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Abstract

The concept of Mathematics Examination Anxiety needs to be highlighted because of being important for academic success and future plans of students. However, this research's scope is middle school seniors. This paper struggles to present the data with anxious students about mathematics examinations while they are on transition step to high-school. The participants of this study were 375 seniors from 14 different middle schools, in Malatya. In the research, Mathematics Examination Anxiety Scale (Şan, 2014) was adapted for 8th grade students and applied to determine the level of the mathematics examination anxiety. Also, the relations between the followings were examined: Mathematics Examination Anxiety Level, Academic Success both in general and mathematics in fall semester, the raw score of both High-School Entrance Exam in mathematics and the overall tests, gender, parents education level, gender of students' mathematics teachers. Middle school seniors show mathematics examination anxiety symptoms "*frequently*". The frequency level significantly differentiated according to gender and parents' educational status. The level is also found to be correlated with academic success. Middle school senior students show higher mathematics examination anxiety levels than regular students. This emotional-state is limited to evaluative academic tasks but could be extended too many educational situations as participation and homework tasks. It is suggested that assessment process should include the affective measurements for middle school students

Resumen

El concepto de ansiedad del examen de matemáticas debe destacarse. Es importante para el éxito académico y los planes futuros de los estudiantes. Sin embargo, el alcance de esta investigación es de estudiantes de ocho grados. Este documento se esfuerza por presentar los datos con estudiantes ansiedad del examen de matemáticas mientras están en el paso de transición a la escuela secundaria. Los participantes de este estudio fueron 375 estudiantes del último año de 14 escuelas intermedias diferentes, en Malatya. En la investigación, la Escala de ansiedad por el examen de matemáticas (Şan, 2014) se adaptó para estudiantes de 8 ° grado y se aplicó para determinar el nivel de ansiedad del examen de matemáticas. Asimismo, se examinaron las relaciones entre los siguientes: ansiedad del examen de matemáticas, éxito académico tanto en general como en matemáticas en el semestre de otoño, Los resultados brutos del examen de ingreso a la escuela secundaria tanto en matemáticas como en las pruebas generales, género, nivel de educación de los padres, género de los profesores de matemáticas de los alumnos. Ocho grados muestran síntomas de "*ansiedad ante los exámenes matemáticos*" con frecuencia. El nivel de frecuencia significativamente diferenciado según género y estado educativo de los padres. El nivel también se correlaciona con el éxito académico. Este estado emocional se limita a tareas académicas evaluativas, pero podría extenderse a muchas situaciones educativas como participación en clase y tareas para el hogar. Se sugiere que el proceso de evaluación debe incluir medidas afectivas para estudiantes de ocho grados

Keywords

Mathematics Examination Anxiety; Middle School; Mathematics Anxiety; Examination Anxiety

Palabras clave

Ansiedad de las Examen de Matemáticas; Secundaria; Ansiedad de las Matemática; Ansiedad de las Examen

1. Introduction

Academic success in schools can be considered the most important factor of success in life (Campbell & Mandel, 1990). Especially, success at mathematics is the most important one throughout the other courses (Steinberg, Varua, & Yong, 2010). May be this reality makes students to engage with mathematics without thinking. According to Fullarton, Walker, Ainley, & Hillman (2003) stated that the level of participation is low in the courses with many numbers such as mathematics. This decline harden researchers to investigate the reasons for the decline.

Considering exams for different levels of Turkish education system make clear the importance of mathematics courses. It is obvious that there is a relationship between mathematics anxiety and the success in the mathematics course (Sentürk, 2010). However, this relationship is not linear. There is a peak point to get the highest success because of the facilitating effect of the anxiety. In this context describing this concept for education process as an approach-avoidance conflict is possible. Because of the debilitating test anxiety its intensity must be tuned carefully. Examination anxiety is that feeling uncomfortable before, during, or after any exam and thinking that s/he will always fail. Student with high-test-anxiety feels threatened during an examination. This feeling also develops negative attitudes toward himself/herself and causes distractibility. In this regard, the student may fail to read and answer the questions as usual just as organizing his/her thoughts and behaviors. Examination anxiety causing wrong career choices prevents showing the current potential of student. While some children do not have a negative attitude towards mathematics, when it comes to the measurement of mathematics knowledge, that is, examinations they suddenly feel anxious. The high importance of mathematics at the central examinations prepares the ground for this fact. Although it is emphasized that the assessment process should include the whole training process, this is not possible in the existing examination systems and results-oriented assessment maintains it presence. Because the child who is not afraid of mathematics or perhaps enjoys mathematics, may not be successful in the mathematics examinations, s/he naturally feels anxious about it.

