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International Journal of Curriculum and Instruction 14(2) (2022) 1204–1221

IJCI
International Journal of Curriculum and Instruction

# Mathematics self-efficacy as a mediator between task value and math anxiety in secondary school students

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**Abstract**

In this study, the relationships between task value, self-efficacy and mathematics anxiety in everyday life in secondary school students were investigated. In addition, the mediating role of self-efficacy in the relationship between task value and mathematics anxiety in daily life was examined. 203 secondary school students participated in the research. Data were obtained by using Motivated Strategies for Learning Questionnaire and Mathematics Anxiety Scale. The relationships between task value, self-efficacy and anxiety were examined by applying Pearson Product-Moment Correlation analysis. The mediating role of self-efficacy was tested by applying structural equation model analysis. It was determined that as the perception of task value increased, perceptions of mathematics self-efficacy increased and mathematics anxiety in everyday life decreased. It was found that as self-efficacy belief increases, mathematics anxiety in everyday life decreases. Self-efficacy has a partial mediating role in the relationship between task value and mathematics anxiety in everyday life. In order to reduce mathematics anxiety in everyday life, students can be provided with successful experiences in mathematics, while making them feel that mathematics is important and useful.

***Keywords:*** Task value; math anxiety in everyday life; self-efficacy; secondary school students; mediator variable

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## 1. Introduction

Understanding the world and gaining mental discipline is possible with mathematics. Mathematics is a fundamental part of human life. Mathematical knowledge and skills are used while shopping, cooking, calculating time, playing video games, doing scientific research. Mathematical skills help the individual to realize himself in fields such as social sciences, music and art. Mathematics requires logical reasoning, critical thinking, creative thinking, spatial thinking, problem solving and using effective communication skills. In this respect, mathematics is associated with high-level mental skills. Mathematics is an important discipline for students to learn at school. However, most

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students can feel stress and anxiety while solving mathematical problems. A study has shown that even six-year-old students experience math anxiety (Ramirez, Gunderson, Levine & Beilock, 2013). Mathematics anxiety negatively affects students' success (Zhang, Zhao & Kong, 2019). Individuals with math anxiety are less likely to be successful in science, technology, engineering and math-related professions (Sokolowski & Ansari, 2017). For this reason, it is important to investigate the factors that may be associated with math anxiety. Thus, suggestions can be developed to reduce math anxiety.

### *1.1. Math anxiety*

Mathematics anxiety is a subject that has been studied for many years. Fear, tension and anxiety experienced in mathematical activities are associated with math anxiety (Ashcraft & Ridley, 2005). Mathematics anxiety is a common problem observed in primary, secondary, high school and university students (Jain & Dowson, 2009; Luttenberger, Wimmer & Paechter, 2018; Ramirez, et al., 2013; Zhang, Zhao & Kong, 2019). It can be argued that this situation affects students' performance negatively. As a matter of fact, the mathematical reasoning and problem solving performances of students with high mathematics anxiety are lower (Ashcraft, 2002; Das & Das, 2013; Ma & Xu, 2004).

Research shows that it is a positive situation for students to experience a certain level of math anxiety (Arem, 1993; Wang et al., 2015). Optimum level of math anxiety can create a motivating force for students. Students with high motivation can spend more time on mathematics and increase their mathematics performance. Too low or high math anxiety affects performance negatively. Students with low mathematics anxiety are indifferent to the lesson, do not give importance to mathematics subjects and participate less in the lesson. Students with high levels of math anxiety cannot show their real performance due to anxiety and worry. These students are likely to develop negative attitudes towards mathematics (Baloğlu, 2001).

Faust et al., (1996) stated that individuals with high math anxiety exhibit avoidance-like behaviors to finish math tests quickly. It has been stated that the probability of observing these behaviors increases as the problems in the mathematics test become more difficult. Ashcraft and Krause (2007) investigated the relationships between working memory, math performance and math anxiety. It was found that working memory could not perform its task effectively due to mathematics anxiety. Fear, anxiety and worries related to mathematics increased the load on working memory and negatively affected mathematics performance. Klados et al., (2019) examined the effect of math anxiety on working memory. It was stated that individuals with high math anxiety activate the area of working memory associated with negative emotions such as pain, fear and anxiety. In addition, according to functional connectivity analysis results, it was

found that the brains of these individuals had a dispersed and unstructured network image. It is seen that mathematics anxiety affects students' cognitive processes negatively and prevents them from showing real mathematics performance.

