

**Journal of Education in Science,
Environment and Health**

www.jeseh.net

**The Relationship between Academic
Coping, Approach Achievement Goals
and the Fear of Shame and
Embarrassment in Science Class**

Pelin Mete¹, Munevver Subasi²

¹ Ataturk University

² Mustafa Kemal University

ISSN: 2149-214X

To cite this article:

Mete, P. & Subasi, M. (2021). The relationship between academic coping, approach achievement goals and the fear of shame and embarrassment in science class. *Journal of Education in Science, Environment and Health (JESEH)*, 7(1), 15-25. <https://doi.org/10.21891/jeseh.806463>

This article may be used for research, teaching, and private study purposes.

Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

Authors alone are responsible for the contents of their articles. The journal owns the copyright of the articles.

The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of the research material.

The Relationship between Academic Coping, Approach Achievement Goals and the Fear of Shame and Embarrassment in Science Class

Pelin Mete, Munevver Subasi

Article Info

Article History

Received:
14 April 2020

Accepted:
30 September 2020

Keywords

Achievement goals,
Coping strategies,
Fear of failure,
Fear of shame and
embarrassment

Abstract

This study aims to examine the relationship between approach achievement goals, the fear of shame embarrassment failure, and coping strategies in secondary school science courses. Academic coping was handled in four dimensions: positive, projective, denial, and non-coping. The sample of the study included 249 sixth, seventh, and eighth-grade students studying at one of the largest cities in the eastern part of Turkey. Descriptive statistics of variables were determined with the SPSS program. The relationship between the variables of the study was examined with the path analysis using the Amos program. According to the results of the analysis, a positive correlation was found between performance-approach goals and positive coping strategies. Fear of shame and embarrassment was positively correlated with positive coping and non-coping from the coping strategies and with mastery-approach goals from the approach achievement goals.

Introduction

Coping is defined as the strategies used to manage a negative or stressful event or an academic failure. Coping can also be defined as a response to the barriers to achieving one's cognitive, behavioral, or emotional goals. (Folkman & Moskowitz, 2004; Kamins & Dweck, 1999; Lazarus & Folkman, 1987). In the educational environment, students face academic difficulties such as difficult tasks, group work and exams that affect their cognition and they experience the fear of failure. The fear of failure is directly related to how people define and perceive academic failure (Elliot & Sheldon, 1997; Elliot, 1999). Students' fear of failure in the learning environment constitutes both a cognitive and complex stress response (Bledsoe et al., 2018; Raftery-Helmer & Grolnick, 2016; Skaalvik, 1999). Achievement goals are one of the reasons why students manage their emotions when they face stressful academic situations and how they survive this difficult period. Achievement goals are more about why students want to do well in a task or exam rather than being successful in an exam or a task (Ames, 1992; Urdan, 1997; Pintrich, 2000). Related research shows that students' achievement goals are significantly linked to their use of various coping strategies (Brdar et al., 2006; Friedel et al., 2007; Flavell, 1999).

The Relationship between Academic Coping and Approach Achievement Goals

Academic coping is behaviors, strategies, or emotions used to deal with an event, such as a response to negative events or stress (Folkman & Moskowitz, 2004; Kamins & Dweck, 1999; Lazarus & Folkman, 1987). Tero and Connel (1984) categorized coping strategies into four categories: positive, projective, denial and non-coping strategy. In positive coping students ask for help and find out where the wrong was performed, students blame other people in projective coping, students try to ignore failure and tell that failure is not important in denial coping. Finally, non-coping refers to self-accusation. These students feel terrible if they choose not to cope (Friedel et al., 2007; Kaplan & Midgley, 1999). Some coping strategies are related to positive outcomes and others are related to negative outcomes. Therefore, researchers categorized coping strategies as adaptive and maladaptive strategies. Maladaptive coping strategies include projective coping, denial coping and non-coping, and adaptive coping strategy includes positive coping. According to the relevant literature, students' use of various coping strategies is significantly related to goal orientation. According to the researchers, mastery goals are positively related to adaptive coping strategy, and performance goals are positively associated with maladaptive coping strategies (Brdar et al., 2006; Friedel et al., 2007; Ntoumanis et al., 1999; Taye & Zhou, 2009). Based on the aforementioned studies, the use of various coping strategies of the students and the results of the students' achievement goals were examined in this study.

The Relationship between Academic Coping and the Fear of Shame and Embarrassment

According to previous research, the fear of failure has indirect effects on choosing a task, performing a task to complete it, and success behaviors. (Elliot & Church, 1997; Elliot & Sheldon, 1997; Elliot & McGregor, 1999; Conroy & Elliot, 2004; Elliot et al., 2005). Based on the domino effect of fear, fear is seen as a precursor to direct achievement goals (Elliot, 1999), and achievement goals are thought to directly affect achievement behavior. The fear of failure is seen as the determinant of the approach achievement goals. Researchers have stated that the most important factor underlying the fear of failure is the sense of shame and embarrassment. (Atkinson, 1957; McGregor & Elliot, 2005). The first dimension of the fear of failure, the fear of failure based on shame, expresses people's negative self-evaluation of themselves. The fear of failure is seen as a tendency to perceive the embarrassment and a possibility to be humiliated by peers, for this reason, students try to avoid failure (Atkinson, 1957; Conroy, 2001; Conroy et al., 2002; Conroy et al., 2002b; Conroy et al., 2003; Conroy & Elliot, 2004; Elliot et al., 2005; McClelland et al., 1953; Sagar & Stober, 2009). Students with a high fear of failure are more ashamed of failure than those with low fear of failure (McGregor & Elliot, 2005). According to related studies, it is generally seen that students' fear of failure is associated with using maladaptive coping strategies (Blankstein et al., 1992; Veisson et al., 2004). In other words, students with low fear of failure are more successful in coping with fear.

