



Examination of the Relationship Between Test Anxiety and Selective Attention Among Adolescents¹

Ergenlerde Sınav Kaygısı ve Seçici Dikkat Arasındaki İlişkinin İncelenmesi²

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Abstract. The purpose of this study is to determine the predictive level of test anxiety and selective attention skills on test performances of adolescents, who are studying in public and private schools and took TEOG (Transition from Basic Education to Secondary Education) exam in 2015-2016. The sample of this study consists of 258 8th grade students in total, including 134 boys and 124 girls, between 13-14 ages. The data of the study were obtained from d2 Test of Attention, Test Anxiety Inventory and from TEOG exams. After examination of the results of the study, it has been indicated that there is a significant relationship between students' performance on TEOG exams and selective attention skills. As the quality of student's visual scanning accuracy, rule compliance and attention performance increase during the exam, test performance increases as well. Likewise, as the students' negative thoughts about themselves and negative assessments about failing their exams increase, then test performance decreases.

Keywords: Test anxiety, TEOG exam, attention performance

Öz. Bu araştırmanın amacı devlet ve özel okullarda öğrenim gören, 2015-2016 yılında TEOG (Temel eğitimden ortaöğretime geçiş) sınavına giren ergenlerin, sınav kaygısı ve seçici dikkat becerilerinin sınav performanslarını yordama düzeyinin belirlenmesidir. Araştırmanın örneklemini İstanbul ili Anadolu yakasında bulunan ortaokullar arasından tesadüfi örnekleme yöntemi ile belirlenen üç okulda öğrenim görmekte olan 13-14 yaş aralığındaki 134 erkek, 124 kız olmak üzere toplam 258 öğrenci oluşturmaktadır. Araştırmanın verileri d2 dikkat testi, Sınav Kaygısı Envanteri ve TEOG sınav sonuçları ile elde edilmiştir. Elde edilen sonuçlar incelendiğinde öğrencilerin TEOG performansı ile seçici dikkat becerileri arasında anlamlı ilişkinin olduğu görülmektedir. Öğrencilerin sınav esnasındaki görsel tarama doğruluğu, kurala uyumları ve dikkat performanslarının kalitesi arttıkça sınav performansları da artmaktadır. Yine aynı şekilde öğrencilerin kendileri hakkındaki olumsuz düşünceleri, sınav başarısızlığına ilişkin olumsuz değerlendirmeleri arttıkça sınav performansları azalmaktadır. Bununla birlikte öğrencilerin sınava ilişkin olumsuz değerlendirmeleri ve kuruntuları yoğunlaştıkça dikkat performanslarının kalitesinin de düştüğü belirlenmiştir.

Anahtar Sözcükler: Sınav kaygısı, TEOG (Temel eğitimden ortaöğretime geçiş), dikkat performansı.

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INTRODUCTION

Many countries need several educational indicators to represent their national and international level in education. Countries, therefore, do their own exams as well as participating in international exams. The success of schools is considered as equivalent to the success of students attending in these exams, which are used to assess the success of students and to make decisions about passing to the next grade and completion (Kubiszyn & Borich, 2003). In Turkey, national exams are organized in order to follow the school success of students and students are allowed to participate in international exams. Also, various exams are administered for the transition to secondary education and university (Kumandaş & Kutlu, 2014). In case we raise concern about the pressure created by education system and inequalities within the system, students are led to different expectations and feel themselves under pressure in order to show a better performance (McDonald, 2001). Students make decisions about their life in the future depending on these exams. Placement, the decision on continuing to education, class, program or transitions to another school in educational stages are all dependent on the results of exams. Therefore, it seems normal that students consider exams as a threat and have worries about them (Bacanlı & Sürücü, 2006; Çakmak, 2007). Students studying in secondary schools continue to their education at school while preparing for higher education. Any thought related to the failure in the exams negatively affects students during the preparation phase (Kumandaş & Kutlu, 2014).

