Investigation of Variebles Affecting Mathematic Anxiety Levels of Special School Students

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Abstract: The aim of this research is to examine the math anxiety level of private school students according to some variables. As a data collection tool, the "Mathematics Anxiety Scale" developed by Bindak 2005 and the personal information form prepared by the researcher were used. The research was conducted in the first semester of 2017-2018 academic year. The sample of the research; A total of 100 students randomly selected from the students studying in the 5th, 6th, 7th and 8th grades of the private schools in the district of Tatvan. Independent sample t-test and ANOVA were used for the analysis of collected data. According to the results of the analysis, it was determined that students' math anxiety levels did not differ significantly according to gender and class variables but there was a significant difference between mathematics anxiety levels and mathematics achievement. Accordingly, it was seen that students with high mathematics achievement had low math worries and students with low mathematics achievement had high mathematical worries. Some suggestions based on the results of the research were presented.
Keywords: Mathematics anxiety, mathematics achievement, private school, anxiety, mathematics.

INTRODUCTION

With the rapid development of technology and the contemporary life circumstances, the perspectives of people living their lives in a developed country may be different. For this reason, it is clear that countries compete with each other in all respects. The level of development of an country is expected to be high in proportion to the level of education of people living in that country. Therefore, it is necessary for people participating in this competition to have the necessary level of knowledge and to use this information in the best way. In recent times, the importance of knowledge and education is increasing. From this point of view, it turns out that mathematics education and mathematics education are related to the prevailing technology and life standards. Because the development of an country, its development, science and technology are advanced but it is possible with mathematics education [1].

For this reason, the importance of learning and teaching my mathematics in recent years has been emphasized and various evaluations and researches have been carried out in order to learn the problems. The obligation to learn mathematics as a field that develops high-level behaviors such as solving, communicating, generalizing, creative and independent thinking necessary not only in science and technology but also in daily and professional life is a definite reality [2].

It is seen that all students who have received mathematics education since primary school have different attitudes towards mathematics lesson. The fear that the student will not succeed in mathematics seems to cause him to worry about the mathematics lesson and not to like the lesson. Students who are unsuccessful in mathematics are known to have mathematics anxieties. It should not be forgotten that students who are experiencing math anxiety will come to a situation that will lead to bigger problems in the future and can not be avoided unless this problem is solved. For this reason, it is necessary to carry out various researches in order to determine the cause of the mathematical concerns of the students and to decrease their anxiety [3].

Anxiety is defined as an emotional, emotional phenomenon that occurs under anxiety and anxiety conditions or threatening conditions felt by the individual in the face of a general threatening situation [4]. Öner [5] described this concept as "a state of mood in the individual, connected to an environmentally stimulating stimulus that the individual perceives as dangerous or threatening, and whose effects are not as pleasant as the ones we often use in our everyday life" .

Anxiety is a universal feeling and experience encountered at certain times in one's life. It is often the reaction of a person who feels like something bad at any moment and which he or she perceives as dangerous. Anxiety emerges in the form of confusion, fear, anxiety, indecision, pessimism and hopelessness, thus causing someone to fail [6]. Math anxiety is defined as solving mathematical problems in daily and academic life and feeling feelings of anxiety and tension in using numbers [7, 8]. According to Tobias [9], mathematical anxiety is an emotional tension or anxiety when an individual meets situations such as solving mathematical problems in school or in daily life, dealing with numbers.

A variety of studies have been carried out on the mathematics concerns of the students in the literature survey [10-22]. However, in the literature, it has been found that there are only a few studies on mathematics anxiety levels of students studying in private schools. For this reason, in this study, it was investigated to examine the math anxiety levels of the private school students according to some variables. It is thought that the work will contribute to the literature.

RESEARCH
The purposes of the study
The aim of this research is to examine the mathematics anxiety levels of students who study at 5th, 6th, 7th and 8th grade of private schools according to their gender, class and mathematics achievement levels. The following questions have been answered for this purpose.

- Is there a meaningful difference between students' math anxiety according to gender variable?
- Is there a meaningful difference between math anxiety of students according to grade level?
- Is there a meaningful difference between students' math anxiety according to mathematics achievement?

METHODS
Research Methods
In the realization of the research, the relational screening model was used. The screening model is a research approach aimed at describing the past or existing situation as it exists [23].

Research Group
The research group of the study created a total of 100 students randomly selected from the students in the 5th, 6th, 7th and 8th grades of the private schools in the province of Tatvan in the province of Bitlis during the first semester of the academic year of 2017-2018. Of the students who formed the sample group of the study, 43 (43.0 %) were female and 57 (57.0 %) were female. In addition, 29.0 % (N = 29) of the students were in the 5th grade, 33.0 % (N = 33) in the 6th grade, 21.0% , And 0 is 8. class student.

