TEST ANXIETY AND OTHER VARIABLES THAT INFLUENCE THE PERFORMANCE ACHIEVED IN EDUCATIONAL COMPETITIONS

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Abstract
Research has repeatedly demonstrated how test anxiety is negatively associated with variables such as performance, academic achievement, and intellectual aptitude tests. The objective of the present study was to investigate the existing relationships between self-efficacy, self-esteem, test anxiety, and performance in academic competitions to which 253 high school students took part. We have also been interested in the role that some variables have (like gender, academic achievement - GPA, and the number of hours/day allocated to training for the competition) in the relationship between test anxiety and competition's performance. The results suggest that there are negative correlations between test anxiety and self-efficacy, self-esteem and the number of hours/day allocated to the training. What is noteworthy, however, is that self-efficacy, self-esteem and the number of hours / day allocated to the training proved to be negative predictors of test anxiety, and these variables justify 26% of the variance of test anxiety. Multiple regression has shown that self-esteem mediates the relationship between test anxiety and performance, in the sense that a high level of test anxiety leads to affect self-esteem, which in turn has a negative effect on performance.

Keywords: academic competitions; test anxiety; self-esteem; self-efficacy; performance

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School competitions have as their general objective the stimulation of students with high intellectual abilities or who have special interests and skills in the scientific, technical, cultural-artistic, civic and sports fields. At the same time, educational competitions promote fundamental cultural and ethical values, the spirit of fair play, competitiveness and interpersonal communication. They can be found on all school cycles and are one of extra-curricular activities that attract students of all ages. The main advantages of participating in educational competitions are represented by the opportunity for students to demonstrate their skills in their preferred field and regardless of their field or award, stimulates creativity and critical thinking, provides the necessary motivation in the learning process, and helps identifying and developing talents, abilities and knowledge, contributing to the personal and professional development of students.

Like teaching, learning and evaluation activities, school competitions are part of academic life. Even though the academic environment is a space whose purpose is to initiate students in their learning process, it also represents a framework in which emotions are constantly found and play a sufficiently important role, both in inter-human relationships and academic achievement. Pekrun and collaborators (Pekrun et al., 2002a) defined academic emotions as those emotions experienced in academic contexts and associated with learning and achievement activities. Such emotions, for example, relate to the pleasure of learning, the success offered, the anger manifested when the tasks received are too difficult or impossible to achieve, or the anxiety about the evaluation. In recent years, a number of researchers (Zeidner, 1998; Pekrun et al., 2002a; Daniels et al., 2009) have been concerned with the issue of academic emotions, more specifically, the interest has been focused on the role and influence of academic emotions on academic performance. Among the emotions studied in the academic field, attention was focused on test anxiety. The phenomenon of test anxiety has been studied since the 1950s, and many studies have argued that it negatively influences academic achievement. The studies have taken into account different variables, such as gender, type of motivation, perceived parenting styles, etc. No study of anxiety in a competitive academic context has been identified, as well as an analysis of other variables that could play an important role in this relationship.

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Test anxiety and its impact on academic performance

Test anxiety is actually a strong emotional reaction that an individual experiences before and during an examination (Akca, 2011). When pupils are placed in an evaluative situation, comparative and competitive behaviors will lead to increased anxiety that will disrupt their focus on doing what they need to successfully complete their work tasks (Zeidner & Matthews, 2011).

Other authors (Sarason, 1980; Spielberger & Vagg, 1995) define test anxiety as the predisposition of an individual to react through a state of excessive concern, intrusive thoughts, mental disorganization, tension, and physiological activation when is exposed to an evaluative situation. Obtaining much lower scores or results in tests, experimenting with shame, and the fact that you might disappoint important people are some of the consequences of the assessment that students perceive to be threatening (Zeidner, 2007; Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011).

At the beginning of the research on the concept of "test anxiety", the construct was considered to be one-dimensional and was measured by scales such as the Test Anxiety Questionnaire (Mandler & Sarason, 1952). Subsequently, field research has demonstrated that there are at least two dimensions present in measuring test anxiety.

