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To cite this article:

Mete, P. (2021). Structural relationships between coping strategies, self-efficacy, and fear of losing one's self-esteem in science class. *International Journal of Technology in Education and Science (IJTES)*, 5(3), 375-393. <https://doi.org/10.46328/ijtes.180>

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Structural Relationships between Coping Strategies, Self-Efficacy, and Fear of Losing One's Self-Esteem in Science Class

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Article Info

Article History

Received:

21 September 2020

Accepted:

23 January 2021

Keywords

Coping strategies

Self-efficacy

Fear of failure

Fear of losing one's self-esteem

Abstract

This study aimed to investigate the relationship between coping strategies (positive coping, projective coping, non-coping and denial coping), self-efficacy, and fear of losing one's self-esteem among secondary school students in science course. The study group consisted of 381 students studying in a large city located in the eastern part of Turkey. The data of the study were obtained using Academic Coping, Self-efficacy, Fear of losing one's self-esteem scales. Data were analyzed with the structural equality model using the Amos program, and the proposed relationships between variables were tested. According to the results obtained from the research, it was found that the positive coping and projective coping strategy predicted positively and the non-coping strategy negatively on self-efficacy. Self-efficacy negatively predicted the fear of losing one's self-esteem. Additionally, positive coping, denial coping, and non-coping strategies were observed to positively predict the fear of losing one's self-esteem. Additionally, positive coping, projective coping, non-coping, and denial coping strategies variables together explained 28% of the variance in self-efficacy. The self-efficacy and all of the coping strategies explained 48% of the variance in fear of losing one's self-esteem.

Introduction

Coping Strategies and Self-Efficacy

Self-efficacy is not only an important part of people's motivation and behavior but also affects actions that can change people's lives (Chiou et al., 2007; Kozcu Cakir, 2020; Pintrich & Schunk, 2002; Redmond, 2015; Stajkovic & Zulkosky, 2009). According to Bandura (1977), self-efficacy is one's belief in one's abilities in planning and realizing the forms of action he needs to take to manage forward situations. The basic assumption relating to self-efficacy is that individuals are more likely to take actions that they feel they can do and less likely to perform actions that they think they cannot do (Bandura, 1977; Bandura & Schunk, 1981; Redmond, 2015; Schunk, 1995; Stajkovic & Luthans, 2002; Zimmerman, 2000; Zulkosky, 2009). Individuals with high self-efficacy have a positive tendency to participate in an activity while individuals with low self-efficacy have a negative tendency to do so (Bandura, 1977; Bandura & Schunk, 1981; Tipton & Worthington, 1984). High self-efficacy, in many ways, allows individuals to feel happy and successful in their lives. If their self-efficacy is high, individuals can be said to prefer risky jobs. (Landaas, 2005; Stajkovic & Luthans, 1998)). It has also been

stated that these individuals have confidence in being successful in their school, business, or professional life (Stajkovic & Luthans, 1998). High self-efficacy has a protective role in encountering stressful situations and combating negative situations. In summary, when individuals have high self-efficacy, their motivation is also known to be high (Pajares & Schunk, 2001; Zhou & Kam, 2017).

However, having a high level of self-efficacy can sometimes cause problems. Individuals with high self-efficacy can think that they can do the things they are capable of doing or the things they believe they can do with a high level of probability, thinking they would do it anyway. Individuals' acts with this thought can lead them to failure from time to time. In other words, individuals with high self-efficacy are also likely to be inadequate and unsuccessful in the work they will do (Hong et al., 2019; Vancouver & Kendall, 2006).

Self-efficacy is related to coping strategies used by individuals in the face of problems or complex events. Students experience many problems in their living spaces and especially in school life. Their ability to solve these problems successfully and effectively is considered to be directly related to self-efficacy (Anshel et al., 2001; Pintrich et al., 1993). The school environment is one of the areas where these effects continue to exist. The coping strategy of dealing with the problems faced by the individual is a skill that needs to be supported in all life periods and its effects continue throughout life. The ability to cope has been defined by Folkman and Lazarus (1984) as the total of cognitive and behavioral strategies developed to solve the problem experienced or to reduce its effect on the individual.

