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Gender Difference and Test Anxiety

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Abstract

This study compared male and female students in the 4th, 6th, and 10th grades to see which sex had more test anxiety. The students are from a rural town in Southeastern Ohio. A total of 85 students filled out the Revised Children's Manifest Anxiety Scale. The students were given the Revised Children's Manifest Anxiety Scale (RCMAS) two weeks prior to, one week prior to, and one week after the Ohio Fourth and Ohio Sixth Grade Proficiency Tests and the Ohio Graduation Test (OGT). The hypotheses of this study are that the 10th grade females will have greater test anxiety than the 4th and 6th grade males and females and the 10th grade males two weeks prior to the high stakes testing, one week prior to the high stakes testing, and their anxiety will decrease the most during the posttest. The results were analyzed using T tests. The results showed there was a significant difference between the 6th grade males and females during the pretest administration, with the males showing more anxiety.

Introduction

The Ohio proficiency exams for 4th and 6th grades test their knowledge in reading, writing, mathematics, citizenship, and science. In 2004, mathematics and science scores for the 4th grade and mathematics and writing for the 6th grade rose. In the school year 2004-2005, the 4th grade reading and writing tests will be replaced by new achievement tests. Because the No Child Left Behind Act focused on mathematics last year and scores went up, could the language arts scores raise this year because that is the focus?

The 10th grade will be given the Ohio Graduation Test (OGT). Starting in 2005, students must pass this test to receive their high school diploma. There are nineteen states that currently have exit exams and five other states that are phasing them in by the year 2008. The test requirements were compiled by the Ohio General Assembly in 2001 (Ohio Board of Education, 2004). The General Assembly listed three purposes for the OGT. The state wants to make sure the students have at least high school levels of achievement in the subjects tested and that the students meet the federal requirement for high school testing. Like the proficiency tests for the 4th and 6th grades, the OGT also has five subjects. Reading, writing, mathematics, science, and social studies are the subjects the students need to know for the OGT.

Because the OGT is new, teachers must change their curriculum to make sure all items are covered. The state of Ohio has given them two years to make this change. If the students do not pass the test on the first try, they can retake it in the fall, spring, and summer of their junior and senior years.

So, does the fact that the students can retake the parts of the tests they failed make them less anxious, and if so, are boys or girls the least anxious?

The purpose of this study was to determine if male or female students have greater test anxiety on the high stakes testing. This information will benefit teachers, administrators, and parents. They will want to know this information because it will help them focus on who needs the most attention on test taking strategies or relaxation techniques before the tests.

The hypotheses for this study were that the 10th grade females will have greater test anxiety two weeks before the high stakes testing compared to the 4th and 6th grade males and females and the 10th grade males, the 10th grade females will have greater test anxiety one week before the high stakes testing and third, the anxiety levels will decrease the most for the 10th grade females during the posttest.

Review of Literature

Keith, Hodapp, Schemelleh-Engel, and Moosbrugger (2003) found that emotionality, worry, interference, and lack of confidence are the four main areas that affect test performance. They came to this conclusion after administering the German Test Anxiety Inventory to 302 nursing students. They found that lack of confidence was the best predictor of test anxiety and interference was the weakest predictor.

Oostdam and Meijer (2003) tested if worry, emotionality, and lack of confidence were better measures of test anxiety than worry and emotionality alone. They also wanted to know if test anxiety would inhibit performance on an intelligence test. Their subjects were 207 Dutch students aged 11-14 years old.

Oostdam used the Test Anxiety Questionnaire to measure the subjects' anxiety levels. To measure the subjects' intelligence, the experimenters used three tests of verbal

ability, two tests of reasoning, and two tests of visual-spatial ability from the Netherlands Differentiation Test.

The results showed that measuring for worry, emotionality, and lack of confidence was better than measuring worry and emotionality alone. The results also showed that, for the subjects that had test anxiety, the negative effects went away after the first scale of the intelligence test was given. The researchers hypothesized one reason for this may be the students are nervous because they do not know what to expect and then they calm down after they start.

Reidy (2002) studied the effect of anxiety on memory, by testing 45 undergraduate students assigned to a high or low anxiety group based on scores from the Spielberger State-Trait Anxiety Inventory. Participants also rated 40 items (20 worry and 20 nonworry) on how often they thought about each. Finally, he had them fill out the Hospital Anxiety and Depression Scale.

The study took place in a room, where a cartoon was shown on the overhead projector. First, the participants rated the 40 items, and then drew the cartoon from memory. After two minutes they were asked to write down all of the items they could remember.