Liebert and Morris (1967) have shown that "Worry" and "Emotionality" are present in measuring the concept of test anxiety and are two different constructs. The *Worry* component refers to mind-distracting thoughts, self-disapproving rumors, and other types of distractors of the thinking process associated with assessment. Vasey, Crnic, and Carter (1994) refer to the cognitive characteristic of anxiety as "an anticipatory cognitive process involving repetitive thoughts associated with possible threatening outcomes and their potential consequences" (p. 530). The Emotionality component refers to body responses that are associated with anxiety (increased heart rate, headaches, sweating, etc.) (Cassady & Johnson, 2002).

The cognitive component of test anxiety is the most commonly found factor associated with the decline in performance (Hembree, 1988). In addition to the evidence available through traditional correlation studies and meta-analyzes, it has been confirmed that cognitive test anxiety has the closest connection to performance. While the analyzes did not demonstrate significant influence of the emotional component, the links between concern and academic

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results proved to be significant in adolescents (Williams, 1991) and students (Bandalos, Yates, & Thorndike-Christ, 1995).

Test anxiety and other variables (age and gender)

The results of gender-specific studies of test anxiety suggest that female subjects have repeatedly reported higher scores than male (Hembree, 1988; Zeidner, 1990; Chapell et al., 2005). However, there was no consensus among researchers about the causes of these gender differences. An explanation for the gender differences identified with respect to test anxiety contexts refers to the fact that both male and female subjects face similar anxiety levels of the "Worry" component, but female presented higher levels of the "Emotionality" component, which generates higher scores of global test anxiety (Deffenbacher, 1980).

Considerable research has investigated the relationship between test anxiety and its effect on school performance for students at all age levels. Hill and Sarason (1966) found in a 5-year longitudinal study among approximately 700 primary school children that there is a negative relationship between the scores of test anxiety and the results of the school tests, and the phenomenon has steadily increased during the next stages of schooling. In the first grade, the relationship between the two variables was negligible. For third-grade pupils, correlations were statistically significant, but modest (-.25). At fifth and sixth grades, correlations were moderate and significant, reaching -45. For the situation of high school students, the analysis of a data set has demonstrated that this relationship is even stronger, with a correlation between the scores of test anxiety and test results of -.60, for the pupils of the 11th grade (Hill, 1979; Sud & Sujata, 2006).

Self-efficacy and academic performance

Bandura (1977) defines self-efficacy as the levels of confidence that individuals have in their ability to perform certain actions or achieve specific outcomes. Thus, expectations of self-efficacy are assumed to influence the initial behaviors, the effort capacity to be consumed, and the degree of persistence in overcoming the difficulties encountered in performing a task (Bandura, 1977).

Studies conducted on the analysis of the relationship between self-efficacy and performance have taken into account different contexts, and their

results appear to support the existence of conditions that may influence the effect of this relationship (e.g., Wolters & Pintrich, 1998; Pajares, 1996).

Bandura (1997) argues that there are a number of conditions that play an important role in the relationship between self-efficacy and performance, such as: knowing the task to be achieved, a brief period between self-efficacy assessment and the task to be achieved and self-efficacy measures and performance that lie in the same behavioral domain.

In the educational environment, self-efficacy was related to persistence, tenacity and academic results (Bandura, 1986; Zimmerman, 1989). Bandura has suggested that individuals with high self-efficacy exhibit reduced anxiety, better working styles and better concentration. A meta-analysis of studies conducted in the educational environment (Multon, Brown, & Lent, 1991) found that the self-efficacy effect was related both to academic performance (r=.38) and persistence (r=.34).

Pajares (1996) found that academic self-efficacy is strongly correlated with academic performance among students (obtaining positive correlations ranging from r=.49 to r=.71). Chemers et al. (2001) also found that academic self-efficacy is a significant predictor of academic performance and expectations. In addition, researchers have found that as academic expectations and student self-efficacy increase, there is a greater likelihood for academic performance to increase (Chemers et al., 2001).

The fact that self-efficacy is a predictor of the performance of individuals has been highlighted by studies by some researchers interested in this topic (Bruch, Chesser, & Meyer, 1998). Lent and collaborators (1986) have shown that self-efficacy is a good predictor for grade point average. Students who are positive about their academic abilities (high self-efficacy) expect great exam marks and expect the quality of their work to gain benefits. The opposite is true for those students who do not have a high level of self-efficacy. Students who are not sure of their academic abilities provide poor grades before an exam.

