THE ROLE OF ACADEMIC SELF-EFFICACY IN RELATION BETWEEN WAYS OF COPING AND TEST ANXIETY

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Abstract: The current study was designed to examine the mediational role of academic self-efficacy in the relation between coping with stress and test anxiety. For this purpose, a structural model was proposed. In this model, it was hypothesized that ways of coping predicts academic self-efficacy positively and also academic self-efficacy predicts test anxiety negatively. A total of 849 students (609 female and 240 male) participated in the study. Ways of Coping Inventory, Academic Self-Efficacy Scale and Test Anxiety Inventory were used to collect the data. The structural equation modeling method was used to analyze the data. The results of the analysis confirmed the proposed model. According to results, ways of coping both directly and indirectly through academic self-efficacy predicts test anxiety. Fit indices of the model were AGFI=.95, RMSEA=.069, TLI=.95 and CFI=.98. These fit indices were accepted sufficient and acceptable. The path analysis revealed that ways of coping explained 71% ($.81^2$=0.705) of variance in academic self-efficacy and 40% ($-.63^2$=0.396) of variance in test anxiety through predicted academic self-efficacy. In addition to, academic self-efficacy explained 55% ($-.74^2$=0.547) of variance in test anxiety. Thereby totally 95% (40+55=95) of variance in test anxiety was explained together ways of coping and academic self-efficacy.

Key words: Academic self-efficacy, coping, test anxiety, undergraduate students.

1. Introduction

Tests and exams are sources of stress at almost every level of education because of its nature (Açıkgöz, 2007). Many students feel anxious while preparing for an exam. In fact, some level of anxiety is effective for motivating students and letting them to be successful in exams (Salend, 2011). However, when anxiety increases and surpasses normal level, it can be draining.

Test anxiety is defined as "combination of physiological, psychological and behavioral responses that go along with fear about potential negative outcomes on an exam or comparable appraising situations (Chapell, Blanding, Takahashi, Silverstein, Newman, Gubi, & McCann, 2005). In other words, it is a condition in which people experience extreme

distress and anxiety in testing situations. Test anxiety includes two major components that are worry and emotionality which reflect cognitive concerns and emotional reactions linked with evaluation stress (Spielberger, 1980). Worry is composed of individuals' cognitive responses to evaluative situations, or internal dialogue concerning evaluative situations before, during and after the exam (Cassady & Johnson, 2002). On the other hand, emotionality dimension refers to physiological reactions such as increased galvanic skin response and heart rate, nausea and feelings of panic experienced during appraising situations (Hembree, 1988; Cassady & Johnson, 2002).

According to personal causation theory of De Charms (1992), human behavior comes up from the individual, and that people struggle to remain in control of their own behavior. That is to say, individuals usually tend to determine their own behavior by his own choosing. Thus, whether individuals will respond test anxiety may depend on the ways which coping with stress and improve motivation.

Coping is a positive response outcome expectancy (Ursin, 2014). Coping is based on specific area that "stress and coping are common and omnipresent in our everyday lives" (Iwasaki & Schneider, 2003). Coping with stress is defined as "attempts to handle a specific situation that is evaluated as onerous within the context of the person-environment relationship" (McKinzie, Reinhardt, & Benn, 2007). Besides, most widely cited definition of Lazarus and Folkman (1984) about stress refers to "perpetually changing cognitive and behavioral efforts to handle particular external and/or internal requests that are evaluated as onerous or exceeding the resources of the person". Individuals with high levels of coping with stress have good academic performance (Struthers, Perry, & Menec, 2000), think optimistic and feel themselves happy (Lyubomirsky, 2008). Not surprisingly, coping with stress is widely regarded as an important factor for test anxiety and reduces individuals' distress in exam situations (Baker, 2003) and also motivates them to be successful. That is to say, if a person has greater motivation and has the ability to cope with stress, test anxiety will automatically decrease (Struthers, Perry, & Menec, 2000).

People use different coping strategies to manage stress and anxiety. These strategies can have positive or negative effects on their health status (Grodzinsky, Walter, Viktorsson, Carlsson, Jones & Faresjo 2015). Coping strategies using self-confident behavior are characterized by tendency to manage rather than escaping difficulties. People using this strategy are motivated to cope with challenges as they have the ability to produce a desired or intended result which is called "self-efficacy".