Coping strategies have been differently evaluated by the researchers. For example, coping strategies developed by Spirito et al., (1988) have been handled under three sub-dimensions as active coping, negative coping, and avoided coping strategy. The active coping strategy includes individuals' approaching problems positively, recognizing the problem and producing solutions to the problem, making decisions, and evaluating the steps. The avoiding coping strategy includes dysfunctional approaches to problem-solving such as getting away from problems and waiting for the problem to be automatically solved. The negative coping strategy includes reactions such as perceiving the problem as a threat, believing that the problem cannot be solved, blaming oneself and others, and harming those around. In another study, the coping strategy is classified as problem-focused coping, emotion-focused coping and avoidance coping (Aspinwall & Taylor, 1992; Carver et al., 1989; Folkman et al., 1986; Lazarus & DeLongis, 1983; Lazarus & Folkman, 1987; Lazarus, 1990). Problem-focused coping aims to manage and solve the problem, develop relationships between the person and the environment, and change or eliminate stressful situations. For example, getting advice from people, asking for help, time management, or planning a job are considered in this group. The second category, emotion-focused coping aims to regulate emotional responses that are produced against stressful situations. Strategies in this category focus on emotions without changing the situation. Seeking emotional support and agreeing to live with the problem can be examples of emotional coping (Lenz, 2010). The final category, avoidance coping aims to avoid or reject problems (Lenz, 2010). In addition to all these, coping was examined in four headings: positive coping, projective coping, denial coping and non-coping (Tero & Connell, 1984). This category was used in the present study. Positive coping is about asking for help when faced with a problem or finding where the mistake has been made. Other people are blamed for projective coping strategies. In denial coping, students think that failure or

trying to forget failure is not important. Finally, non-coping means blaming yourself, feeling terrible and bad (Kaplan & Midgley, 1999; Tero & Connell, 1984). According to the related literature, the response to positive coping is problem-focused coping (Aspinwall & Taylor, 1992; Carver et al., 1989); the response to denial coping is avoidance-focused coping; and the response to the projective and non-coping strategy is emotion-focused coping (Alexander-Passe, 2006; Lenz, 2010; Litman & Lunsford, 2009).

According to the literature, there is a positive relationship between self-efficacy and positive coping strategies (Devenport & Lane, 2006; Khan, 2013; Mantzicopoulos, 1997; Taylor et al., 1992). Individuals who prefer emotion-focused coping have lower self-efficacy levels (Carver et. al, 1989; Luthans & Youssef, 2004; Pooley et al., 2012; Taylor et, al, 1992). In the current study, it is thought that there may be a positive relationship between the students' active coping strategies and self-efficacy when they encounter an unsuccessful situation in science class. In addition, projective and non-coping strategies are expected to negatively predict self-efficacy.

Self-Efficacy and Fear of Losing one's Self-Esteem

Individuals exhibit positive or negative attitudes both to themselves and to living things in the world they live in. These attitudes are thought to be closely related to their self-efficacy and self-esteem (Bandura, 1997; Blascovich & Tomaka, 1991; Nosenko et al., 2016). Pintrich & Linnenrink, 2003). The concepts of self-efficacy and self-esteem are often different from each other although they are perceived as similar. Generally, self-efficacy is defined as the beliefs of the individuals in their capacity to influence events in their lives (Bandura, 1977, 1997; Briones et al., 2007; Fortman, 2006; Tillema et al., 2001). In academic terms, self-efficacy is one's belief in his/her capacity to perform an academic task (Bandura, 1977; Britner & Pajares, 2006; Pintrich, & Schunk, 2002; Redmond, 2015; Stajkovic & Luthans, 1998; Zulkosky, 2009). Self-esteem is defined as the attitudes of individuals towards their self, positive or negative self-evaluation, or self-evaluations in different situations conceptually. In addition, it is known that self-esteem has a dynamic structure rather than stationary (Blascovich & Tomaka, 1991; Baldwin & Hoffmann, 2002; Baumeister et al., 2003; Bleidorn et al., 2016; Chen et al., 2016; Fortman, 2006; Rosenberg, 1965; Salmivalli et al., 1999; Stajkovic & Luthans, 1998).