Data Collection Tools
The data of the study were collected by the "Mathematics Anxiety Scale" developed by Bindak [24] and the personal information form prepared by the researcher. Questions such as gender, class and mathematics achievement level were included in the personal information form. The scale consists of 10 items. One item is negative for anxiety and the other is positive. The Cronbach alpha reliability coefficient of the scale was 0.84. In this study, the reliability coefficient of Cronbach alpha was found to be 0.80.

Analysis of Data
For the purpose of the research, SPSS17.0 package program was used for the statistical analysis of the data collected by the questionnaire. According to the options indicated by the students who participated in the survey, mean anxiety score and standard deviation values were found. While the average anxiety score is calculated; the total number of item points is divided by the number of items and an anxiety score is calculated for each student so that the anxiety score of students is standardized to be between 1 and 5. A high average score of anxiety means that the math anxiety of the student is high. The evaluations and comparisons were made according to this score range. One-way ANOVA was used to determine whether the students' mathematical concerns showed a meaningful difference with respect to sex, either by independent sample t-test or by classroom and mathematical achievement. According to the result of homogeneity test of variance, p> 0.05 was found. From this it can be said that the variances are homogeneous. For this reason parametric tests were used in the analysis of data. As a result, we can say that the results obtained from the analysis of variance are healthy [25] since the basic assumption of the variance analysis is provided. The level of significance in the statistical analyzes performed is taken as .05.

FINDINGS
In this section, the findings obtained based on the collected data in the direction of the researcher were included.

For the first question of the research, the results of the t-test analysis conducted to determine whether the math anxiety levels of the students showed a meaningful difference compared to the gender variable are given in Table-1.

Table-1: Results of t-test according to gender variable of students' mathematical concerns

Gender	N	$\bar{x}$	Ss	Sd	t	P	
Female	43	1,962	0,998	98	1,236	0,219	
Male	57	1,752	0,701				

According to Table-1, the average score of female students was 1,962 and the average score of male students was 1,752. According to these results, the average anxiety scores of female students are higher than male male students. However, this difference is not statistically significant ($t_{(98)}$= 1,236, p>.05). According

to this result, it can be said that the gender variable has no significant effect on students' math anxiety.

For the second question of the research, it was tested whether the students' math anxiety levels were meaningful according to the grade level and the results are given in Table-2.

Table-2: Analysis results of mathematics anxiety levels according to class level of students

Grade	N	$\bar{x}$	Ss	F	P		
5. Grade	29	1,721	0,720				
6. Grade	33	1,781	0,687	,575	.633		
7. Grade	21	1,931	1,096				
8. Grade	17	2,005	0,775				
Total	100	1,843	0,844				

According to Table-2, it is seen that the students who read in the 5th grade have a math anxiety point average of $\bar{x}$= 1,721, students in the 6th grade = 1,781, students in the 7th grade $\bar{x}$= 1,931 and students in the 8th grade $\bar{x}$= 2,005. In addition, in general, the total math anxiety score of the students was found to be $\bar{x}$=1,8843. Based on this, it can be said that the mathematics concerns of the students are generally low. It is seen that the students with the lowest math anxiety belong to the students who study in the 5th grade, but the students with the highest math anxiety are the students who study in the 8th grade. From here the math

anxiety of the students increased in proportion to the grade level. That is, there is a difference between the mathematics worries of the students in the class, but it is not statistically significant according to Scheffe test results to determine whether this difference is significant ($F_{(3-96)}$ = ,575, p> 0.05).

As to the third question of the research, it was tested whether the mathematics anxiety levels of the students were meaningful according to the mathematics achievement levels and the results are given in Table 3.

Table-3: Analysis results of mathematics anxiety levels according to mathematics achievement levels of students

Mathematics Achievement	N	$\bar{x}$	Ss	F	P	Significant difference
Weak	2	4,300	0,282			W – M
Passing	6	3,300	1,237			W - G
Middle	11	2,309	0,613	21,209	.001	W- V
Good	17	1,894	0,595			P - G
Very Good	64	1,535	0,564			P – V and M - V
Toplam	100	1,843	0,844			

W= weak, P= passing, M=Middle, G=good, V= very good

According to Table-3, it is seen that the average score of anxiety point average of students with weak math achievement $\bar{x}$= 4,300, the average score of the students with a passing grade $\bar{x}$= 3,300, the average score of the students with middle score $\bar{x}$=2,309, the score average of students with good score $\bar{x}$= 1,894 and the mean score of the students who are very good $\bar{x}$ =1,535. According to these results, there is a difference between math achievement levels of students and math anxiety point averages. The results of the Scheffe test to determine whether this difference was meaningful were statistically significant ($F_{(3-96)}$ = 21,209, p< 0.05). Mathematical success is between students with weak to moderate, weak to good and weak to very good.