Self-efficacy is a multidimensional construct including the sense of personal effectiveness of individuals changing depending on the circumstance in which it is included (Savarese, Carpinelli, Fasano, Mollo, Pecoraro & Iannacconne, 2013). The concept of self-efficacy is quite common in educational studies (Yılmaz, Gürçay & Ekici, 2007). Bandura (1982) defines self-efficacy as "beliefs of how well one can accomplish ways of action required to handle prospective situations. It was stated that all people do not have same level of self-efficacy; instead it depends on the feature of the task (Abesha, 2012).

One of the most studied types of self- efficacy is academic self-efficacy. Academic self-efficacy is defined as "students' confidence in mastering academic subjects" (Chemers, Hu & Garcia, 2001). Midgley, Maehr, Hruda, Anderman & Freeman (2000) expressed that "academic self-efficacy refers to students' perceptions of their competence to do their tasks". Academic self-efficacy is related to career selection, performance, grade goals and academic aspirations, cognitive strategy use and self-regulation (Bong & Skaalvik, 2003). Besides, not only is academic self-efficacy related to students' test scores (Vrugt, Langereis & Hoogstraten, 1997) but also to their persistence (Linnenbrink & Pintrich, 2002). Especially, persistence is an important factor in helping at-risk students pass hardcore tests.

The available studies have indicated that test anxiety has been related to several concepts such as coping (Piemontesi, Heredia, Furlan, Rosas & Martinez, 2012; Ruckholm & Viverais, 1993; Thomas, Cassady & Heller, 2017); academic-self-efficacy (Pajares & Kranzler, 1995; Pajares & Miller, 1994; Pajares, Miller & Johnson, 1999; Turgut, 2013); academic performance (Cassady & Johnson, 2002; Chapell, Blanding, Silverstein, Takahashi, Newman, Gubi, & McCann et al., 2005; Rana & Mahmood, 2010). Based on these findings, it can be thought whether each of these concepts is an important indicator of test anxiety separately and also to find out whether academic self-efficacy serves as a mediator between ways of coping and test anxiety. Consequently the purpose of the present paper is to investigate whether ways of coping predict test anxiety and also to determine how ways coping affect test anxiety through academic self-efficacy. In other saying, the current study is designed to examine the mediational role of academic self-efficacy in the relation between coping with stress and test anxiety in university students.

2. Methodology

2.1. Participants

The data were gathered from a total of 849 (609 female, 240 male) college students in

Trakya University. Age of participants varied between 18 and 29. (MAge= 22, 22; SD=1, 80). 34.6% of the participants (N=294) were in their first year of university education; 23.2% (N=197) were in their second year of university education; 22.9 % (N= 194) were in their third year of university education and 19.3 % of the participants (N=164) were in their fourth year of university education. When analyzed in terms of income level, it is seen that the majority (92%) of the participants have income between 0-3000 TL.

2.2. Measures

Three instruments and a demographic form were used to collect relevant data. These are Ways of Coping Inventory (WCI), Academic Self-Efficacy Scale (ASES), and Test Anxiety Inventory (TAI).

2.2.1. Ways of Coping Inventory

Ways of Coping Inventory (WCI) was designed to measure individual's coping styles across different situations. It was originally developed by Lazarus and Folkman (1984) and adapted into Turkish by Şahin & Durak (1995). This inventory consists of five dimensions which are Self-confident style (7 items), optimistic style (5 items), helpless style (8 items), submissive style (6 items) and seeking social support style (4 items). Each item was rated on a 4-point Likert scale from 0 (not used) to 4 (used a great deal). There is no total score for this scale. Cronbach alpha reliability coefficients for the present sample changed from .59 to .78.