The Relationship between Approach Achievement Goals and the Fear of Shame and Embarrassment

Students focus on improving themselves in mastery-approach goals while they show themselves sufficient and hardworking to others in performance-approach goals (Pintrich, 2000; Pintrich & Schunk, 2002). Students' learning environments affect their goal orientation (Greene et al., 2004; Linnenbrink, 2004). It is thought that embarrassment might be involved in important ways of adapting the student to the learning environment and in student learnings (Johnson, 2012). The fear of failure is a precursor to achievement goals (Elliot, 1999; Elliot & Sheldon (1997). In previous studies, performance-approach achievement goals were positively associated with the fear of shame and embarrassment and general failure fear (Conroy & Elliot 2004; Conroy et al., 2004; Nien & Duda, 2008). Besides, no relationship was found between mastery-approach goals and the fear of failure (Conroy et al., 2003).

Purpose and Proposed Model of the Study

In the above-mentioned literature, it is thought that approach achievement goals and the fear of shame embarrassment failure in science courses significantly affect students' use of various coping strategies. In addition, the fear of shame and embarrassment is thought to be the essence of the fear of failure (Atkinson, 1957; McGregor & Elliot, 2005) and it is associated with approach achievement goals. However, it is seen that previous studies were generally conducted in Western countries in terms of the relationship between related variables. Given the possibility that the relationship between approach achievement goals and other variables might be influenced by socio-cultural factors in different contexts (McInerney, 2008; Sungur & Senler 2009), further studies on this issue are needed.

Students often experienced shame and embarrassment because of their failure and attributed the failure to a lack of talent (Mcgregor & Eliot, 2005). Atkinson (1957) associated shame with fear of failure and stated that shame is the equivalent of pride. While shame is an extremely disruption feeling, it is seen as the core of the fear of failure, and an intrinsic feeling that guides one's achievement goals and coping strategies (Gilbert, 1998). Shame appears as an emotion that affects the whole self of the person who can be devastating.

This study was conducted with students in the exam-oriented competitive education system in Turkey. The results obtained from the science lesson of secondary school Turkish students might show some inconsistencies with the students in Western countries. Sungur and Senler (2009) and Kahraman and Sungur (2013) interpreted the findings considering the Turkish education system and culture. Investigation of achievement goals in terms of various variables in both Western and non-Western cultures can provide an opportunity for effective instructional design to investigate the impact of culture on learning and teaching.

Given the relevant literature, there are studies that examine the relationships between different variables such as fear of shame and embarrassment with coping strategy (Elliot, et.al., 2005; McGregor & Elliot, 2005; Sagar & Stober, 2009); approach achievement goals with coping strategy (Brdar et al., 2006; Friedel, et.al., 2007; Zhou & Kam, 2017); fear of shame and embarrassment with approach achievement goals (Bartels & Ryan, 2013;

Conroy & Elliot 2004; Conroy et al., 2003). However, there are a limited number of studies in which coping strategy, fear of shame and embarrassment and approach achievement goals are examined together. In the present study, the relationship between all variables was examined using a path model considering the relevant literature. Path analysis can allow simultaneous examination of the relationships between variables. This study aims to investigate the relationship between approach achievement goals, the fear of shame embarrassment failure, and academic coping strategies in secondary school science lessons. The research model formed in accordance with this aim and the relevant literature is presented in Figure 1.

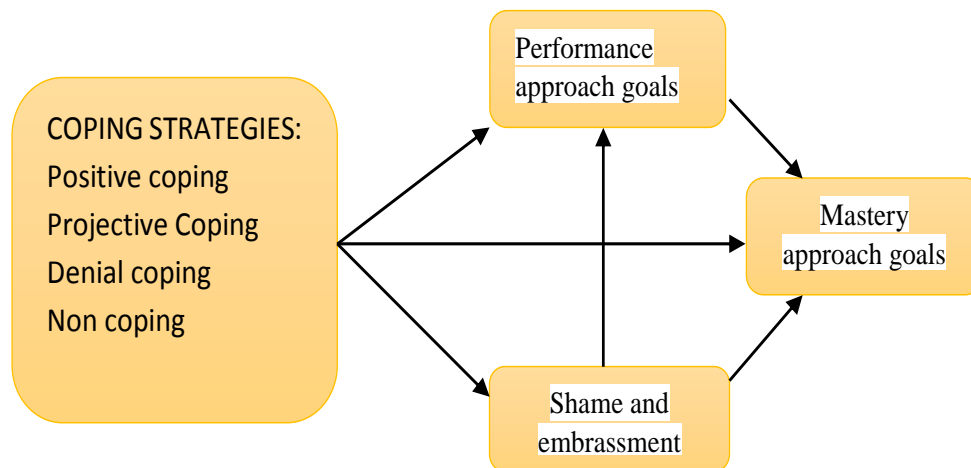


Figure 1. A proposed research model for the relationship between academic coping, approach achievement goals and fear of shame and embarrassment in science

Method

This study is a correlational study in terms of examining the relationship between variables. Correlational research is the study of the relationships between two or more variables without any interference with the variables. The current study is a correlation study that examines the relationships among the fear of failure, approach achievement goals, and academic coping strategy. By use of this method, it is aimed to reveal the relations among the variables of interest and determine the levels of relations. The relationship between the literature-supported model and the data was examined by the path analysis method.