A study by Collins (1982) included students with low, medium and high levels of self-efficacy in Mathematics. After being trained, the students were given the opportunity to solve new problems and correct the missed ones. Collins noticed that skills were related to performance, but regardless of skill level, students with higher levels of self-efficacy correctly solved more problems. Bouffard-Bouchard, Parent, and Larivèe (1991) observed that

students with high levels of self-efficacy were committed to using more efficient self-regulation strategies at each level of ability. Berry (1987) found that high levels of self-efficacy enhance students performance by enhancing perseverance.

The results of Zimmerman, Bandura and Martinez-Pons (1992) argue that self-efficacy directly influences academic achievements (ß=.21) and indirectly by increasing grade goals (ß=.36). The results of regulated learning variables support the fact that students who think they are capable of doing academic tasks use cognitive and metacognitive strategies to a greater extent, and insist more on tasks compared to those who do not trust in their abilities (Pintrich & Garcia, 1991).

In terms of the prediction power of academic achievements, self-efficacy has shown poor strength in student's grade point average prediction. The most powerful predictors are self-assessment of memory ability and locus of control (Wilhite, 1990). The same results were also obtained by Smith, Arnkoff, and Wright (1990), who tested the predictive power of three theoretical models on students' academic performance. Researchers have come to the conclusion that even if the variables in each model predict performance at a certain level, self-efficacy is a poor predictor. The findings of this research point out that when self-efficacy is measured globally and some criteria are not taken into account, prediction power is weak or even null.

Self-esteem and academic performance

Rosenberg and collaborators (1989) consider self-esteem as a product of social interaction that depends on reflections, social comparisons and self-attribution. Woolfolk (2005) defines self-esteem as an affective act and encapsulates the value we attach to our self- attribution. Demo (1992) argues that self-esteem is a stable variable over time. However, this conception was challenged by a number of theoretical and empirical arguments, including Rosenberg (1986) who suggested that self-esteem poses variations in the long term. He also argued that self-esteem is sensitive to daily events (good or bad) and that stability (or instability) can reflect the reactivity of an individual in these events. Legum and Hoare (2004) argue that the definition of self-esteem is difficult to formulate, and measurement is also problematic. Thus, there are two types of self-esteem: global and specific, both of which can be divided into other more specific categories (Rosenberg et al., 1995). Global self-esteem

measures the positive or negative attitude of an individual towards himself as a totality, particularly with regard to the psychological well-being of the individual, sometimes called self-esteem (Crocker & Major, 1989). Specific self-esteem measures a behavior, especially the behavior that is measured at a given time (Rosenberg et al., 1995). It is assumed that specific self-esteem is a better predictor of specific behaviors than global self-esteem because global self-esteem is far less likely to produce a direct effect on any behaviors or performances (Rosenberg et al., 1995). Some studies have shown that specific self-esteem is a predictor of academic performance, while global self-esteem is not. Thus, Crocker, and Wolfe (2001) argue that predictions improve when self-esteem is measured for the area of interest and among those who consider this area to be important for itself. If relevant domains are organized hierarchically, it is important to measure self-esteem at an appropriate level of specificity. If the field becomes too narrow, the assessment of specific self-esteem can only produce ambiguous results (Baumeister et al., 2003).

Bandura (1997) makes a clear distinction between self-efficacy and self-esteem. Self-efficacy refers to the self-evaluations of an individual regarding their capabilities to perform certain tasks whose results may or may not relate to self-esteem. For example, if a person has a high level of self-efficacy in a task or activity and also invests a lot of self-esteem, then the most likely between self-esteem and self-efficacy will positively correlate. But when there is a low level of self-esteem invested in that activity, there is little chance that these relationships exist (Bandura, 1997). Bandura (1997) also pointed out that a high level of self-esteem does not necessarily lead to performance.

The results of literature studies have shown that self-esteem has positively correlated with academic achievements (Harter, 1993; Johnson & Kanoy, 1980), psychological adjustment (Brownfain, 1952), successful social relationships (Grove, 1980) and personality traits such as self-confidence, self-expression, effort and leadership (Rosenberg, 1965 *apud* Janos et al., 1985). People with high self-esteem can set higher aspirations than people with a low level of self-esteem. They may be more willing to persist in the face of the initial failure and less susceptible to having paralyzing feelings of incompetence and self-doubt. The high level of self-esteem can stimulate confidence in solving difficult problems and allows individuals to gain satisfaction from progress and success (Baumeister et al., 2003).