The results showed that low anxiety people think more about nonworry items and can recall these better. Highly anxious people, on the other hand, think about worry items more often but could recall both worry and nonworry items the same. So, while anxious people worry more often it does not affect their memories.

In an experiment that studied accountability for testing in milepost grades, Stecher and Barron (2001) found that high stakes testing does have negative effects on

curriculum and teaching. The grades in this study were 4th, 5th, 6th, and 7th in Kentucky. As an incentive for schools to do well on the Kentucky Instructional Results Information System (KIRIS) the teachers can receive monetary rewards for passing scores.

The sample for this study was 72 schools for the elementary grades and 80 schools for the middle school sample. The study looked at professional development, school and class organization, curriculum and instruction, test preparation, and school level practices of the tests. A survey was completed by the teachers in this study.

The results showed that teachers were more concerned with the subjects the students were to be tested on that year than any other subjects. It also showed that teachers in the 4th, 5th, and 7th grades had more professional development hours than the 6th grade teachers. This showed that the school system wanted the teachers who had to give the proficiency tests to be better prepared than the other teachers in the school.

Schonwetter, Clifton, and Perry (2002) studied effective teaching on student outcomes. They wanted to see if previous knowledge of a subject, perceived learning and achievement, different teaching styles, student differences (i.e. anxiety, gender, etc.), and prior performances were related.

Schonwetter had 418 undergraduate students participate in this study. The students were put into groups of 40-60 students and asked to fill out a questionnaire before the lecture. They then watched a taped lecture, wrote an achievement test, and filled out another questionnaire before they left.

The results showed that the students who were familiar with the content thought they did well on the achievement test and did not learn much from the lectures. The students who did not know the content before the class did not think they did well on the

test but learned from the lecture. The results also showed that high school GPA had a positive effect for both groups while test anxiety negatively affected both groups. However, students not familiar with the subject had higher test anxiety and lower achievement than the students familiar with the subject. The experimenters broke down the results into male/female. Males had lower test anxiety and lower learning perceptions but they achieved higher than the females.

Minnaert (2003) wanted to see if test anxiety was a moderator of test expectancy and memory of prose. He tested 292 undergraduate freshmen. He assigned them to either the No Retention Expectancy group or the Retention Expectancy group depending on the first letter of their last name.

The subjects took a silent reading test and then a retention test. The Retention Expectancy group knew there was going to be a retention test, while the No Retention Expectancy group did not. Minnaert then tested each subject for test anxiety with the Mehrabian Achieving Tendency Scale.

The results showed that both low and high anxiety subjects in the Expectancy group did better than everyone else. Also, high anxiety subjects in the No Expectancy group did worse than everyone else. The hypothesis that test anxiety would be a moderator was supported.

Smith and Smith (2002) studied whether motivation and anxiety played a role in test performance. Their study consisted of 112 undergraduate students in educational psychology classes. The subjects had to take two tests for the class, the Posttest Index of Test Motivation, and the Posttest Index of Test Anxiety. Five days before the students took the educational psychology test they filled out the Learning and Study Skills

Inventory. The subjects were told that one of the class exams counted toward their grade (the Consequential stage) and that the other did not (the Nonconsequential stage). This was to see if motivation for a grade changed their performance.

The results showed that motivation played a significant role on performance in the Consequential stage as opposed to the Nonconsequential stage. Also, test anxiety was higher during the Consequential stage than the Nonconsequential stage.

Williams (1996) studied the amount of test anxiety reported by academically talented students, determined the relationship between the two components of test anxiety and academic performance, and uncovered gender differences in perceived worry and emotionality.

Her participants were 103 primarily white, middle class high school students in a Midwestern suburban public school. The students were in an enrichment program of honor courses. The Worry-Emotionality Scale was used to test the anxiety levels shortly after the science achievement test was given.

The results showed that about 54% of the high-achieving students were high on both worry and emotionality. Females reported experiencing significantly more worry than emotionality compared to the males that reported relatively little difference between the anxiety components. The results also showed that the students who reported having greater anxiety had lower performance score than did the students whose anxiety was minimal.

Hodge, McCormick and Elliott (1997) investigated the association between the Higher School Certificate, the reported distress and anxiety levels of the adolescent students taking the test, and various other internal and environmental variables (e.g. sex,

ethnic and socio-economic background, etc). The participants were 224 juniors (year 11) and 221 seniors (year 12) from state and independent schools in the Sydney metropolitan area. There were two subgroups for this study as well. They were English speaking students and non-English speaking students.

