The Relationships among Test Anxiety, Study Habits, Achievement, Motivation, and Academic Performance among Turkish High School Students*

Lise Öğrencilerinin Sınav Kaygısı, Çalışma Alışkanlıkları, Başarı Güdüsü ve Akademik Performans Düzeyleri Arasındaki İlişkilerin İncelenmesi

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Abstract

The relationships among study habits, test anxiety, achievement, motivation, and academic success were investigated in a Turkish tenth grade high school sample consisting of 510 participants, 267 (52.4%) of whom were females and 243 (47.6%) were males. The data were collected by the Turkish version of Test Anxiety Inventory (TAI), Study Habits Inventory (SHI) and Self Evaluation Inventory (SEI). Students' GPA was accepted as the indicator of their academic success. Small but significant correlations were found between the worry subscale of TAI scores and academic success ($r = - 0.18$, p 0.01), and between the Study Habits Scale scores and academic success level ($r = 0.15$, $p < 0.01$). A positive relationship between study habits scores and achievement motivation level ($r=.39$, p 0.01) was found. Gender, worry subscale of TAI and study habits predicted academic success in general. No correlation was observed between achievement motivation and academic success. Test anxiety and study habits were associated positively with academic success and there was no association with achivement motivation. Females were significantly higher in test anxiety scores as consistent with the literature. The results were discussed in the light of the literature.

Keywords: Test anxiety, worry, emotionality, achievement motivation, academic success, study habits, secondary school students

Öz

Lise onuncu sınıf öğrencilerinin bulunduğu 510 kişiden (267, % 52,4 Kız; 243, %47,6 Erkek) oluşan bir örneklem üzerinde öğrencilerin çalışma alışkanlıkları, sınav kaygısı, başarı güdüsü ve akademik başarı düzeyleri arasındaki ilişkiler incelenmiştir. Veriler, Sınav Kaygısı Envanteri Türkçe versiyonu (TAI), Çalışma Alışkanlıkları Envanteri (ÇAI) ve Kendini Değerlendirme Envanteri (SEI)'den elde edilmiştir. Öğrencilerin okullarından elde edilen akademik ortalamaları, akademik başarı düzeyleri olarak belirlenmiştir. Sınav Kaygısı Envanteri kuruntu alt boyutu puanları ile akademik başarı düzeyi arasında anlamı bir ilişki ($r = - 0.18$, $p < 0.01$), çalışma alışkanlıkları ölçeğinden alınan puanlar ile akademik başarı düzeyi arasında ($r = 0.15$, $p < 0.01$) ve çalışma alışkanlıkları ile başarı güdüsü arasında ($r =.39$, $p<0.01$) anlamlı yönde bir ilişki bulunmuştur. Öğrencilerin cinsiyeti, sınav kaygısının kuruntu boyutu ve çalışma alışkanlıkları düzeylerinin genel olarak akademik başarıyı yordadığı belirlenmiştir. Başarı güdüsü düzeyi ile

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akademik başarı ilişkili bulunmamıştır. Sınav kaygısı ve çalışma alışkanlıkları akademik başarı ile olumlu yönde ilişkiliyken, akademik motivasyon arasında bir ilişki gözlenmemiştir. Kızların sınav kaygısı düzeyinin erkeklere göre, literatürü de destekler bir biçimde daha yüksek olduğu tespit edilmiştir. Araştırmadan elde edilen bulgular literatür ışığında tartışılmıştır.

Anahtar Sözcükler: Sınav kaygısı, kuruntu, duygusallık, başarı güdüsü, akademik başarı, çalışma alışkanlıkları, lise öğrencileri.

