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The Relationship Between the Family Environment and the Attitudes of the Secondary School Students and the Mathematics Course

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ABSTRACT

In this study, it was aimed to examine the relationship between students' attitudes towards mathematics and their family environment. The population of the research consists of students studying at secondary school level affiliated to the Ministry of National Education in the Izmit district of Kocaeli province in the 2022-2023 academic year. The sample of the study consists of 109 students selected from the universe by simple random sampling method. "Attitude Scale Towards Mathematics Lesson" developed by Duatepe and 4-point Likert-type Family Environment Scale developed by Moss and reduced to 30 items by Fowler as a result of factor analysis were used as data collection tools. Jamovi 2.3.21.0 package program was used for the analysis of the data. As a result of the findings, it was concluded that the family environment or the opportunities offered by the family have a similar effect on the attitude towards the mathematics course.

Keywords: Family Environment, Education, Attitudes to Mathematics Lesson, Secondary School, Student.

Introduction:

Educational institutions have a superior aspect than other institutions in directing people's behaviors and creating desired changes. Recently, in almost every country of the world, cultural, social, technological etc. significant changes are taking place in the fields. Information is frequently updated, events are now explained in more than one dimension. Especially the great developments in the fields of electronics and computers have accelerated the pace of development of social events. This situation has further increased the demand for qualified personnel. For this reason, school and academic success have become the most important way, if not the only way to individual success in life [1, 2]. One of the important factors for countries is education. The element of education has a very clear effect on the birth and development of nations. The support of teachers and families is very important in order to adapt to the conditions of the day in terms of education. The situation of student family environments affects performances in motivation as much as it affects people's perspective on the education system in general. In summary, the importance of the family environment in ensuring efficiency in education is too great to be underestimated. In order to meet the family expectations of the students, it is necessary to examine the family structure [3, 4].

The purpose of the study; The aim of this study is to determine the level of students' attitudes towards mathematics lesson and whether the relationship between family environment and attitudes towards mathematics lesson is significant.

Methodology:

In this study, an answer was sought to the question of what is the relationship between students' mathematics attitudes and their family environment. The relational survey model was used in this study, in which secondary school students were examined in terms of their family environment and mathematics attitudes. This model is used to find out how the variables differ by looking at the correlation of at least two variables within themselves [5]. Most of the researches are carried out on sample groups. The results of the researches are generalized in their own universe [6]. Since the sample is a part of the universe, it is important both for research and statistically. One of the simplest features of the sample is that it is neutral and representative. To all the elements in the determined universe; Simple random sampling method was used to give an independent and equal chance to be selected for sampling [7]. A total of 124,361 secondary school students studying in the second semester of the 2022/2023 academic year constitute the universe of the research. A total of 109 secondary school students, 60 girls and 49 boys, in a state school in Kocaeli province Izmit district, selected by simple random sampling method among the students studying in these schools, are formed. 13 of the students are 5th grade, 35 of them are 6th grade, 36 of them are 7th grade and 25 of them are 8th grade students. A questionnaire was applied to the students. The Family Environment Scale [8] included in this survey consists of 26 questions. Mathematics Attitude Scale consists of 38 questions. The answers formed were 1 (I strongly disagree) on the scale of family environment, 2 (somewhat agree), 3 (agree), 4 (strongly agree). The Mathematics Attitude scale consists of 1 (Disagree), 2 (Partly Agree), 3 (Agree), 4 (I am undecided), 5 (Strongly agree) [9]. According to the simple random sampling formula, the sample size should be at least 383 in studies with a population size of 124.361, with a 95% confidence interval and a 0.05 margin of error. For this research, only 109 people were reached. The formula used for sampling is given in Equation (1) [10].

$$n = \frac{Nt^2 Pq}{d^2 (N-1)+t^2 Pq} \qquad\qquad (1)$$

n: Sample size, N: Population size, t: Theoretical value in the t table according to a certain level of significance, P: probability of occurrence of the investigated event, q: probability of non-occurrence of the investigated event, t: margin of error.

