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MULTI-GROUP ANALYSIS OF THE EFFECTS OF COPING WITH MATHEMATICS ON MATH ANXIETY AND ACHIEVEMENT

Abstract: The aim of this study was to investigate the effects of the strategy of coping with mathematics on math anxiety and achievement. From the population of teacher candidates in Turkey, a total of 255 students from one state university were recruited through a combination of convenience and purposive sampling and willingness to participate in the present study. Data were collected from the participants using Mathematics Anxiety Rating Scale-Short Version (MARS-SV) and Coping with Mathematics Scale-Short Version (CMS-SV). MANOVA results showed differences on the levels of math anxiety depending on the participants' coping strategies. For example; Those using the coping focused on solving the problem strategy were less anxious in mathematics. In addition, women experienced more mathematics test anxiety than men. Finally, a negative significant correlation was found between mathematics course anxiety and calculation anxiety and GPA score.

Key words: Math anxiety, coping, achievement, grade point average, multivariate analysis of variance.

Regarding the assessment of student achievement on course basis in Turkey, mathematics is considered as one of the most troublesome areas (Haser, 2006; Memnun & Hart, 2012; Yetkiner, 2010). Regarding the studies conducted in the field of mathematics education, many students believe that they have difficulty in mathematics course and believe that they cannot succeed (Karabenick, 2004; Lazarus & Folkman 1984). This sense of failure creates anxiety in students and thus they develop negative attitudes towards mathematics (Ashcraft, 2002; Baykul, 1999). So that mathematics is becoming the fearful dream of students in all levels of education, especially in primary schools. In TIMSS 2015, Turkey showed improvement at 8th grade level compared to the previous years, however the score is still below average at both 4^{th} and 8^{th} grades in mathematics. In addition to this, Turkey is far behind of European Union countries in terms of the average mathematics scores (Yücel & Karadağ, 2016). Of course, anxiety is not the only underlying factor of this fact, but it can be said that anxiety is an important predictor of achievement along with other affective factors. Evaluating the researches such as TIMSS and PISA only according to math score rankings is not a correct approach. This type of researches provides important outcomes, especially about the sources of achievement/failure. For example; the thoughts developed by the students about the courses form their anxieties about these courses and this fact is reflected on their success. Similarly, in educational settings, anxiety can have detrimental effects on learners. It involves feelings in specific situations, such as examinations, as well as overall learning, and even lifelong academic and vocational development. Along with more overarching anxiety disorders, individuals may suffer from specific forms of test and performance anxiety that are connected to a knowledge

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domain. Clearly, the most prominent of these disorders is math anxiety (Blazer, 2011). In the literature, it is reported that math anxiety creates a sense of tension in the student, and this anxiety is effective in the loss of students' self-confidence in many areas of daily life and in solving mathematical problems (Ashcraft & Krause, 2007; Olatunde, 2009). According to Baloğlu (2001), the math anxiety is not completely negative, in some cases (e.g., few anxiety) this anxiety can function as motivator on students, but often (for example, especially in case of extreme anxiety) it has a negative impact on students' achievement and in the long term on their behavior towards mathematics.

Although the relationship between math anxiety and mathematics achievement has been investigated extensively in the literature, there is no consensus on whether the effects of math anxiety on mathematics achievement direct effects or indirect effects are (Bong, 2009; Linnenbrink, 2005; Pekrun, Elliot & Maier, 2009; Zusho, Pintrich & Cortina, 2005). For example, Cognitive Impairment Theory (CIT, Wine, 1980) and Deficit Theory (DT, Tobias, 1986) are two theories that try to explain the relationship between anxiety and achievement. According to Cognitive Impairment Theory, high anxiety level causes low achievement. On the other hand, Deficit Theory suggests that the level of anxiety increased in individuals due to low achievement (Baloğlu & Harris, 2004). Studies involving the effects of mathematics anxiety are frequently encountered in the literature. For example;

- The negative relationship between math anxiety and mathematical attitude (Sırnacı, 2010; Yenilmez & Özabacı, 2003),
- Math anxiety level of teacher candidates with a low level of belief that learning depends on effort is lower (Delice, Ertekin, Aydın & Dilmaç, 2009),
- Math anxiety and positive and negative perfectionism were significant predictors of mathematics achievement (İlhan & Öner-Sünkür, 2012),
- As the level of autonomous decision-making in motivational arrangements increases, math anxiety decreases from positive to negative direction (Durmaz & Akkuş, 2012),
- The negative relationship between math anxiety and teacher support (Erden & Akgül, 2010),
- The negative relationship between mathematics self-efficacy perception and anxiety about mathematics teaching (Ural, 2015),
- Success motivations and social benchmarks appear to be an important predictor of math anxiety (Erdoğan, Kesici & Şahin, 2011).