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In a study conducted, Wylie (1979 *apud* Janos et al., 1985) concluded that the correlation between self-esteem and students' grade point averages was about .30. She noted that there are similar or slightly stronger relationships between self-esteem and scores in different performance tests. In a meta-analysis conducted by Hansford and Hattie (1982), 128 studies involving more than 200,000 participants were used. These studies explored a variety of measures of self-respect (most of them self-esteem) and a variety of objective performance measures, most of which were performance tests. The correlations reported varied greatly from -.77 to .96. Hansford and Hattie concluded that, in general, there is a significant positive relationship between self-esteem and academic performance, and self-esteem is somewhere between 4 and 7% of the variation in academic performance. Using standard achievement tests, Davies and Brember (1999) found positive, but weak relationships between self-esteem and academic performance among British students (N=3,001). Correlations ranged from .10 to .13. A somewhat stronger relationship was found by Bowles (1999), who demonstrated that self-esteem correlated to .29 with students' grade mid-term averages from Mathematics and English. Rubin, Dorle, and Sandidge (1977) found that self-esteem correlated with all their measures of achievement as well as teacher's assessments of student behavior and performance. However, the statistical analysis has shown that taking self-esteem into the prediction of academic achievements has not improved the predicted results using only variables such as socio-economic status and intelligence (IQ).

These and other findings generally indicate a positive, but weak and ambiguous relationship between self-esteem and school performance. Students with a high level of self-esteem generally did better at school and achieve better academic outcomes than low self-esteem students. Correlative results do not indicate whether self-esteem is a cause or outcome of school performance. Such causality has been investigated by Rosenberg et al. (1989). They found positive correlations, though weak, between self-esteem and self-reported grades, r=.24 in the 10th grade and r=.25 in the 12th grade. The authors conclude that self-esteem is the result of school results rather than vice versa. Thus, the results of the study support the fact that there was a modest causal relationship (.15) leading from grades to self-esteem, but the causal relationship leading from self-esteem to grades was only .08.

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Objective

The main objective of this study is to investigate how self-efficacy, self-esteem and test anxiety influence the performance of high school students at the educational competitions they participate in. We are also interested in investigating the relationships between self-efficacy, self-esteem, and test anxiety. We also want to see if self-efficacy and self-esteem are mediating variables in the relation of test anxiety and performance at educational competitions. Finally, we were interested in investigating the role that gender has in variations of test anxiety levels. We also want to identify other variables that can predict test anxiety experienced in the educational competitions to which adolescents take part. The literature highlights a number of variables that can influence the relationship between test anxiety and performance, such as social support (Sarason, 1981), academic achievement (Hembree 1988; Hancock, 2001; Burns, 2004), family relationships (Peleg-Popko & Klingman, 2002), perfectionism (Bieling, Israeli, Smith, & Antony, 2003), academic perceived control (Moore 2006) and fear of failure (Elliot & McGregor, 1999).

In this study, we also want to test other variables that we consider important in this relationship, such as the number of hours allocated to the study / day and students' grade point average.

Method

Participants

The subjects of this study will be represented by undergraduate high school students, grades IX-XII, with ages between 15 - 19 (N=253, 114 males and 139 female, M=16.91, SD=1.18) across the country, participants at national and / or international educational competitions (Olympics, disciplinary/interdisciplinary competitions) that have won or not various awards / medals. They will be selected from the public lists of the results of national and / or international competitions held in the current school year. The selected students participated in the following Olympics: Romanian Language and Literature, English, French, Italian, Portuguese, Spanish, Reading as Life Skills, Socio-Human Sciences, Religion, Geography, History, Mathematics, Biology, Informatics, Physics, Chemistry.

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Measures

Test Anxiety Inventory. Developed by Spielberger (1980), the Test Anxiety Inventory (TAI) is made up of 20 items. According to Chapell and collaborators (2005), the Test Anxiety Inventory (TAI) is the most important and often used tool in measuring test anxiety among high school students and university students. The TAI is a self-reporting questionnaire consisting of 20 items, available on three scales: Test Anxiety-Total (TAI-T) with items 1, 12, 13, and 19; Test Anxiety-Worry (TAI-W) containing items 3, 4, 5, 6, 7, 14, 17, 20; and the Anxiety-Emotionality Scale (TAI-E) consisting of items 2, 8, 9, 10, 11, 15, 16, 18. Test Anxiety Inventory is a scale of responses that are measured by 4 steps (Likert), and the choices among respondents are as follows: 1 - "Almost Never", 2 - "Sometimes", 3 - „Often "and 4 -"Almost Always ". The internal consistency for each of the three scales in the case of the version translated and adapted in Romanian for the competitive contexts was: .89 for TAI-T scale; .73 for the TAI-W scale; and .86 for the TAI-E scale, and for the entire instrument .86.