The qualities of self-efficacy and self-esteem have the effect of helping students to attend classes when faced with an academic disability or in situations where there is a fear of failure (Newton et al., 2008). Fear of failure depends on how one identifies and perceives academic failure. At the same time, the thoughts of others about the failure of the individual are among the causes of fear of failure (Neff et al., 2005; Oplatka & Iglan, 2020). According to Conroy et al. (2001), fear of failure can cause losing one's self-esteem. That is, the individual is afraid of failure due to the probability that his self-esteem will decrease. In this case, failure leads some people to question their abilities and intelligence (Conroy, 2001; Conroy et al., 2002; Conroy et al., 2003; Conroy & Elliot, 2004; Stajkovic & Luthans, 2002). In the fear of losing one's self-esteem, students evaluate themselves due to their failure and attribute the cause of failure to their lack of intelligence and inability. In other words, individuals with fear of failure may experience a decrease in self-efficacy and self-esteem (Caraway et al., 2003).

According to related studies, there is a positive relationship between self-efficacy and self-esteem (Al-Darmaki, 2012; D'Amico & Cardaci, 2003; Rose et al., 2019). There is a positive relationship between the students' academic achievement in a given course and their belief in the ability to do some academic work (Asakereh & Yousofi, 2018; Bahmani Fard, 2013; Baumeister et al., 2003; Brooks & Noy, 2010; Lent et al., 1984). However, in some studies, the relationship between self-efficacy and fear of losing one's self-esteem as a dimension of fear of failure was examined and it was stated that there could be a negative relationship (Caraway et al., 2003; Kahraman & Sungur, 2013; Stuart, 2013). When students have high self-efficacy, their fear of losing one's self-esteem will be reduced when they face failure in a lesson. In the current study, a negative relationship is expected between self-efficacy and the fear of losing one's self-esteem.

Coping Strategies and Fear of Losing one's Self-Esteem

In their study, Veisson et al., (2004) concluded that individuals with low fear of failure are more successful in dealing with problems than individuals with high fear of failure. In other words, they stated that there is a negative relationship between fear of failure and academic coping. In previous research examining the relationships between fear of losing one's self-esteem and coping strategies, it was indicated that individuals with higher self-esteem were better at coping with problems (Chan, 1977; Chapman & Mullis, 1999; Colletta et al., 1981; Moos, 1990; Mullis & Chapman, 2000; Neureiter & Traut-Mattausch, 2016; Wolf et al., 2015). According to Blankstein et al., (1992), individuals who experience fear of failure preferred emotion-focused and avoidance coping strategies. Chapman and Mullis (1999) determined that individuals with low self-esteem preferred problem-avoidance coping strategies while individuals with high self-esteem preferred problem-solving strategies. As far as the related literature is concerned, it is expected in the present study that there will be a positive correlation between fear of losing one's self-esteem and emotion-focused coping and avoidance coping.

The Rationale for the Current Study

In educational research, factors affecting the learning process of students are examined to better and deeply understand the nature of learning. Some of these factors are strategies for coping with academic problems, fear of losing one's self-esteem and self-efficacy. The ability to cope with the problems faced by the individual is a skill that needs to be supported during childhood and adolescence and its effects continue throughout life.

Given the relevant literature, numerous studies have examined the relationship between academic self-efficacy and fear of losing one's self-esteem (Bahmani Fard, 2013; Baumeister et al., 2003; Brooks & Noy, 2010; Caraway et al., 2003; Lent et al., 1984; Kahraman & Sungur, 2013; Stuart, 2013); self-efficacy and coping strategies (Devenport & Lane, 2006; Khan, 2013; Mantzicopoulos, 1997; Pooley et al., 2012); fear of losing one's self-esteem and coping strategies (Chan, 1977; Chapman & Mullis, 1999; Colletta et al., 1981; Mullis & Chapman, 2000; Moos, 1990; Neureiter & Traut-Mattausch, 2016). It is seen that the studies are generally carried out on social issues and in the field of medicine and that university students are selected as the sample. However, there are a limited number of studies in which the relationship between students' academic self-

efficacy, coping strategies, and fear of losing one's self-esteem are explored together in the science class. Therefore, it is necessary to examine the relationships between the variables specified in the 6th, 7th, and 8th-grade students in science class. In the current study, all of the relationships between the variables in the model created by considering the relevant literature were examined using the path model. Path analysis enables the study of multiple direct and indirect relationships among variables simultaneously (Valenzuela & Bachmann, 2017).

This study aimed to examine the relationship between the coping strategies that students use when faced with a failure, students' self-efficacy, and students' fear of losing one's self-esteem in the science course. The coping strategy is expected to be associated with the fear of losing one's self-esteem through the self-efficacy variable and also to predict the fear of losing one's self-esteem directly. In addition, self-efficacy is expected to be associated with fear of losing one's self-esteem (see Figure 1).

