of Variation	Sum of Squares	df	Mean Squares	F
$N = 22 \quad -15fd \quad 2053fd^2$				
$SS = 2053 fd^2$				
$\begin{array}{r} 1349 \\ 3402. \\ - 6.11 \\ \hline 3395.89 \text{ total SS} \end{array}$				
$SS_W = 3395.89$				
$\begin{array}{r} - 39.23 \\ \hline 3356.66 \end{array}$				
$F = \frac{39.23}{65.81}$				
$F = .59$				
$N = 31 \quad fd = 33 \quad fd^2 = 1349$				
$SS_B = \frac{(-15)^2}{22} + \frac{(33)^2}{31} - \frac{(10)^2}{53}$				
$\frac{225}{22} + \frac{1089}{31} - 6.11 =$				
$SS_B = 10.22 + 35.12 - 6.11$				
$= 39.23$				
$\overline{SS} = \frac{3356.66}{51}$				
$\overline{SS} = 65.81$				
$SS = fd^2 - \frac{(fd)^2}{N} \quad \text{Between groups} = (fd)^2 - \text{correction } (fd)^2$				
$\text{Within groups} = fd^2 - \frac{(fd)^2}{N} \quad F = \frac{\text{Between } \overline{SS}}{\text{Within } \overline{SS}} \quad \overline{SS} = \frac{Bg}{df} \text{ and } \frac{Wg}{df}$				
Between groups	39.23	1	39.23	
Within groups	3356.66	51	65.81	.59
Total	3395.89	52		
				$\frac{5\%}{1\%} = 4.03$ $= 7.17$

HYPOTHESIS II PROBLEM

Anxiety Scores of the Boys
Below Expected Reading LevelsAnxiety Scores of the Boys
Above Expected Reading Levels

Scores	f	d	fd	fd ²	Scores	f	d	fd	fd ²
37	2	13	26	338	34	1	12	12	144
36	1	12	12	144	32	1	10	10	100
32	1	8	8	64	27	1	5	5	25
31	1	7	7	49	25	1	3	3	9
27	2	3	6	18	22	1	-0	0	0
24	3	0	0	0	21	1	-1	-1	1
21	1	-3	-3	9	20	1	-2	-2	4
20	1	-4	-4	16	19	1	-3	-3	9
18	1	-6	-6	36	13	1	-9	-9	81
17	1	-7	-7	49	<u>213</u>	9		<u>15</u>	<u>373</u>
14	1	-10	-10	100	N = 9 AM = 22 M = 23.66				
10	1	-14	-14	196					
7	1	-17	-17	289					
<u>4006</u>	<u>17</u>		<u>-2</u>	<u>1308</u>					
N = 17 AM = 24 M = 23.88									

HYPOTHESIS II PROBLEM - continued

Summary Table for the Analysis of Variance - F-ratio					
Source of Variation	Sum of Squares	df	Mean Squares	F	
Below N = 17 -2fd 1308fd ²				Above N = 9 15fd 373fd ²	
Total SS = 1308 fd ² -2				SS _B = $\frac{(-2)^2}{17} + \frac{(15)^2}{9} - \frac{(13)^2}{26}$	
373	15				
1681. - (13) ²	26			.23 + 25.00 - 6.50 =	
- 6.50				18.73	
1674.50					
SS _W = 1674.50 - 18.73				SS = $\frac{1655.77}{24}$	
SS _W = 1655.77				SS = 68.99	
or					
1308 - (2) ² = 1308 - .23 =					
1307.77					
348.00					
373 - (15) ² = 373 - 25.00					
= 1655.77 Wg					
F = $\frac{18.73}{68.99}$					
F = .27					
Between groups	18.73	1	18.73		
Within groups	1655.77	24	68.99	.27	
Total	1674.50	25		5% = 4.26	
				1% = 7.82	

HYPOTHESIS III PROBLEM

Anxiety Scores of the Girls
Below Expected Reading Levels

Anxiety Scores of the Girls
Above Expected Reading Levels

Scores	f	d	fd	fd ²	Scores	f	d	fd	fd ²
42	1	10	10	100	39	1	10	10	100
39	1	7	7	49	37	3	8	24	112
37	1	5	5	25	36	1	7	7	49
32	1	0	0	0	35	1	6	6	36
29	1	-3	-3	9	34	1	5	5	25
28	1	-4	-4	16	32	3	3	9	27
27	1	-5	-5	25	31	1	2	2	4
<u>234</u>	<u>7</u>		<u>10</u>	<u>224</u>	29	1	0	0	0