Mathematics anxiety negatively affects the quality of daily life besides academic success. Being confused frequently while shopping, taking the change without counting most of the time, not being able to make mathematical calculations while being watched in public, worrying about calculating time and staying away from mathematical discussions are the indicators of math anxiety in daily life (Erol, 1989). This state of anxiety can cause forgetfulness and loss of self-confidence in the individual (Tobias, 1993). Thus, it is important to carry out studies aiming to determine the factors that cause math anxiety.

### *1.2. Task value and anxiety*

Thinking that a particular task is useful and important is related to the perception of task value. As the value given to a task increase, the tendency to continue and complete that task also increases (Eccles, 1983). A student's evaluation of how important, how useful, and how interesting a particular task are related to task value (Nata, 2004). Accordingly, a student who finds a lesson important, useful and interesting can put in more effort to learn the subjects of that lesson, spend more time for homework, and participate in lessons more effectively.

According to the expactancy-value theory, intrinsic value, utility value or usefulness, attainment value/importance and cost are the components of task value. Intrinsic value is explained by the feelings of pleasure and pleasure that an individual gives to accomplishing a task (Wigfield, Tonks & Lutz Klauda, 2009). An individual is more willing to do a task that has intrinsic value for him or her. In this case, the individual acts more determinedly and puts in more effort to complete that task. Utility value or usefulness has been associated with the fact that accomplishing a task helps to achieve some future gains (Wigfield & Eccles, 1992). Even if the individual is not interested in a particular task, he or she may see it as a tool for future opportunities. Depending on this situation, he or she tries to achieve the task. Attainment value/importance value is related to the fact that a task provides opportunities for the individual to demonstrate and validate important aspects of self (Eccles & Wigfield, 2002). Students who are successful in mathematics may begin to see mathematics as an important part of their personality and identity. The cost value is associated with the difficulty of a task and how much effort it requires (Wigfield et al, 2009). Easy and low effort tasks are more likely to be preferred by the individual.

Task evaluative beliefs are considered an important factor affecting anxiety (Wigfield & Meece, 1988; Zeidner & Matthews, 2005). However, there are debates about the direction of the relationship between task value and anxiety in the literature.

Researchers have stated that there are positive relationships between task value and anxiety. It has been suggested that task value is perceived as a threat when there is an expectation of failure. Accordingly, the greater the value attributed to the task, the greater the expectation of failure will create anxiety (Covington, 1985). Wigfield and Meece (1988) reported that there is a moderately positive relationship between students' perception of task value and their anxiety in a study conducted with secondary and high school students. Nie, Lau, and Liau (2011) suggested that the attitudes and behaviors of teachers and parents to emphasize the importance of the lesson may cause an increase in test anxiety among students. There are also studies stating that there is a negative relationship between task value and anxiety. Yurt and Şahin (2015) stated that the task value of secondary school students has moderate negative correlations with mathematics exam and assessment anxiety, anxiety in mathematics lessons, and mathematics anxiety in everyday life. Şanlı (2021) stated that there is a negative relationship between the task value of geography lesson and test anxiety among high school students. Task value can be considered as a driving force that enables an individual to take action for a certain task (Wigfield & Eccles, 1992). When a student thinks that a lesson is important and useful for him, he tends to put more effort to succeed in that lesson. This can enable the student to be more successful and experience less anxiety. Investigating the factors that may affect the relationship between task value and anxiety will help to better understand the relationship between task value and anxiety.

### *1.3. Self-efficacy and its mediator role*

Self-efficacy is an individual's belief in his or her own capacity to achieve the level of learning and behavior he or she aims at (Bandura, 1997). Self-efficacy is an individual's knowing what he or she is capable of doing rather than knowing what he or she wants to do. Many findings have been presented showing that self-efficacy belief is a determinant and mediator for the performance results of different academic tasks (Fadlelmula, Cakiroglu & Sungur, 2015; Honicke & Broadbent, 2016; Zimmerman, Bandura & Martinez-Pons, 1992). The level of perseverance and effort that an individual will show to achieve a task depends on self-efficacy belief (Schunk & Pajares, 2009).