The questionnaire for this study had 5 sections: Part A was background information, school characteristics, academic self-concept, coping practices, and perceptions of support, Part B was the State-Trait Anxiety Inventory, Part C was the General Health Questionnaire, Part D was the Adolescent Coping Scale, and Part E was the Self-Description Questionnaire III.

The results showed the level of distress was highest among the year 12 students, females more than males, and the non-English speaking students as opposed to English speaking students.

Hypotheses

The hypotheses of the current study is that 1) the 10^{th} grade females will have greater test anxiety than will the 4^{th} and 6^{th} grade males and females and the 10^{th} grade males two weeks prior to the high stakes testing, 2) the 10^{th} grade females will have the greater anxiety levels one week prior to the high stakes testing, and 3) the 10^{th} grade females' anxiety will decrease the most during the posttest. The independent variable is the grade level and sex of the students. The students were not assigned to a grade just for the purposes of this experiment. The dependent variable is the scores the students receive on the anxiety test. For the purposes of the current study, test anxiety will be defined as the emotional aspects (i.e. nervousness, stress) of anxiety.

Method

Subjects

All 4th, 6th, and 10th grade students in Chesapeake, OH were selected for this study. The students that chose to participate were randomly assigned a code number so they could not be identified during the testing process.

Instrument

The anxiety levels of students was measured using the *Revised Children's Manifest Anxiety Scale (RCMAS;* Reynolds & Richmond, 1985). The *RCMAS* is a self report scale for children and adolescents that measures types and amounts of anxiety they are experiencing (Conoley & Kramer, 1989; Reynolds & Richmond, 1985). The anxiety scale consist of 37 yes/no statements and four subscales: Physiological Anxiety, Worry/Oversensitivity, Social Concern/Concentration, and one Lie subscale. There are five raw scores on the *RCMAS*. They are scores for each of the three anxiety scales, a score for the lie subscale, and a Total Anxiety score. It takes approximately 10-15 minutes to complete the scale. The *RCMAS* is designed for children and adolescents ages 6-19 years, and it can be given individually or in groups. Scores are obtained by adding the number of "yes" responses for each subscale. A raw score for the Total Anxiety scale can range from 0-28. Scores may be converted to scaled scores or percentiles or can stay as raw scores. The Total Anxiety score can be converted to a standard score. The reliability coefficient for the *RCMAS* is .79-.85 (Conoley & Kramer, 1989). The Total Anxiety score yields a reliability coefficient above .80, except for African American girls, ages 6-11, who yield lower reliability coefficients. The *RCMAS* yields test-retest

reliability coefficients above .90 and .68 for three-week and nine-month periods between administrations of the measure.

Procedures

The experimenter spoke with each 4th, 6th, and 10th grade and asked for their assistance in this experiment. The students were given a permission form and asked to have their parents sign and return the form if they wished to participate. Those who returned the permission forms were then given a form to sign stating they agreed to participate in the study and they understood that confidentiality would be maintained and that the study was voluntary.

The participates completed the anxiety scale at one week intervals: two weeks before the high stakes testing, one week before the high stakes testing, and one week after the high stakes testing. The scores were then compared to see which group had the highest anxiety two weeks prior to the high stakes testing and if the same group had the highest anxiety one week prior and one week after the high stakes testing. The data collection took place from February 14, 2005-March 25, 2005.

Design

The design of this experiment is quasi-experimental. To test the hypotheses T tests were used. The independent variable of the study is the grades the students are in and the dependent variable is the anxiety test scores. A p level of .05 was chosen for this experiment.

A quasi-experimental design was chosen because the groups were not randomly assigned. Also, two pretests and one posttest were given.

Data Analysis

The type of data that was statistically analyzed was quantitative and interval data, based on the scores from the self-report anxiety measure. Total anxiety scores were used as standard scores (T-score). There was a t test completed on the baseline, pretest and posttest data. The hypotheses were tested for significance at the .05 alpha levels. Results are explained according to the finding from the t test at the .05 alpha levels. Table 1 represents the means and standard deviations of the scores from the anxiety scale for the three grade levels at all three administrations. Table 2 represents the results of the t tests between the females, males, and females versus males at all three administrations.

Results

The data showed that there was a significant difference between some males and females and not others. As shown in Table 1 the males in each grade had higher anxiety than did the females on each administration of the *RCMAS.* It should be noted that although the males had higher anxiety scores both the males and females scores on all three administrations fell within the Average range of anxiety. Table 1 also shows that all the means fell after each administration with the exception of the 6th grade males Baseline-Pretest scores and the 10th grade males Pretest-Posttest scores.