In addition, avoiding mathematics and areas related to mathematics, low self-esteem, learned helplessness and compulsive behaviors are among long-term effects caused by math anxiety (Fennema & Sherman, 1976; Hendel, 1980). The most important factors in the formation of these anxieties on the students are their primary school teachers, and their mathematics teachers in secondary school and high school (Berkedmir, Işık & Çıkılı, 2004; Sırmacı, 2010). This fact tells us that teachers may have an important role in the formation of math anxiety. This perturbative effect can be controlled by the arrangements to be made in teacher education. In this context, the anxiety levels of teachers and teacher candidates are considered to be important. As a result, although many researches were conducted on the variables and effects of math anxiety, the studies examining the relationship between teacher candidates' math anxiety (Elementary Mathematic Teaching and Classroom Teaching) and the ways of coping with mathematics are not found in the literature.

The aim of the study is to determine the relationship between the ways of coping with mathematics and math anxiety and achievement and thus contribute to the field of mathematics education. Accordingly, the following hypothesis are tested in this research:

- Math anxiety and strategy of coping with mathematics will show a significant difference in favor of the women and mathematics teaching students [H_1];
- There will be a significant negative relationship between math anxiety and strategy of coping with mathematics [H_2];

- There will be a significant negative relationship between math anxiety and teacher candidates' GPA score [H_3];
- There will be a significant positive relationship between math anxiety and teacher candidates' GPA score [H_4];
- Math anxieties would differ significantly according to the dominantly preferred strategy of coping with mathematics [H5].

Method

Sample

From the population of teacher candidates in Turkey, a total of 255 students from one state university were recruited through a combination of convenience and purposive sampling and willingness to participate in the present study. Of the subjects, 191 were women (75%) and 63 were men (25%); 94 were student 1st grade (76%), 25 were student 2nd grade (10%), 106 were student 3rd grade (41%) and 29 were student 4th grade (11%). The GPA score (Grade Point Average) of the participants varied between 1.82 and 3.80 (*M*=3,00; *SD*=0,42). Study majors represented in this research were elementary mathematics teaching (60%), and classroom teaching (%40).

Instruments

Mathematics Anxiety Rating Scale-Short Version (MARS-SV)

The MARS-SV was derived from the 98-item Mathematics Anxiety Rating Scale (MARS) which was adopted by Suinn and Winston (2003). The short version of MARS was revised since the original instrument is a long and time-consuming instrument with many dimensions. The MARS-SV includes 30 Likert-type items under five sub-scales (i.e, Test anxiety (TA), Course anxiety (CA), Application anxiety (AA), Social anxiety (SA) and Computation anxiety (ComA)). Baloğlu (2010) was adapted the scale into Turkish. Internal consistency of the MARS-SV data in the current study was ranged from .72 to .81 (Table 1).

Coping with Mathematics Scale-Short Version (CMS-SV)

The CMS-SV includes 18 Likert-type items under there sub-scales (i.e., "Coping focused on solving the problem, Coping with reference to others, and Non-productive coping") (Ader & Erktin, 2012). The CMS-SV was prepared to evaluate the coping strategies of individuals when faced with difficulties in mathematics based on the adolescent coping model of Frydenberg and Lewis (1993). The items are rated on a 4-point Likert scale, ranging from 'always' to 'never'. *Coping focused on solving the problem* (CFSP) sub-scale consists of seven items three of which are negatively linked with this category as they still address action-oriented strategies but in a negative manner of not taking action. *Coping with reference to others* (CRO) sub-scale was enlarged to include strategies not only addressing the social dimension of coping but also included strategies involving activities "other" the directly tackling the difficulties faced in mathematics such as engaging in physical sportive activities and relaxing through one's favorite activities. This category consists of seven items in the final revised form of the scale. *Non-productive coping* (NPC) sub-scale consists of four items concerning coping strategies which do not embody an action orientation. They are emotion focused strategies such as worrying, keeping to self, blaming the self and taking refuge in religion. Internal consistency of the CMS-SV data in the current study was ranged from .75 to .81 (Table 1).