Sample

Participants of the study involve 6th, 7th, and 8th grade students studying in four public schools in the city of Erzurum. Erzurum is one of the largest cities in the eastern part of Turkey. The schools where the study would be carried out were selected through convenience sampling. These schools were easily accessible to the authors of the study. In the current study, there were 249 participants; 109 (45.60%) of whom were female students and 130 (54.40 %) of whom were male students. The study involved 91 (38%) 6th grade students, 97 (40%) 7th grade students, and 51 (21%) 8th grade students. The mean age of the participants was 12.62. (SD= .93). The students' year-end average for a science lesson was 80.10 over 100 in the previous term (SD=12.9).

Data Collection Tools

The data were collected through Demographic Information Questionnaire, Fear of failure Inventory, Achievement goals Questionnaire, and Academic Coping Inventory.

Demographic Information Questionnaire

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

Fear of Failure Inventory

Fear of failure inventory was developed by Conroy et al. (2002a) to assess the fear of failure of the students. 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 shame and embarrassment (n = 7 items, e.g. When I fail, it is embarrassing if others are there to see it) was used. The results of the confirmatory factor analysis conducted by Kahraman and Sungur (2013) provide evidence about the validity of the Turkish version of the scale. Cronbach's alpha reliability coefficient was estimated .80 for the fear of shame and embarrassment. The reliability levels obtained in this study were similarly high. Cronbach's alpha coefficient for the fear of shame and embarrassment was .853.

Achievement Goals Inventory

Achievement goals inventory was developed by Elliot and Church (2001) to assess students' adaptation of goals. It is a five-point Likert scale ranging from strongly agree to strongly disagree. It consists of 15 items in four sub-scales namely: mastery-approach goals (3 items), mastery avoidance goals (3 items), performance-approach goals (3 items), and performance-avoidance goals (6) items. The current study was carried out with the sub-dimensions of mastery-approach goals and performance-approach goals.

Mastery-approach goal is about self-improvement, learning new things, and developing skills. (e.g. I desire to completely master the material that presented in this science lesson). Performance-approach goal is related to the willingness to show their knowledge and skills to others and to appear more successful compared to others (e.g. It is important to me to do better than other students). The Turkish version of achievement goals inventory was translated and adapted into Turkish by Senler and Sungur (2007). The coefficient alpha values for the Turkish sample were found to be .81 for mastery-approach goals, .69 for performance-approach goals. The reliability levels obtained in this study were similarly high. In this study, Cronbach's alpha reliability coefficients were found to be .750 for the performance-approach goal, .760 for the mastery-approach goal.

Academic Coping Inventory

Academic coping inventory 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 Turkish version of the academic coping inventory was translated and adapted into Turkish by Kahraman and Sungur (2013). 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's alpha reliability coefficients were found to be .795 for positive coping, .835 for projective coping; .779 for denial coping, and .755 for non-coping.

Procedure

The survey was in paper form. The first author of the study collected the data in class and no particular class was selected. Directions written on the surveys were also explained by the data collector and it was explained that the data were going to be used only for scientific research purposes. The participants were not asked any information that would reveal their identity. The participants completed surveys within one class period that is 40 minutes. All the data were collected in two and a half months.

Results and Discussion

Descriptive Statistics

Descriptive statistics (mean, standard deviation, reliability coefficient, Pearson correlations, skewness, and kurtosis) related to the variables in the study were tested through the SPSS program. Pearson correlations among variables of the study were presented in Table 1. The biggest correlation is between non-coping strategies and the fear of shame and embarrassment ($r = .540, p < .01$), while the smallest correlation is between denial coping and performance-approach goals ($r = -.234, p < .05$) (see Table 1).

Table 1. Pearson correlations among the variables of the study

	1	2	3	4	5	6	7
1. Positive coping	1	-.274**	-.263*	.241*	.538**	.300**	.274**
2. Projective coping		1	.359**	.209**	-.396	.264	.209
3. Denial coping			1	.265*	-.234*	-.292	.275
4. Non coping				1	.213	.378**	.540**
5. Performans-approach goals					1	.431**	.342*
6. Mastery-approach goals						1	.365**
7. Shame and embarrassment							1

Note: * $p < .05$, ** $p < .01$

Arithmetic means of the dimensions such as positive coping ($M = 4.22$; $SD = .059$), performance-approach goals ($M = 4.19$; $SD = .054$), mastery-approach goals ($M = 4.04$; $SD = .063$), and fear of shame and embarrassment ($M = 3.28$; $SD = .068$) are above the average value (see table 2). Projective coping ($M = 2.04$; $SD = .075$), denial coping ($M = 2.18$; $SD = .068$) and non-coping ($M = 2.89$; $SD = .073$) dimensions were below the average (see Table 2). Since the Skewness and Kurtosis values of the variables vary between ± 2.0 , the data is in normal distribution (George & Mallery, 2010).