Self-efficacy belief has four main sources: mastery experiences, vicarious experiences, verbal persuasions, and physiological and affective states (Bandura, 1997). Mastery experiences refer to the positive and negative experiences of an individual. As one has successful experiences with a task, self-efficacy belief towards that task increases. Vicarious experiences can also increase self-efficacy belief (Bandura, 1997). When individuals observe that other individuals with the same status as them have accomplished a task, the belief that they can achieve the same task may increase. Verbal persuasion is another source that supports self-efficacy (Bandura, 1997). Motivating notifications from one's parents, teachers, or friends can increase self-efficacy belief for a

particular task. Motivating statements given above the individual's capacity may weaken his self-efficacy belief by causing unsuccessful experiences. Negative emotions such as anxiety, stress, worry and fear are expressed as emotional and psychological states and they have a negative effect on self-efficacy belief (Bandura, 1997). An individual may lose faith in his own capacity in an environment where he or she experiences anxiety, stress and anxiety.

Self-efficacy belief is a powerful resource that helps protect individuals from psychological stress (Bandura, 1997). When an individual has self-efficacy beliefs, the tasks that need to be accomplished are perceived as a struggle. When an individual's self-efficacy belief is weak, the tasks that need to be accomplished are seen by the individual as a source of threat and anxiety. Individuals with weak self-efficacy beliefs may think that they have more to lose when they cannot accomplish an important task compared to other individuals. This may increase the anxiety levels of these individuals. Studies have supported these findings. Nie, Lau, and Liau (2011) stated that students who think that mathematics and English lessons are useful and important but have weak self-efficacy beliefs in these lessons experience more test anxiety. Şanlı (2021) determined that the negative relationship between task value and test anxiety weakens when students' self-efficacy beliefs in geography lesson increase.

### *1.4. Purpose of the study*

When the studies are evaluated, it is clearly seen that the task value affects mathematics anxiety. In order to better understand the relationship between task value and math anxiety, it is necessary to investigate the factors that may affect this relationship. There are a limited number of studies in the literature investigating the factors affecting the relationship between task value and anxiety (Nie, Lau & Liau, 2011; Şanlı, 2021). In addition, there are no studies examining the mediating role of self-efficacy perception in the relationship between task value and math anxiety. Secondary school years are a critical period for the development of mathematical skills (Reynolds, 1991). In this period, it is important to investigate the factors associated with students' math anxiety. In this study, it was investigated whether self-efficacy belief had a mediating role in the relationship between secondary school students' task value and mathematics anxiety in everyday life. The results obtained can provide suggestions to reduce math anxiety. In accordance with the purpose of the research, answers to the following research questions were sought;

1- What is the relationship between task value, math anxiety in daily life and self-efficacy?

2- Does self-efficacy have a mediating role between task value and math anxiety in daily life?

## 2. Method

### *2.1. Sampling and participants*

203 secondary school students participated in this research. 24.1% of the students are 6th graders (n=49), 34.5% are 7th graders (n=70) and 41.4% are 8th graders (n=84). 45% of the students are female (n=91), and 55% are male (n=112). The students participating in the research study in the city center and in different secondary schools. Before data collection, approval from the research ethics committee was received, and all participants gave informed consent and participation was on voluntary basis.

### *2.2. Variables*

Self-efficacy: The subscale of Motivated Strategies for Learning Questionnaire (Pintrich, Smith, Garcia & McKeachie, 1993) was used to determine secondary school students' mathematics self-efficacy. The scale is 7-point Likert type (1=Absolutely wrong for me, 7=Absolutely true for me). Self-efficacy was measured with 5 items in the scale. One of the expressions on the scale is as follows; "I am confident that I can very well do the skills taught in math classes". The scores that can be obtained from the scale range from 1 to 35. High scores indicate higher mathematics self-efficacy beliefs.

Task value: The subscale of the Motivated Strategies for Learning Questionnaire (Pintrich, Smith, Garcia & McKeachie, 1993) was used to determine secondary school students' perceptions of task value towards mathematics. The scale is 7-point Likert type (1=Absolutely wrong for me, 7=Absolutely true for me). In the scale, task value was measured with 5 items. One of the expressions on the scale is as follows; "I think the topics covered in the mathematics lesson are useful". The scores that can be obtained from the scale range from 1 to 35. High scores indicate that the perception of task value towards mathematics is high.