In the field of psychology, Freud is the first person to use the word 'anxiety' and to study of its causes by defining it conceptually (Freud 2001). Freud (1969) described anxiety as an undesirable and unpleasant emotional state that can be experienced at any time and everywhere. Since Freud, numerous scientists have created their own definitions of anxiety. Kozacıoğlu (1986) defined anxiety as a subjective emotion such as fear and worry occurred in an environment where the whole personality is threatened. Anxiety, in general terms, is a universal emotion and experience that one lives at certain periods of life. This reaction, which occurs when individual perceives a situation to make troubles in the future and where the individual feels insecure, creates prospective feelings of concern, instability, confusion, fear, pessimism and despair. This anxiety state can be observed frequently in school environment (Hill & Sarason, 1966).

According to Sieber (1980) exam anxiety is the special case of general anxiety. Spielberger (1966) who is interested with the studies about general and exam anxiety in literature, explains the exam anxiety with State Trait Model. Anxiety is divided in to two as State and Trait Anxiety. It may be due to the temporary situation in which the individual lives, and also may show continuity (Köknel, 1987). Trait anxiety is often the result of a tendency to perceive situations within the individual as stressful or anxious. Individual who lives Trait Anxiety, often lives the State Anxiety and these people can be easily bruise and feel depressed (Köknel, 1987). State anxiety is due to the stress which is related to environmental conditions, mostly related to a reason and usually due to the temporary situation experienced by individual (Öner & Le Compte, 1998).

There are many findings in the literature that anxiety affects the success. It has been determined that a generally anxious individual is more likely to feel anxious during exams, and therefore it has a negative effect on his or her academic achievement (Leary & Kowalski, 1995), and causes negative self-perception (Sübaşı, 2007). In addition, it is found there are various studies that such variables as parental attitudes (Geçtan, 1995), age, gender, level of parental education, number of siblings, socio-economic status (Aral, 1997; Ök, 1990; Varol, 1990), affective characteristics (Bloom, Hastins & Madaus 1971) have an effect on anxiety and academic performance accordingly.

Anxiety is more common at test period. Therefore, test anxiety can be defined as a feeling that causes disturbance associated with fear as well as being a special kind of feeling (Baltaş & Baltaş, 1997). Test anxiety is a state of emotion that individual generally undergoes through his/her education life. These are unease and worry situations arising from inadequate preparation for exams, lack of knowledge regarding how to study efficiently, setting high level expectations compared to the level of competence, bad test experiences and lack of self-confidence (Goleman, 2003). A person with test anxiety may have physiological symptoms such as; insomnia, palpitations, nightmares, sweating, headache, etc., behavioral symptoms; tension,

nervousness, anger, unhappiness, reluctance, insouciance, and cognitive symptoms; negative expectations about exam results, failure, inadequacy, embarrassment (Uşaklı & Yapıcı, 2001). Uncontrollable emotions caused by anxiety associate with negative situations. Accordingly, the student with test anxiety is unable to focus on studying even if he/she wants to study. Even if he or she has studied, he or she cannot remember the information during the exam and makes mistakes. The thought that these negativities will continue, becomes an obsession on student's mind and causes the test anxiety to persist. In addition, the student is thrilled thinking he/she will fail, and the exam becomes the cause of fear and anxiety.

According to Spielberger (1995), test anxiety is an unpleasant emotional state that occurs in a formal test or evaluation, and has cognitive, affective, behavioral characteristics that make the individual feel stressed and hinder the individual from showing his or her actual performance. Test anxiety has two dimensions; "worry" and "emotionality". "Emotionality" is the arousal of the autonomic nervous system that creates the affective physiological side of test anxiety. Emotionality is a period in which there are physical reactions such as palpitation, sweating, sudden temperature rise followed by chills, flush, nausea, nervousness and tension. The results of the studies in which the relation between test anxiety and performance have been examined generally support the idea that high test-anxious individuals show poor performance on their examinations than those who have low test anxiety (Cassady, 2004). "Worry" is the cognitive dimension of test anxiety. It involves negative self-evaluations, negative thoughts on his or her failures and inadequacies and internal dialogues. Worry is a process that causes individual to be distracted by negative thoughts such as "What if I can't succeed, what if I can't do it!" and he or she cannot do what needs to be done, cannot solve the problems during exams (Spielberger, 1995).