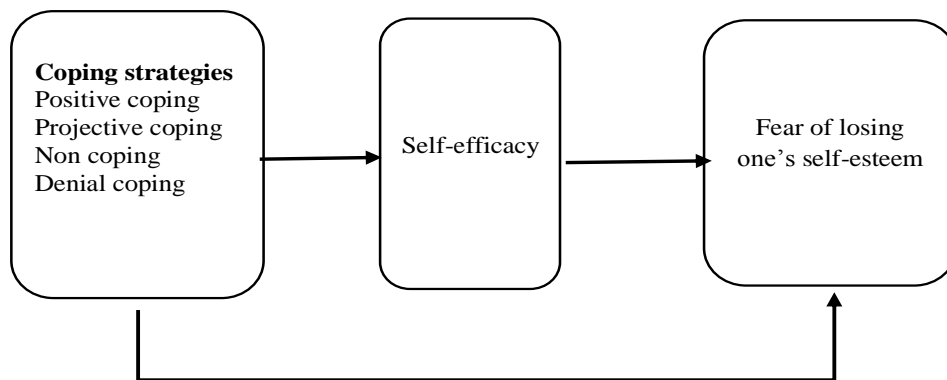


Figure 1. Hypothesized Research Model

Method

The current study is a correlation study that examines the relationships between academic coping strategies, self-efficacy, and fear of losing one's self-esteem. Correlational research is the study of the relationships between two or more variables without any interference with the variables. By use of this method, it is aimed to reveal the relations between the variables of interest and determine the levels of relations. The relationship between the proposed research model and the data were examined by the path analysis method.

Study group

The study group of the study is made up of sixth, seventh, and eighth-grade students studying at four public schools in Erzurum, a province in eastern Turkey. The schools were selected from among those that were easily accessible to the researcher. In Turkey, sixth, seventh, and eighth-grade students take 160 minutes of science lessons a week. Science education has been designed to educate individuals who can generate new information and make significant investigations. It is stated in the Science Course Curriculum that it is intended to educate

all individuals as science-literate and that the inquiry-based learning approach is based (MONE, 2018). In the current study, there were 381 participants 183 (45.60%) of whom were female students and 198 (54.40 %) of whom were male students. The study involved 140 (36.8%) 6th-grade students, 149 (39.1%) 7th-grade students, and 92 (24.1%) 8th-grade students. The mean age of the participants was 12.62 (SD= .93). It was stated to the students that the data collected in the study would be used for scientific purposes. The study was carried out through voluntary participation of the students.

Instruments

Demographic Information Questionnaire

With the purpose of obtaining background information about the students, the participants were asked about their gender, date of birth, grades, their end-of-term scores in a science lesson in the previous term.

Fear of Losing one's Self-Esteem Scale

The fear of failure scale was developed by Conroy et al., (2002) to assess students' fear of failure. It was adapted into Turkish by Kahraman and Sungur (2013). It is a five-point Likert scale (1= Strongly Disagree, 5= Strongly Agree) with 25 items. The scale includes five sub-dimensions. In the current study, the sub-dimension of the scale's fear of low self-esteem (devaluing one's self estimate) (n = 4 items, When I fail, it is often because I am not smart enough to perform successfully; When I fail, I blame my lack of talent; When I fail, I am afraid that I might not have enough talent; When I fail, I hate the fact that I am not in control of the outcome) was used. The subscale was translated into Turkish by Kahraman (2013) and CFA results demonstrated good model fit (SRMR = .030, RMSEA = .10, GFI = .98, CFI = .98). Cronbach's alpha reliability coefficient was estimated at .70 for the fear of losing one's self-esteem. The reliability levels obtained in this study were similarly high. Cronbach's alpha coefficient for the fear of losing one's self-esteem was .67.

Academic Coping Scale

The academic coping scale was developed by Tero and Connell (1984) to assess students' coping strategies when faced with academic failure. It is a five-point Likert scale from 1 "do not believe at all" to 5 "completely true". It consists of 13 items in four sub-scale. Positive coping assesses students' adaptive strategy (3 items, e.g., I would try to see what I did wrong), while students who prefer projective coping blame others (3 items, e.g. I would say it was the teacher's fault). Students who prefer denial coping generally say that they do not care about the negative event (3 items, e.g. I would say it wasn't important), and in non-coping, students blame themselves (4 items, e.g., I would get really mad at myself). All items in the questionnaire start with a stem that "If something bad happened to me during a science lesson, such as doing poorly on a test or not being able to answer a question in class..." and students complete this stem with items.