$$N = 7$$

$$AM = 32$$

$$M = AM + 0 + \frac{fd}{N}$$

$$(32 + 0 + 1.43 = 33.43)$$

$$M = 33.43$$

28	3	-1	-3	3
27	2	-2	-4	8
25	1	-4	-4	16
24	1	-5	-5	25
22	1	-7	-7	49
21	1	-8	-8	64
17	1	-12	-12	144
<u>658</u>	<u>22</u>		<u>20</u>	<u>662</u>

$$N = 22$$

$$AM = 29 \quad (29 + 0 + .90 = 29.90)$$

$$M = 29.90$$

HYPOTHESIS III PROBLEM - continued

Summary Table for the Analysis of Variance - F-ratio				
Source of Variation	Sum of Squares	df	Mean Squares	F
<div> <div> Below N = 7 10fd 224fd² </div> <div> Above N = 22 20fd 662fd² </div> </div>				
<div> <div> SS = 224 10 662 20 886.00 (30)² = 31.03 - 31.03 29 SS = 854.97 </div> <div> SS_B = $\frac{(10)^2}{7} + \frac{(20)^2}{22} - \frac{(30)^2}{29}$ SS_B = 14.28 + 18.18 - 31.03 SS_B = 1.43 SS = $\frac{853.54}{27}$ SS = 31.61 F = $\frac{1.43}{31.61}$ F = .04 </div> </div>				
<div> <div> SS_W = 854.97 - 1.43 SS_W = 853.54 or SS_W = 224 - $\frac{(10)^2}{7}$ 662 - $\frac{(20)^2}{22}$ SS_W = 209.72 + 643.82 SS_W = 853.54 </div> </div>				
Between groups	1.43	1	1.43	
Within Groups	853.54	27	31.61	.04
Total	854.97	28		5% = 4.21 1% = 7.68

HYPOTHESIS IV PROBLEM

Boys' Anxiety Scores on the
General Anxiety Scale for
Children

Girls' Anxiety Scores on
the General Anxiety Scale
for Children

Scores	f	d	fd	fd ²	Scores	f	d	fd	fd ²
37	2	15	30	450	42	1	11	11	121
36	1	14	14	196	39	2	8	16	128
34	1	12	12	144	37	4	6	24	144
32	2	10	20	200	36	2	5	10	50
31	1	9	9	81	35	1	4	4	16
27	3	5	15	75	34	1	3	3	9
25	2	3	6	18	33	1	2	2	4
24	4	2	8	16	32	5	1	5	5
22	1	0	0	0	31	1	0	0	0
21	2	-1	-2	2	29	2	-2	-4	8
20	2	-2	-4	8	28	4	-3	-12	36
19	1	-3	-3	9	27	3	-4	-12	48
18	1	-4	-4	16	25	1	-6	-6	36
17	1	-5	-5	25	24	1	-7	-7	49
16	1	-6	-6	36	22	1	-9	-9	81
14	1	-8	-8	64	21	1	-10	-10	100
13	1	-9	-9	81	18	1	-13	-13	169
11	1	-11	-11	121	17	1	-14	-14	196
10	2	-12	-24	288	3063	33	-12	-1200	
7	1	-15	-15	225	N = 33				
704	31	-23	-23	2055	AM = 31	M = 31.00 - .36 =			
AM = 22	M = 22.74					30.64			
					M = 30.64				

HYPOTHESIS IV PROBLEM - continued

Summary Table for the Analysis of Variance - F-ratio				
Source of Variation	Sum of Squares	df	Mean Squares	F
<div> Boys N = 31 23fd 2055fd² Girls N = 33 -12fd 1200fd² </div>				
<div> $SS = 2055 + 1200 - \frac{(23-12)^2}{64}$ $\overline{SS} = \frac{3233.58}{62}$ </div>				
<div> $SS = 3255 - 1.89$ $\overline{SS} = 52.15$ </div>				
<div> $SS = 3253.11$ $F = \frac{19.53}{52.15}$ </div>				
<div> $SS_B = \frac{(23)^2}{31} + \frac{(-12)^2}{33} - \frac{(11)^2}{64}$ $F = .37$ </div>				
<div> $SS_B = \frac{529}{31} + \frac{144}{33} - \frac{121}{64}$ </div>				
<div> $SS_B = 17.06 + 4.36 - 1.89$ </div>				
<div> $SS_B = 19.53$ </div>				
<div> $SS_W = 3253.11 - 19.53$ </div>				
<div> $SS_W = 3233.58$ </div>				
<div> $SS_W = 2055 - \frac{(23)^2}{31}$ $SS_W = 2055 - 17.06$ </div>				
<div> $SS_W = 1200 - \frac{(-12)^2}{33}$ $SS_W = 2037.94$ </div>				
<div> $SS_W = 3233.58$ $SS_W = 1200 - 4.36$ </div>				
<div> $SS_W = 1195.64$ </div>				
Between groups	19.53	1	19.53	
Within groups	3233.58	62	52.15	.37
Total	3253.11	63		5% = 4.00 1% = 7.08