Introduction

School and examinations are an inevitable aspect of most children's lives in today's world in which academic stress and test anxiety are ubiquitous problems (Bodas, & Ollendick, 2005; Deb, Chatterjee, & Wals, 2010; Mcllroy, & Bunting, 2002; Yildirim, Ergene, & Munir, 2007). Because of the detrimental effects of test anxiety such as poor academic performance and achievement, this construct will continue to be researched by researchers and professionals who work with children and youth. Understanding the relationship among some contributing factors like study habits, achievement motivation, test anxiety, and also prediction of academic success in a different culture may contribute to the international knowledge base in this field.

There is a highly competitive educational system that stresses the acquisition of knowledge at all costs by the students in Turkey. Students have to take many highly competitive centralized, high-stake examinations, such as the Anatolia High School Entrance Examination, University Entrance Examinations. Particularly, the public education system at the end of the 8th grades has had a dramatic impact on the lives of children and their parents. Performance in these high-stake exams is crucial for seeking admission for higher education at universities and colleges and to gain access to prestigious careers. Such practices put considerable pressure on the students (Yildirim, Ergene, & Munir, 2007). This is evident in the kind of preparation that is undertaken for these examinations such as attending private tutoring centers (called "dershane" in Turkish) or coaching classes, using study guides and the like, to the extent that classroom teaching has become a "chore." Moreover, much of this preparation begins long before the children enter these grades and during their summer breaks as well.

In a recent study by Yildirim & Ergene (2003), examination preperation process was correlated with level of depression among Turkish adolescents. Schoolwork generated negative subjective states, most frequently experienced during homework. In particular, those who spent more time doing homework experienced more internalizing problems. The "do or die" competitive educational system was thought to induce high levels of stress in students as well as parents. Examinations through the school career carry increasing priorities and consequences as years progress. Places for the students are limited at high quality schools and universities in Turkey and there is a quota for entering a higher education institute. Only 9% of the students who take University Entrance and Placement Examination have a chance to study at an undergraduate program.

Investigating the interrelationship of non-cognitive factors affecting students' academic success, study skills, test anxiety and academic motivation can be beneficial for providing better opportunities for high school students, not only for adolescents' academic life but also their well-being at schools. Researchers consistently have reported a positive relationship between study habits and academic success (Di Vesta, & Moreno, 1993; Elliot, Godshall, Shrout, & Witty, 1990; Kleijn, Van der Ploeg, & Toprnan, 1994). The relationship between study habits and academic achievement has been found at the high school level (Jones, Slate, Bell, & Saddler, 1991; Jones, Slate, Blake, & Holifield, 1992; Slate, Jones, & Dawson, 1993), and poor study skills have been noted at both secondary and postsecondary levels (Onwuegbuzie, Slate, & Schwartz, 2001). Only between 40% and 46% of appropriate study behaviors are being practiced by high school students. The study habits of the students have often been examined as a potential predictor of success in school. In their study, Michaels and Miethe (1989) found a small (r = .18, p < .01) relationship between

study skills and GPA.

Covington and Omelich, (1979) found that individuals with a strong motive to achieve generally see themselves as highly capable individuals. Therefore feel more optimistic with respect to their chances of academic success than individuals low in achievement motivation. This is also known to be an important predictor for academic performance (Pintrich, & Schunk, 1996). Indeed, Onwuegbuzie, et al. (2001) reported that students' expectation of their overall achievement was the best predictor for overall academic success.

Test anxiety is considered one of the contributing factors on GPA. Spielberger (1980) defined test anxiety as an apprehension that occurs when a student encounters examinations in any form and at any level. According to McDonald (2001), between two thirds of high school students appear to experience uncomfortable levels of test anxiety. Indeed, for many students, high school exams and centralized, high - stake examinations are the most anxiety-inducing experiences in their programs of study (Zeidner, 1991). Test anxiety has been found to be related negatively to academic success.