Math anxiety in everyday life: The subscale of Mathematics Anxiety Scale (Erol, 1989) was used to determine the level of math anxiety experienced by secondary school students in everyday life. The scale is in a 5-point Likert type (1=strongly disagree, 5=strongly agree). Mathematics anxiety in daily life was measured with 8 items in the scale. One of the expressions on the scale is as follows; "Even if I think that a seller gives the wrong change, I do not speak up because I cannot calculate when someone is watching me". The scores that can be obtained from the scale range from 1 to 40. Higher scores indicate high math anxiety in everyday life.

### *2.3. Data analysis*

In this study, a two-stage approach, which is the measurement model and the structural model, proposed by Anderson and Gerbing (1988), is based. In the first stage,

it was determined whether there was an acceptable fit between the measurement model and the data, and confirmatory factor analysis was applied for this. In the second stage, the mediating role of self-efficacy in the relationship between task value and math anxiety was examined by structural equation model analysis. The Bootstrap method was used to test the mediation role. In order for the mediating effect to occur in this method, i) the total effect of the independent variable on the dependent variable must be significant, ii) the indirect effect must be statistically significant, and iii) VAF (Variance Accounted For= indirect effect/total effect*100) value greater than 80%, in a range of 20% to 80%, and below 20% is considered full mediation, partial mediation, and no mediation, respectively (Hair, et al., 2014).

Before analyzing the research data, some assumptions were checked. Cook distance values were calculated and it was examined whether there were extreme values in the data set that made the normal distribution difficult. Cook distance >1 values indicate that there are extreme values in the data set (Steven, 2002). The results obtained showed that there were no extreme values in the data set. In the next step, the distribution of the data was controlled by calculating the skewness and kurtosis coefficients. The fact that the skewness and kurtosis coefficients are in the range of ±1 indicates that the data are distributed close to normal (Tabachnick & Fidell, 2007). The calculated coefficients were within the specified range ($-0.63 \leq$ skewness $\leq 0.26$, $-0.13 \leq$ kurtosis $\leq 0.49$). In the next step, the existence of a multicollinearity problem between the factors was investigated by calculating the correlation coefficients. High-level relationships ($r>0.90$) indicate multicollinearity (O'brien, 2007). The calculated correlation coefficients were examined and it was determined that there was no multicollinearity problem between the factors. Analyzes were performed using SPSS 25.0 and AMOS 24.0 statistical package programs.

## 3. Results

### *3.1. Testing the measurement model*

Confirmatory factor analysis was applied to test the measurement model (Figure 1). Calculated fit values ($\chi^2$=224.64, $\chi^2$/df = 1.74, GFI = 0.90, AGFI= 0.86, TLI= 0.92, CFI= 0.93, IFI= 0.94, SRMR= 0.06, RMSEA = 0.06) indicated acceptable fit between the data and the measurement model (Browne & Cudeck, 1993; Jöreskog & Sörbom, 1984; McDonald & Marsh, 1990). The factor loads of the items in the model ranged from 0.43 to 0.83. Each factor loads were found to be significant at 0.001 level (Table 1).