Table 2. Descriptive statistics for the variables of the study

	Mean	Std error	Skewness	Kurtosis
1. Positive coping	4.22	.059	-1.53	2.03
2. Projective coping	2.04	.075	.993	-.003
3. Denial coping	2.18	.068	.68	-.359
4. Non coping	2.89	.073	.085	.157
5. Performans-approach goals	4.19	.054	-1.37	2.01
6. Mastery-approach goals	4.04	.063	-1.06	.460
7. Shame and embarrassment	3.28	.068	-.462	-.513

Inferential Statistics

To investigate the proposed relationships among academic coping dimensions, approach achievement goals, and fear of shame and embarrassment in science, path analysis was conducted using AMOS. Fit indices were used to evaluate how well the proposed model fit to the data. The model created to test is among the acceptable fit indices. The fit indices obtained from the analysis using the Maximum Likelihood method are presented in Table 3 and the Amos program Output representing the model is given in Figure 2. The standardized path coefficients are presented in Table 4 and significant path coefficients are displayed in Figure 3.

Table 3. Result of the Fit indices

	χ^2	df	χ^2/df	GFI	AGFI	CFI	IFI	RMSEA
Fit indices	399.215	277	1.44	.890	.860	.948	.947	.043
Good fit indices*			≤ 3	$\geq 0,90$	$\geq 0,90$	$\geq 0,95$	$\geq 0,95$	$\leq 0,05$
Acceptable fit indices*			≤ 5	$\geq 0,85$	$\geq 0,85$	$\geq 0,90$	$\geq 0,90$	$\leq 0,08$

* source (Hair et al., 1998; Kline, 1998; Schermelleh-Engel et al., 2003; Simsek, 2007).

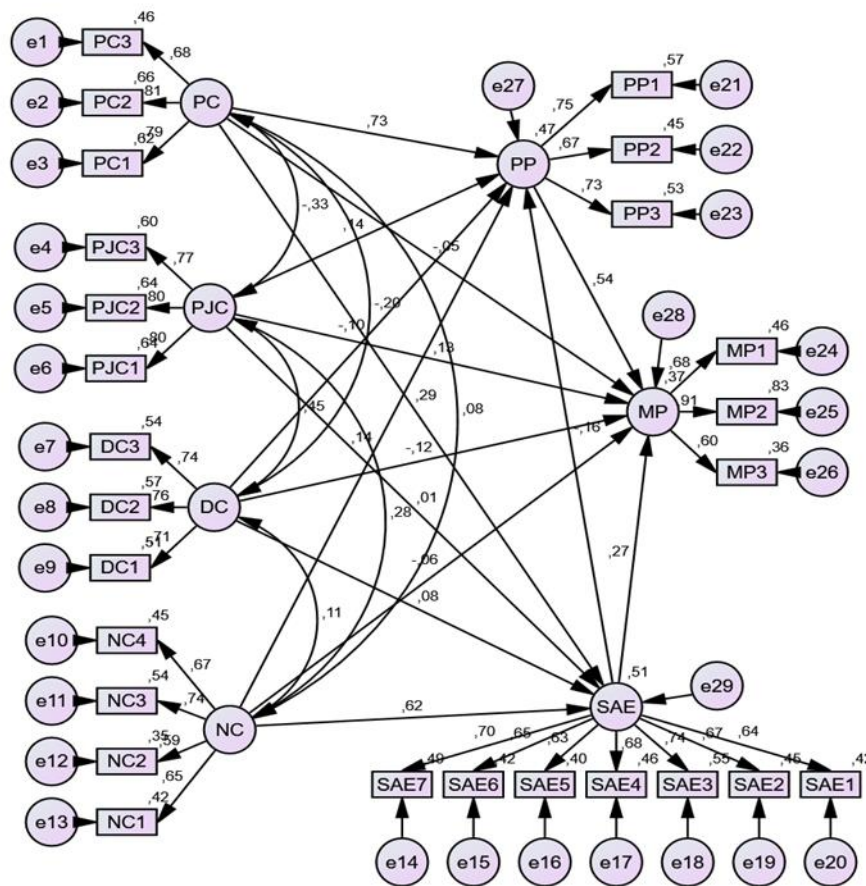


Figure 2. Amos output for the model
 (Positive coping= PC, Projective coping=PJC, Non-coping=NC, Denial coping=DC, Shame and embarrassment=SAE, Performance-approach goals=PP, Mastery-approach goals=MP)

Table 4. Standardized coefficient

		Standardize β	SE of the estimates	t	p	R ²
Shame and embarrassment	Positive coping	.286	.103	3.678	***	.51
	Non-coping	.622	.094	6,310	***	
	Projective coping	.013	.080	.155	.877	
	Denial coping	.082	.078	1.059	.290	
Performance- approach goal	Positive coping	.728	.114	6.581	***	.47
	Projective coping	.140	.068	1.491	.136	
	Non-coping	.135	.088	1.141	.254	
	Denial coping	-.096	.067	-1.114	.265	
Mastery- approach goals	Shame and embarrassment	-.160	.092	-1.344	.179	.38
	Shame and embarrassment	.272	.095	2.259	.024	
	Performance approach goal	.542	.134	4.129	***	
	Projective coping	.132	.069	1.425	.154	
	Denial coping	-.124	.067	-1.472	.141	
	Non-coping	-.064	.087	-.555	.579	
	Positive coping	-.050	.137	-.386	.699	