Test-anxious children are more likely to receive poorer scores, repeat a grade, and perform more poorly on tasks requiring new learning and on those administered in a highly evaluative manner (Beidel, Turner, & Karen., 1994; De Rosa and Patalano, 1991). Anxiety over test performance has also been related to low self-esteem, dependency, and passivity (Yildirim, & Ergene, 2003; Yildirim, Genctanirim, Yalcin, & Baydan, 2008), all of which have an adverse effect on academic achievement (Zeidner, 1991). Although theories of test anxiety provide important insights regarding the process like interference model, deficits model, or information processing model by which test anxiety affects performance, much of the research on test anxiety has focused on the differential impact of emotionality and worry factors of test anxiety on performance (Cassady, & Johnson, 2002; Hembree, 1988; Parks – Stamm, Collwitzer, & Oettingen, 2010). Emotionality refers to the physiological reactions such as arousal, trembling, sweating that are experienced in an evaluative situation. Worry, on the other hand is the cognitive manifestation of test anxiety. Studies examining the impact of the emotionality factor on performance, however, suggest a lack of consistency in findings. Somewhat unexpectedly, the majority of the studies have found that the emotionality factor (i.e., physiological arousal) has weak or insignificant effects on performance (Hembree, 1988). According to the Yerkes-Dodson law, an inverted U-shaped function relates performance to arousal, with the peak of performance occurring at some intermediate level of arousal. Consistent with this theory, Cassady and Johnson (2002) provided evidence that moderate, but not low or high, levels of physiological arousal were related to higher exam performance. Most other studies, however, have failed to support this finding (Hembree, 1988; Hong, 1999; King, Ollendick, & Prins, 2000; Sarason, 1984).

In contrast to these mixed findings, the worry component of test anxiety has been shown to have an inverse relationship with performance; a relationship that has been observed among children as well as adults (Cassady & Johnson, 2002; Hembree, 1988; Hong, 1999; King et al., 2000; McIlroy & Bunting, 2002; in both genders (Sowa & LaFleur, 1986). Moreover, these studies have also reliably shown that worry is manifested as task debilitating cognitions, including more negative self-evaluations and off-task thoughts and fewer positive self-evaluations. A meta-analytic study conducted by Seipp and Schwarzer (1996) examined TAI (Spielberger, 1980) data obtained from 14 different countries. They reported that women in the majority of the cultural groups tended to have higher levels of test anxiety than men. Moreover, this pattern is more prominent in the emotionality scores than in the worry scores.

The purpose of the present study was to investigate the multiple relationships among study habits, worry and emotionality dimensions of test anxiety, achievement motivation and academic succes (GPA) in a Turkish high school sample This sample was culturally diferent from the samples of some earlier studies conducted in the western culture. The second purpose of the study was to investigate the role of study habits, test anxiety, achievement motivation and gender in predicting academic success level (GPA) of students at high school. It will be interesting to find out

which combination of these variables are revealed to be important in academic success for tenth grade high school students in Turkey. Usualy 9th grade students are in the adjustment process for high school. Eleventh grade students usually focus on centralized examinations and join private tutoring courses outside the school. For that reason, the research was carried on relatively more stable students at the 10th grade.

Methodology

Participants

The sample comprised 510 high school students from tenth grade at two state high schools from mid-socico-economic status (SES) regions in Ankara, Turkey. Participation to the study was voluntary. To participate, students' parents were required to give their consent by signing an informed consent form. A total number of 267 (52.4%) females and 243 (47.6%) males at mean age of 17 returned the questionnaires.

Measurements

The following instruments were administered on the third week of first semestre: The Test Anxiety Scale (TAI), The Study Habits Inventory (SHI), Self Evaluation Inventory (SEI), and The Demographic Form.

Test Anxiety

Student's test anxiety was evaluated using the Turkish version (Oner, 1990) of the Test Anxiety Inventory (TAI), an adaptation of Spielberger (1980)'s Test Anxiety Inventory. This instrument is a 20 -item inventory providing a total test anxiety score (score range = 20-80) and separate scores for Worry (TAI-W) and Emotionality (TAI-E) components (score range = 8-32 for worry and 12 – 48 for emotionality sub-scales). Students use a four-point scale (1 = almost never, 4 = almost always) to report how frequently they experience specific symptoms of anxiety (e.g., upset stomach, uneasy feeling, heart beating very fast, nervousness) in evaluative situations.