The presence of students who behave out of task in the mathematics exams despite not to having mathematics anxiety was the starting point. Mathematics examination anxiety (MEA) is not a sign of math anxiety alone. It is a well-known fact that some students who successfully conducts mathematical activities until the examination time may fail because of the MEA. Therefore, MEA regarded as a sub-dimension of mathematics anxiety expresses an independent psychological state. Although mathematics test anxiety is presented at different levels in almost all grade level students, when it comes to the eighth grade, this level can go far beyond what is desired. The possible reasons for this situation can be listed as following: for the first time having a central-examination of the student, not to have chance to have this examination later and the meaning of this examination for schools, families and the students. Knowing the MEA level and the variables that affect it is thought to prevent the failure by taking the necessary precautions. There are a lot of parameters that effects a student's test or exam anxiety level. Lowe, Lee, Witteborg, Prichard, Luhr, Cullinan, Mildren, Raad, Cornelius, & Janik (2008) relate this concept to both facilitating and debilitating effects on test performance. Test anxiety model of Lowe et al. is given on Figure 1.

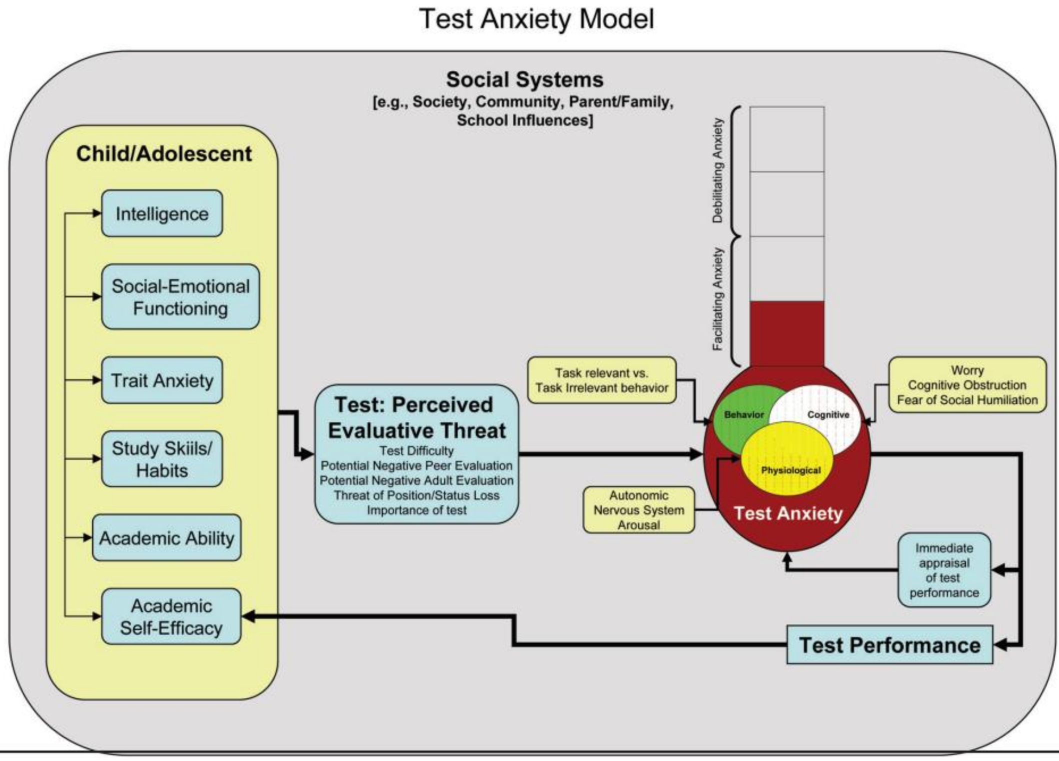

Figure 1. Lowe et all. (2008).

This model encourages educators to provide facilitating anxiety sources and not to bring students face-to-face with debilitating environment. As can be understood from the model, there are a number of reasons for testing anxiety. It is not possible to achieve success in the test without benefiting from the facilitation of this concept of cognitive, behavioral and psychological dimensions. It is important that this concept is likely to emerge in different forms for different courses.