According to the results of the analysis, academic coping strategies accounted for 51% of the variance in the fear of shame and embarrassment. According to the parameter estimates, high levels of positive coping strategies ($\beta = .286$; $p < 0,05$), non-coping strategies ($\beta = .622$; $p < 0,05$) are statistically significantly and positively linked to fear of shame and embarrassment. Academic coping strategies and the fear of shame and embarrassment accounted for 47% of the variance in performance-approach goals. The relationship between

performance-approach goals and positive coping ($\beta=.728$; $p<0.05$) is statistically positive. The fear of shame and embarrassment, academic coping strategies and performance-approach goals accounted for 38% of the variance in mastery-approach goals. The fear of shame and embarrassment ($\beta=.272$; $p<0.05$), performance-approach goals ($\beta=.542$; $p<0.05$) are statistically significantly and positively linked to mastery-approach goals.

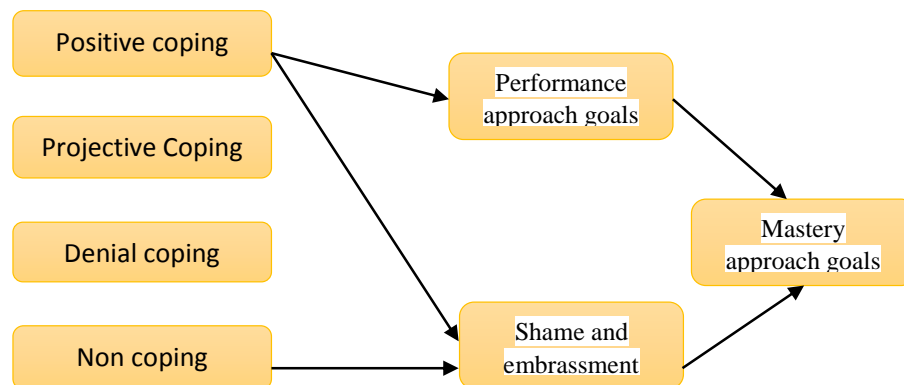


Figure 3. Path model with significant paths

Conclusion

The Relationship between Academic Coping and Approach Achievement Goals

According to the results of the path analysis, adaptive coping strategy, also known as the positive coping was found to be positively correlated with performance-approach goal. In the current study, the expression in the following can be said by looking at the relationship between students' performance-approach goal and positive coping strategy: the students with the aim of discovering knowledge, developing skills, and doing better than other students in the science lesson try to see where they made mistakes when they encounter an academic failure and they make more efforts next time. Students with this acquisition try to find out where the wrong is and they prefer to blame others for this failure less. This finding of the study is supported by the study (Kahraman & Sungur, 2013), which states that the performance-approach goals in the literature are positively related to both adaptive coping strategy and maladaptive coping strategies (Brdar et al., 2006; Friedel et al., 2007; Taye & Zhou, 2009). However, this finding is not supported by the study of Brdar (2009). Findings in these studies suggest that students with mastery goals use more adaptive coping strategy and students with performance goals use more maladaptive coping strategies. Besides, in these studies, the mastery-approach goal was positively associated with adaptive coping (Friedel et al., 2007) and negatively associated with maladaptive coping (Brdar et al., 2006; Friedel et al., 2007; Taye & Zhou, 2009). According to the relevant literature, performance-oriented students use less adaptive strategy and generally blame others when they face academic failure. That is, students who use performance-approach goals use less adaptive strategy and students are less likely to do better in the later process or to think about where they made mistakes. Skaalvik (2018) similarly stated that there is a negative weak relationship between performance-approach goals and adaptive coping strategy, and there is a positive strong correlation between mastery-approach goals and adaptive coping strategy. In this study, the lack of a significant positive relationship between mastery-approach goals and academic coping was an unexpected result in light of the relevant literature.

The Relationship between Academic Coping and the Fear of Shame and Embarrassment

In the present study, the fear of shame and embarrassment were found to be positively correlated with positive coping, and non-coping strategy from maladaptive coping strategies. When students meet an academic failure in a science lesson, they blame themselves not others, and do not try to ignore failure by trying to find out where the mistake is made. Students who think that failure will embarrass themselves will feel bad when they face a bad situation such as failing a test or failing to answer a question in the science lesson and try to make the activities or answer the questions better next time. In other words, students who think that failure is embarrassing do not forget what happened, they blame themselves rather than others and do not ignore failure. The positive relationship between the fear of shame and embarrassment and non-coping in the present study is consistent with the results of the study by Kahraman and Sungur (2013). In the present study, unlike the literature, it can be concluded that the fear of failure is not only related to the maladaptive coping strategies but

also the adaptive strategy. According to previous studies, students who have the fear of failure blame others, feel bad, that is to say, they use maladaptive coping strategies (Blankstein et al., 1992; Bartels & Magun-Jackson; 2008; Veisson et al., 2004).

The Relationship between Approach Achievement Goals and the Fear of Shame and Embarrassment

The fear of shame and embarrassment, which is a dimension of the fear of failure, expresses people's negative self-evaluations about themselves, and they think that failure will embarrass them. In other words, the fear of failure is seen as a tendency to be embarrassed and a possibility of humiliation by peers (McGregor & Elliot, 2005; Kahraman & Sungur, 2013). According to the results of the path analysis in the present study, the fear of shame and embarrassment is positively related to the mastery-approach goal. The students who have the fear of shame and embarrassment because of their failure want to understand science lesson well, learn as much as possible and understand everything fully. Students who have the fear of embarrassment are not interested in their friends' achievements and good grades and do not care about doing activities or assignments better than their friends.