Procedure

After the permission to use the MARS-SV and CMS-SV was obtained, a research package including the demographic questions and the items of the MARS-SV and CMS-SV was assembled. Students were contacted during their classes and informed about the study. The participants signed consent forms, and which took approximately 20 minutes. The gender and field of the participants were compared with independent t-test in terms of research variables and the relationships between the variables were examined by Pearson moments product correlation coefficient. In the research, the statistical differences of participants' math anxiety scores were examined by Multivariate Analysis of Variance (MANOVA) according to the strategy that they dominantly preferred among the strategies of coping with mathematics. In the literature, it is recommended to conduct a single multiple variance analysis for theoretically and statistically interrelated variables of MARS-SV sub-scales instead of conducting a separate one-way analysis of variance for each. Therefore, MANOVA analyzes were performed on the linear combination of six sub-scales of MARS-SV. Data were screened for the assumptions of parametric statistics. Normality, homogeneity of variances, and linearity assumptions for each cell were tested at multivariate level. In a non-orthogonal design, MANOVA was used to test five dependent variables of the strategy of coping with mathematics (Test anxiety, Course anxiety, Application anxiety, Social anxiety and Computation anxiety). The independent variable was the dominantly preferred strategy of coping with mathematics (Coping focused on solving the problem (CFSP), Coping with reference to others (CRO), and nonproductive coping (NPC)). For both analyses, if a multivariate significance was found, analysis proceeded with univaraite *F*-tests (Tabachnick & Fidell, 2007). In addition to, multivariate test statistics values, *F*s, and statistical significances, effects sizes (η^2) and power estimates were reported. Effect sizes were reported as eta-squared (Burba, Petrosko, & Boyle, 2001). As suggested by Cohen (1992), 0.01 is a small effect, 0.06 a moderate effect, and 0.14 is a large effect. In the data analyses carried out in the current study, significance was set at $p<.05$. The Statistical Package for Social Sciences (SPSS) 20.0 was used to code and analyze the data.

Findings

The study described participants' math anxiety and most and least preferred coping behaviors for coping with mathematics (Table 1). The most common math anxieties that participants experienced were Math Test Anxiety (*M*=3.45, *SD*=0.85) and Math Course Anxiety (*M*=2.95, *SD*=0.86). Whereas the least common math anxieties were Calculation Anxiety (*M*=1.38, *SD*=0.71) and Social Anxiety (*M*=1.62, *SD*=0.80). The research revealed that regarding the strategy of coping with mathematics participants' most preferred mathematics strategy was Coping focused on solving the problem (*M*=3.17, *SD*=0.52), whereas the least preferred was Coping with reference to others (*M*=2.56, *SD*=0.56).

The sub-scales of MARS-SV and CMS-SV and the differences in terms of gender and field were analyzed by *independent t-test* (Table 1). Female participants (*M*=3.53, *SD*=0.81) were found to experience Math Test Anxiety more than male participants (*M*=3.20, *SD*=0.95) ($t_{(253)} = 2.71$, $p < .01$). On the other hand, males experience Calculation Anxiety (*M*=1.59, *SD*=0.97) more than females (*M*=1.32, *SD*=0.59) ($t_{(253)}=-2.62$, $p<.01$). The mean score of women in the three sub-scale scores of CMS-SV was significantly higher than the mean score of men ($p<.05$).

Regarding Social Anxiety and Calculation Anxiety sub-scales of MARS-SV, the mean score of classroom teaching students was significantly higher than that of mathematics teaching students ($p < .01$). Mathematics teaching students (*M*=2.64, *SD*=0.54) used "Coping with reference to others" strategy more than classroom teaching students (*M*=2.45, *SD*=0.56) ($t_{(253)} = 2.65$, $p < .01$). According to these results, the hypothesis 1 developed at the beginning of the research was rejected.