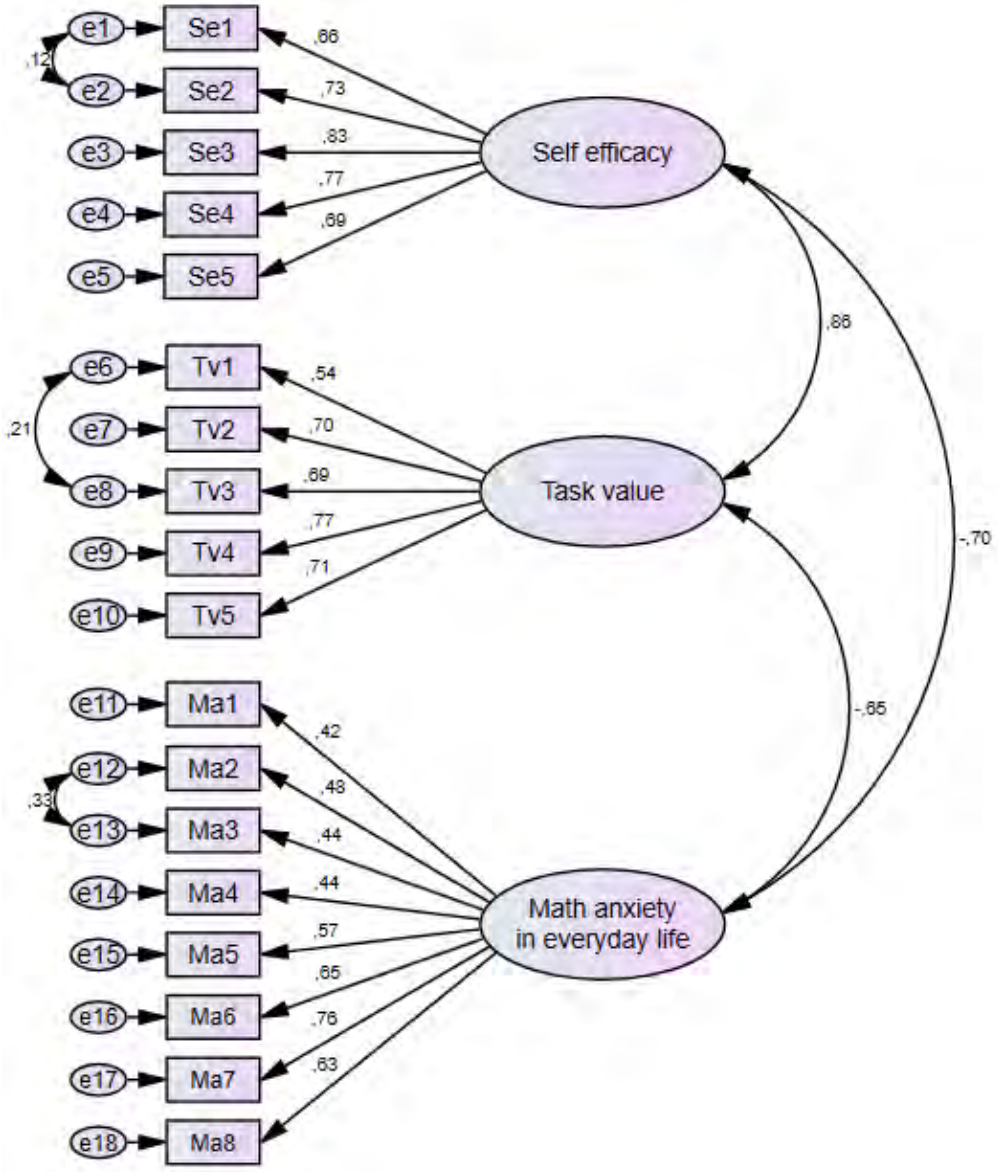


Figure 1. The Measurement Model

Cronbach Alpha coefficients were calculated to determine the reliability level of the factors in the measurement model. The alpha coefficient should be 0.70 and higher (Cortina, 1993). The alpha coefficients calculated for self-efficacy, task value and math anxiety were 0.86, 0.82 and 0.79, respectively (Table 1). The coefficients obtained showed that the internal consistency of the measurement tools was sufficient. As a result, it was understood that the measurement model was consistent with the research data and the measurement model was confirmed.