The subscale was translated into Turkish by Kahraman (2013). Confirmatory factor analyses results revealed a perfect fit for the positive coping, projective coping and denial coping (GFI= 1.00, CFI = 1.00, RMSEA = .00,

SRMR = .00), and a good model fit for non-coping sub-scales (GFI=.99, CFI=.98, RMSEA= .09, SRMR= .01). The coefficient alpha values for the Turkish sample were found to be .730 for positive coping, .840 for projective coping, .840 for denial coping, and .800 for non-coping. In this study, Cronbach alpha reliability coefficients were found to be .795 for positive coping, .835 for projective coping; .779 for denial coping and .755 for non-coping.

Self-Efficacy Scale

The self-efficacy scale was developed by Pintrich et al., (1991) to measure the self-perception of students about their capacity to organize and succeed in events to demonstrate a particular performance. The scale is rated from 1 (not at all true of me) to 7 (very true of me). The self-efficacy subscale has seven items (e.g. “I believe I will receive an excellent grade in the science class”). The subscale was translated into Turkish by Sungur (2004) and CFA results demonstrated good model fit (SRMR = .040, RMSEA = .12, GFI = .94, CFI = .95). The coefficient alpha values for the Turkish sample were found to be .890. In this study, Cronbach alpha reliability coefficients were found to be .860 for self-efficacy.

Data Collection

The scales were applied to students in a 40-minute lecture hour. The instructions written on the scale were explained by the researcher and the data were contemplated to be used only for scientific purposes. Besides, students were given information about how to answer questions and when they do not understand the questions.

Results

Descriptive Statistics

Descriptive statistics (mean, standard deviation, skewness, and kurtosis) related to the variables in the study were tested through the SPSS program. Means, standard deviations, skewness, and kurtosis between variables of the study were presented in Table 1. Since the Skewness and Kurtosis values of the variables vary between ± 2.0 , the data is in a normal distribution (George & Mallery, 2010).

Table 1. Descriptive Statistics for the Variables of the Study

Variables	Mean	Std. deviation	Skewness	Kurtosis
Positive coping	4.224	.918	-1.530	2.038
Projective coping	2.047	1.170	.993	-.003
Danial coping	2.184	1.059	.680	-.359
Non-coping	2.896	1.140	.085	-.836
Self-efficacy	5.347	1.432	-.939	.463
Fear of losing one's self-esteem	2.553	.941	.124	-.661

Inferential Statistics

To investigate the hypothesized relationships among coping strategies, fear of losing one’s self-esteem, and self-efficacy beliefs in science, path analysis was conducted using AMOS. The fit indices obtained as a result of analysis ($X^2/df= 1.68$, $RMSEA=.049$, $IFI=.936$, $CFI=.935$, $GFI=.884$, $AGFI=.852$) indicated that the hypothesized model fits an acceptable level to the data set (Hair et al., 1998). The standardized path coefficients are presented in Table 2, and the figure representing the model is given in Figure 2.

Table 2. Standardized Coefficients

		Standardized β	SE of the estimates	t	p	R^2
	Positive coping	1.169	.206	5.671	***	
Self- efficacy	Non-coping	-.314	.129	-2.443	.015	0.28
	Projective coping	.304	.138	2.199	.028	
	Denial coping	-.049	.134	-.368	.713	
Fear of losing one’s self- esteem	Positive coping	.234	.103	2.267	.023	0.48
	Projective coping	.044	.066	.678	.501	
	Non-coping	.345	.081	4.276	***	
	Denial coping	.163	.067	2.437	.015	
	Self-efficacy	-.135	.043	-3.115	.002	

Note: * $p < .05$.

According to the results of the path analysis, academic coping strategies (positive coping, non-coping, projective coping, and denial coping) accounted for 28% of the variance in self-efficacy. Parameter estimates revealed that coping strategies ($\beta = 1.169$; $p < 0.05$), and projective coping ($\beta = .304$; $p < 0.05$) are statistically significant and positively linked to self-efficacy. However, non-coping strategies ($\beta = -.314$; $p < 0.05$) are statistically significant and negatively linked to self-efficacy.