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was originally developed to measure the overall feeling of personal value and self-acceptance. The scale contains 10 items with 4 possible answers between total disagreement (1 point) and total agreement (4 points). Items 2, 5, 6, 8, 9 are inversely quoted. Scores may range from 10 to 40; high scores indicate high self-esteem. The Alpha Cronbach coefficient is .89, reported by the author, indicating good internal consistency, and test-retest fidelity included in the author's studies between .85 (one week interval) and .88 (two-week interval).

The General Self-Efficacy Scale (SES, Schwarzer & Jerusalem, 1995) comprises 10 items and is designed to evaluate the person's beliefs about their ability to cope with the difficulties encountered during the task. The scale was developed in 1981 in German by Matthias Jerusalim and Ralf Schwarzer and has so far been used in numerous studies, with adaptations for 33 languages. It can be said that the SES scale measures self-efficacy in adapting to everyday problems, confidence in setting goals, investing in effort and persistence in action. According to the authors, the Auto-Efficacy Scale shows good psychometric properties, with alpha Cronbach values between .82 and .93, according to the study. The test-retest declared validity is .47 for men and .63 for females for a sample of 991 subjects and a two-year interval. In a study

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conducted in order to validate it in the case of the Romanian population (Vasiliu et al., 2015), it obtained an Alpha Cronbach coefficient of .78.

Results

Regarding the gender differences between female and male subjects in terms of the level of test anxiety experienced, we present the identified results. By using t tests for independent samples, we notice a difference between the mean scores of the test anxiety for female subjects (M=43.4; SD=10.6) that are significantly higher (t=-1.9, df=251, p<.05) than those of male subjects (M=40.9; SD=9.4). In order to identify the differences between male and female subjects for the two dimensions of the anxiety test, we also used t tests for independent samples, and we notice that there are no significant differences of the level of cognitive test anxiety between the two groups (t=-1.45, df=251, p=.146). In the case of emotionality, differences between male and female subjects were identified as follows: mean scores of emotionality test anxiety for female subjects (M=17.65; SD=5.7) are significantly higher (t=-2.01, df=251, p<.05) than those of male subjects (M=16.32; SD=4.7).

Regarding the relationships between self-esteem, self-efficacy, test anxiety and performance at educational competitions, the results indicate that self-efficacy and self-esteem correlate negatively with test anxiety, with cognitive test anxiety dimension, emotionality test anxiety dimension, but there is no significant correlation between them and the achieved performance.

In Table 1 we present the correlations between self-esteem, self-efficacy, cognitive test anxiety, emotionality test anxiety, test anxiety (total score), and performance.

Table 1. Correlations between self-esteem, self-efficacy, cognitive test anxiety, emotionality test anxiety, test anxiety (total score), and performance

	1	2	3	4	5	6
(1) Self-esteem	-	.495**	-.406**	-.430**	-.447**	.120*
(2) Self-efficacy		-	-.295**	-.426**	-.381**	.043
(3) Cognitive test anxiety			-	.668**	.881**	.040
(4) Emotionality test anxiety				-	.919**	.011
(5) Test anxiety (total)					-	.018
(6) Performance						-

Note: **p<0.01 ; *p<0.05

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To test the mediation relationship, we initially wanted to identify if test anxiety is a predictor of self-efficacy and performance; then if self-efficacy is a predictor of performance. Then we will examine the relationship between performance, self-efficacy and test anxiety through a mediation relationship, where self-efficacy is seen as a mediator between performance and test anxiety.

In *Table 2* are presented the results obtained in the simple regression analyzes of test anxiety, performance and self-efficacy.