2.2.2. The Academic Self-Efficacy Scale

This scale was used to assess teacher candidates' perceived beliefs on academic tasks. It was originally developed by Jerusalem & Schwarzer (1981) and adapted into Turkish by Yılmaz, Gürçay & Ekici (2007). According to adaption results, the scale was found to have an original property which was one dimension with seven items in Turkish version. Each item was rated on a 4-point Likert scale from 1 (not suitable) to 4 (absolutely suitable). The internal consistency of the scale for the present sample with university students was found to be .77

2.2.3 Test Anxiety Inventory

The scale was used to assess test anxiety level of individuals. It was originally developed by Spielberger (1980)'s and adapted into Turkish by Oner (1990). The scale consists of 20 items and has two dimensions which are worry (8 items) and emotionality (12 items). Each item was rated on a 4-point Likert scale from 1 (almost never) to 4 (almost always). Cronbach alpha reliability coefficients of dimensions for the present sample were .90 to .83 respectively. The internal consistency of all scale for the present sample was found to

be .93.

2.3. Data collection

All the data were collected by the authors with groups of approximately 50 subjects. Before scales were given to participants, they were informed about the purpose of the study. The scales were administered to a total of 849 volunteered university students attending to Faculty of Education, Trakya University in Edirne.

2.4. Data Analysis

In this study, the path analysis in terms of structural equation modeling (SEM) was performed to examine the interaction ways of coping, academic self-efficacy and test anxiety. SPSS 17 for Windows and AMOS 16.0 was used to analyze the data. The maximum likelihood was used to test the model. After the data were entered into the computer environment, the data were cleaned and 12 participants who had values in the end groups (-3.29> z <3.29) were not included in the study. Moreover in this study, latent variable of the ways of coping, academic self-efficacy and test anxiety were explored by using observed variables. Our aim was to simultaneously examine how ways of coping predicted and how academic self-efficacy predicted test anxiety, and also to examine how ways of coping predicted test anxiety through academic self-efficacy. In other words, it was investigated the mediating role of academic self-efficacy in the relationship between coping and test anxiety.

3. Results

Descriptive statistics for teacher candidates' ways of coping, academic self-efficacy, and test anxiety were calculated and are displayed in Table 1.

Table 1

Descriptive Analysis of Variables

Variables	*M*	*SD*
Confidence style	14.34	3.43
Optimistic style	8.93	2.72
Helpless style	9.36	3.86
Submissive style	4.81	2.72
Seeking social support	8.00	2.06
Academic self-efficacy	20.44	3.35
Worry	15.79	4.51
Emotionality	23.63	6.89

While there weren't significant correlations between some variables (optimistic style - submissive style, helpless style - seeking social support, seeking social support - worry, seeking social support – emotionality), the significant correlations emerged between -.41 and .59. Correlation coefficients among all scales are reported in Table 2. It is assumed that if the correlation coefficient is higher than .90, there is multicollinearity (Kline, 2005: 57; Tabachnick & Fidell, 2007: 90). This view is based on it can be said that there is no multicollinearity.

Table 2

Correlations among variables

	1	2	3	4	5	6	7	8
1. Self-confidence style		.59**	-.33**	-.23**	.16**	.41**	-.29**	-.28**
2. Optimistic style			-.33**	-.05	.09*	.27**	-.22**	-.24**
3. Helpless style				,45**	-.05	-.30**	.45**	.44**
4. Submissive style					-.13**	-.19**	.31**	.27**
5. Seeking social support						.09**	-.05	-.03
6. Academic self-efficacy							-.41**	-.41**
7. Worry								.82**
8. Emotionality								

**. Correlation is significant at the 0.01 level.
*. Correlation is significant at the 0.05 level.

Findings from the first path analysis of relationships teacher candidates' ways of coping, academic self-efficacy, and test anxiety in Figure 1. We hypothesized that ways of coping predict academic self-efficacy as mediator variable, and the efficacy predict test anxiety.

