



Research Paper

# Interrelation of Mathematical Nervousness and Academic Achievement amongst the adolescent Secondary School Students

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## I. INTRODUCTION

Everyone in this fast paced and techno world is in stress in which he has to meet various challenges of future. Some of us do not cope with the environment and easily get anxious. Everyone faces this situation once in life and that situation is called anxiety. Now question arises what is anxiety? Anxiety seems to have both cognitive and affective components. The cognitive side includes worry and negative thoughts. The affective side involves physiological and emotional reactions such as sweaty palms, upset stomach, racing heart beat or fear. Due to this, it affects thinking, decision-making ability, and perceptions of the environment, learning, memory and concentration. Generally, anxiety is either a trait anxiety or a state anxiety. A trait anxiety is a stable characteristic of a person and a state anxiety is one which is aroused by some temporary condition of the environment such as examination, accident, punishment, etc. Mild or even moderate amount of anxiety is not bad. It rather motivates to do better. But the prevailing education system has fuelled severe anxiety among the school children. Due to continuous and comprehensive evaluation, students are stressed as they have to complete their assignments, projects, unit tests and terminal examinations. During examinations, highly anxious individuals are likely to engage in a negative, self-depreciatory internal dialogue or worrisome thoughts about test consequences, especially about mathematics, which is known as the most difficult subject to learn and teach. Mathematics is an expression of the human mind which reflects the active will, the contemplative reason and desire for aesthetic perfection. Its basic elements are logic and intuition, analysis and construction, generality and individuality. It is the only subject that encourages and develops logical thinking and the logic employed is simple, exact, accurate, true and useful. Mathematics forms the basis for all the scientific and technological advancement. Today, what we enjoy in our life as a result of scientific inventions has only been possible because of mathematics. Therefore, mathematics becomes a compulsory subject in school curriculum. Mathematics is not so easy a subject. It requires special aptitude and a favorable disposition. It also needs special ability for successful performance in the subject. Compulsory learning of such a subject can adversely affect the student's attitude and maybe on their performance. Despite mathematics being the need of everyday life, it is considered as a difficult and boring subject as it is abstract and students become anxious while doing mathematics test. It develops mainly at the stage of elementary level, at the time that a shift occurs from concrete to abstract thinking. Mathematical anxiety is the state of sinking feeling, uncertainty and despair of not doing the subject well. Mathematical anxiety is described as "feelings of tension and anxiety that interfere with the manipulation of mathematical problems in a wide variety of ordinary life and academic situations" [1]. People who suffer from mathematical anxiety feel that they are incapable of doing activities and classes that involve mathematics. Some math-anxious people even have a fear of math; it is called math phobia.

It is an emotional reaction to mathematics based on a past unpleasant experience which harms future learning. In the 1970s, Richardson and Suinn declared that "mathematics anxiety involves feelings of tension and anxiety that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations" [2]. Fennema and Sherman referred to mathematical anxiety as feelings of anxiety, dread and nervousness and associated bodily symptoms related to doing mathematics. Trujillo and Hadfield [3] defined mathematical anxiety as a state of discomfort that occurs in response to situations involving mathematical tasks that are perceived as threatening to self-esteem. Ertekin *et al.* [4] stated "anxiety is a state of arousal that surfaces through bodily, emotional, and mental changes an individual experiences when faced a stimulus." Mathematical anxiety usually arises from a lack of self-confidence when working in mathematical tasks.

Lack of confidence in oneself is also probably the greatest obstacle to learning because beliefs govern action. Since many mathematics tasks, especially at the secondary (middle) school level, are complex, involving multiple responses, anxiety can be “over-roused” and debilitating especially among low achievers. They may perceive their inability to handle mathematics problems as “threatening,” giving rise to feelings of self-doubt, fear of failure and loss of regard by others[5]. This is commonly observed in the classroom situations when students suffer from mathematical anxiety. Due to mathematical anxiety, performance of students can be affected and they do not show interest in solving problems related to mathematics and want to get rid of the subject. To study at what level mathematical anxiety affects students’ performance, the authors have undertaken this study.