For a long time, researchers have studied the anxiety situation that students experience during exams and its reasons. As a consequence of the researches, it has been found that the exams taken for transition to secondary education and university entrance in Turkey have increased the anxiety levels of the students (Baltaş, 1993; Börü, 2000; Güler & Çakır, 2013, Yörükoğlu, 1989). It was found that the entrance exams to universities in Japan and Korea are stressful for the students (Kumandaş & Kutlu, 2014) and the possibility of clinical depression among young Koreans was found to be related to the university entrance exams in a study conducted by Lee & Larson (2000).

In case we examine the factors related to learner within those that affect learning, these are species-specific readiness, maturation, motivation, level of general arousal and anxiety, transferring, attention, age and intelligence (Senemoğlu, 2013). All of these factors affect student success and any problem that may occur in any or all of these factors can also interfere with school performance. Attention can have a negative impact on student's performance before the exam as much as the above mentioned anxiety. Attention is one of the crucial components of education and business life besides daily life. Attention means to be aware of the stimulant in the simplest term. These stimulants can be internal and external. Most of the stimuli in the outside world are received by sense organs, but certain senses are selected and perceived. Banich (2007) defined attention as a function of nervous system that allows the individual focus on instant need among many stimuli around. In the school environment, it can be stated that the processes in which attention negatively affects the student are class participation, keeping up with the class and examinations. The main feature of attention deficit is the shortness of permanent and continuous attention period, uneasiness and nerviness seen in behaviors and cognition caused by the lack of supervision to prevent (Öncü & Şenol, 2002). The most common concurrent diagnosis with attention deficit is anxiety disorder (Biederman, 2005; Gökçe, Ayaz, Arman & Kayan, 2015; Karaman, Türker, Kara, Durukan & Fidancı, 2013; Kavakçı, Güler & Çetinkaya, 2011; Kavakçı, Semiz, Kartal, Dikici & Kuğu, 2014; Spencer, Biederman & Mick, 2007).

There are usually problems about anxiety within the needs of students to receive psychological support before exams that play a crucial role in shaping their future, such as TEOG exam and LYS (university entrance exam) (Aysan, Thomson & Hamarat, 2001; Halahan, David & Rudolf, 1995; Murat, Emiroğlu & Bindak, 2011; Yıldırım, 2000). However, children with poor attention span could not succeed in exams as much, even though they study hard through their education life, they may go through into a period of time as their academic self-perceptions

weaken until they are unable to concentrate studying exams. In this regard, children who are not diagnosed with attention deficit disorder but can be easily distracted may have anxiety for exam over the years. In the end, attention may be one of the predictor variables of test anxiety. In this manner, it may be placed at forefront by specialists who provide psychological counseling and guidance services in schools while organizing the educational guidance activities. Due to the reasons mentioned above, this study aims to determine the predictive level of test anxiety and selective attention skills on test performances of 8th grade students, who are studying in public and private schools and took TEOG exams in 2015-2016.

METHOD

Research Design

The method of this study is correlational research that aims to determine the relationship between test anxiety level and selective attention skills of 8th grade students and TEOG placement scores. In general, a correlational research aims to determine the relationships between two or more variables and to obtain data on cause and effect (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz & Demirel, 2013).

Population and Sample

The sample group of the study consists of 8th grade students who are studying at three different secondary schools determined by random sampling method among the state and private secondary schools located in Anatolian side of Istanbul. A total of 258 students, including 134 boys (%51.9) and 124 girls (%48.1) constitute the sample group. All students who constitute the sample group are in the age range of 13-14.