Table 1. *MARS-SV and CMS-SV Sub-scale means, standard deviations, internal consistency coefficients, and t-test results according to gender and field*

Sub-scales	Alpha	M	SD	Female		Male		t	M		S		t
				M	SD	M	SD		M	SD	M	SD	
Mathematics Anxiety Rating Scale-Short Version													
MARS-SV total	.92	2.29	0.62	2.30	0.58	2.26	0.75	.51	2.26	0.58	2.34	0.69	-0.98
TA	.76	3.45	0.85	3.53	0.81	3.20	0.95	2.71**	3.46	0.85	3.43	0.87	0.26
CA	.75	2.95	0.86	2.98	0.84	2.83	0.93	1.19	2.94	0.85	2.95	0.89	-0.13
AA	.81	2.07	0.86	2.08	0.85	2.05	0.90	.21	2.06	0.83	2.08	0.92	-0.23
SA	.72	1.62	0.80	1.62	0.75	1.62	0.94	-.06	1.55	0.73	1.72	0.89	-1.64**
ComA	.80	1.38	0.71	1.32	0.59	1.59	0.97	-2.62**	1.30	0.62	1.51	0.83	-2.36**
Coping with Mathematics Scale-Short Version													
CFSP	.79	3.17	0.52	3.21	0.50	3.06	0.56	1.98*	3.16	0.52	3.18	0.52	-.19
CRO	.75	2.56	0.56	2.65	0.52	2.32	0.58	4.21**	2.64	0.54	2.45	0.56	2.65**
NPC	.81	2.62	0.53	2.66	0.53	2.49	0.51	2.20*	2.61	0.54	2.62	0.51	-.13

CFSP: Coping focused on solving the problem; **CRO**: Coping with reference to others; **NPC**: Non-productive coping; **TA**: Test anxiety; **CA**: Course anxiety; **AA**: Application anxiety; **SA**: Social anxiety; **ComA**: Computation anxiety; **M**: Mathematics teaching; **CT**: Classroom teaching

The relationships between MARS-SV and CMS-SV sub-scales and GPA score were analyzed through Pearson-moment Correlation Coefficient (Table 2). The results are:

- Overall MARS-SV showed that TA, AA had negative significant correlation with CFSP and positive significant correlation with CRO, whereas it had no significant relationship with NPC and GPA score.
- It showed that CA had negative significant correlation with CFSP and GPA score, and positive significant correlation with CRO, but no significant relationship with NPC.
- It showed that SA had negative significant correlation with CFSP, whereas it had no significant relationship with CRO, NPC and GPA score.
- It showed that ComA had negative significant correlation with CFSP, NP and GPA score, and positive significant correlation with CRO.

The results showed that there was significant correlation between overall MARS-SV, its sub-scales and CMS's sub-scales; therefore, hypothesis 2 was supported. However, regarding overall MARS-SV and its sub-scales, only CA and ComA had negative significant correlation with GPA SCORE. Therefore, hypothesis 3 was rejected except for CA and ComA.

Regarding the sub-scales of CMS-SV, the results showed that CFSP had positive significant correlation with GPA score, NPC had negative significant correlation with GPA score and CRO had no significant relationship with GPA score. Therefore, hypothesis 4 was supported except for CRO.

Table 2. *MARS-SV, CMS-SV and GPA SCORE Correlation Matrix*

Sub-scales	1	2	3	4	5	6	7	8	9	10
Mathematics Anxiety Rating Scale-Short Version										
1- MARS-SV total	-									
2- TA	.71*	-								
3- CA	.77*	.79*	-							
4- AA	.77*	.29*	.37*	-						

5- SA	.81*	.32*	.37*	.72*	-					
6- ComA	.73*	.23*	.35*	.54*	.73*	-				
Coping with Mathematics Scale-Short Version										
7- CFSP	-.39*	-.20*	-.41*	-.28*	-.27*	-.31*	-			
8- CRO	.42*	.46*	.40*	.27*	.25	.21*	-.16*	-		
9- NPC	-.07	.03	.01	-.12	-.12	-.12*	.39*	.02	-	
10- GABO	-.12	-.06	-.23*	-.00	.01	-.18*	.46*	-.02	-.17*	-