When the predictive effect of self-efficacy and the academic coping strategies (positive coping, non-coping, projective coping and denial coping) on fear of losing one’s self-esteem were examined, it is seen that they explained 48% of the variance in fear of losing one’s self-esteem. The positive coping ($\beta = .234$; $p < 0.05$), non-coping ($\beta = .345$; $p < 0.05$), and denial coping ($\beta = .163$; $p < 0.05$) are statistically significant and positively linked to fear of losing one’s self-esteem. However, self-efficacy ($\beta = -.135$; $p < 0.05$) is statistically significant and negatively linked to the fear of losing one’s self-esteem.

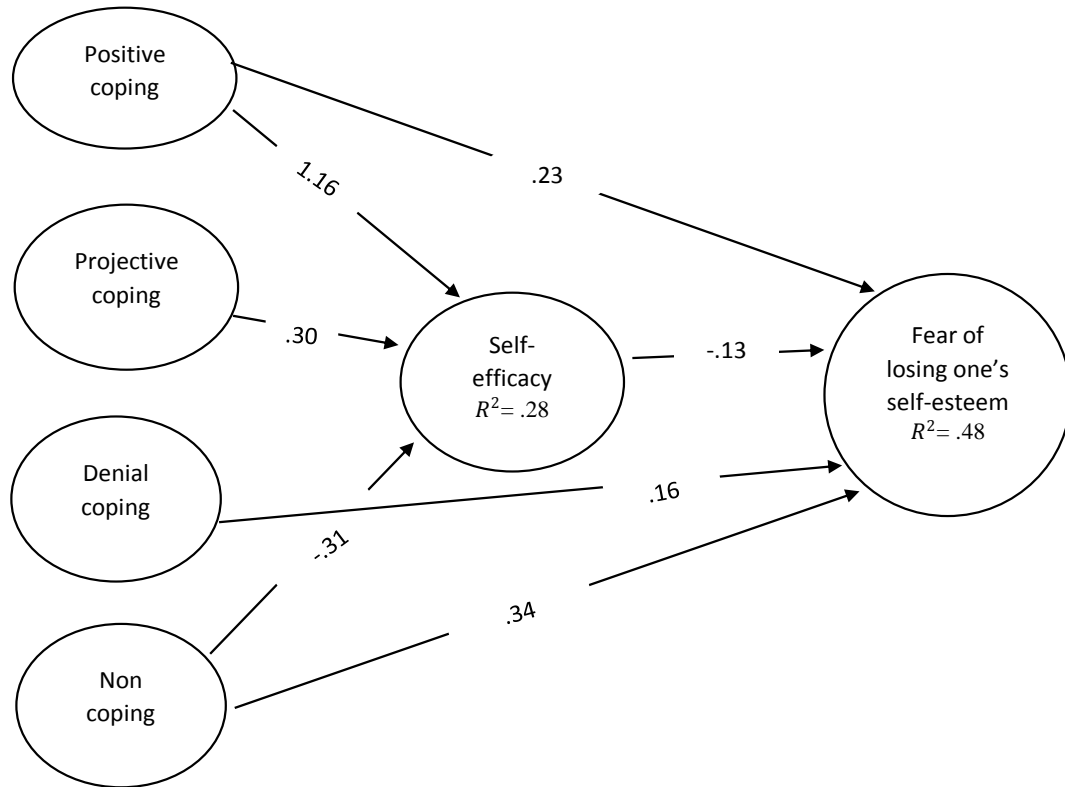


Figure 2. Path Model with Significant Paths

Discussion and Conclusion

The Predictive Effect of Coping Strategies on Self-Efficacy

According to the path analysis results in the current study, it is found that positive coping positively predicts self-efficacy. If the students who face a negative situation in science class have high academic self-efficacy, they try to find out where they are doing wrong. Moreover, they tend to produce solutions to avoid experiencing this situation again. This finding is supported by most studies in the literature (Bandura, 1994; Chang & Edwards, 2015; Devonport et al., 2003; Frydenberg & Brandon, 2002; Kahraman & Sungur, 2013; Khan, 2013; Lane et al., 2002; Lenz, 2010; Litman & Lunsford, 2009). Litman and Lunsford (2009) stated that students who accept the problem and plan for its solution and use problem-focused coping strategies have a high level of self-efficacy. In another study, there was a positive relationship between the positive coping and self-efficacy of secondary school students in science class (Kahraman & Sungur, 2013).