The TAI was derived via factor analytic procedures, and the total score is reported to be an internally consistent measure of test anxiety (Spielberger, 1980). Cronbach alpha coefficients reported in the Turkish version (Öner, 1990) for the total TAI score (.93) and components (Worry = .93, Emotionality =.94) compared favorably with those reported for larger U.S. samples. Cronbach alphas for scores of the present sample were .93 for worry and .89 for emotionality subscales. This scale provides three different of scores, total (TAI-T), worry (TAI-W) and emotionality (TAI-E). TAI composed of total 20 items and total score would be between 20 - 80.

Achievement Motivation

Kuzgun's (1988) "Self Evaluation Inventory (SEI)" was used to measure achievement motivation among high school students. The two subscales of this instrument, mastery and aspiration, have been adapted and used successfully by Erkan (1991). The Inventory consists of 18 statements regarding the attitudes and behaviors that reflect achievement motivation. Students rated how strongly each statement applied to them on a four point likert scale. The minimum and maximum scores can be obtained in the inventory was between 18 – 72. According to Erkan (1991), test-retest reliability was r = .83 for the test. Convergent and divergent validity were also high. For the sample of this study, internal consistency using Cronbach's alpha was .91.

Study Habits

The Study Habits Inventory (SHI), developed by Uluğ (1981), consists of 60 true-false items designed to assess the typical study behaviors of high school students. A total of 50 items describe

effective study habits, while 10 items are control items. The control items are key revealed such that total scale scores range from 0 to 50, with high scores indicating good study habits. A series of studies conducted by Uluğ (1981) suggests that the Study Habits Inventory yields reliable scores. Test retest relaibility of the scale was r=.82 for the current study, and scores pertaining to the Study Habits Inventory yielded Cronbach alpha reliability coefficient of .87.

Academic Success

The high schools official records were used to acquire information regarding the students' grade point averages from high school courses prior to the current semester on a five level grading scale. The researcher was in colloboration with shool registration offices.

Background Demographic Form

The researcher prepared a demographical data collection form from the participants. The bacground data were collected by using Background Demographic Form.

Procedure

Prior to the administration of the instruments, parents were provided with written information of the purpose of the overall study and planned administration date. Permission was obtained from the school principal and parents to administer questionnaires to pupils within actual class time. A cover sheet explaining that the questions were related to the participant's own thoughts and feelings and that all responses would be confidential was on the front of each test booklet. The study was conducted in the booklets for mentioned three scales were administered to the participants in classroom settings by the researcher himself in approximately 40 minutes sessions. They were instructed to read the directions of each scale carefully and respond to all the items anonymously.

Results

Means and standard deviations for the TAI-T, TAI-W, TAI-E, SEI and SHI scales were reported separetely for gender groups as well as for the whole sample in Table 1.

Table 1.

Means, Standard Deviations and F Values for Gender Differences

	Whole Sample (n=510)		Females (n=267)		Males (n=243)		F
	M	SD	M	SD	M	SD	
Test Anxiety - Total	45.75	12.16	47.99	11.31	43.27	12.58	19.936**
Test Anxiety - Worry	17.55	5.25	17.86	4.95	17.21	5.55	1.938
Test Anxiety - Emotionality	28.17	7.88	30.18	7.33	25.96	7.89	39.280**
Achievement Motivation	55.41	6.96	55.25	6.76	55.59	7.18	0.300
Study Habits	33.30	7.07	33.45	6.56	33.14	7.07	0.250
Academic Success - GPA	3.35	.82	3.57	.80	3.11	.78	43.228**

*p < 0.05; **p < 0.01; ***p < 0.001

As seen in the Table 1, female students scored significantly higher than males on total and emotionality scores of test anxiety scale. Also females scored high academic success level, (GPA) compared to males. No significant difference observed for subscale of worry (TAI-W), achievement motivation (SEI) and study habits scores (SHI).