The problem of this research is determining the level of MEA of middle school seniors'. Mathematics test anxiety originates from fear and negative emotional reactions. Anxiety is associated with panic, nervousness, restlessness, helplessness, trembling and confusion that arise in students when mathematics or mathematics tests are mentioned (Ugodulunwa & Okolo, 2015). In this research, MEA means the scores that students got at "*Mathematics Examination Anxiety Scale*" (Şan, 2014). The sub-dimensions of the scale help to measure both facilitating and debilitating anxiety about the mathematics test. The higher scale score means the more debilitating MEA.

This research intends to answer the following questions: 1. What is the level of MEA of eighth grade students? 2. Is the level of MEA correlated with mathematics success, general academic success, central examination mathematics and general scores; 3. Does the level of MEA differs due to gender, class size, parents' educational statue, teacher's gender?

Adapting the Mathematics Examination Anxiety Scale for grade 8 is one of the importance of this research. There is not any scale that measures middle school seniors' MEA level. So, adapting the scale for 8 grade is important. On the other hand this independent psychological state is not obviously studied yet. Because of the miss-perception about being an intersection of mathematics anxiety and examination anxiety MEA has not been focused on as it deserves. In Turkey, nearly all of the central examination and selective academic promotion requires high mathematics test scores. MEA having the biggest portion to be successful for a student has to be studied deeper and this study is important to assume this duty.

The participants of this research is limited to the senior students in the middle schools that in the central districts of Malatya in the spring semester of 2016-2017 academic year.

2. Methodological frames of the research

2.1. Model

In this study, it was aimed to determine the level of middle school seniors' MEA. For that aim, descriptive and relational design were held. Descriptive studies are a research approach that reveals a situation as it exists. The subject matter of the research, the individual or object is tried to be defined in its own conditions and as it is. There is no attempt to change them in any way. What is important is its proper observation and determination (Karasar, 2011: 77). The relational design is defined as a research approach aiming to determine the coexistence of two or more variables (Karasar, 2011: 81).

2.2. Participants

The participants of this study were 375 eight-grade students from 14 different middle schools in Malatya, in Turkey. In the research, Mathematics Examination Anxiety Scale was applied to the students to determine the level of the mathematics exam anxiety. Also the relations between that level and academic success both in general and mathematics in fall semester, the raw score of TEOG mathematics test and total, gender, parents education level, gender of students' mathematics teachers was examined.

2.3. Tests and materials

The data collection tools of the research were the adaptation of "*Mathematics Examination Anxiety Scale*" (Şan, 2014) and "*Personal Information Form*". The scale was adapted because of the existing scale was for 7th grade students. Overall, reliability for the mathematics examination anxiety scale was .83, while reliabilities for the individual subscales were as follows: .83 for facilitating MEA; .76 for debilitating MEA. As the final form, the data collection tool was prepared consisting of 15 items for the MEA scale and 9 independent variables as "*personal information form*".

2.4. Procedure

Data was collected in the spring semester of 2016-17 academic year. One of the researcher took the responsibility to take care of filling the scale and the personal information form. To provide the reliability the researcher went to the schools and collected the data by herself and the Cronbach alpha score of the scale and the subscales were calculated.

Data was analyzed with statistical packet programs in accordance with the appropriate analyzing methods by considering the assumptions. Descriptive statistics, normality tests, t-test and ANOVA for parametric data, Spearman correlation coefficient were applied to determine the relationship.

3. Results

3.1. Mathematics examination anxiety levels of participants

Mean standard scores of the participants are presented in Table 1. The scores are average for both the subscales and the total MEA scale. Facilitating MEA scores were reversed to calculate the total score because of the dominating perception for debilitating of anxiety.

Table 1.
Mean standard scores for MEA and subscales

	N	x̄(%)	Std. Deviation	n (Highest-level)	n (Lowest level)
Facilitating MEA	375	61.10	21.80	92 (24.%5)	106 (28.3%)
Debilitating MEA	375	57.40	19.31	39 (10.4%)	114 (30.4%)
MEA-Total	375	60.44	18.13	54 (14.4%)	92 (24.5%)

According to table 1 MEA-total score of participants' is not too high but above fifty percent (60.44 %). On the other side, there were 54 students (14.4%) with high-level MAE. This result shows that a remarkable percentage of the participants has high level MAE. Also it can be seen that FMEA scores of 106 students (28.3%) were low and 39 students (10.4%) has the highest level DMEA.