In the study, the theoretical t value was calculated as 1.96. For this, 95% confidence interval and 0.05 sampling error were taken into account. When the data obtained in the study is substituted in Equation (1), the result obtained is given in Equation (2).

$$n = \frac{124361 \times 1,96^2 \times 0,5 \times 0,5}{0,05^2 \times (124361-1)+1,96^2 \times 0,5 \times 0,5} = 382,98 \qquad\qquad (2)$$

In Table 1, the frequency analysis results of the variables of the participants' class, gender, type of lesson enjoyed, and education level of the parents are given. When the results were analyzed, 13 (11.9%) of the participants were in the 5th grade, 35 (32.1%) were in the 6th grade, 36 (33%) were in the 7th grade, and 25 (22.9%) were in the 7th grade. It is seen that he is an 8th grade student. Considering the results obtained from the analysis of the data, it was seen that 49 (45%) of the participants were female and 60 (55%) were male. According to the frequency analysis results regarding the enjoyable and liked course type variable, it is seen that 53 (48.6%) of the students like Turkish more and 56 (51.4%) Mathematics. When analyzed according to the mother's educational status variable, 3 people (2.8%) were illiterate, 16 people (14.7%) were in primary school, 12 people were in secondary school (11%), 43 people were in high school (39.4%), and 28 people were undergraduates (% 25, 7) and 7 people (6.4%) are at the level of postgraduate education. When examined according to the father's educational status variable, it was found that 1 person was illiterate (0.9%), 8 people were in primary school (7.3%), 7 people were in secondary school (6.4%), 43 people were in high school (39.4%), and 32 people were illiterate. It is seen that undergraduate (29.4%) and 18 people (16.5%) are at graduate level.

Table 1 Frequency analysis of the demographic characteristics of the participants

	Parameters	Frequency (f)	Percent (%)
Class	5	13	11,9
	6	35	32,1
	7	36	33
	8	25	22,9
Gender	Female	49	45
	Male	60	55
Favorite Type of Lesson	Turkish	53	48,6
	Mathematics	56	51,4
Mother Education Level	High school and below	74	67,9
	Bachelor and Above	35	32,1
Father Education Level	High school and below	59	54,1
	Bachelor and Above	50	45,9

Data Collection Tools

In this study, "Mathematics Attitude Scale" and "Family Environment Scale" were used to determine the effect of middle school students' family environment on their attitudes towards mathematics lessons. In addition, there is a "Personal Information Form" at the entrance to determine the demographic characteristics of the students.

Data Collection

The survey form was sent to the sample group online via whats app groups by the author and students who volunteered to participate in the study were asked to fill in. After the preliminary application, it was determined that the questionnaires were completed in an average of 10 minutes.

Analysis of Data

Jamovi 2.3.21.0 package program was used to analyze the data collected in this study. The answers to the research questions were found by using the descriptive statistics method. The skewness coefficient was calculated in order to have an idea about whether the distribution of the dependent variables "Family environment" and "Attitude towards the mathematics lesson" is normal or not. Since these values were calculated between -1 and +1 for the general dimension and sub-dimensions of the scales, it was determined that the family environment status of the students and their level of attitude towards the mathematics lesson were normally distributed. The Levene homogeneity test was applied to the research questions to determine whether they used parametric or non-parametric tests. As a result of the data obtained after this test, independent sample t-test was used.

Results

In this section, some data formed by analyzing the data obtained after the study and the scales used according to the problems are interpreted as tables. Quantitative results of middle school students' family environment's attitudes towards mathematics lesson were examined according to the variables and in relation to the scores they got.