In order to examine the relationships among test anxiety total score, worry and emotionality subscale scores, study habits, and achivement motivation, intercorrelations among total and subscale scores of related instruments were computed by the pearson correlation analysis, and presented in Table 2.

Table 2.

Correlations between Test Anxiety, Achievement Motivation, Study Skills and Academic Success (N = 510)

	2	3	4	5	6
1. Test Anxiety - Total	.886***	.934***	- .028	- .072	- .095*
2. Test Anxiety - Worry	1	.736**	- .030	- .122**	- .179**
3. Test Anxiety - Emotionality		1	- .019	- .054	- .023
4. Achievement Motivation			1	.389***	.027
5. Study Habits				1	.145**
6. Academic Success GPA					1

*p < 0.05; **p < 0.01; ***p < 0.001

As seen in Table 2, small but significant correlations between the TAI-T and Academic Success (GPA) (r = -0.095, p < 0.05), the TAI-W and Academic Success (GPA) (r = -0.179, P < 0.01), the TAI – W and SHI (r = -0.122, p < 0.01) were found. There were positive correlations between TAI-W and TAI-E subscales (r = .736, p<0.001), and SEI and SHI scores (r = .389, P<0.001).

As a first step in understanding the factors that influence performance in high school, we examined the zero-order correlations between the different assessments of high school GPA and the variables that we anticipated would predict high school GPA. The full set of correlations between the measures can be seen in Table 2. Study habits and gender were both positively associated with high-school GPA. TAI-W was negatively associated with high school GPA. In addition, contrary to expectations, there were no significant relationship betwen achievement motivation and GPA.

Stepwise regression analyses were used to identify the effects of predictor variables for performance on high school GPA. For these analyses, tenth grade students GPA was chosen as the dependent factor. The regresion analysis results were given in Table 3 .

Table 3.

Summary of Stepwise Multiple Regression Analyses for Variables Predicting Academic Success (GPA)

Variable	B	SEB	p
Step 1			
Constant	4.030	.109	.000
Gender	- .459	.070	.000
Step 2			
Constant	4.599	.161	.000
Gender	- .479	.068	.000
Worry	- .031	.007	.000
Step 3			
Constant	4.103	.240	.000
Gender	- .473	.068	.000
Worry	- .029	.007	.000
Study Habits	.013	.005	.000

R^2 = .28 for Step 1; R^2 = .34 for Step 2; R^2 = .36 for Step 3 (p < .001).

Stepwise multiple regression analysis for the entire sample was used to determine which combination of variables (gender, emotionality, worry, study habits) best predicts tenth grade high school GPA. Gender entered the equation first, accounting for 7% of the variance in predicting GPA. Worry entered on the second step accounting for an additional 4% variance. Study habits entered last, accounting for an aditional 2% variance. The initial regression design contained the students' GPA, TAI-W, TAI-E, SEI and SHI scores. Since TAI – T score is combination of TAI-W and TAI-E, it did not enter the regression analysis. The regression analyses with this full model

produced three predictor variables, gender, worry and study habits, on high school GPA, *B* = .24, p < .001, which accounted for 13% of the variance in predicting high school GPA. Gender was the strongest predictor of GPA at high school. Achievement motivation is not predicting academic success.

Discussion

The present study had two main aims. First, it aimed to look at the intercorelations among some non-cognitve variables and high school GPA. Second, it aimed to find out the role of these variables in predicting high school GPA. It was shown that there were small but significant relationships among test anxiety worry scale¸ gender, study habits and GPA in a Turkish high school sample, in accordance with some earlier studies Ericsson et al., (1993) ve Zimmerman, (1998) conducted in other countries.