Table 2. Simple regression results of Test Anxiety, Performance and Self-Efficacy

Variable	Predictor	R	R²	Δ R²	ß	Std.Err.	Beta	t
Self-efficacy	Test anxiety	.381	.145	.142	-.18**	.029	-.38	-6.5
Performance	Test anxiety	.018	.000	-.004	.003	.009	.018	.290
Performance	Self-efficacy	.043	.002	-.002	.013	.018	.043	.677

Note: **p<.01

As we can see, an existing mediation relationship between test anxiety and performance, where self-efficacy is a mediating variable, is unlikely. However, we have verified this relationship, and the indirect effect of test anxiety towards performance was statistically insignificant (-.0032, CI[-.0112, .0040] Sobel test z=-.8341, p=.4042).

To test the mediation relationship for the second case, we initially wanted to identify the if test anxiety is a predictor of self-esteem and performance; then if self-esteem is a predictor of performance. Then we will examine the relationship between performance, self-esteem and test anxiety through a mediation relationship where self-esteem is seen as a mediator between performance and test anxiety.

In Table 3 are presented the results obtained in the simple regression analysis of test anxiety, performance and self-esteem.

Table 3. Simple regression results of Test Anxiety, Performance and Self-Esteem

Variable	Predictor	R	R²	Δ R²	ß	Std.Err.	Beta	t
Self-esteem	Test anxiety	.447	.20	.196	-.21**	.027	-.447	-7.9
Performance	Test anxiety	.018	.000	-.004	.003	.009	.018	.290
Performance	Self-esteem	.120	.014	.010	.03*	.019	.120	1.91

Note: **p<.01 ; *p<.05

As we can see, there is no direct association between the test anxiety and performance, but when self-esteem acts as a mediator variable then it becomes statistically significant. The indirect effect of test anxiety over

performance was poorly but statistically significant (-.0104, CI[-.0215, -.0022] Sobel test z=-2.18, p<.02).

Another objective of this study was to identify predictors of test anxiety that could influence its level. Table 4 presents the correlations between test anxiety, self-esteem, self-efficacy, grade point average, and hours of study/day.

In Table 4 are presented the correlations between test anxiety, self-esteem, self-efficacy, grade point average and number of hours allocated to the study/day.

Table 4. Correlations between test anxiety, self-esteem, self-efficacy, grade point average and number of hours allocated to the study/day

	(1)	(2)	(3)	(4)	(5)
(1) Test anxiety	-	-.447**	-.381**	-.024	-.152*
(2) Self-esteem		-	.495**	-.016	-.025
(3) Self-efficacy			-	.031	-.092
(4) Grade point average				-	.288**
(5) Study hours/day					-

Note: **p<.01 ; *p<.05

In this analysis, we will use the Self-esteem, Self-efficacy and Study hours/day variables to identify the model that best explains the variance of the criterion. We note that the grade point average variable does not correlate with test anxiety, so it was not included in this analysis.

Table 5 presents the results of Multiple Predictors for Test Anxiety: Self-esteem, Self-efficacy and Study hours/day.

Table 5. Multiple regression of predictors for Test Anxiety: Self-esteem, Self-efficacy and Study hours/day

Variable	R	R²	ß	Std.Err.	Beta	t
Self-esteem	.447	.200	-.714	.132	-.337**	-5.38
Self-efficacy	.483	.233	-.466	.126	-.231**	-3.68
Study hours/day	.516	.266	-1.9	.575	-.182**	-3.33

Note: **p<.01

Conclusions

The main objective of this study was to investigate the relationship between test anxiety and the performance of the high school students who participate on educational competitions as well as the influence of certain

variables on this interaction. In a first step, we wanted to find out if the level of test anxiety differs depending on the gender variable. Thus, we noticed that female subjects experience a higher level of test anxiety. These results corroborate with those obtained by other researchers in the field as Hembree (1988), Zeidner (1990), and Chapell and collaborators (2005). Deffenbacher (1980) argues that both male and female subjects face similar anxiety levels of the "worry" component, but the latter exhibit higher levels of the "emotionality" component, and this generates higher scores of overall test anxiety. The same results have been obtained in our case by analyzing the variations of test anxiety of each of its components (cognitive/worry and emotionality). It has been found that statistically significant differences have not been identified on the cognitive component of the test anxiety, meaning both female and male participants experience the same level of cognitive test anxiety in the educational competitions they take part in. What determines the existence of a difference in total scores of test anxiety consists of the scores obtained at the emotionality component of test anxiety, where female subjects riched significantly higher scores. Thus, we can argue that girls participating in educational competitions exhibit biological and body type reactions that are associated with anxiety (increased heart rate, headaches, sweating, etc.) to a greater extent than boys.