In the study conducted by Elliot and Sheldon (1997), mastery and performance goals were considered as approach achievement goals without differentiation and their relationship between the fear of failure was investigated. In conclusion, they found that the fear of failure might be one of the pioneers of approach achievement goals, which is consistent with the present study finding. Conroy et al. (2003) examined the effects of the fear of failure on achievement goals using the 2x2 achievement goal model, which includes mastery-approach, mastery-avoidance, performance-approach and performance-avoidance in sport. The results showed that there was a positive relationship between the fear of failure and performance-approach goals and that there was no relationship between the mastery-approach goals and the fear of failure. Besides, the fear of shame and embarrassment failure has a positive relationship with the performance-approach goal. In these studies, the fear of failure is considered as a precursor of performance-approach goals (Bartels & Ryan, 2013; Conroy & Elliot, 2004; Elliot & McGregor, 2001; Elliot & Murayama, 2008; Nien & Duda; 2008). In addition, Kahraman and Sungur (2013) found no significant relationship between the fear of shame and embarrassment and performance and mastery-approach goals. In a different study with university students, the performance-approach goals significantly explained the variance in fear of failure variables (Bartels & Ryan, 2013).

The findings of these studies are not consistent with the findings of the present study. According to the researchers, if students perceive the mastery goals of the social environment as important, they tend to adopt mastery goals, and if they perceive the performance goals from the social environment, they tend to adopt performance goals (Bong, 2008; Gonida et al., 2007; Kim et al., 2010). Turkish secondary school students, whose fear of shame and embarrassment are dominant, focus on learning everything as much as possible in science class (mastery-approach goals) rather than being more successful than other students (performance-approach goals). Turkish society has a collectivist culture, and fear of failure in the education system is dominant (Sungur & Şenler, 2009). Students who aim to have a good career in Turkey want to be successful in the science course as well as getting high scores in the university exam. Because the goals are very important, and the high score is the key to the faculty they want.

Limitations

There are some limitations in the present study. The variables of the study depend on the students' use of academic coping strategies, choosing approach achievement goals and fear of shame and embarrassment. Since the study is correlational, it is not possible to establish a cause-effect relationship between the variables of the study. The sample of the study was limited to 249 students studying in public secondary schools. Besides, considering the relationship between the variables is specific to the science lesson, it is necessary to examine the relationships in other subjects as well. Each dimension of the fear of failure scale characterizes different features. For example, there are sub-dimensions such as fear of losing social interest, uncertain future, devalue self-estimate, and upset others. Other dimensions may also be associated with approach achievement goals or coping strategy. However, in the current study, path analysis was created with the fear of shame and failure, and the study was limited in this aspect.

Scientific Ethics Declaration

The authors declare that the scientific ethical and legal responsibility of this article published in JESEH journal belongs to the authors.

References

- Ames, C. (1992). Classrooms: goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261-271. <https://psycnet.apa.org/doi/10.1037/0022-0663.84.3.261>
- Atkinson, J. W. (1957). Motivational determinant of risk-taking behavior. *Psychological Review, 64*, 359–372. <https://psycnet.apa.org/doi/10.1037/h0043445>
- Bartels, J. M., & Magun-Jackson, S. (2009). Approach-avoidance motivation and metacognitive self-regulation:
The role of need for achievement and fear of failure. *Learning and Individual Differences, 30*, 2-5. <https://doi.org/10.1016/j.lindif.2009.03.008>
- Brdar, I., Rijavec, M., & Loncaric, D. (2006). Goal orientations, coping with school failure and school achievement. *European Journal of Psychology of Education, 21*(1),53-70. <https://doi.org/10.1007/BF03173569>
- Bartels, J. M., & Ryan, J. J. (2013). Fear of failure and achievement goals: A canonical analysis. *Journal of Instructional Psychology, 40*(1), 42-49.
- Bong, M. (2008). Effects of parent-child relationships and classroom goal structures on motivation, help-seeking avoidance, and cheating. *Journal of Experimental Education, 76*(2), 191–217. <https://doi.org/10.3200/JEXE.76.2.191-217>
- Blankstein, K. R., Flett, G. L., & Watson, M. S. (1992). Coping and academic problem- solving ability in test anxiety. *Journal of Clinical Psychology, 48*(1), 37-46. [https://doi.org/10.1002/1097-4679\(199201\)48:1%3C37::AID-JCLP2270480105%3E3.0.CO;2-F](https://doi.org/10.1002/1097-4679(199201)48:1%3C37::AID-JCLP2270480105%3E3.0.CO;2-F)
- Bledsoe, S; Baskin, J. J & Berry, F. (2018). Fear not! How Students Cope with the Fears and Anxieties of College Life. *College Teaching, 66*(3), 158-165. <https://doi.org/10.1080/87567555.2018.1472064>
- Conroy, D. E. (2001). Progress in the development of a multidimensional measure of fear of failure: The Performance Failure Appraisal Inventory (PFAI). *Anxiety, Stress and Coping, 14*(4), 431-452. <https://doi.org/10.1080/10615800108248365>
- Conroy, D. E., Willow, J. P., & Metzler, J. N. (2002a). Multidimensional measurement of fear of failure: The Performance Failure Appraisal Inventory (PFAI). *Anxiety, Stress & Coping, 14*, 431-52. <https://doi.org/10.1080/10413200252907752>
- Conroy, D. E., Willow, J. P., & Metzler, J. N. (2002b). Multidimensional fear of failure measurement: The performance failure appraisal inventory. *Journal of Applied Sport Psychology, 14*, 76-90. <https://doi.org/10.1080/10413200252907752>
- Conroy, D. E., Metzler, J. N., & Hofer, S. M. (2003). Factorial invariance and latent mean stability of performance failure appraisals. *Structural Equation Modeling, 10*, 401- 422. https://doi.org/10.1207/S15328007SEM1003_4
- Conroy, D. E., & Elliot, A. J. (2004). Fear of failure and achievement goals in sport: Addressing the issue of the chicken and the egg. *Anxiety, Stress, and Coping, 17*(3), 271-285. <https://doi.org/10.1080/1061580042000191642>
- Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*, 169-189. https://doi.org/10.1207/s15326985ep3403_3
- Elliot, A. J., & Sheldon, K. M. (1997). Avoidance achievement motivation: A personal goals analysis. *Journal of Personality and Social Psychology, 73*, 171-185. <https://psycnet.apa.org/doi/10.1037/0022-3514.73.1.171>
- Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72*, 218-232. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.431.7950&rep=rep1&type=pdf>
- Elliot, A. J., Shell, M. M., Henry, K. B., & Maier, M. (2005). Achievement goals, performance contingencies, and performance attainment: An experimental test. *Journal of Educational Psychology, 97*, 630 – 640. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.430.9165&rep=rep1&type=pdf>
- Elliot, A. J., & McGregor, H. A. (1999). Test anxiety and the hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 76*, 628-644. <https://psycnet.apa.org/doi/10.1037/0022-3514.76.4.628>