In the path analysis of the current study, it is found that non-coping predicts self-efficacy negatively. In other words, students who are faced with a negative situation such as being unsuccessful in science class and failing to answer the question have an increased sense of blame and feeling bad and their self-efficacy decreases. This finding is an expected result in line with the related literature (Chang & Edwards, 2015; Devonport & Lane, 2006; Pooley et al., 2012).

In the literature, the situation of blaming others when individuals face a negative situation has been described as

emotion-focused coping and is associated with self-efficacy (Devonport & Lane, 2006). In their study, Pooley et al., (2012) stated that stress is negatively related to self-efficacy. More specifically, previous research results have revealed that individuals dealing with emotion-focused coping have lower levels of self-efficacy (Chang & Edwards, 2015; Chwalisz, 1992; Pooley et al., 2012). Students using problem-focused coping strategies have higher self-efficacy levels, and emotion-focused strategies have better results in self-efficacy than avoidance-focused strategies (Litman & Lunsford, 2009). Individuals with low self-esteem may be vulnerable to chronic stress and may prefer emotion-focused or avoidance coping strategies when faced with stressful situations. These individuals may believe that they will not be able to accomplish the task when faced with a stressful task (Bandura, 1994; Pooley et.al, 2012).

According to the path analysis in the present study, there is a positive relationship between self-efficacy and projective coping. There is a positive relationship between self-efficacy and the use of the strategy of choosing to blame other people when students encounter a negative situation such as not being able to solve the question in science class. This finding was an unexpected result in line with the relevant literature.

Both non-coping and projective coping strategies can be evaluated as emotion-focused coping strategies (Alexander-Passe, 2006; Lenz, 2010; Litman & Lunsford, 2009). However, according to the path analysis in the current study, the relationships of non-coping strategy and projective coping strategy with self-efficacy are different. According to the related literature, there is a negative relationship between emotional coping and self-efficacy. According to pathway analysis in the current study, projective coping is an unexpected result to positively predict self-efficacy. It can be thought that the Turkish educational system and its cultural structure are effective on this result. According to Folkman and Lazarus (1984), coping is described as behavioral and emotional responses to control the demands and conflicts from the environment and the heart, and to minimize the tension of life. Lazarus and Folkman (1987) state that individual differences, social skills, social support, and personal resources are effective in individuals' preference for strategies to cope with stress. Furthermore, the effectiveness of any strategy is proportional to the fit of the relevant strategy to the characteristics of the individual (Folkman, 1984). Since Turkey is a country with a collectivist culture (Kagitcibası, 1994), students shape their preferences in a subject according to society (Markus et al., 1996). Moreover, the education system in Turkey has a highly competitive and exam-oriented structure. The way students' achievements are evaluated for a course can lead to differences in their preference for coping strategies.

According to the path analysis in the current study, there is no relationship between denial coping and self-efficacy. It can be stated that some studies in the related literature are compatible with the current study's findings in this respect (Bandura, 1994; Kahraman & Sungur, 2013; Khan, 2013; Litman & Lunsford, 2009). In some studies, it is stated that an avoidance coping strategy might be negatively related to self-efficacy (Litman & Lunsford, 2009; Verešová & Malá, 2012). In their study, Verešová and Malá (2012) examined the relationship between teachers' self-efficacy and strategies for coping with stress. As a result of the study, emotion-focused, avoidance-focused, and social coping strategies were all negatively correlated with self-efficacy.

The Predictive Effect of Self-Efficacy on Fear of Losing one's Self-Esteem

According to the path analysis in the current study, it is found that self-efficacy predicts the fear of losing one's self-esteem negatively. This result is considered to be compatible with previous studies (Caraway et al., 2003; Kahraman & Sungur, 2013; Klassen et al., 2008; Stuart, 2013). In the current study, self-esteem is assessed as part of the fear of failure scale. Students with low academic self-efficacy think that when they encounter academic failure in a science lesson, that failure will undermine their self-esteem. The nature of self-efficacy and self-esteem is guiding when the student faces academic barriers or situations where the risk of failure is evident (Newton et al., 2008). Fear of failure often reduces self-efficacy. In other words, if self-efficacy falls, the fear of failure increases, and if the fear of failure falls, self-efficacy increases. Students with a high level of fear of failure may have a greater tendency to postpone academic tasks. A student with a low fear of failure may have high self-efficacy in academic tasks and tend to delay less academic responsibility (Caraway et al., 2003; Cohen, 1975; Covington, 1992; Hall et al., 2008; Klassen et al., 2008; Zhang et al., 2018). Self-esteem conceptually represents the self-assessment of students in different situations in academic life. In contrast, self-efficacy is an individual's belief in a talent specific to the task and content (Stajkovic & Luthans, 1998). Being aware of one's inefficiency and thinking that an individual cannot perform a task has a preventive effect on motivation and success, and fear of failure generally reduces self-efficacy (Caraway et al., 2003).