Table 1.
Mean Anxiety Scores, with Standard Deviations, by Gender

	4th Grade Females		4th Grade Males	
	M	SD	M	SD
Baseline	48.88	6.702	54.21	8.963
Pretest	45.94	10.994	49.36	9.427
Posttest	42.13	8.702	47.29	9.603

	6th Grade Females		6th Grade Males	
	M	SD	M	SD
Baseline	49.08	9.358	54.69	9.268
Pretest	46.72	10.482	55.08	13.111
Posttest	44.84	10.546	50.46	15.169
	10th Grade Females		10th Grade Males	
	M	SD	M	SD
Baseline	52.18	8.328	52.83	6.882
Pretest	50.55	9.954	50.33	6.250
Posttest	48.18	11.250	53.00	6.899

Table 2 shows the significance levels between the males and females in the 6th grade. As the table shows there was a significant difference between the anxiety levels of the males and females at the pretest administration.

	Baseline	Pretest	Posttest
Significance (2-tailed)	.087	.039	.189

Discussion

Overall, the data does not support the hypotheses that the 10th grade females will be more anxious than the 4th and 6th grade males and females and the 10th grade males. The data shows that all the participants were within the Average range of anxiety according to the *RCMAS* manual. The only significant differences were between the males and females in the 6th grade during the pretest administration, with the males showing more anxiety than the females. The research does not support the findings of the current study. The research says that females tend to be more anxious than males;

however, that was not the case for this study. Even though there were not many significant differences, in every grade and at almost every administration the males tended to score higher in anxiety than the females.

One limitation of this sample was that there was only one elementary school, one middle school, and one high school participating in the study. The reason for this was because all the schools were located on one campus. Another limitation of this sample was that they were all from Southeastern Ohio. The reason this is a limitation is because not all students in Ohio may be as anxious about the high stakes testing and the sample may not be representative of the entire population.

A limitation of the design is the participants may have learned how to answer the anxiety scale during the two pretests and were able to make themselves look less anxious on the posttest.

A limitation to the data collected was that the Lie scales on some of the tests were high. These scores indicate that the participants were not being entirely truthful when answering the questions and that may have affected the means and significance levels.

If this study is to be replicated in the future more schools and more diverse participants should be added to ensure more accurate results.

References

Hodge, G.M., McCormick, J., Elliott, R. (1997). Examination-induced distress in a public examination at the completion of secondary schooling. *British Journal of Educational Psychology.* Vol. 67, 185-197

Keith, N., Hodapp, V., Schermelleh-Engel, K., Moosbrugger, H. (2003). Cross Sectional and Longitudinal Confirmatory Factor Models for the German Test Anxiety Inventory: A Construct Validation. *Anxiety, Stress, and Coping.* Vol. 16(3) 251-270

Minnaert, A.E. (2003). The Moderator Effect of Test Anxiety in the Relationship Between Test Expectancy and the Retention of Prose. *Psychological Reports.* Vol. 93, 961-971

Ohio Graduation Tests: Frequently Asked Questions. Retrieved on July 16, 2004 from http://www.ode.state.oh.us

Oostdam, R., Meijer, J. (2003). Influence of Test Anxiety on Measurement of Intelligence. *Psychological Reports.* Vol. 92, 3-20

Reidy, J. (2002). Trait Anxiety, Trait Depression, Worry, and Memory. *Behaviour Research and Therapy.* Vol. 42(8) 937-948

Sadker, D., Zittleman, K. (2004). Test Anxiety: Are Students Failing Tests-Or Are Tests Failing Students? *Phi Delta Kappan.* June 2004, 740-744

Schonwetter, D.J., Clifton, R.A., Perry, R.P. (2002). Content Familiarity: Differential Impact of Effective Teaching on Student Achievement Outcomes. *Research in Higher Education.* Vol. 43(6), 625-651.

Smith, L.F., Smith, J.K. (2002). Relation of Test-Specific Motivation and Anxiety To Test Performance. *Psychological Reports.* Vol. 91, 1011-1021

Stecher, B.M., Barron, S. (2001). Unintended Consequences of Test-Based Accountability When Testing in "Milepost" Grades. *Educational Assessment.* Vol. 7(4) 259-281

Williams, J.E. (1996). Gender-Related Worry and Emotionality Test Anxiety For High-Achieving Students. *Psychology in the Schools.* Vol. 33(2), 159-162