Data Collection Tools

The data of the study were obtained from d2 Test of Attention, which was developed by Brickenkamp (1966) and adapted into Turkish by Toker (1990); from Test Anxiety Inventory, developed by Spielberger, Gorsuch and Lushene (1970) and adapted into Turkish by Öner (1990) and from TEOG exam results.

d2 Test of Attention

The d2 Test of Attention, which measures selective attention depending on time, was developed by Brickenkamp (1966). The d2 test measures quality of discrimination performance of similar stimuli, processing speed and rule compliance, allowing the estimation of individual attention and concentration performance. There are 14 lines and 47 characters on a test which can be applied both individually and in groups. Characters consist of letters 'p' and 'd' with at least one and at most four marks at the top and bottom. The test taker is expected to mark the right character, namely the 'd' letter with two dashes at the top and bottom, within the specified time (20 sec. for each line) (Brickenkamp & Zillmer, 1998). The d2 test for 11-14 ages was adapted into Turkish by Toker (1990). After reliability analysis, TN (total number of items processed) was found $r=.94$. Three months later, having conducted test-retest method, it has been found that $r=.71$ for TN; $r=.77$ for TN-E (total performance); $r=.66$ for E% (error percent). It was compared with the Wechsler Scale's password subtest and a significant correlation was identified between the password subtest and the d2 test sub-dimensions TN ($r=.42$) and TN-E ($r=.44$) within the scope of validity analysis (Çağlar & Koruç, 2006).

Test Anxiety Inventory (TAI)

The Test Anxiety Inventory was developed by Spielberger et al (1970) and adapted into Turkish by Öner (1990). The test, which is a 4 point likert-type scale, has two sub-dimensions: 'worry' and 'emotionality'. There are a total of 20 items, 12 of which are in the worry sub-dimension and 8 of which are in the emotionality sub-dimension. The worry sub-dimension refers to the cognitive side of test anxiety. Nevertheless, the emotionality sub-dimension is related to the physiological and emotional experiences that occur during the anxiety period. Besides the total score, scores on sub-dimensions can also be obtained from the scale. High scores obtained from TAI correspond to high test anxiety while low scores correspond to low test anxiety. For the total scale the t-test correlation coefficients were found .90 and the internal consistency of the inventory was assessed by Cronbach Alpha, and Alpha coefficient for the total scale was .87 (Öner, 1990).

TEOG (Transition from Basic Education to Secondary Education) Exam

TEOG exam has been prepared by the Ministry of Education (MEB) and administered to 8th grade students. TEOG is an exam including 6 lessons (Turkish, Mathematics, Science and Technology, Religion and Moral Knowledge, English and Revolution History and Kemalism) in terms of its content. There are 20 multiple choice question for each lesson. Students take 5 points for each of the right answer and null point for the wrong ones. TEOG exams are implemented two time in an academic year: autumn term and spring term. In this study we used TEOG placement scores in line with the aim of study. TEOG placemet scores include year-end success score of 6th, 7th, 8th grade and TEOG scores. At last TEOG placement scores are calculated over 500 full points (Ministry of Education [MEB], 2016).

Data Collection Process

The data collection process was carried out in two stages. First of all, test anxiety inventory and d2 test were administered to 258 students in line with the directive with the help of psychological counselors working at school 1 week before the TEOG exam within the first (autumn) semester of 2015-2016 academic year. Because of the difficulty of applying the d2 test to the crowded groups, the classes were divided into 10 students groups and applied. The test administration lasted between 15 and 25 minutes. In the second stage, the initial TEOG exam scores for the students at the beginning of the academic year 2016-2017 were requested from the schools where tests were administered. TEOG placement scores of 156 students from test participants who were applied to test anxiety inventory and d2 test were obtained.

SPSS 15.0 program were used to carry out statistical analyzes of data. Primarily, the descriptive statistics of test anxiety, d2 test and TEOG placement scores of the students constituting the research group were sorted out and Pearson product-moment correlation analysis was carried out to determine whether there was a significant relation between these scores. Finally, multiple regression analysis was carried out to determine the predictive level of test anxiety and selective attention skills with TEOG placement scores. The findings were discussed in line with the literature.

