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CAN AUTOMATIC THOUGHTS AND TEST ANXIETY EXPLAIN SCHOOL SUCCESS AND SATISFACTION IN ADOLESCENTS?

School situation, especially the one in class, causes a certain level of anxiety in most children and adolescents and arouses thinking about testing, grades, accomplishments, and possible success and failure. Based on cognitive-behavioral model, this research aimed to explore possible developmental differences in the role that automatic thoughts and test anxiety have in explaining school success and satisfaction in adolescents; and to examine possible differences in prominence of the examined variables in relation to sex. The data were obtained in one primary and one secondary school in Stip, R. Macedonia, at the end of the second term of the 2010/2011 school year. The sample consisted of 110 students, aged 13-14 years, from the 7th and 8th grade of primary school, and 120 students, aged 15-16 years, from 1st and 2nd year of secondary school, of which 148 were female, and 82 male. We have used the adapted scale for the assessment of automatic thoughts during learning (Živčić-Bećirević, 2003); an adapted version of Spielberg's Test Anxiety Inventory; Likert scale for satisfaction with themselves as students; and assessment of overall school success. All three types of negative thoughts were significant predictors of school success, while positive thoughts and negative thoughts related to fear of failure and fear of disappointing parents were significant predictors of student satisfaction as students. Girls have more negative thoughts related to fear of failure than boys do, which is also reflected on their higher test anxiety and they are at the same time less satisfied with their school achievements than boys. While there is no difference in the frequency of positive thoughts, older students have more negative thoughts than younger ones, as well as higher test anxiety. It is also notable that negative automatic thoughts related to fear of disappointing parents have significant effect on the success and satisfaction only in older group of students.

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Introduction

Traditional education in the Republic of Macedonia is competitive, with testing situations in schools that are supposed to carry a high degree of anxiety. Unfortunately, there are no empirical data on this assumption.

This is the first survey in the Republic of Macedonia, which indicates not only the importance of studying the test anxiety and the role of automatic thoughts in adolescents, but the need for other studies that would have institutional support and application of results as well.

Test anxiety occurs in everyday life situations, regardless of the period in life when such situations are assessed, our abilities, achievements, and interests evaluated. Test anxiety is one of the most common factors that impede success in school (Birenbaum & Nasser, 1994, according to Lufi, Okasha, & Cohen, 2004).

School situation, especially the one in class, causes a certain level of anxiety in most children and adolescents and arouses thinking about testing, grades, accomplishments, and possible success and failure (Živčić-Bećirević & Anić, 2001). Thus availability and recognition of respective negative and positive automatic thoughts are ensured.

The cognitive model emphasizes the impeding impact of negative automatic thoughts on behavior and mood (Southwick, Litz, Charney, & Friedman, 2011). Studies conducted in test situations in schools find that negative thoughts are positively associated with test anxiety and that negative thoughts, test anxiety and worry are negatively associated with academic success (according to Diaz, Glass, Arknoff, & Tanofsky-Kraff, 2001).

This pattern of negative repetitive thought is presented in anxious youth (Comer, Kendall, Franklin, Hudson, & Pimental, 2004; Hodson, McManus, Clark, & Doll, 2008) and has been shown to be associated with poor problem solving skills, impaired motivation, and inhibition of instrumental behaviour (Lyubomirsky & Tkach, 2004).

There are number of researches reporting text anxiety as one of the major cause for students' underachievement and low performances at different levels of their educational life and has been shown to affect students' ability to profit from instruction (Oludipe, 2009).

Most studies that have attempted to explain academic failure support the significant relationship between test anxiety (fear of testing) and academic failure (Benjamin, McKeachie, Lin, & Holinger, 1981; Donnelly, Renk, Sims, & McGuire, 2011;

McKeachie, 1984; Rana & Mahmood, 2010). Most previous studies have suggested that high anxiety has an interfering impact, thus inducing the occurrence of reactions that are irrelevant to performing the tasks, which in turn impedes further successful task performance.