**p*<.05, ***p*<.01

Regarding the strategy of coping with mathematics, 188 (73.7%) of the teacher candidates who participated in the study stated that they were dominantly preferring "Coping focused on solving the problem" strategy, 43 of them (16.9%) "Coping with reference to others" strategy and 24 of them (9.4%) "Nonproductive coping" strategy. One-way analysis of variance (ANOVA) was used to determine whether these three groups differ in terms of overall MARS-SV scores. Table 3 shows the means and standard deviations of overall MARS-SV and its sub-scales scores of the participants from these three groups and F-test results of overall MARS-SV. As seen, a statistically significant difference was found between the groups in the overall math anxiety dimension. Tukey post-hoc showed that the following differences between groups are significant: the group that uses CFSP strategy for coping with mathematics and the group that uses CRO strategy (mean difference = -.62, *p*<.01); the group that uses CRO strategy and the group that uses NFC strategy (mean difference =.35, *p*<.05); but no significant difference was observed between the group that uses CFSP strategy and the group that uses NFC strategy (mean difference = -.26, *p*>.05).

Table 3. *Comparison of Overall MARS-SV and its Sub-Scale Scores regarding Dominantly Preferred Strategy of Coping with Mathematics*

	Coping with Mathematics						
	CFSP		**CRO**		**NPC**		
	M	***SD***	***M***	***SD***	***M***	***SD***	***F***
MARS-SV total	2.16	0.53	2.78	0.76	2.43	0.56	13.704*
1- TA	3.30	0.83	4.01	0.74	3.59	0.83	
2- CA	2.75	0.80	3.60	0.76	3.29	0.88	
3- AA	1.96	0.78	2.53	1.11	2.08	0.71	
4- SA	1.51	0.66	2.04	1.13	1.67	0.91	
5- ComA	1.28	0.55	1.74	1.12	1.51	0.74	

**p*<.01

Significant correlation coefficients found between MARS-SV sub-scale scores indicate that these sub-scales are interrelated (Table 2). It is recommended to conduct a single multiple variance analysis for theoretically and statistically related variables instead of conducting a separate one-way analysis of variance for each of them. For this reason, the statistical differentiation of the three groups which were predominantly preferred from the strategies of coping with mathematics in five MARS-SV sub-scales were examined with Multivariate Analysis of Variance (MANOVA). MANOVA analyzes were performed on the linear combination of these five sub-scales. Due to the differences in the number of students between the cells, non-orthogonal pattern was applied.

The data show that the variance-covariance homogeneity assumption required for variance analysis was satisfied (Box *M*=21.538, F = 1.17, p> .05). In addition, homogeneity test for regression and

general regression homogeneity test for MANOVA indicated that these assumptions were satisfied (p> .05). A significant multiple variance effect for the three groups of different strategies for coping with mathematics was found (*Wilks' λ*=.09, *F*= 5.21, *p*<.01). The relationship between coping with mathematics strategies and combined dependent variables is moderate (η^2= 09).

Since the overall MANOVA showed a significant difference for the preferred strategy of coping with mathematics groups, the nature of this difference was examined in more detail. Participants who were using CFSP, CRO and NPC strategies in coping with mathematics have significantly differentiated in all sub-scales of MARS-SV. The group using CFSP strategy was found to be less anxious about mathematics on all sub-scales.

Table 4. *Differences in MARS-SV Sub-Scales regarding Preferred Strategy of Coping with Mathematics*

Dependent Variable	Type III Sum of Squares	*df*	Mean Square	*F*	*p*	Eta-squared
1- TA	18.21	2	9.10	13.70	.00	.09
2- CA	28.58	2	14.29	22.52	.00	.15
3- AA	11.68	2	5.84	8.30	.00	.06
4- SA	9.68	2	4.84	7.93	.00	.05
5- ComA	7.67	2	3.80	7.91	.00	.05

Discussion and Conclusion

This research focused on the relationship between the ways of coping with mathematics and math anxiety and achievement. Findings showed that there was a negative significant relationship between overall math anxiety, mathematics test anxiety and application anxiety and using CFSP strategy in coping with mathematics, whereas there was a positive significant relationship between them and using CRO strategy. In addition to the findings, there was a negative correlation between CFSP strategy and math test anxiety and calculation anxiety. Although no study is available to directly compare the results of this study, Skaalvik's (2018) study on secondary school students contains similar findings. Notably, the evidence also indicates that the use of adaptive versus maladaptive coping strategies in response to math difficulties is significantly predictive of math anxiety. Children who more often respond to mathematical challenges with problem-focused coping mechanisms such as strategizing report significantly lower math anxiety. In contrast, children who tend to use maladaptive defensive strategies such as concealment experience higher levels of math anxiety.