3.2. Gender

There were 201 male and 200 female participants. An independent-samples t-test was run to determine if there were differences in MEA and subscales between males and females. There were no outliers in the data, as assessed by inspection of a boxplot. MEA and subscales scores for each level of gender were normally distributed, as assessed by Shapiro-Wilk's test (p > .05).

Table 2.
Levene tests, means, and t-tests for MEA and subscales by gender.

	Levene Test						t-test for Equality of Means		
	F	**p**	**Gender**	N	**x̄(%)**	**SD**	**t**	**df**	**P**
FMEA	.450	.503	Female	192	57.65	20,81	-3.15	391	.002
			Male	201	64.33	21,71			
DMEA	.049	.825	Female	200	58.48	19.12	1.08	399	.279
			Male	201	56.39	19.13			
MEA-Total	.438	.508	Female	200	62.62	17.62	2.38	399	.018
			Male	201	58.39	17.94			

There were homogeneity of variances for each measurement, as assessed by Levene's test for equality of variances (p > .05). The MEA score was more higher for female participants (M = 62.64) than males (M = 58.20), a statistically significant difference, M = 4.44, 95% CI [0.73, 7.72], t(399) = 2.38, p = .018. On the other side, FMEA score was higher for male participants (M64.66) than females (M=57.60) and a statistically significant difference, M=7.06, 95% CI [-10.86, -2.51], t(391)=-3.15, p=.002; and there was not any statistically significant difference at DMEA scores by gender.

3.3. Class size

A one-way ANOVA was conducted to determine if the MEA and subscales scores were different for groups with different class size categories. Participants were classified into five groups: less than 10 (n = 5), 11-16 (n = 13), 17-24 (n = 37), 25-30 (n=254) and more than 31 (n = 66). For MEA, there were no outliers, as assessed by boxplot; data was normally distributed for each group, as assessed by Shapiro-Wilk test (p > .05); and there was homogeneity of variances, as assessed by Levene's test of homogeneity of variances (for MEA (p = .305); FMEA (p=.519); DMEA (p=.058)). MEA score increased from the 17-24 (M = 56,30, SD=19.80), to 11-16 (M = 60.24, SD = 24.48), to 31 or more (M = 61.27, SD = 21.46) to 25-30 (M = 61.48, SD = 21.70), to 10 or less (M=72.14, S= 17.02) class sizes groups, in that order, but the differences between these physical activity groups was not statistically significant, for MEA [F(4, 394) = .436, p = .782]; FMEA [F(4, 394)= .826, p= .509]; and DMEA [F(4, 394)= .192, p=.942].

Table 3.
ANOVA summary table for MEA and subscales by the class sizes.

	Class Sizes	n	**$\bar{x}$(%)**	Sum of Square	df	Mean Square	F	*p*
FMEA	10 or less	5	72.14	1566.38	4	391.60	.82	.51
	11-16	13	59.62	176117.79	370	475.99		1
	17-24	37	56.27	177684.17	374			
	25-30	254	61.51					
	31 or more	66	61.69					
	Total	375	61.10					
DMEA	10 or less	5	53.13	138.34	4	34.59	.09	.98
	11-16	13	56.73	139249.28	370	376.35		5
	17-24	37	58.19	139387.62	374			
	25-30	254	57.52					
	31 or more	66	56.94					
	Total	375	57.40					
MEA	10 or less	5	53.00	564.07	4	141.02	.43	.79
	11-16	13	60.77	122404.79	370	330.82		0
	17-24	37	63.11	122968.86	374			
	25-30	254	60.31					
	31 or more	66	59.91					
	Total	375	60.44					

3.4. Maternal education status

A one-way ANOVA was conducted to determine if the MEA and subscales scores were different for groups with different maternal education status categories. Participants were classified into five groups: nonliterate (n = 42), primary school (n = 152), middle school (n = 96), high-school (n=89) and undergraduate (n = 20). For MEA, there were no outliers, as assessed by boxplot; data was normally distributed for each group, as assessed by Shapiro-Wilk test ($p > .05$); and there was homogeneity of variances, as assessed by Levene's test of homogeneity of variances (for MEA ($p = .167$); FMEA (p=.181); DMEA (p=.378)). MEA score increased from the undergraduate (M = 50.58, SD=16.96), to nonliterate (M = 60.28, SD = 17.84), to primary school (M = 60.81, SD = 18.65) to high school (M = 61.12, SD = 18.35), to middle school (M=61.62, S= 16.24) maternal education statue groups, in that order, but the differences between these groups was not statistically significant, for MEA [$F(4, 394) = 1.68$, $p = .155$]; FMEA [$F(4, 394)= 1.00$, $p= .406$]; and DMEA [$F(4, 394)= 1.68$, $p=.155$].