The results obtained support the fact that both self-esteem and self-efficacy have a negative relationship with test anxiety (as a total score), but also with each of its dimensions (the cognitive dimension and the emotionality dimension of test anxiety). Thus, we can argue that participants in competitions with a high level of test anxiety experience low self-esteem ($r=-.447$, $df=251$, $p<.001$). The same can be said in the case of self-efficacy, namely that participants with a level of test anxiety have a low level of self-efficacy ($r=-381$, $df=251$, $p<.001$). The results obtained are complementary to those obtained by Hodapp and Benson (1997), Keith (2003) and Ringeisen (2010) performed on a group of adolescents. Test anxiety is defined as the predisposition of an individual to react through a state of excessive concern, intrusive thoughts, mental disorganization, tension, and physiological activation when exposed to an evaluation situation (Sarason, 1980; Spielberger & Vagg, 1995). The existence of these concerns or thoughts during an evaluation situation can affect the level of self-esteem and self-efficacy of the participants in the Olympics. Olympics' tests involve complex work tasks, carried out in a

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determined time. The mere fact that these teenagers compete with other colleagues implies the need for a level of self-confidence and trust in their ability to accomplish those tasks. Once they interfere with the concerns and thoughts that disrupt the focus on activity, then there is also a lack of confidence in the ability to successfully complete work tasks (Zeidner & Matthews, 2011). The fact that there is a possibility of getting poor results, or experiencing shame/embarrassment, and the fact that they might disappoint some important people around them are some of the consequences that students perceive as threatening (Zeidner, 2007; Pekrun et al., 2011). Thus, we may believe that the presence of a high level of test anxiety can have a negative impact on the levels of self-esteem and self-efficacy needed in an academic competition. However, there may be a reverse situation. Thus, expectations of self-efficacy are assumed to influence the initial behaviors, the effort capacity to be consumed, and the degree of persistence in overcoming the difficulties encountered in performing a task (Bandura, 1977). Woolfolk (2005) argues that self-esteem encapsulates the value we attach to our self-evaluations. Considering all of this, we can argue that participants who generally do not have a high level of self-efficacy and self-esteem may display a high level of test anxiety when competing in an educational competition, precisely from this reason. Mistrust in their own efforts to successfully accomplish the tasks they receive in the competition and their poor self-worth can cause the participant to have intrusive thoughts and excessive concerns about his ability to achieve a good result. Bandura (1977) has suggested that individuals with high self-efficacy exhibit reduced anxiety, better working styles and better concentration.

What was interesting to note about the results was that performance did not show any relationship with any of the variables that were analyzed, and only with self-esteem. Thus, the performance did not significantly correlate with either self-efficacy or test anxiety (or its dimensions, cognitive/worry and emotionality), but only with self-esteem. This is interesting because there have been many studies that have suggested that test anxiety interferes with academic performance (e.g., Hill, 1979; Zeidner, 1998; 2007), especially the cognitive component of test anxiety, wich is the most commonly found factor being associated with declines in performance (Hembree, 1988). It was also surprising that neither self-efficacy did not show a relationship with performance. The results of Zimmerman, Bandura and Martinez-Pons (1992) and Pajares (1996) argue that self-efficacy directly influences academic

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achievement. A meta-analysis of studies conducted in the educational environment (Multon, Brown, & Lent, 1991) found that the self-efficacy effect was linked both to academic performance and persistence. Chemers and collaborators (2001) also found that academic self-efficacy is a significant predictor of academic performance and expectations. We consider the high level of self-efficacy as necessary in an educational competition, especially because the results of regulated learning variables studies argue that students who think they are capable of doing academic tasks use cognitive and metacognitive strategies to a greater extent and insists more on tasks compared to those who do not trust in their capabilities (Pintrich & Garcia, 1991). In terms of self-esteem, the results of literature studies have shown that self-esteem correlated positively with academic achievements (Johnson & Kanoy, 1980; Harter, 1983), psychological adjustment (Brownfain, 1952; Grove, 1980) and personality traits such as self-confidence, self-expression, effort and leardership (Rosenberg, 1965). Thus, participants of educational competitions with high level of self-esteem can set higher aspirations than those with a low level of self-esteem. They may be more willing to persist in the face of the initial failure and less susceptible to self-doubt. The high level of self-esteem can stimulate confidence in solving difficult problems and allows individuals to gain satisfaction from progress and success (Baumeister et al., 2003). So, we believe that in the case of competitions, students who have a higher level of self-esteem are getting better performance. Considering that high self-esteem is a way for competitors to persist in the work tasks until there are well-done, and the fact that they will be more confident in overcoming the difficulties encountered during competition trials will help them also. Our results indicate that performance and self-esteem are positive associated in the context of educational competitions. Thus, we can believe that self-confidence as well as the skills in achieving work tasks are important aspects that favor student performance in a competition.