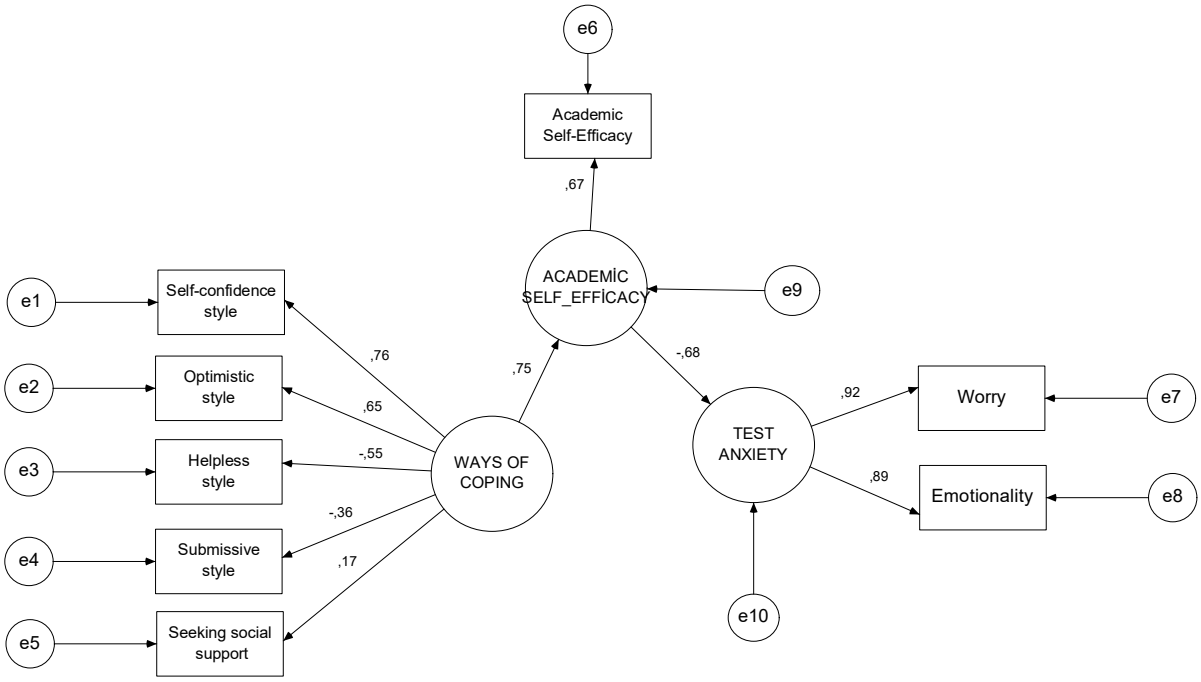

Figure 1. The model of structural relations among ways of coping, academic self-efficacy, and test anxiety

As seen in the Figure 1, there are eight observed variables and three latent variables. In the model, single-headed arrows in the path diagram illustrate the direction of the effect of one variable on another; the number associated with each of the single-headed arrows is the path coefficient. Circles represent errors in the prediction of the endogenous variables (Kline, 2005; Loehlin, 2004).

AGFI, RMSEA, TLI and CFI were selected to test the model's fit based on Sun (2005). The model fit indices were AGFI=.82, RMSEA=.141, TLI=.78 and CFI=.86. These fit indices weren't accepted sufficient and acceptable (Brown, 2006; Hooper, Coughlan & Mullen, 2008; Hu & Bentler, 1995; Steiger, 1990; Sumer, 2000; Weston & Gore, 2006). The modifications proposals were examined and it was saw there were relations some variable (self-confidence - optimistic; self-confidence – helpless; optimistic –submissive; helpless – submissive; helpless – seeking social support). These modifications were added, and then the second path analysis applied (see Figure 2)