Table 4.
ANOVA summary table for MEA and subscales by the maternal education status

	Maternal Education Status	n	x̄(%)	Sum of Square	df	Mean Square	F	*p*
FMEA	Nonliterate(NL)	42	61.56	2100.19	4	465.46	1.00	.406
	Primary School(PS)	140	60.96	175583.99	394	464.48		
	Middle School(MS)	90	59.80	177684.17	398			
	High School(HS)	84	59.99					
	Undergraduate(UG)	20	70.00					
	Total	375	60.98					
DME A	Nonliterate(NL)	42	57.62	2479.46	4	610.45	1.68	.155
	Primary School(PS)	140	57.56	136908.16	387	364.27		
	Middle School(MS)	90	58.46	139387.62	391			
	High School(HS)	84	58.44					
	Undergraduate(UG)	20	46.72					
	Total	375	57.40					
MEA	Nonliterate(NL)	42	60.28	2242.69	4	534.55	1.68	.155
	Primary School(PS)	140	60.81	120726.17	394	319.11		
	Middle School(MS)	90	61.62	122968.86	398			
	High School(HS)	84	61.12					
	Undergraduate(UG)	20	50.58					
	Total	375	60.50					

3.5. Father's education

A one-way ANOVA was conducted to determine if the MEA and subscales scores were different for groups with different father's education categories. Participants were classified into five groups: nonliterate (n = 8), primary school (n = 96), middle school (n = 103), high-school (n= 110) and undergraduate (n = 58). For MEA, there were no outliers, as assessed by boxplot; data was normally distributed for each group, as assessed by Shapiro-Wilk test (p > .05); and there was homogeneity of variances, as assessed by Levene's test of homogeneity of variances (for MEA (p = .167); FMEA (p=.181); DMEA (p=.378)). MEA score increased from the undergraduate (M = 50.58, SD=16.96), to nonliterate (M = 60.28, SD = 17.84), to primary school (M = 60.81, SD = 18.65) to high school (M = 61.12, SD = 18.35), to middle school (M=61.62, S= 16.24) maternal education statue groups, in that order, but the differences between these groups was not statistically significant, for MEA [F(4, 394) = 1.68, p = .155]; FMEA [F(4, 394)= 1.00, p= .406]; and DMEA [F(4, 394)= 1.68, p=.155].

For MEA, there were no outliers, as assessed by boxplot; data was normally distributed for each group, as assessed by Shapiro-Wilk test (p > .05); and there was homogeneity of variances, as assessed by Levene's test of homogeneity of variances (for MEA (p = .167); FMEA (p=.181); DMEA (p=.378)). Data is presented as mean ± standard deviation.

MEA score was statistically significantly different between different father's education groups, F(4, 393) = 5.32, p < .0005. MEA score increased from the undergraduate (M = 52.73, SD = 17.93) to primary school (M = 5.88, SD = 1.69), to middle school (M = 63.10, SD = 16.57), to high school (M = 63.92, SD = 17.16) and nonliterate (M=67.71, SD=10.61) father's education groups, in that order. Scheffe post hoc analysis revealed that the mean increase from Undergraduate to middle school (10.37, 95% CI [2.01, 19.31]) was statistically significant (p = .000), as well as the increase from high school to undergraduate (11.19, 95% CI [1.99, 19.16], p = .000), but no other group differences were statistically significant for MEA.

DMEA score was statistically significantly different between different father's education groups, F(4, 386) = 6.71, p < .0005. DMEA score increased from the nonliterate (M = 64.58) to high school (M = 61.37), to middle school (M = 60.42), to primary school (M = 54.58) and undergraduate (M=48.10) father's education groups, in that order. Scheffe post hoc analysis revealed that the mean increase from middle school to undergraduate (12.31, 95% CI [4.18, 20.44]) was statistically significant (p = .000), as well as the increase from high school to undergraduate (13.26, 95% CI [5.35, 21.17], p = .000), but no other group differences were statistically significant for DMEA.