In addition, there was no correlation between GPA score and the sub-scales of math anxiety (except mathematics course anxiety sub-scale). Regarding the studies in the literature, the relationships observed between academic achievement and math anxiety are low and old-dated. Data from the PISA studies with 15- to 16-year old confirm these results on an international level. Within and across countries, math anxiety correlates negatively with PISA math task achievement. This relationship remained stable over several assessment periods (Lee, 2009; OECD, 2013). The review of the obtained results revealed that, as mentioned in the introduction of this research, the relationship between math anxiety and achievement cannot be fully elucidated. This situation may be caused by a complex relationship between the two variables, so the cases should be studied in more depth.

Findings suggested that those, who use CFSP strategy in coping with mathematics, are likely to experience less math anxiety. When individuals start to use CFSP strategy dominantly to cope with mathematics, they experience less math anxiety. In addition, the GPA scores of the participants who use this strategy were significantly higher than the participants who adopted other strategies. Similar findings were found in the studies of Aner and Ertkin (2010). That coping styles are associated

with low levels of anxiety and high levels of mathematics achievement was inferred from the regression weights. On the other hand, the frequent use of "coping focused on solving the problem" strategies, described broadly as task-oriented, active attempts to overcome difficulty, appeared to be a source of anxiety in the final model and served to decrease mathematics achievement. On the other hand, CFSP strategy is mostly used by women and mathematics teaching students. The findings indicate that CFSP strategy can be useful for individuals not only to cope with anxiety but also to increase their academic achievement. In this study, the role of the gender and field differences on the relationship between coping with mathematics and math anxiety was also investigated. Findings revealed that men and women differ in both coping with mathematics and math anxiety. Women are more concerned about mathematics test anxiety and men are more concerned about calculation anxiety. Similarly, the findings of the study conducted by Baloğlu and Harris (2004) on 559 university students revealed that the level of anxiety was higher in male students than in females regarding numeric operations anxiety dimension. In addition, in the same study no significant difference was found between two genders in terms of mathematics course anxiety. Therefore, examining gender differences in terms of math anxiety is a very complex task, which constitutes one of the clearest findings of this research. And also; females are more at risk in terms of math anxiety than males (Jameson, 2013; Leggett, 2016; Stoet, Bailey, Moore & Geary, 2016). Although girls have the ability to succeed in math, the stereotype that math is a masculine subject puts a great amount of pressure on them to perform (Jameson, 2013). In addition, regarding the field of teacher candidates, classroom teaching students experienced both social anxiety and calculation anxiety more. On the other hand, class teaching students used CRO strategy in coping with mathematics more than mathematics teaching students.

Limitations and Directions for Future Research

In this study, it was found that there were significant relationships between the ways of coping with mathematics and math anxiety. In this context, suggestions for the theoretical and practical areas for advanced research are as follows:

- The cross-sectional nature of research design has hampered deeper understanding of the relationship between coping with mathematics and math anxiety and achievement. Therefore, it may be useful to conduct a longitudinal study using mixed-method approaches for addressing the research problem more comprehensively.
- The research showed the important effects of coping with mathematics on math anxiety. However, it doesn't mean these effects are causal. Future studies may use real experimental designs to investigate whether the impact of mathematics on math anxiety is causal or not.
- Based on the findings of this study, it was concluded that CFSP strategy could be useful in coping with math anxiety and women could significantly benefit more from CFSP strategies.
- In conclusion, it can be said that strategies to reduce math anxiety can be taught to students to help them reduce their anxiety levels.

The most important limitation of the research is being conducted on teacher candidates (from the same faculty). In addition, data were collected from one faculty and evaluated. In this respect, the generalizability of the findings is limited. In the study, data were collected by self-report, which caused common method bias. This may have led to an artificial increase in the observed correlations. Although this limitation cannot be completely eliminated in the research, errors can be reduced to minimum levels. Therefore, necessary measures were taken during the collection stage of the data with the recommended practices within the scope of this research. First of all, the research was conducted in two different teaching areas and 4 different class levels. The validity and reliability of the scale used in the data collection phase of the research were tested. Secondly, it was expressed to the participants in the face-to-face interviews that the answers would be kept in full confidentiality and not be disclosed. In addition, the questionnaire form which was applied to the participants was arranged as items related to independent variables were located before the items

related to the dependent variables.

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