- Elliot, A., & McGregor, H. (2001). A 2 x 2 achievement goal framework. *Journal of Personality and Social Psychology*, 80(3), 501–519. <https://academic.udayton.edu/JackBauer/Readings%20361/Elliot%2001%20ach%20goal%202x2.pdf>
- Elliot, A. J., & Murayama, K. (2008). On the measurement of achievement goals: Critique, illustration, and application. *Journal of Educational Psychology*, 100, 613–628. <https://psycnet.apa.org/doi/10.1037/0022-0663.100.3.613>
- Flavell, J.H. (1999). Cognitive development: children's knowledge about the mind. *Annual Review of Psychology*, 50, 21–45. <https://doi.org/10.1146/annurev.psych.50.1.21>
- Folkman, S., & Moskowitz, J. T. (2004). Coping: pitfalls and promise. *Annual Review of Psychology*, 55, 745–774. <https://doi.org/10.1146/annurev.psych.55.090902.141456>
- Friedel, J. M., Cortina, K. S., Turner, J. C., & Midgley, C. (2007). Achievement goals, efficacy beliefs and coping strategies in mathematics: The roles of perceived parent and teacher goal emphases. *Contemporary Educational Psychology*, 32(3), 434–458. <https://doi.org/10.1016/j.cedpsych.2006.10.009>
- George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference*, 17.0 update (10 th edition.). Pearson.
- Gilbert, P. (1998). *What is shame? Some core issues and controversies*. In P. Gilbert & B. Andrews (Eds.), *Shame: Interpersonal behavior, psychopathology, and culture Series in affective science* (pp. 3–38). Oxford University Press.
- Gonida, E. N., Kiosseoglou, G., & Voulala, K. (2007). Perceptions of parent goals and their contribution to student achievement goal orientation and engagement in the classroom: Grade-level differences across adolescence. *European Journal of Psychology of Education*, 22(1), 23–39. <https://doi.org/10.1007/BF03173687>
- Greene, B. A., Miller, R. B., Crowson, H. M., Duke, B. L., & Akey, K. L. (2004). Predicting high school students' cognitive engagement and achievement: Contributions of classroom perceptions and motivation. *Contemporary Educational Psychology*, 29(4), 462–482. <https://doi.org/10.1016/j.cedpsych.2004.01.006>
- Johnson, D.E. (2012). Considering Shame and Its Implications for Student Learning. *College Student Journal*, 46(1), 3–17.
- Kahraman, N., & Sungur, S. (2013). Antecedents and Consequences of Middle School Students' Achievement Goals in Science. *Asia-Pacific Education Research*, 22(1), 45–60. <https://doi.org/10.1007/s40299-012-0024-2>
- Kamins, M. L., & Dweck, C. S. (1999). Person Versus Process Praise and Criticism: Implications for Contingent Self-Worth and Coping. *Developmental Psychology*, 35(3), 833–847. <https://psycnet.apa.org/doi/10.1037/0012-1649.35.3.835>
- Kaplan, A., & Midgley, C. (1999). The relationship between perceptions of the classroom goal structure and early adolescents affect in school: The mediating role of coping strategies. *Learning and Individual Differences*, 11, 187–212. [https://doi.org/10.1016/S1041-6080\(00\)80005-9](https://doi.org/10.1016/S1041-6080(00)80005-9)
- Kim, J., Schallert, D. L., & Kim, M. (2010). An integrative cultural view of achievement motivation: Parental and classroom predictors of children's goal orientations when learning mathematics in Korea. *Journal of Educational Psychology*, 102(2), 418–437. <https://psycnet.apa.org/doi/10.1037/a0018676>
- Kline, R. (1998). *Principles and practice of structural equation modeling*. Guilford Press.
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, 1, 141–169. <https://doi.org/10.1002/per.2410010304>
- Linnenbrink, E. A. (2004). Person and context: Theoretical concerns in achievement goal theory. In: M. L. Maehr, & P. R. Pintrich (Eds), *Advances in motivation and achievement* (Vol. 13, pp. 159–184). JAI Press.
- McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). *The achievement motives*. Appleton-Century-Croft.
- McGregor, H. A., & Elliot, A.J. (2005). The shame of failure: examining the link between fear of failure and shame. *Personality and Social Psychology Bulletin*, 31, 218–231. <https://doi.org/10.1177%2F0146167204271420>
- McInerney, D. M. (2008). Personal investment, culture and learning: Insights into school achievement across Anglo, Aboriginal, Asian and Lebanese students in Australia. *International Journal of Psychology*, 43, 870–879. <https://doi.org/10.1080/00207590701836364>
- Nien, C., & Duda, J. L. (2008). Antecedents and consequences of approach and avoidance achievement goals: A test of gender invariance. *Psychology of Sport and Exercise*, 9(3), 352–372.