Based on cognitive-behavioral model, and bearing in mind the relevance for clinical and educational practice this research aimed to:

1. explore possible developmental differences in the role that automatic thoughts and test anxiety have in explaining school success and satisfaction in adolescents;
2. examine possible differences in prominence of the examined variables in relation to sex;

If there are significant gender differences found, it could impact educational practices to promote gender-friendly testing and testing methodology; however, since this study is only looking at general test anxiety, it could lead to further research in the area of subject specific anxiety.

The relevance of this kind of research is obvious especially for educational practice in the area of teachers and students' educational strategies which could enhanced level of anxiety, and methods, programs and strategies for prevention and reduction of test anxiety.

Method

Sample and procedure

The data were obtained in one primary and one secondary school in Stip, R. Macedonia at the end of the second term of the 2010/2011 school year. The sample consisted of 110 students, aged 13-14 years, from the 7th and 8th grade of primary school, and 120 students, aged 15-16 years, from 1st and 2nd year of secondary school, of which 148 were female, and 82 male.

The research was conducted anonymously during regular classes (per class hour). The goal was explained to the students briefly before the research, and after that they were directed to positive, encouraging thoughts, using relaxation technique.

Instruments

Questionnaire for automatic thoughts in the course of learning. The adjusted scale for assessment of automatic thoughts in learning and taking exams (Živčić-Bećirević, 2003) for adolescents was used. The questionnaire consists of 48 items, and the examinee assesses the frequency of occurrence of some thoughts on a scale of 4 degrees. The total score of the scales is not calculated, and the result of individual subscales is determined by the linear shrinkage of estimates. According to the authors of the original scale for students (Živčić-Bećirević, 2003), the scale resulted in 4 factors: fear of failure, positive thoughts, fear of disappointing parents, lack of motivation and disinterest in the content.

By means of factor analysis of common factors, with Varimax rotation, results similar to those in the research of the authors of the questionnaire (Živčić-Bećirević, 2003) were obtained. Four factors were confirmed, the first of which contains 18 items that reflect negative expectations and fear of failure, and explain 15.50% of the variance.

The second factor contains 16 items that reflect positive, encouraging thoughts, and explain 9.28% of the variance. The third factor contains 7 items that reflect the fear of disappointing parents and explain 9.05% of the variance, and the fourth factor relates to lack of motivation and interest in learning and explains 8.52% of the variance. All four factors together explain 42.35% of the total variance. Internal consistency (Cronbach alpha) on Macedonian sample for each of the subscales and for the total scale vary from .81 to .84, respectively.

Test anxiety questionnaire. In addition to automatic thoughts during learning, students also assessed their test anxiety with Spielberg's questionnaire for test anxiety as traits for students (Spielberg, an adapted version of the questionnaire for test anxiety as a trait for students, according to Arambašić et al., 1989). The questionnaire consists of 32 items that describe symptoms of test anxiety, and the examinee assesses the frequency of their appearance on a scale of 4 degrees.

Factor analysis of common factors with Varimax rotation confirmed the findings of previous research (e.g. Živčić-Bećirević, 2003). Two factors were established which together explained 31.28% of the total variance.

The first factor explains 16.30% of the variance and includes items that describe cognitive aspects of test anxiety, while the other factor explains 14.98% of the variance, and includes particles that describe physiological and emotional signs of test anxiety. The scale was reported as having good internal consistency on Macedonian sample. Cronbach alpha coefficient was .80. School success is determined by an assessment of overall school success at the end of the previous grade.

The general success is in the range from 2 to 5 and the average is 4.30. Students also assessed the satisfaction with themselves as students (as subjective estimation for their academic achievements as students) on Likert scale of 4 degrees (1-4), and the average estimate is 2.98.

Results and discussion

In this part we showed and interpreted the results regarding the main aims of the research. In order to check the age, developmental differences in prominence of individual measures t-tests are calculated.

Students are divided into two age categories, with younger students aged 13-14 years clustered into one group, and older at the age of 15-16 years are clustered into another group. The results are shown in Table 1.