APPENDIX D

TEST

GENERAL ANXIETY SCALE FOR CHILDREN (GASC)

Name _____ Age _____ Boy _____ Girl _____

School _____ Grade _____

Following are some questions which are different from the usual school questions because there are no right or wrong answers. You are to read each question and then put a circle around either "Yes" or "No." These questions are about how you think and feel and, therefore, they have no right or wrong answers. People think and feel differently. One person might put a circle around "Yes" and you may put a circle around "No." For example, if you were asked this question: "Do you like to play ball?" Some persons would put a circle around "Yes" and some would put it around "No." Your answers depend on how you think and feel. These questions are about how you think and feel about school and a lot of other things. Remember, read each question carefully and then answer it "Yes" or "No" by deciding how you think and feel. If you don't understand a question, ask about it.

1. When you are away from home, do you worry about what might be happening at home?
2. Do you sometimes worry about whether your body is growing the way it should?
3. Are you afraid of mice or rats?
4. Do you ever worry about knowing your lessons?
5. If you were to climb a ladder, would you worry about falling off it?
6. Do you worry about whether your mother is going to get sick?
7. Do you get scared when you have to walk home alone at night?
8. Do you ever worry about what other people think of you?
9. Do you get a funny feeling when you see blood?
10. When your father is away from home, do you worry about whether he is going to come back?
11. Are you frightened by lightning and thunderstorms?
12. Do you ever worry that you won't be able to do something you want to do?

13. When you go to the dentist, do you worry that he may hurt you?
14. Are you afraid of things like snakes?
15. When you are in bed at night trying to go to sleep, do you often find that you are worrying about something?
16. When you were younger, were you ever scared of anything?
17. Are you sometimes frightened when looking down from a high place?
18. Do you get worried when you have to go to the Doctor's office?
19. Do some of the stories on radio or television scare you?
20. Have you ever been afraid of getting hurt?
21. When you are home alone and someone knocks on the door, do you get a worried feeling?
22. Do you get a scary feeling when you see a dead animal?
23. Do you think you worry more than other boys or girls?
24. Do you worry that you might get hurt in some accident?
25. Has anyone ever been able to scare you?
26. Are you afraid of things like guns?
27. Without knowing why, do you sometimes get a funny feeling in your stomach?
28. Are you afraid of being bitten or hurt by a dog?
29. Do you ever worry about something bad happening to someone you know?
30. Do you worry when you are home alone at night?
31. Are you afraid of being too near fireworks because of their exploding?
32. Do you worry that you are going to get sick?
33. Are you ever unhappy?
34. When your mother is away from home, do you worry about whether she is going to come back?

35. Are you afraid to dive into the water because you might get hurt?
36. Do you get a funny feeling when you touch something that has a real sharp edge?
37. Do you ever worry about what is going to happen?
38. Do you get scared when you have to go into a dark room?
39. Do you dislike getting in fights because you worry about getting hurt in them?
40. Do you worry about whether your father is going to get sick?
41. Have you ever had a scary dream?
42. Are you afraid of spiders?
43. Do you sometimes get the feeling that something bad is going to happen to you?
44. When you are alone in a room and you hear a strange noise, do you get a frightened feeling?
45. Do you ever worry?

APPENDIX E

COMPARISON OF I.Q. WITH ANXIETY SCORES

COMPARISON OF I.Q. WITH ANXIETY SCORE FOR THE GIRLS

											Total n
I.Q. SCALE	128-133				1						1
	122-127				2	1					3
	116-121			2		2		1	1		6
	110-115		1			1	1	1			4
	104-109					1	1	2			4
	98-103					1		3		1	5
	92- 97					2	2	1			5
	85- 91					1		1	1		3
	79- 84						2				2
	73- 78										0
	6-- 9	10-- 13	14-- 17	18-- 21	22-- 25	26-- 29	30-- 33	34-- 37	38-- 41	42-- 45	
Total n	0	0	1	2	3	9	6	9	2	1	33
Anxiety Scores											

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