The separate contributions of study skills, achievement motivation, test anxiety and gender in predicting academic achievement (GPA) was another interest. Therefore a stepwise multiple regression analysis was run for all variables as seen in Table 2. Only test anxiety worry, gender and study skills predict the academic success (GPA). Studies of non-cognitive variables in predicting academic success are limited, regardless of the recognized influence of personality traits on academic performance (Cassady & Johnson, 2002; Gumora & Arsenio, 2002). Problems associated with testing non-cognitive variables as predictors of academic success may be due to the type of instruments used, or to multiple variables such as motivation, anxiety, and future orientation, which contribute to students' success.

Only three of these variables, namely gender, worry and study skills had a direct relationship with GPA. The interpretation of this pattern of results is that high school students have established habits for studying, especially the girls, that include their tendency to attend classes, their tendency to participate class discussions, the amount of time they spend socializing, and their involvement in preparation for centralized examinations.

In this study, we observed that there were a positive corelation between study habits and academic success. This result supports other studies (Jones, Slate, Bell, & Sadder, 1991; Slate, Jones & Dawson, 1993). Michael and Miethe (1989) also found a small relationship (r = .18; p< .01) between study skills and GPA. A full understanding of academic achievement will likely require careful consideration of both the activities that increase the productivity and study skills as well as the social, cognitive, and motivational factors that lead certain students to engage in these effective study activities. More generally, we would expect that the relationship between quality of study time and grades would be much stronger when their relationship was examined ideally by a standardized test instead of teacher made tests.

Studies on achievement motivation indicate that students with a higher need to achieve perform better than those with a lower need to achieve (Bardwell & Braaksma 1985; Stober & Rambow, 2006). In the present study, there were no relationship observed between achievement motivation and academic success. This result is in contrast to the Onwuegbuzie, et al.'s (1993) study results. But, there were significant relationship between achievement motivation and study habits which also had a positive relationship between academic successes. Achievement motivation might be a mediating factor. This topic would be a good candidate for further study. Lao (1980) observed that highly motivated students, particularly females, who were more internally oriented and experienced low dependency, obtained higher GPAs.

The result that test anxiety is related negatively to academic performance is consistent with the literature (Burns, 2004; Hancock, 2001). Indeed, this finding is consistent with researchers who have found test anxiety to be one of the best predictors of academic achievement (Fitzgerald et al., 1996). In an examination of the relationship of test anxiety, study behaviour, and academic performance, Culler and Holahan (1980) determined that high test-anxious students performed more poorly and had a higher dropout rate than low anxious students.

If we look at the dimensions of test anxiety, it appears that worry accounts for approximately 4 % of the variance in student performance on actual course examinations. This percentage may seem slight, and insignificant, until examined in light of the complex behavior being predicted. A student's performance on a course examination involves a wide array of factors that influence overall performance, ranging from intelligence and preparation to test-taking skill and luck. To account for 4 % of the variance in test scores with test anxiety is indeed significant that worry is a predictor of academic success is consistent with the (Bandalos, Yates & Thorndike – Christ, 1995) study. They also pointed out a strong correlation between worry and academic performance of the students.

The explanation for the negative relationship between the worry score of test anxiety and test performance is not as obvious as it may appear at first glance. It can be argued that test anxiety might be a consequence of poor test performance as well as a cause, with a perpetuating cycle of failure being established or it can be suggested that have suggested that the relationship between anxiety and test performance might be a consequence of a third variable, such as lower ability levels of individuals with high test anxiety, rather than evidence of a causal relationship.

Look at the relationship between the emotionality subscale (Spielberger, 1980) and performance. While there were no significant overall relationship between emotionality and GPA, participants reporting an average level of emotionality performed better than those reporting high emotionality. Previous research has suggested a linear relationship between emotionality and performance, where high emotionality was debilitating and the absence of emotional test anxiety was optimal (Deffenbacher & Deitz, 1978; Hembree, 1988; Sarason, 1984). Regardless, the results also supported the hypothesis that the cognitive domain of test anxiety was far more influential with respect to test performance than emotionality.