Table 1. Factor Loads and Cronbach Alpha Values

| Factor | Factor loading | SE | t | Cronbach alpha |
|---|---|---|---|---|
| **Self-efficacy** | | | | |
| I believe I will get a high grade in math class. | 0.66 | | | |
| I believe that I can understand even the most complex topics that the teacher will explain in the math class. | 0.73 | 0.12 | 9.47*** | |
| I believe that I will do my math homework very well and my exams will pass perfectly. | 0.83 | 0.13 | 9.74*** | 0.86 |
| I am confident that I can do very well the skills taught in math classes. | 0.77 | 0.12 | 9.24*** | |
| When I consider the difficulty of the course, the teacher and my skills, I think I will be successful in mathematics. | 0.69 | 0.10 | 8.43*** | |
| **Task value** | | | | |
| I think that I can use what I learned in math class in other lessons. | 0.54 | | | |
| Learning math topics is important to me. | 0.70 | 0.16 | 6.89*** | |
| I think the topics covered in the math class are useful. | 0.69 | 0.16 | 7.72*** | 0.82 |
| I like the topics covered in math class. | 0.77 | 0.21 | 7.25*** | |
| It is very important for me to understand the topics covered in the math class. | 0.71 | 0.16 | 6.99*** | |
| **Math anxiety in everyday life** | | | | |
| I get confused even when calculating the amount of money I will receive at the canteen, I often get the money without counting it. | 0.42 | | | |
| Even if I think that a seller is giving the wrong change, there are times when I remain silent because I cannot calculate when someone is watching me. | 0.48 | 0.29 | 4.54*** | |
| I can't even addition while someone is watching me. | 0.44 | 0.25 | 4.32*** | |
| At the beginning of the year, I will enter my first math lesson with hope. | 0.44 | 0.29 | 4.35*** | 0.79 |
| Even calculating time gives me discomfort. | 0.57 | 0.29 | 4.91*** | |
| If I were asked to help a primary school student with her math homework, I might refuse to help out of fear of questions I can't solve | 0.65 | 0.33 | 5.18*** | |
| In daily life, the necessity of solving mathematical problems and doing calculations, even if it is simple, annoys me. | 0.76 | 0.39 | 5.46*** | |
| If a friend asks me to solve the math problem in the magazine, I am afraid of being embarrassed by not being able to solve even the simplest questions. | 0.63 | 0.38 | 5.14*** | |

***$p<0.001$

### *3.2. Correlation analysis*

Before testing the structural model in the research, the relationships between the variables in the model were examined through Pearson Product-Moment Correlation analysis. The coefficients obtained are presented in Table 2.

Table 2. Pearson product-moment correlation coefficients

| Variables | *M* | *SD* | 1. | 2. | 3. |
|---|---|---|---|---|---|
| 1. Self-efficacy | 26.14 | 6.87 | 1 | | |
| 2. Task value | 27.72 | 6.29 | 0.70** | 1 | |
| 3. Math anxiety in everyday life | 14.82 | 6.24 | -0.55** | -0.50** | 1 |

**p<0.01, N=203

When Table 2 is examined, it is understood that self-efficacy positively correlated with task value (r=0.70; p<0.01). Self-efficacy negatively correlated with math anxiety scores in everyday life (r=-0.55; p<0.01). Task value negatively correlated with math anxiety scores in everyday life (r=-0.50; p<0.01).

### *3.3. Testing the structural model*

In the structural model, the mediating role of self-efficacy in the relationship between task value and mathematics anxiety in everyday life was tested. In the model, task value was the independent variable, mathematics anxiety in everyday life was the dependent variable, and self-efficacy was the mediator variable (Figure 2). Calculated fit values ($\chi^2$=224.64, $\chi^2$/df = 1.74, GFI = 0.90, AGFI= 0.86, TLI= 0.92, CFI= 0.93, IFI= 0.94, SRMR= 0.06, RMSEA = 0.06) indicated acceptable fit between the data and the structural model (Browne & Cudeck, 1993; Jöreskog & Sörbom, 1984; McDonald & Marsh, 1990). Total, direct and indirect effects in the model are shown in Table 3.

When Table 3 is examined, the total effect of task value on math anxiety in everyday life was statistically significant (β=-0.65, p<0.001, 95% CI [-0.75, -0.54]). Task value negatively predicted math anxiety in everyday life.

When the direct effects are examined, the direct effect of task value on mathematics anxiety in everyday life was not statistically significant (β=-0.19, p=0.35, 95% CI [-0.61, 0.29]). However, the direct effect of task value on self-efficacy was statistically significant (β=0.86, p<0.001, 95% CI [0.77, 0.93]). According to this result, task value predicted self-efficacy positively. The direct effect of self-efficacy on mathematics anxiety in everyday life was significant (β=-0.54, p<0.01, 95% CI [-0.99, -0.13]). According to this result, self-efficacy predicted mathematics anxiety in everyday life negatively (Table 3).