Table 1
Age differences in prominence of the examined variables

Variable	<i>M</i>		<i>SD</i>		<i>t</i>	<i>p</i>
	Younger	Older	Younger	Older		
AT – fear of failure	17.35	21.10	11.25	11.14	4.53	< .001
AT – fear of disappointing parents	6.82	8.02	5.25	5.21	2.54	.014
Positive Automatic Thoughts	28.15	29.42	8.22	6.89	1.32	.146
AT – lack of motivation	5.45	7.82	4.53	5.11	5.33	< .001
Test anxiety – (cognitive)	30.12	31.35	7.60	7.98	2.09	.011
Test anxiety – (physiological)	36.74	38.10	8.12	9.10	1.78	.065
School success	4.38	4.19	.78	.83	1.98	.063
Satisfaction with themselves as students	2.08	2.08	.88	.76	.038	.990

Legend: AT - Automatic Thoughts

It is established that older students have more strongly expressed two types of negative automatic thoughts, while there are no differences in the frequency of positive thoughts. This could be explained by the more complex cognitive development and more complex thinking, as well as by using inner speech in control of their behavior and emotional experience (Steinberg, 2006). Younger students

have a borderline better school success. Both age groups do not differ in satisfaction with school achievements.

The contribution of automatic thoughts and test anxiety to the students' success and satisfaction, respectively in the group of younger students and in the group of older students, is determined by applying stepwise regression analysis. The results are shown in Table 2.

Table 2
Significant predictors of school success in both age categories of students

Predictors	Younger students	Older students
	β	β
AT – fear of failure	-.367**	n.s.
Positive Automatic Thoughts	n.s.	n.s.
AT – fear of disappointing parents	n.s.	-.169*
AT – lack of motivation	.158*	n.s.
Test anxiety – (cognitive)	-.269*	-.370**
Test anxiety – (physiological)	.310**	.411**
	$R = .39; R^2 = .15$ $F(7,586) = 7.54^{**}$	$R = .48; R^2 = .23$ $F(8,105) = 16.79^{**}$

Legend: AT - Automatic Thoughts; ** $p < .001$, * $p < .01$, n.s. - not statistically significant

As can be seen from Table 2, the cognitive aspect of test anxiety (worry) has a negative effect, and the physiological aspect of test anxiety has a positive effect on school success in both age groups. Negative automatic thoughts that reflect the fear of failure are a significant negative predictor, and those that reflect lack of motivation and interest in the material are a positive predictor of school success only in the group of younger students, but not in the group of older students. On the other hand, negative automatic thoughts that reflect the fear of disappointing parents are a negative predictor of school success only in students in the older age category, but not in the younger category.

When test anxiety occurs for the first time, it cannot be determined with certainty, although there is a presumption that it occurs between the seventh and the fifteenth year (Lacković-Grgin, 2006). The intensity of test anxiety grows in the function of developmental periods, following the curve of negative acceleration (it first grows rapidly, then its growth slows down, and eventually around the

eighteenth year it stabilizes at the achieved level). These changes are taking place simultaneously with the changes in cognitive development. Developed logical thinking allows better prediction of possible violations of self-esteem (Lacković-Grgin, 2006).

Table 3
Significant predictors of satisfaction with themselves as students in both age categories of students

Predictors	Younger	Older
	β	β
AT – fear of failure	-.242*	-.312**
Positive Automatic Thoughts	.147*	.158**
AT – fear of disappointing parents	n.s.	-.178*
Test anxiety – (cognitive)	-.231*	-.195*
Test anxiety – (physiological)	n.s.	.184*
School success	.229**	n.s.
	$R = .53; R^2 = .28$ $F(6,941) = 12.82^{**}$	$R = .51; R^2 = .26$ $F(7,312) = 20.12^{**}$

Legend: AT- Automatic Thoughts; ** $p < .001$, * $p < .01$, n.s. - not statistically significant

From Table 3 it can be seen that a grade as a relatively objective measure of school success is a significant predictor of satisfaction with oneself as a student, as a subjective measure of success, but only in younger students, not in older ones. Again, as in the research performed by Živčić-Bećirević (2003), it is confirmed that fear of disappointing parents is an important predictor of satisfaction with oneself as a student, but only in the group of older students. Additional studies need to be conducted to investigate the role of parents and peers as predictors of adolescents' satisfaction.