Gender differences were evident in the majority of measures with females displaying significantly greater levels of anxiety on the examinations. The results from this investigation supporting the assertion that gender differences in test anxiety are merely due to heightened levels of emotionality experienced by females (Deffenbacher & Hazelius, 1985). The results of the study demonstrated that females reported higher levels of test anxiety in emotionality test anxiety. Furthermore, the results from this study do not support Zeidner's (1990) proposition that females' heightened reports of test anxiety are simply due to lower levels of academic ability. The observed gender differences in course examination performance here favour the females. Our results are consistent with the cognitive appraisal model of test anxiety (Schwarzer & Jerusalem, 1992).

The role of socialization practices that encourage women to express their emotions and men to suppress their emotions including anxiety has been implicated in an attempt to explain these cross-cultural trends (Seipp & Schwarzer, 1996; Zeidner, 1998). Thus, gender differences may not be true differences in the level of test anxiety experienced by men and women, but may reflect the degree to which men and women are willing to *admit* their test anxiety. Among the various nations, the highest levels of test anxiety were noted for youth from Egypt, Jordan, and Hungary, while the lowest levels of test anxiety were reported for China, Italy, Japan, and the Netherlands. Overall, the Islamic countries as a group reported the highest levels of test anxiety while Western European and Asian countries reported the lowest levels of test anxiety. Seipp and Schwarzer (1996) attributed the high scores of Arabic students on the test anxiety scale to the severe negative consequences related to poor examination performance in these countries.

Conclusion

The purpose of this study was to investigate the interrelationships among test anxiety, study skills and achievement motivation and to find out the predictive power of these non-cognitive factors in academic success of high school students. Some well-known empirical tendencies were confirmed. According to the correlational analyses, worry dimension of test anxiety was negatively associated; good study habits and being female were positively associated with academic success, which is in accordance with the literature.

Achievement motivation was not associated positively with academic success.

It can be suggested that early intervention and proactive prevention programes may aid in the reduction of anxiety symptoms found to occur in children and adolescents. Moreover, interventions which reduce test anxiety may result in an increase in overall well-being and in academic performance. It would be entirely appropriate for school counselors and psychologists to provide such a supportive role in applying the best psychological principles to school based interventions.

It is important to note that GPA is only one potential measure of academic performance in high school. Further, as an outcome measure, GPA has clear limitations regarding what it can tell us about the academic experience, and it likely misses many important aspects of the educational process, for example, mastery, interest. However, GPA is an easily quantifiable and domain-general measure that captures many general mechanisms and factors involved in learning. From a practical point of view, GPA is one of the few accepted measures of performance in college that is used for applications to graduate school and for job applications. As a result, GPA in a given semester and cumulatively have meaningful real-life implications for students' experiences and life outcomes. However, it is important for examinations of learning to explore a range of outcome measures assessing different aspects of learning. In future work it will be important to explore the current framework for some of these other assessments.

With the introduction of Anatolian High School Examinations and University Entrance Examination in Turkey, the pressure to succeed in examinations and high-stake tests is applied much earlier and we should be aware of the distress that may be experienced by young children and adolescents taking these kinds of tests. There may, therefore, be a need for early intervention in managing any possible adverse reactions and a greater number of counseling services and support from schools and teachers.

These results therefore suggest the need for a school-based provision aimed at pro-actively increasing pupils' self-esteem, self-concept and skills for dealing with stressful situations, particularly important examinations. We might try to reduce overall anxiety and negative emotions, with special attention in schools with particularly high standards and expectations for students. Although this investigation was limited by the small convenience sample, and the self-report course marks, there are several implications for schools. Information about the relationships among achievement motivation, anxiety and academic success in students, particularly, could be important for educators who develop educational programs and implement teaching strategies.

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