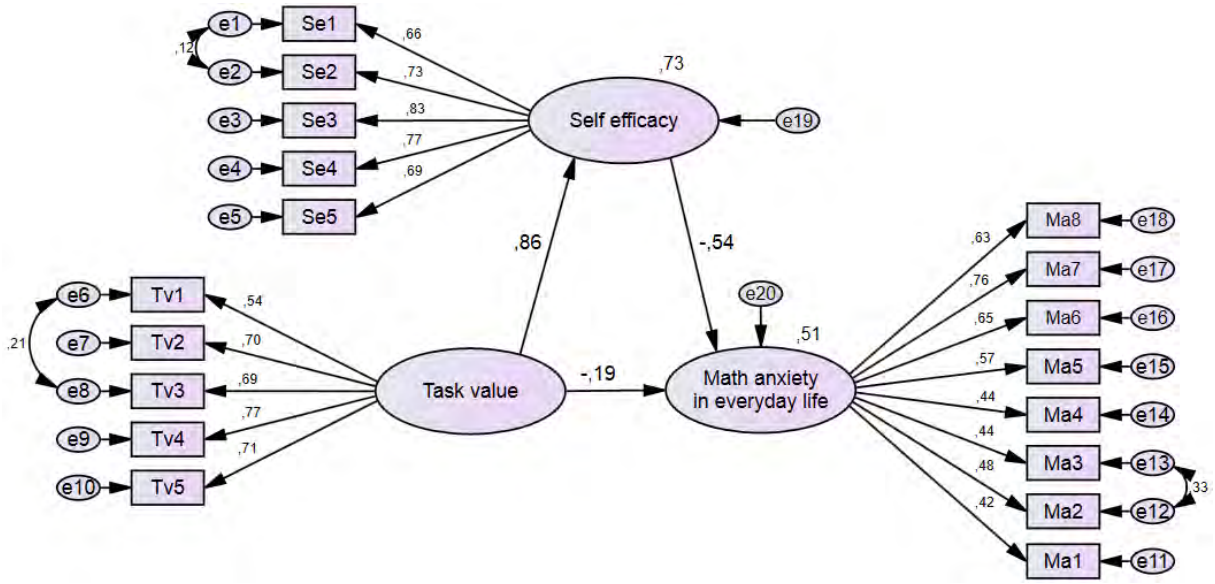


Figure 2. The Structural Model

Table 3. Total, Direct and Indirect Effects

| | | | ß | SE | p | LLCI | ULCI |
|---|---|---|---|---|---|---|---|
| Total effects | | | | | | | |
| Task value | ---> | Math anxiety in everyday life | -0.65 | 0.06 | *** | -0.75 | -0.54 |
| Direct Effects | | | | | | | |
| Task value | ---> | Math anxiety in everyday life | -0.19 | 0.22 | 0.35 | -0.61 | 0.29 |
| Task value | ---> | Self-efficacy | 0.86 | 0.04 | *** | 0.77 | 0.93 |
| Self-efficacy | ---> | Math anxiety in everyday life | -0.54 | 0.21 | ** | -0.99 | -0.13 |
| Indirect Effects | | | | | | | |
| Task value | ---> | Math anxiety in everyday life | -0.46 | 0.19 | ** | -0.76 | -0.17 |

***p<0.001, **p<0.01, LLCI= Lower limit of Confidence interval, ULCI= Upper limit of Confidence interval

When the indirect effects were examined in Table 3, the indirect effect of task value on mathematics anxiety in everyday life was found to be statistically significant (ß=-0.46, p<0.01, 95% CI [-0.76, -0.17]). Task value negatively predicted mathematics anxiety in everyday life through self-efficacy. According to the results obtained, self-efficacy had a partial mediator role in the relationship between task value and math anxiety in everyday life (VAF= 71%).

## 4. Discussion

In this study, the relationships between task value, self-efficacy and mathematics anxiety in everyday life in secondary school students were examined. In addition, the mediating role of self-efficacy in the relationship between task value and mathematics anxiety in everyday life was tested. Thus, the two-stage approach proposed by Anderson and Gerbing (1988) was used. In the first stage, the measurement model was tested. The three-factor model consisting of task value, mathematics anxiety in everyday life, and self-efficacy was validated. In the second stage, the structural model was tested. In this model, task value is the independent variable, mathematics anxiety in everyday life is the dependent variable, and self-efficacy is the mediator variable. It was found that self-efficacy had a partial mediating role in the relationship between task value and mathematics anxiety in everyday life.