FMEA score decreased from the undergraduate (M = 66.75, SD=20.89), to primary school (M = 63.90, SD = 22.91), to high school (M = 59.11, SD = 21.76) to middle school (M = 57.94, SD = 20.31), to nonliterate (M=54.37, SD= 10.38) father's education statue groups, in that order, Scheffe post hoc analysis revealed that no group differences were statistically significant for DMEA.

Table 5.
ANOVA summary table for MEA and subscales by the father education status

	Father Education Status	n	x̄(%)	SD	Sum of Square	df	Mean Square	F	*p*	Difference
FMEA	Nonliterate(NL)	9	54.37	10.38	4716,9	4	1179,2	2.58	.037	
	Primary School(PS)	103	63.90	22.91	179536,7	393	456,8			
	Middle School(MS)	110	57.94	20.31	184253,7	397				
	High School(HS)	115	59.11	21.76						
	Undergraduate(UG)	61	66.75	20.89						
	Total	398	61.10	21.54						
DMEA	Nonliterate(NL)	9	64.58	14,99	9284,6	4	2321,1	6.71	.000	MS>UG
	Primary School(PS)	103	54.58	19,26	133609,8	393	346,1			HS>UG
	Middle School(MS)	110	60.42	18,99	142894,4	397				
	High School(HS)	115	61.37	18,28						
	Undergraduate(UG)	61	48.10	17,82						
	Total	398	57.33	19,14						
MEA	Nonliterate(NL)	9	67,41	10,61	6825,0	4	1706,2	5.57	.000	MS>UG
	Primary School(PS)	103	57,62	18,99	120476,2	393				HS>UG
	Middle School(MS)	110	63,50	16,57	127301,2	397	306,5			
	High School(HS)	115	63,41	17,16						
	Undergraduate(UG)	61	52,84	17,93						
	Total	398	60,41	17,91						

3.6. Teacher's gender

There were 275 male and 125 female mathematics teachers of participants. An independent-samples t-test was run to determine if there were differences in MEA and subscales between males and females mathematics teachers. There were no outliers in the data, as assessed by inspection of a boxplot. MEA and subscales scores for each level of gender were normally distributed, as assessed by Shapiro-Wilk's test (p > .05).

Table 5.
t-test summary table for MEA and subscales by the teacher's gender

	Levene Test					*t-test for Equality of Means*		
	F	***p***	**Teacher's Gender**	N	x̄(%)	**t**	**Sd**	**p**
FMEA	.20	.655	Female	125	61.39	.17	373	.862
			Male	275	60.97			
DMEA	.39	.532	Female	125	57.83	.29	373	.770
			Male	275	57.20			
MEA	.08	.774	Female	125	60.54	.07	373	.942
			Male	275	60.39			

There were homogeneity of variances for each measurement, as assessed by Levene's test for equality of variances ($p > .05$). There was not any statistically significant difference at MEA and subscale scores by teacher's gender of students.

3.7. Correlations

Correlations between participants' academic success in mathematics (the previous semester mathematics and general scorecard note; central examination scores at mathematics and general) and MEA and subscales' scores were calculated. Results are shown in Table 2. Each of MEA, FMEA and DMEA were associated with academic success. Within the MEA scale and subscales, mathematics examination anxiety was associated with all academic abilities, as predicted.

Table 7.
Summary of Pearson correlation coefficients for academic success and mathematics examination anxiety

	Scorecard note		Central Examination Scores	
	Mathematics	**General**	**Mathematics**	**General**
MEA-total	-.350**	-.237**	-.311**	-.194**
FMEA	.324**	.239**	.265**	.213**
DMEA	-.296**	-.181**	-.286**	-.132*

* Significant at p<05.
** Significant at p<01.

A Pearson's product-moment correlation was run to assess the relationships between scorecard notes (mathematics and general), central examination score (mathematics and general) and MEA in middle school seniors. Preliminary analyses showed the relationship to be linear with both variables normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$), and there were no outliers.