As for physiological anxiety, it has less impact on satisfaction with oneself than on students' achievement, especially in the younger group. Positive thoughts, contrary to expectations, contribute to the explanation of satisfaction, but not of students' success from both age categories. In order to test for differences in gender in the prominence of the investigated variables t-tests for large samples are calculated. The results are shown in Table 4.

Table 4
Prominence of automatic thoughts, test anxiety, and school success and satisfaction in girls and boys

Variable	<i>M</i>		<i>SD</i>		<i>t</i>	<i>p</i>
	Boys	Girls	Boys	Girls		
AT – fear of failure	18.98	22.00	10.80	10.35	2.18	.013
AT – fear of disappointing parents	5.88	6.35	.40	.42	1.27	.274
Positive automatic Thoughts	28.30	30.28	8.45	7.45	1.43	.123
AT – lack of motivation	8.32	7.88	5.12	4.35	.84	.468
Test anxiety – (cognitive)	30.12	29.00	8.16	8.86	5.45	< .001
Test anxiety – (physiological)	33.85	40.99	8.45	8.51	4.12	.014
School success	4.18	4.37	.79	.71	6.42	< .001
Satisfaction with themselves as students	2.12	2.04	.79	.78	2.18	.027

Legend: AT - Automatic Thoughts

Analysis showed that girls have more negative automatic thoughts that reflect their fear of failure, as well as a more intensive test anxiety. Lewinsohn et al. (1998) suggested that adolescent girls are more likely to reflect and self-focus when distressed whereas adolescent boys distract themselves.

Lewinsohn et al. (1998) used Nolen-Hoeksema's theory to suggest that perhaps girls ruminate more on future events than boys do. In general, girls are more susceptible to such negative self-evaluative processes and ruminative concerns than boys, and these sex differences may intensify during adolescence (Broderick, 1998; Nolen-Hoeksema, 2002). Between girls and boys, no significant differences in frequency of other, neither negative nor positive, automatic thoughts were determined. Girls achieved better objective school success, but it is interesting that, unlike them, boys are more satisfied with their school achievements. To identify the contribution of automatic thoughts and test anxiety to students' success and satisfaction, a stepwise regression analysis was conducted, respectively for girls' and boys' group. The results are shown in Tables 5 and 6.

Table 5
Significant predictors of school success of girls and boys

Predictors	Girls	Boys
	β	β
AT – fear of failure	-.202**	-.247*
AT – fear of disappointing parents	-.201*	n.s.
AT – lack of motivation	.156*	n.s.
Test anxiety – (cognitive)	-.302**	-.411**
Test anxiety – (physiological)	.305**	.403**
	$R = .38; R^2 = .14$ $F(7,981) = 8.96^*$	$R = .41; R^2 = .17$ $F(8,031) = 9.75^{**}$

Legend: AT- Automatic Thoughts; ** $p < .001$, * $p < .01$, n.s. - not statistically significant

The analysis showed that the cognitive aspect of test anxiety (worry) has the strongest negative effect on school success for girls and boys, while the physiological aspect of test anxiety has a positive effect on the success of students of both sexes.

These data are consistent with the data obtained in surveys conducted by Živčić-Bećirević (2003), as well as with the data by a number of other authors (according to Spielberger & Vagg, 1995).

As can be seen from Table 5, negative automatic thoughts focused on fear of failure have an impeding effect on school success of students of both sexes, while thoughts that reflect fear of disappointing parents have a negative effect only on girls' success.

Automatic thoughts that reflect lack of interest and motivation for learning have a positive effect on the success of girls, while not affecting the success of boys.