The study revealed that task value had a positive relationship with self-efficacy. It was found that as secondary school students' belief in the task value towards mathematics increased, their self-efficacy also increased. This result is consistent with the results of studies conducted in the literature (Bong, 2001; Joo, Lim & Kim, 2013; Lee, Watson & Watson, 2020; Yurt & Şahin, 2015). Task value is the belief that a task is useful and important (Eccles 1983). A student with a high sense of task value towards a lesson tends to be interested in that lesson, see that lesson as an important tool to achieve his or her future goals, enjoy solving the questions of the lesson, and see that lesson as an important part of his or her academic identity. This may enable the student to devote more time to that lesson and be successful. The self-efficacy belief of the student who has successful experiences with the course may also increase.

It could be argued that self-efficacy had a negative relationship with mathematics anxiety in everyday life. As the self-efficacy beliefs of secondary school students increased, their mathematics anxiety in everyday life decreased. Bandura (1997) stated that self-efficacy belief is a powerful resource that helps protect individuals from psychological stress. When an individual has self-efficacy belief, he or she sees the tasks to be accomplished as a struggle. When the individual's self-efficacy belief is weak, the tasks that need to be accomplished may be seen by the individual as a source of threat and anxiety.

This study found that task value had a negative relationship with mathematics anxiety in everyday life. As secondary school students' belief in the value of duty towards mathematics increases, their mathematics anxiety decreases in everyday life. Some studies in the literature indicate that there is a positive relationship between task value and anxiety (Covington, 1985; Nie, Lau & Liau, 2011; Wigfield & Meece, 1988). It has been stated that the probability of experiencing anxiety increases especially when a task is very important for the individual. Studies suggest that there is a negative relationship

between task value and anxiety (Şanlı, 2021; Yurt & Şahin, 2015). In these studies, task value has been evaluated as a driving force that enables the individual to take action for a certain task. When students feel that a lesson is important and useful to them, they will tend to put more effort into succeeding in that lesson. This can enable the student to be successful and experience less anxiety.

It was determined that self-efficacy had a partial mediating role in the relationship between task value and mathematics anxiety in everyday life. Secondary school students' perception of task value towards mathematics affected their mathematics anxiety in everyday life through their self-efficacy beliefs. Self-efficacy determines the individual's perception of threat elements (Bandura, 1997). When individuals believe that they can accomplish a task, they perceive that task as a struggle that they can overcome. When they think that they do not have the capacity to perform a task, that task becomes a threat and a source of anxiety for the individual (Bandura, 1997). For students with weak self-efficacy beliefs, the importance and benefit value attributed to lessons increases test anxiety (Nie, Lau & Liau, 2011; Şanlı 2021). Individuals with weak self-efficacy beliefs may think that they have more to lose when they fail to accomplish an important task compared to other individuals. In this respect, in order to reduce the anxiety about a lesson, it is necessary to make students feel that that lesson is important and beneficial, and it should also be ensured that students have successful experiences with that lesson.

## 5. Conclusions

It was found that as secondary school students' perception of task value towards mathematics increased, their mathematics self-efficacy beliefs increased, and their mathematics anxiety in everyday life decreased. In addition, as mathematics self-efficacy beliefs increased, mathematics anxiety decreased in everyday life. The study also revealed that self-efficacy had a partial mediating role in the relationship between task value and mathematics anxiety in everyday life. Secondary school students' perception of task value towards mathematics.

## 6. Recommendations

When a student thinks that a lesson is important and useful to him or her, he or she may be inclined to put more effort into succeeding in that lesson. This can enable the student to be successful and experience less anxiety. As a matter of fact, the result of this research showed that in order for this to happen, the individual must also have mathematics self-efficacy. The perceived importance and benefit for the mathematics lesson reduces anxiety through self-efficacy belief. Accordingly, parents and teachers should not only emphasize the importance and usefulness of mathematics in order to reduce students' math anxiety in everyday life, but also enable them to gain self-efficacy

belief in mathematics. For this, it can be ensured that they have successful experiences in mathematics, are supported with motivating words and receive peer support.

This research has some limitations. The fact that the study group was limited to only secondary school students limits the generalizability of the results. In this vein, similar studies can be conducted with students studying at different levels such as high school and university

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