There was a moderate negative correlation between MEA-total and previous semester mathematics scorecard note of students, $r(399) = -.350$, $p < .0005$, with mathematics scorecard note explaining 12% of the variation in MEA-total. There was a small negative correlation between MEA-total and previous semester general scorecard note of students, $r(399) = -.237$, $p < .0005$, with mathematics scorecard note explaining 6% of the variation in MEA-total. There was a moderate negative correlation between MEA-total and central examination mathematics scores of students, $r(399) = -.311$, $p < .0005$, with mathematics scorecard note explaining 10% of the variation in MEA-total. There was a small negative correlation between MEA-total and central examination general scores of students, $r(399) = -.194$, $p < .0005$, with mathematics scorecard note explaining 4% of the variation in MEA-total.

There was a moderate positive correlation between FMEA and previous semester mathematics scorecard note of students, $r(399) = .324$, $p < .0005$, with mathematics scorecard note explaining 10% of the variation in FMEA. There was a small positive correlation between FMEA and previous semester general scorecard note of students, $r(399) = .239$, $p < .0005$, with mathematics scorecard note explaining 6% of the variation in FMEA. There was a small positive correlation between FMEA and central examination mathematics scores of students, $r(399) = .265$, $p < .0005$, with mathematics scorecard note explaining 7% of the variation in FMEA. There was a small positive correlation between FMEA and central examination general scores of students, $r(399) = .194$, $p < .0005$, with mathematics scorecard note explaining 4% of the variation in FMEA.

There was a small negative correlation between DMEA and previous semester mathematics scorecard note of students, $r(399) = -.296$, $p < .0005$, with mathematics scorecard note explaining 9% of the variation in DMEA. There was a small negative correlation between DMEA and previous semester general scorecard note of students, $r(399) = -.181$, $p < .0005$, with mathematics scorecard note explaining 3% of the variation in DMEA. There was a small negative correlation between DMEA and central examination mathematics scores of students, r(399) = -.286, p < .0005, with mathematics scorecard note explaining 8% of the variation in DMEA. There was a small negative correlation between DMEA and central examination general scores of students, r(399) = -.132, p < .0005, with mathematics scorecard note explaining 2% of the variation in DMEA.

4. Discussion

According to the data MEA and subscales doesn't differ due to teacher gender, class size and maternal education status. Males have both more Facilitating MEA and less MEA-total than females. Students whose fathers education level are undergraduate have the minimum MEA-Total and Debilitating MEA. MEA and DMEA is negative correlated with mathematics and general academic success while is positive correlated with FMEA.

Results of the present study support the previously hypothesized associations between academic success and vulnerability to emotional consequences such as anxiety (e.g. Bozkurt, 2012; Donovan & Spence, 2000; Ergenç, 2011; Essau, Conradt & Petermann, 2000; İlhan & Sünkür, 2012; McLoone, Hudson & Rapee, 2006; Rapee, Kennedy, Ingram, Edwards & Sweeney, 2005; Yenilmez & Özabacı, 2003). The findings indicate that middle school seniors have more than average levels of mathematics examination anxiety. This also shows that the level of mathematics examination anxiety is not facilitative one. Being debilitative, MEA is harmful for learning process as many studies have found that there is a relationship between anxiety and success of students. Teachers should be cautious about the importance of students' affective features in classroom. To get more benefits from the teaching process, it is necessary to identify the emotional characteristics of the students at the beginning of the process. Both Carol's School Learning Theory (1965) and Bloom's Mastery Learning (1985) emphasize perseverance for learning. It can be seen that, teachers must focus on the students' attitude such as anxiety before teaching mathematics. Teachers should foreground the fun aspects of the mathematics examinations such as Mathematics Olympics in school. However, studies show that not only teacher but also university academics use examinations as a means of intimidation or punishment (Kumral, 2009). It is clear that punishment-related activities mostly result with unwanted situations for stakeholders of the event. Sometimes the teacher but mostly the students get stressed by the uncomfortable environment. Effect of high-level debilitating examination anxiety is not limited to academic success. Anxious in education also show increased levels of social anxiety. In fact, emotional high tension makes nearly everything harder.

To reduce MEA or DMEA level of middle school seniors.

- Mathematics examinations could be designed to include household chores or to diminish girls' MEA;
- teachers could apply individual therapies for anxious students,
- Males (fathers of future) could be encouraged to do undergraduate,
- Examinations could be organized to make students feel more comfortable. Teachers and parents should compare students development just in itself (not to other children).

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