Table 2 Perception level of the Family Environment Scale

No	Questions	Mean	Standard Deviation
1	Activities in our family are planned very carefully	2,75	0,747
2	Family members express their feelings openly.	3,15	0,791
3	In our family, great care is taken to follow the rules.	2,96	0,781
4	Decisions about our family are mostly made by the elders.	2,66	1,09
5	In our family, individuals have their own problems. they get it done	2,17	0,887
6	In our house, things are done according to a certain order.	2,94	0,864
7	We talk to each other about our personal problems at home.	2,90	0,952
8	Family members have definite opinions about 'right and wrong'.	2,97	0,799
9	Family members really support each other	3,28	0,768
10	We pay attention to what we say when we talk to each other.	3,05	0,832
11	There is plenty of time and attention to be given to everyone in our family.	2,72	0,914
12	We can do whatever we want in our family	1,67	0,77
13	There is a sense of unity and togetherness in our family.	3,31	0,847
14	There are rules that must be followed in our family.	3,09	0,8
15	It is very important to do something decided on time (punctuality) in our family.	2,68	0,804
16	The rules in our family are quite strict.	1,72	0,795
17	In our family, my members change their decision without asking.	2,50	0,878
18	Family members they openly show their anger	2,61	0,932
19	As a family, we are clean and tidy people.	3,33	0,653
20	Our family encourages us to be self-sufficient	3,20	0,791
21	We believe that we cannot achieve anything by raising our voice in our family.	2,72	1
22	The task of each individual in our family is clearly stated	2,83	0,901
23	When there is a disagreement in our family, we make an effort to resolve it and keep the peace.	3,12	0,836
24	We get on really well with each other.	3,14	0,844
25	It's hard to find something we're looking for in place.	2,06	1,02
26	Family members solve their problems among themselves.	2,28	0,893
Total		2,76	0,85

When the findings in Table 2 are examined, it can be said that the perception level of the family environment scale is high (mean=2.76). The students who participated in the research stated that they mostly agreed with the item "Your family is clean and tidy" (average = 3.33), and least with the item "We can do whatever we want in our family" (average = 1.67). According to the information at the end of the research, it was seen that the level of the family environment of the students corresponded to the statement "I agree" on the 4-point Likert type scale. According to this result, it can be stated that the level of student family environment is related (high).

The second sub-problem of the research is; The aim of this study is to determine the students' attitude levels towards the mathematics lesson. The findings related to the students' level of attitude towards the mathematics lesson are given in Table 3.

Table 3 Perception level of the mathematics attitude scale

No	Questions	Mean	Standard Deviation
1	Mathematics doesn't scare me.	2,72	1,01
2	Math is one of my favorite subjects.	3,35	1,26
3	I would like to study math.	3,72	1,22
4	I will use math in many places throughout my life	2,74	1,48
5	I get nervous while studying math	2,64	1,46

6	I feel comfortable when dealing with a new math problem I feel. When I come across an unusual question, I struggle until I find the answer.	1,71	1,13
7	I don't think I will be able to use what I learned in this course in my daily life.	1,82	1,23
Table 3 (Continued) Perception level of mathematics attitude scale			
8	I don't understand how some people like math so much	3,50	1,27
9	I don't think I will use mathematics in my professional life	2,47	1,48
10	I wouldn't take mathematics classes if it wasn't compulsory	3,22	1,38
11	When I start studying mathematics, it's hard to quit.	2,09	1,29
12	Knowing mathematics well will increase my study opportunities	2,56	1,47
13	I can get good grades in mathematics classes.	2,17	1,38
14	Mathematics I do not have anxiety while studying.	1,83	1,20
15	I do not have the ability to think mathematically.	2,80	1,39
16	I like to solve problems using mathematics.	4,00	1,13
17	I think I cannot understand mathematics.	3,50	1,35
18	Mathematics is not a science, it is just a tool.	2,83	1,42
19	It gives me pleasure to deal with unfinished math questions in class.	2,31	1,39
20	Mathematics doesn't scare me.	2,91	1,36
21	Math is one of my favorite subjects.	2,31	1,45
22	I would like to study math.	2,06	1,26
23	I will use math in many places throughout my life	2,65	1,46
24	I get nervous while studying math	4,17	1,13
25	It's important for me to be successful in math classes.	2,39	1,48
26	I don't feel confident when it comes to studying math	2,72	1,43
27	I'm assertive in math.	2,72	1,45
28	I don't like talking about math with others.	3,36	1,37
29	I enjoy math class.	1,85	1,21
30	The name of math Even hearing about it makes me uneasy.	2,11	1,34
31	I don't want to take any more math lessons than this one.	2,28	1,43
32	Other subjects seem more important to me than math	2,93	1,54
33	Math confuses you.	2,14	1,32
34	Math is boring.	2,53	1,55
35	Math is my worst fear.	2,29	1,54
36	I feel so helpless while studying mathematics.	1,90	1,28
37	This course has no contribution to my profession	2,38	1,46
38	I wish I didn't have to use mathematics in other lessons.	2,28	1,43
Total		2,63	1,35