The Predictive Effect of Coping Strategies on Fear of Losing one's Self-Esteem

According to the path analysis results in the present study, there was no relationship between the fear of losing one's self-esteem and projective coping. In other words, there was no correlation between the fact that students who faced failure in science class other people (projective coping) and the fear of losing one's self-esteem. However, students who tend to blame themselves for failure in science class (non-coping) have the fear of losing one's self-esteem. Non-coping strategy predicts the fear of losing one's self-esteem in a positive direction. Non-coping strategy positively predicts the fear of losing one's self-esteem. When projective and non-coping were evaluated in emotional coping, this result was an expected one in line with the related literature (Blankstein et al., 1992; Kahraman & Sungur, 2013; Mullis & Chapman, 2000). For example, Blankstein et al., (1992) examined how the coping strategy of students affects the fear of failure. As a result, they stated that students with a high fear of failure tend to choose an emotion-focused coping strategy.

Another finding from the current study concludes that the denial coping strategy predicts the fear of losing one's self-esteem positively. According to the current study's findings, students who experience a situation such as failure in a test in science class have the fear of losing their self-esteem when they think that this is not important. In the related literature, students with a high fear of failure prefer more avoidance coping strategies in academic life (Blankstein et al., 1992). The students tend to delay and ignore them instead of dealing with academic stress. Sagar et al., (2010) stated that fear of failure affects the coping strategies of athletes in their study. Avoidance-focused coping strategies were the most frequently noted and problem-focused coping strategies were least noted.

Besides this, it is observed that positive coping predicts the fear of losing one's self-esteem positively. In other words, students who experience failure in science class are afraid that fear of losing one's self-esteem values will decrease when they tend to use a problem-focused strategy. This result of the present study was incompatible and unexpected compared to the results of studies in the relevant literature. In the studies of related literature, it is stated that the fear of failure is compatible with maladaptive coping or emotion-focused strategies (Blankstein et al., 1992; Chapman & Mullis, 1999; Mullis & Chapman, 2000). In some studies, it is stated that the fear of failure depends on negative consequences such as emotional-focused and denial coping strategies (Bartels et al., 2010; Bartels, & Magun-Jackson; 2009; Blankstein et al., 1992; Veisson et al., 2004). James (1981) stated that self-esteem was associated with one's achievements and claims. Accordingly, Rosenberg (1965) explained that self-esteem was a positive or negative attitude towards the individual. The level of self-esteem affects everything one thinks, says and does, the way he looks at the world, the way other people look at him, the way he makes his life choices, the ability to give and receive love, and the willingness to take action to change what needs to be changed. It can also be said that the self-esteem of the person is not constant over time, but rather dynamic, and varies depending on the person's achievements and expectations (Baldwin & Hoffmann, 2002).

In addition, this unexpected result may be associated with the cultural structure and student class level. Education in Turkey has a competitive and test-oriented structure. Secondary school students are required to score high in the exams to be able to enter a good high school. Students do not only desire to become successful; they also try to avoid being the student with the lowest grade in the class. In this case, students try to avoid problems and blame themselves for the problems, and try to find out where they did wrong in order not to have the same problem again in science education.

Recommendations and Limitation

The current study has some limitations. The results of the study were based on the responses of the students to the measurement tools. In the study, coping strategies, academic self-efficacy, and fear of losing one's self-esteem reflect students' thoughts and perspectives. In the study, it was known that coping strategies, academic self-efficacy, and fear of losing one's self-esteem reflected students' thoughts and perspectives. In future studies, classroom observations can be made in the science class to determine the students' thoughts on the variables in the current study. The other limitation of the current study was that the data were collected at one time. For example, the relationships between variables at the beginning of the semester or the end of the semester can be examined through a longitudinal study. Another limitation was that the current study was correlational. The cause-and-effect relationship cannot be established based on the results obtained. In future studies, it can be examined whether there is a cause and effect relationship between the variables examined by conducting experimental studies.

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