### **OBJECTIVES**

1. To find out the mathematical anxiety of secondary school boys and girls students
2. To find out the academic achievement of secondary school boys and girls students
3. To find out the relationship between mathematical anxiety and academic achievement of secondary school boys and girls students

### **HYPOTHESIS OF THE STUDY**

There is no significant relation between mathematical anxiety and academic achievement of secondary school boys and girls students.

### **METHOD OF STUDY**

The study was conducted through descriptive survey method of research as it is most suitable for the present study.

### **Sample**

The study was conducted on a representative sample of 40 students aged 12 to 14 years selected on the basis of simple random sampling from private schools.

### **Research Tools**

A self-constructed achievement test was prepared containing 30 items. All items are related to general mathematical concepts. All types of test items are included in it. Right responses scored 2 and wrong responses scored 0.

A Mathematical Anxiety scale by Haiyam Baiet *al.*[6] was taken from the Internet. Two types of test items, negative and positive, contained 14 items. Responses are made on a five-point scale. Responses to all items are summed up to yield the final composite score. The high score is 70. High score indicates high anxiety.

### **Statistical Techniques**

The obtained data were analyzed in terms of mean, standard deviation, t-test and correlation.

### **Analysis and Interpretation of Data**

**Objective 1:** To find out the mathematical anxiety of secondary school boys and girls students.

	<b>Mathematical anxiety</b>		
Boys	Mn = 43.5	S.D. = 9	t = 1.53
Girls	Mn = 39	S.D. = 9.65	

### **At 0.10 Level of Significance:**

It was found that girls are more anxious than boys as the mean difference of boys is more than girls. Therefore, there is significant difference between mathematical anxiety of secondary school boys and girls students.

**Objective 2:** To find out the academic achievement of secondary school boys and girls students.

	<b>Mathematical achievement</b>		
Boys	Mn = 12.8	S.D. = 5.6	t = 1.16
Girls	Mn = 15.1	S.D. = 6.82	

**At 0.10 Level of Significance:**

It was found that the achievement of girls is more than boys as the mean difference of girls is more than boys. Therefore, there is significant difference between mathematical achievement of secondary school boys and girl students.

**Objective 3:** To find out the relationship between mathematical anxiety and academic achievement of secondary school boys and girl students.

Mathematical achievement	Mn = 13.75	S.D. = 6.46
Mathematical anxiety	Mn = 40.8	S.D. = 13.21

R = -0.18

It was found that mathematical anxiety and academic achievement are negatively correlated, i.e., there is negligible negative correlation between mathematical anxiety and mathematical achievement.

**Hypothesis:** There is no significant relation between mathematical anxiety and academic achievement of secondary school boys and girls students.

To test the correlated samples, t-test was done and the value is -1.13, which is less than the table value at 0.10 level of significance. We accept the null hypothesis at the given level of significance and may infer that there is no relationship of statistical significance between the two variables. So, we can say that mathematical anxiety does not affect the mathematical achievement of secondary school students.

## II. RESULTS AND CONCLUSIONS

1. There is a significant difference of mathematical anxiety between boys and girls secondary school students. Girls are more anxious than boys.
2. There is a significant difference of mathematical achievement between boys and girls secondary school students. Girls' performance is better than boys.
3. Both the variables, mathematical anxiety and mathematical achievement, are negatively correlated.
4. There is no significant relation between mathematical anxiety and academic achievement of secondary school boys and girl students.

### CONCLUSIONS

The finding of the study shows that mathematical anxiety and mathematical achievement have a definite relationship and they are negatively related; as the anxiety increases, the academic achievement decreases. Girls are more anxious than boys but their performance is better than boys. Anxious students often know more than they can demonstrate. When students face stressful situations, they can use three kinds of coping strategies: problem solving, emotional management and avoidance.

Parents are educated and help lines are open to solve the problems of students. Due to child-centered education, various steps are taken by the agencies to reduce the anxiety of students. This is the opinion that when we keep boys and girls mentally healthy, they perform better and are motivated to work hard in order to achieve more and more success in their lives.

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