Table 6
Significant predictors of satisfaction with themselves as students in girls and boys

Predictors	Girls	Boys
	β	β
AT – fear of failure	-.220*	-.315**
Positive Automatic Thoughts	.125*	.141*
AT – fear of disappointing parents	-.158*	-.198*
Test anxiety – (cognitive)	-.298**	n.s.
Test anxiety – (physiological)	.203*	n.s.
	$R = .49; R^2 = .24$ $F(7,988) = 15.58^{**}$	$R = .50; R^2 = .25$ $F(7,439) = 14.58^{**}$

Legend: AT - Automatic Thoughts; ** $p < .001$, * $p < .01$, n.s. - not statistically significant

As can be seen from Table 6, negative thoughts that reflect fear of failure and fear of disappointing parents are significant negative predictors, and positive, encouraging automatic thoughts are an important positive predictor of satisfaction with oneself in students of both sexes.

Negative automatic thoughts that reflect lack of interest and motivation for learning do not contribute significantly to students' satisfaction. In girls, unlike in boys, the cognitive aspect of test anxiety is negative, and the physiological aspect is a positive predictor of satisfaction.

While a stronger degree of worrying hinders the experience of satisfaction for girls, enhanced physiological incitement may be a sign of activation and engagement in the tasks and in the desire for achievement and as such it contributes to a greater experience of satisfaction.

Conclusion

It is important to consider some of the limitations of the study as they provide an important perspective for understanding the results obtained. First, based on the above discussion, the primary limitation of this study appears to be due to difficulty in the operational definitions of the variables examined. A second limitation may be related to the sample used for the present study. The sample was convenient and it was restricted with respect to representativeness of Macedonian adolescents.

Cognitive models of psychopathology have emphasized the role of cognitions in the development of affective disorders. As for negative automatic thoughts, it seems that thoughts focused on fear of disappointing parents are somewhat less significant among younger students than in research of older students (e.g. Živčić-Bećirević, 2003). A weaker influence of negative automatic thoughts in this research is confirmed by the results of the conducted regression analysis. Comparably, between the two age subcategories in the sample of this research, it appears that the fear of disappointing parents is a significant predictor of school success and satisfaction with oneself as a student only in older but not in younger children.

On the other hand, automatic thoughts that reflect a lack of motivation and interest in the content are a significant predictor of school success only in younger children and girls, but they do not explain the school success of either older students or boys. A possible explanation would be that younger students, especially girls, are more obedient in doing their school commitments and homework, and are thus probably more persistent in learning the material that they themselves assess as useless and annoying. These thoughts do not contribute to explaining the satisfaction of students, regardless of their gender and age. Positive thoughts are not shown as significant predictors of school success. It was shown that positive thoughts are not significantly associated with any type of negative automatic thoughts during learning. These and the results of similar research (e.g. Živčić-Bećirević, 2003) suggest a greater need to control negative and destructive thoughts, while targeting positive thoughts is less useful.

The conclusion is that in assessing the school successes and satisfaction with themselves as students, particular attention should be focused on identifying thoughts, beliefs and attitudes that students have during the test situation and their own power to prevail these problems. Clinical experience in working with students with learning difficulties and taking tests (examinations) also points to the importance of identifying and modifying negative automatic thoughts. Cognitive techniques for identification and modification of negative automatic thoughts, often lead to significant reduction of emotional discomfort, they improve concentration and performance in learning, and they relieve test anxiety (Cohn, 1998). On the other hand, teaching students to use positive, encouraging automatic thoughts (by means of techniques of self-instruction) also gives positive results in raising motivation and increasing persistence in learning.

Due to the increased rate of test anxiety, there has been a need for many teachers to find a way to help their students who experience test anxiety, succeed, and do well on tests. There are many teachers who have found that specific strategies work better for some students and some work better for others (Erbe, 2007; Flannery, 2008; Huberty, 2010; Paul, Elam, & Verhulst, 2007; Stowell & Bennett, 2010). One obvious problem many teachers notice is that students are doing poorly on their

assessments, but they do not realize that some of these students have moderate to severe test anxiety. Since test anxiety research is relatively new, there are still teachers who are not aware of this form of anxiety. They have not been given the opportunity to help their students since they are unable to identify this it, and in turn provide students with strategies to help increase test scores. Future research is still needed to focus on teacher training for test anxiety, as well as strategies to assist students with test anxiety.

Given the significance of school successes and satisfaction in the lives of children and adolescents, these findings have important implications for further research in education in R. Macedonia and clinical practice.

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