Considering the results in Table 3, it can be said that the perception level of mathematics attitude scale is high (mean=2.63). The students who participated in the research stated that they mostly agreed with the item "It gives me pleasure to deal with unfinished mathematics questions in the course" (mean = 4.17) and the least for the item "I feel comfortable when dealing with a new math problem" (average = 1.71). According to the data obtained as a result of the research, it was understood that the attitudes of the students towards the mathematics lesson correspond to the statement "I agree" on the 4-point Likert type scale. Based on this result, it can be stated that the level of attitude towards the mathematics course is high.

Another result of the study was correlation analysis in order to determine whether there is a relationship between the family environment of secondary school students and their attitudes towards mathematics lessons. Before the correlation analysis, it was determined that the students' family environment scores and the total scores of the mathematics lesson attitude scale were tested for skewness and they had a normal distribution.

Table 4 The relationship between the family environment of the students and their attitudes towards the mathematics lesson

	Mathematics Lesson Attitude Scale
Family Media Scale	0.812

As a result of the Pearson correlation analysis, it was determined that there was a positive and strong correlation between the students' distance family environment scale and their Mathematics Lesson Attitude levels. When the data of the family environment obtained from the scales and the scores obtained for the mathematics course were analyzed, it was found that there was a positive and high level relationship.

Conclusion

According to the students' opinions, it was concluded that the family environment scale perception level of the participants was at the level of 2.76. This is not negative, but thought provoking. Because, just as genes are passed from family to child, the type of education and the opportunities it provides to the child are also important in the success of the child. It was concluded that the students' mathematics attitude scale perception level was at the level of 2.63. Similar results were obtained in the mathematics attitude scale as in the results of the family environment scale. Therefore, the family environment or the opportunities offered by the family have a similar effect on the attitude towards mathematics. For this reason, the importance of family environment should be emphasized in parent meetings in schools. Increasing training activities (in-service training, seminars, etc.) for employees working in the education sector related to the family environment, It can be beneficial to increase positive attitudes towards the lesson. It was concluded that it would be the right way for students to receive support in improving the family environment.

References:

1. Saban, O. (2019). Investigation of the Effect of Mathematics Applications Course on Secondary School Students' Mathematical Literacy and Attitudes Towards Mathematics, Master Thesis, Hacettepe University, Ankara.

2. Dam, H. (2008). Family Factor in Student's School Success. Hitit University Journal of Theology Faculty, 7(14), 75-99.

3. Günkör, C. (2017). Examining the Relationship between Education and Development. International Journal of Social Sciences Education, 3(1), 14-32.

4. Öztabak, M.Ü. (2018). Guidance and Psychological Counseling for Families of Special/Gifted Children, Journal of Education and Human Sciences. 9(17), 80-106.

5. Bahtiyar, A., Can, B. (2016). Investigation of Science Teacher Candidates' Scientific Process Skills and Attitudes towards Scientific Research. Journal of Buca Education Faculty, 42.

6. Özen, Y., Gül, A. (2007). The Universe-Sample Problem in Social and Educational Sciences Research. Kkefd. 15, 1-29.

7. Baltacı, A., (2018). A Conceptual Study on Sampling Methods and Sample Volume Problems in Qualitative Research. Bitlis Eren University Journal of Social Sciences Institute, 7(1), 231-274.

8. Fowler, PC (1980). Family Environment and Early Behavioral Development. A Structural.

9. Yetgin, NB, Yesilyurt M. (2020). Developing a Scale on Mathematics Attitudes of Primary School Students. Journal of Basic Education. 2(4), 26-33.

10. Karasar, N. (2014). Scientific Research Method. (26th Edition). Ankara Nobel Publishing House