RESULTS

In this section, descriptive statistics of the data obtained from the scales used in the research are given. In addition to this, results of the analysis of the relationship level between subscale scores for test anxiety, d2 attention test scores and TEOG placement scores; and of the predictive level of "worry" subscale scores of test anxiety and attention test scores with TEOG placement scores are summarized.

Table 1. *d2 Test of Attention, test anxiety inventory sub-dimensions, and descriptive statistics on TEOG scores*

Scores	N	\bar{x}	Sh	Ss
E*	258	47,39	2,57	41,25

TN-E**	258	411,46	5,16	82,87
TEOG	156	366,02	8,18	102,20
Worry	258	16,08	,29	4,74
Emotionality	258	25,54	,43	6,89

*Total Error

** Total performance (Total number of items processed minus total error)

Table 1 shows the total performance scores and total error scores of d2 test of attention, subtest scores of worry and emotionality sub-dimensions of test anxiety subtests and mean, standard error and standard deviation values of TEOG placement scores of 156 students in sample group.

Table 2. Correlation coefficients among the scores of worry and emotionality sub-dimensions of test anxiety inventory, total performance and total error scores of d2 test of attention and TEOG placement scores

Variable	E	TN-E	YEP	Emotionality	Worry
E (total error)	1				
TN-E (To. Perf.)	,002	1			
TEOG	-,58*	,30*	1		
Emotionality	,11	,05	-,15	1	
Worry	,23*	,03	-,44*	70*	1

* $p < .001$

As shown in Table 2, as a result of the Pearson analysis to determine whether there is a significant relationship between the variables, TEOG placement scores have significant relationships as; negative and medium-level relationship with the total error (E) score of d2 test of attention ($r = -.58$); medium level relationship with total performance scores (TN-E) of d2 test of attention ($r = .30$); negative and medium-level relationship with worry and emotionality sub-dimensions of test anxiety ($r = -.44$). However, it's found that there is low-level significant relationship ($r = .23$) between total error score of d2 test of attention and worry sub-dimension and no significant relationship with the emotionality sub-dimension. The results revealed that there is a significant relationship between TEOG performances and selective attention skills of students. As the quality of student's visual scanning accuracy, rule compliance and attention performance increase during the exam, TEOG performance increases as well. Likewise, as the students' negative thoughts about themselves and negative assessments about failing their exams increase, then TEOG performance decreases. In addition to this, it may be specified that the quality of attention performance also decreases as the student's negative assessments and worries about the exam become more intense.

Table 3. Multiple regression analysis results on the predictive level of the scores of worry sub-dimension of test anxiety, total performance and total error scores of d2 test of attention with TEOG placement scores

Variable	B	St. Error	β	T	p	Tolerance	Partial r
Constant	403,80	38,526		10,481	,000		
E(Total)	-1,168	,146	-,485	-7,977	,000	,931	-,54
Worry	-6,641	1,387	-,291	-4,789	,000	,930	-,36
TN-E	,298	,073	,240	4,073	,000	,991	,31

$R = .69$; $R^2 = .47$; $F = 46,28$; $p < .001$

When we examine the tolerance values, it is seen that there is no multiple connection problem between the predictor variables (Tolerance > .333). As seen in the table, according to the

results of Multiple Regression Analysis carried out to determine the predictive level of the TEOG placement scores with worry sub-dimension and total performance and total error scores of the d2 test of attention; total error score ($\beta = -.48, p < .001$), total performance score ($\beta = .30, p < .001$) of d2 test of attention and worry sub-dimension ($\beta = -.29, p < .001$) significantly predict TEOG placement scores. The standardized regression coefficients indicate the order of importance of the predictive variables over the TEOG placement scores as follows; total error score of d2 test of attention, worry sub-dimension score and TN-E score. Finally, multiple regression analysis revealed that predictive variables together accounted for approximately 47% of the total variance of TEOG placement scores ($R = .69; R^2 = .47; p < .001$). The results show that student's quality of discrimination performance of similar stimuli, processing speed and rule compliance, the quality of individual attention and cognitive evaluations and worries about exam moderately affects TEOG performance.