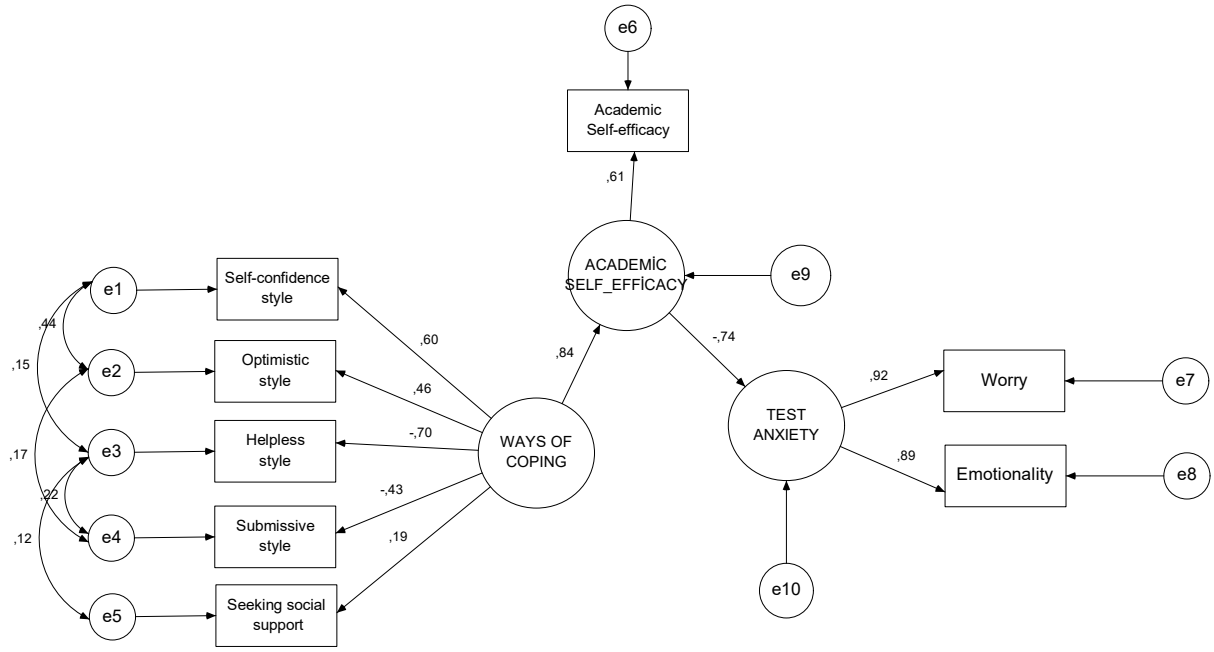

Figure 2. The second model of structural relations among ways of coping, academic self-efficacy, and test anxiety

The second model of fit indices were AGFI=.95, RMSEA=.069, TLI=.95 and CFI=.98. These fit indices were accepted sufficient and acceptable. The standardized path coefficients were commented based on Keith's (1993, Cited in: Taasoobshirazi, & Sinatra, 2011: 911) view which is standardized path values ranging from .05 to .10 are small, but meaningful influences; path values ranging from .11 to .25 are moderate in size and influence, and path values above .25 are large in size and influence. The path model revealed that when teacher candidates' ways of coping significantly and largely predicted academic self-efficacy (β = .84, $p < .001$), that is, when ways of coping increased by 1 standard deviation, academic self-efficacy increased by .84 standard deviations. When the model is continued to examine, it can be seen that academic self-efficacy significantly and largely predicted test anxiety (β = -.74, $p < .001$), that is, when academic self-efficacy increased by 1 standard deviation, academic self-efficacy decreased by .74 standard deviations.

Table 3.

Standardized direct, indirect, and total effects

	Ways of Coping			Academic Self-Efficacy		
	Direct	Indirect	Total	Direct	Indirect	Total
Academic Self-Efficacy	.84		.84			
Test Anxiety		-.63	-.63	-.74		-.74

When the indirect paths are examined (see Table 3), it can be seen that ways of coping estimated significantly and high level test anxiety through its predicted academic self-efficacy (β = -.63, $p < .001$), that is, due to the indirect (mediated) effect of ways of coping on academic self-efficacy, when ways of coping gone up by 1 standard deviation, test anxiety gone down by .63 standard deviations. In other words, ways of coping was associated to academic self-efficacy which, in order, was associated to test anxiety.

It can be calculated in the model, ways of coping explained 71% ($.81^2$=0.705) of variance in academic self-efficacy and 40% ($-.63^2$=0.396) of variance in test anxiety through its predicted academic self-efficacy. In addition to, academic self-efficacy explained 55% ($-.74^2$=0.547) of variance in test anxiety. Thereby totally 95% (40+55=95) of variance in test anxiety was explained together ways of coping and academic self-efficacy.