A second objective of this study was to identify if self-esteem and self-efficacy can be considered as mediating variables in the test anxiety and performance relation. As self-efficacy has only shown a negative relationship with test anxiety and no interaction with performance, this model was impossible. However, self-esteem could be considered a mediating variable, and the indirect effect of test anxiety on performance was weak but statistically significant (-0104, CI [-0.215, -.0022] Sobel test z=-2.18 , p<.02). We can see

that test anxiety is a predictor variable for self-esteem, but not for performance, and self-esteem is a predictive variable for performance. Thus, we can argue that regardless of whether test anxiety has no influence on performance, when subjects exhibit a low level of self-esteem, this interaction takes place and the effect is negative on performance. This can be explained by the fact that high levels of self-esteem have a beneficial effect on performance, as various studies have shown this. For example, Baumeister (2003) argued that a high level of self-esteem can stimulate confidence in solving difficult problems, and allows individuals to gain satisfaction from progress and success, especially in an educational competition. Students with a high level of self-esteem generally did better at school and achieved better academic outcomes than low self-esteem students. The problem arises when test anxiety is experienced, and has a negative relationship with self-esteem, so this interaction explains our results. Thus, our results indicate that when participants in educational competitions experience a high level of test anxiety their level of self-esteem decreases and this also affects their performance in the competition. Therefore, in the absence of a high level of test anxiety the performance will increase due to self-esteem that is not affected by this.

For the final objective of this study, we focused on identifying some predictors of test anxiety. The literature suggests a number of variables that can influence the level of test anxiety, such as social support (Sarason, 1981), academic achievement (Hembree, 1988; Hancock, 2001; Burns, 2004), family relationships (Peleg-Popko & Klingman, 2002), perfectionism (Bieling et al., 2003), perceived control (Moore, 2006) and fear of failure (Elliot & McGregor, 1999). We wanted to investigate the contribution that other variables, such as the number of hours allocated to the study/day and grade point average, may have in determining the level of test anxiety experienced in an educational competition. Thus, we investigated the relationships between self-esteem, self-efficacy, the number of hours allocated to the study/day, grade point average and test anxiety. We notice that grade point average (GPA) did not present any interaction with test anxiety, and for this reason this variable was not included in our prediction model. Thus, the results obtained support the fact that self-esteem explains in a proportion of 20% of the test anxiety, self-efficacy together with self-esteem explains a proportion of 23% and when counting number of hours allocated to the study/day, this proportion increases to 26%. Thus, we can conclude that the three variables, self-esteem, self-efficacy and

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number of study hours/day together account for 26% of the test anxiety variance. These results can be very useful to both teachers and students participating in educational competitions, as they can identify some of the issues that affect the level of anxiety experienced in a competition. Increasing the level of self-confidence, the ability to persist in the face of failure, and avoiding feelings of incompetence and self-doubt, as well as increasing the hours allocated to the study, can lead to more effective control of test anxiety through intrusive thoughts and excessive worries that lead to a decrease in concentration and efficacy in solving the tasks received. We believe that making an effective control of the test anxiety experienced in educational competitions can be an important objective not only to increase the performance of the participants, their well-being, but also to encourage other students to take part in such activities ; and especially those students who are afraid that they may experience failure or disappointment by participating in an educational competition. So, these findings of the study may be a starting point for teachers and school counselors to support the students with high abilities in an academic field who wish to improve their talents or meet their expectations by achieving remarkable results in an educational competition. Taking into account the aspects related to the variables that influence the performance, teachers and counselors may consider these potential impediments and design various training activities or programs to teach students how to better manage those things that can help them achieve the success.

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