- <https://doi.org/10.1016/j.psychsport.2007.05.002>
- Ntoumanis, N., Biddle, S., J. H., & Haddock, G. (1999). The mediating role of coping strategies on the relationship between achievement motivation and affect in sport. *Anxiety, Stress, and Coping*, 12, 299- 327. <https://doi.org/10.1080/10615809908250480>
- Pintrich, P. R. (2000). Multiple goals, multiple pathways: the role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92(3), 544-555. <https://psycnet.apa.org/doi/10.1037/0022-0663.92.3.544>
- Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in education: Theory, research and applications*. Merrill Prentice Hall.
- Raftery-Helmer, J. N., & Grolnick, W. S. (2016). Children's Coping With Academic Failure: Relations With Contextual and Motivational Resources Supporting Competence. *Journal of Early Adolescence*, 36(8), 1017 –1041. <https://doi.org/10.1177/0272431615594459>
- Sagar, S., & Stoeber, J. (2009). Perfectionism, Fear of Failure, and Affective Responses to Success and Failure: The Central Role of Fear of Experiencing Shame and Embarrassment. *Journal of Sport and Exercise Psychology*, 31, 602-627. <https://doi.org/10.1123/jsep.31.5.602>
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, 8(2), 23-74. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.509.4258&rep=rep1&type=pdf>
- Senler, B., & Sungur, S. (2009). Parental influences on students' self-concept, task value beliefs, and achievement in science. *The Spanish Journal of Psychology*, 12(1), 106-107. <https://doi.org/10.1017/S1138741600001529>
- Skaalvik, S. (1999). *Hverdag, arbeid og utdanning. En studie av voksne med lese- og skrivevansker*. Trondheim: Norsk voksenpedagogisk forskningsinstitutt.
- Skaalvik, E. M. (2018). Mathematics anxiety and coping strategies among middle school students: relations with students' achievement goal orientations and level of performance. *Social Psychology of Education*, 21, 709–723. <https://doi.org/10.1007/s11218-018-9433-2>
- Senler, B., & Sungur, S. (2007). *Hedef yönelimi anketinin Türkçe'ye çevrilmesi ve adaptasyonu*. Paper presented at the 1. Ulusal İlköğretim Kongresi, Ankara, Turkey.
- Simsek, Ö.F. (2007). *Yapısal eşitlik modellemesine giriş: temel ilkeler ve Lisrel Uygulamaları*. Ekinoks.
- Taye, E. A., & Zhou, Z. (2009). Effects of goal orientations, on coping strategies and self-efficacy for Ethiopian University students in their academic life. *Pakistan Journal of Social Sciences*, 6(6), 372-375. Retrieved from <http://docsdrive.com/pdfs/medwelljournals/pjssci/2009/372-375.pdf>
- Tero, P. F., & Connell, J. P. (1984). *When children think they've failed: An academic coping inventory*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
- Urduan, T. C., (1997). Examining the relations among early adolescent students' goals and friends' orientation toward effort and achievement in school. *Contemporary Educational Psychology*, 22, 165-191. <https://doi.org/10.1006/ceps.1997.0930>
- Veisson, M., Leino, M., Ots, L., Ruus V. R., & Sarv-S. E. (2004). *Academic coping of students*. Paper presented at the European Conference on Educational Research, University of Crete, 22-25 September.
- Zhou M., & Kam, C. C. S. (2017). Trait procrastination, self-efficacy and achievement goals: the mediation role of boredom coping strategies, *Educational Psychology*, 37(7), 854-872. <https://doi.org/10.1080/01443410.2017.1293801>

Author Information

Pelin Mete

Ataturk University
Kazim Karabekir Faculty of Education,
Department of Primary School Education, 25249, Erzurum
Turkey
Contact e-mail: pepinmete25@gmail.com
ORCID iD: <https://orcid.org/0000-0002-3075-2575>

Munevver Subasi

Mustafa Kemal University
Faculty of Education,
Department of Mathematics and Science Education, Turkey
ORCID iD: 0000-0001-6777- 6995