4. Discussion and Conclusion

The aim of the present study was first to investigate the impact of ways of coping on test anxiety; secondly to find out the impact of academic self-efficacy on test anxiety and finally the effect of ways of coping on test anxiety through academic self-efficacy. In other words, it was examined whether well-documented ways of coping and test anxiety link is mediated by academic self-efficacy. Regression analysis yielded that ways of coping predicted test anxiety both directly and also through academic self-efficacy. Additionally, academic self-efficacy was found to serve as a mediator in the relationship between ways of coping and test anxiety.

Test anxiety is actually a type of performance anxiety- a feeling someone may have in a circumstance where performance really matters or when the pressure's on to do well enough (Mashayek & Hashemi, 2011). Test anxiety is the result of many interconnected beliefs and experiences. In this context treating and reducing test anxiety is crucial for individuals to be successful. One way of reducing test anxiety is individuals to make learn coping strategies

and self-evaluation. As a matter of fact available studies emphasized the same saying stated above and also previous studies (Blankstein, Flett & Watson, 1992; Stöber, 2004), ways of coping was found to be significantly correlated with test anxiety. For instance, Blankstein, Flett & Watson (1992), confirmed that emotion-focused coping (i.e., avoidant and confrontive coping) was associated positively with test anxiety. Also, test-anxious individuals claimed poorer ability to solve academic problems. Finally, regression analyses revealed that coping tendencies and perceived problem-solving ability predicted unique variance in test-anxiety scores. In addition to this, Stöber (2004) stated that overall test anxiety was related to seeking social support and worry dimension was related to task-orientation and preparation and inversely related to cognitive avoidance.

Another important finding of this study was academic-self-efficacy predicted test anxiety negatively. This finding meant that when academic self-efficacy increased, test anxiety decreased. This is consistent with the existing literature (Asayesh, Hosseini, Sharififard & Kharameh, 2016; Majidifar & Oroji, 2015). Asayesh, Hosseini, Sharififard, and Kharameh (2016), found out that in the univariate logistic regression analysis, the increasing of self-efficacy score was associated with the decreasing of the of test anxiety. Likewise, Majidifar & Oroji (2015) indicated that the individuals having high self-efficacy reported low test anxiety.

The most stunning result of the study was the prediction of test anxiety by ways of coping through academic self-efficacy. That is to say, ways of coping estimated significantly and high level test anxiety through its predicted academic self-efficacy. When academic self-efficacy served as a mediator the level of test anxiety decreases much than before. Within this context it can be stated that academic self-efficacy played an important role in relation between test anxiety and ways of coping. When previous studies examined, there seemed to be lots of research with test anxiety and academic achievement, self-esteem, academic self-efficacy, self-efficacy (Khan, 2013; Onyeizugbo, 2010; Salar, Banghaei, Zare & E.Salar, 2016; Sideeg, 2015) but no research was found to explain the underlying mechanisms in relation between ways of coping and test anxiety. Thus, the present study contributed to literature and researchers in terms of new knowledge.

To sum up, the results revealed that ways of coping and academic self-efficacy played a significant role in reducing test anxiety of university students. In the light of these findings, it is suggested that, counselors in counseling centers of universities should help students promote their self-efficacy and also make them learn coping strategies. For this, school-based

intervention programs about self-efficacy and coping with stress can be carried out for university students to provide them a healthier life both in terms of physically and psychologically during college years. This is also worthy of note for students' prospective life such as career development, special life and interpersonal relationships.

Several limitations of the present study are worth mentioning. First one is that the study was carried out within a cross-sectional design. So, with a longitudinal study the impact of ways of coping and academic self-efficacy can be seen effectively with well-established school-based programs. The second one is that, data were collected from students attending faculty of education. Data can be collected from a different sample such as students from other faculties. Additional studies are needed to replicate our findings and to better. The third one is that, in this study elf-report measures were administered to students which may stimulate to cause social desirability. Therefore, prospective studies should use other methods such as observation and interviews to widen the data collection in order to increase reliability. The last one is that, reciprocal, bi-directional relations among the variables, which were not examined in this study, are certainly possible and make intuitive sense. Given that our model provided a better fit for the data than alternative models, including the model in which the mediator and outcome variables were switched, we believe that the accepted model was most valid.

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