Significant differences were found between passing to good, passing between passing to very good and middle to very good students.It can be argued that students with weak mathematics achievement are more likely to have a higher level of math achievement than those with moderate to good maturity achievement, and those with moderate math achievement are more likely to have higher math achievement. that is, it can be said that students with high mathematics achievement had low mathematics anxiety, and students with low mathematics achievement had high mathematics anxiety.

CONCLUSION DISCUSSION AND RECOMMENDATIONS

The findings of this study are discussed with other research findings and some suggestions are given.

In the research conducted, it was determined that students did not show any significant difference in math anxiety levels compared to gender [$t_{(98)}$= 1,236, p>.05]. Although there was no significant difference between math anxiety scores of male and female students, it was determined that the average of math anxiety scores of female students was higher than male students. From this, it can be said that the gender variable has no significant effect on students' math anxiety. This result of the study is similar to the results of the studies conducted by [26, 3, 11, 20, 12, 13, 15, 17, 19]. However, Stipek and Granlinski [27] differ from the results of the work done by Peker and Senturk [28]. The study by Tapia and Marsh [29] reveals that girls have higher math concerns. The reason for this is that girls are more exposed to social and cultural repression at the point of their careers. In our country, it is seen that there is more pressure on the students at the career point [19].

Another important result of the research was that the math anxiety levels of the students did not show any significant difference according to the class variable [$F_{(3-96)}$ = ,575, p> 0.05]. t was determined that the students with the lowest math anxiety belonged to the students who read in the 5th grade but the students with the highest math anxiety were the students who read in the 8th grade. From here, the math anxiety of the students has increased in proportion to the grade level. This result of the study is similar to the result of the study done by [10]. However, it differs from the results of the studies conducted by [3, 11, 13, 15, 17]. The reason that math anxieties of eighth grade students are higher than those of other grades may be that mathematics topics are becoming more and more difficult with increasing class levels and students may have difficulty understanding math topics and students may focus on high school preparatory exams at the end of the academic year.

Another important result of the research is that there is a significant difference between students' math anxiety points and math achievement levels ($F_{(3-96)}$ = 21,209, p< 0.05). Mathematical success is between students with weak to moderate, weak to good and weak to very good. Significant differences were found between passing to good, passing between passing to very good and middle to very good students.It can be argued that students with weak mathematics achievement are more likely to have a higher level of math achievement than those with moderate to good maturity achievement, and those with moderate math achievement are more likely to have higher math achievement. that is, it can be said that students with high mathematics achievement had low mathematics anxiety, and students with low mathematics achievement had high mathematics anxiety. This result of the research overlaps with the result of the research done by Yenilmez and Özbey [3]. Similarly, in the study conducted by Dursun and Bindak [11], they found that there was a negative and significant correlation between the students' report card grades and anxiety scores. In the study conducted by Kutluca, Alpay and Kutluca [12], the mathematical achievements of students with high math concerns were low; and those with lower mathematical concerns had higher math achievement. This situation has been reported in the literature as a negative relationship between mathematical success and math anxiety [30-34]. As a reason for this negative relationship; the student fails when he or she feels anxiety, and when he fails, he is afraid and the state of failure continues. In addition, we can say that the affective characteristics possessed by the successful student also have an effect on the level of anxiety. That is to say, the success of the learner in the lecture does not seem to be an obstacle that the mathematics can not be surmounted and does not worry because it increases the confidence of the learner. Again, if we think that mathematics is composed of interrelated topics, it is natural that the student who has enough preliminary knowledge does not worry about learning new information. Because the student knows that he can easily acquire new information by associating his / her knowledge with new concepts. A student with a high success may also be another indication that he likes lessons and enjoys working and there is no reason to worry. In addition to general success, students with high mathematical achievement also showed a lower level of anxiety, ie anxiety levels decreased as mathematical success increased. It is natural for students who fail in mathematics to have high levels of anxiety. Because the student is worried about generalizing the failure situation in the course and believing he will show the same failure situation while learning new concepts. Besides, since DerSt is not enough, every question to be asked or any new concept to learn will make the student worried [3].

As a result of the findings of the research, it was determined that there was no significant difference between students' mathematical worries, gender and class variables but there was a significant difference between mathematics anxiety levels and mathematics achievement. According to this, the students with high mathematics achievement were found to have low mathematics worries and those with low mathematics achievement were found to have high mathematical concerns.

The following suggestions were presented in the light of the results of the research.

- This research was conducted according to gender, class, and math achievement levels of math concerns of private school students. Similar study can be done by expanding to different variables.

- There is a negative correlation between math anxiety and mathematics achievement, both in this study and in previous studies. For this reason, teachers should develop new methods in mathematics lessons to reduce students' math worries.

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