DISCUSSION and CONCLUSION

The results of the research show that there is a significant relationship between TEOG performances and selective attention skills of the students. As the quality of student's visual scanning accuracy, rule compliance and attention performance increase during the exam, test performance increases as well. Likewise, as the students' negative thoughts about themselves and negative assessments about failing their exams increase, then TEOG performance decreases. In addition to this, it may be specified that the quality of attention performance also decreases as the student's negative assessments and worries about the exam become more intense. Researches have been found in the literature that support the findings obtained from this study.

Many studies reveal that test anxiety has negative impact on focusing and continuity of attention and that situation also affects academic success. It is stated that children with low test anxiety have better attention span and have no troubles in their ability to focus, on the contrary children suffering from anxiety have difficulty in focusing (Aysan, Thomson & Hamarat 2001; Cassady, 2004; Culler & Holahan, 1980; Kavakçı, Güler, Çetinkaya; 2011 Koçkar, Kılıç & Şener, 2002; Köknel, 1987; Kuyucu; 2001; Sullivan, 2002; Wine, 1971). According to Hunsley (1985), students who lack attention and academic skills have high test anxiety and low performance. In addition, an individual with high test anxiety may think his or her potential is threatened during the exam. These individuals can also be fearful, nervous and excited not only during exams, but such activities as speaking in groups and reading aloud. These circumstances can easily distract their attention (Öner, 1990).

Blankstein, Toner, Flett (1989): found that individuals with high test anxiety have intrusive thoughts on making mistakes during the exam. According to the study conducted by Kayapınar (2006), students who have thoughts on failure cannot truly concentrate during exams. The results of another study show that negative internal dialogues of the students suffering from high test anxiety prevent them from focusing the exam and cause distraction (Uşaklı & Yapıcı, 2001). Wine (1980) explained the effect of test anxiety on performance with Attention Model. According to the Model, individuals direct greater part of their attention to the unrelated reactions and worries during the exam. These individuals pay less attention to the reactions related to the exams. This situation causes a decrease on individuals' performance. In university entrance and similar kind of exams, it is stated that students with high test anxiety find the test difficult, have problems to focus on the test and fail in the end. The inability of students to prepare adequately to the exams due to anxiety causes them not to be able to use their cognitive competence and results in anxiety again (Cassady, 2004; Cassady & Johnson, 2002).

It is stated that test anxiety is not the only thing that affects academic performance and attention process, stage performance anxiety has also a negative impact on individuals. According to Wine (1980), when high test-anxious individuals face with evaluation situation they are distracted by other things. These trends are associated with affective and autonomic reactions. The influence of these cognitive reactions on performance is greater than the extent of affective-emotional reactions. According to the results of the research administered by Yöndem (2012) to determine the physical, behavioral and cognitive characteristics of performance anxiety of the

students of music department, performance anxiety leads students to fail to see musical notes, lack of attention etc. It is reported that this situation causes performance anxiety in individuals (Powell, 2004; Rodebaugh & Chambless, 2004) and has negative effect on psychological processes such as self-respect and self-confidence (Clark, 2001; Sinden, 1999; Toback & Downs, 1986).

As a result, student's discrimination performance of similar stimuli, processing speed, rule compliance, quality of individual attention performance and cognitive evaluations and worries about exam affect high school entrance exam performance. It can be stressful that young people have to enter exams that will shape their career since adolescence. It may be suggested to properly evaluate the academic development of the individuals who apply for test anxiety problem and psychological support. Factors resulting from personality traits should not be ignored. Getting psychological support for children and supporting the family may also be effective in coping with the worries of children. It may be beneficial to examine the cognitive processes such as memory, focusing and continuity of attention in detail whether there are any problems arising from them and discuss the test anxiety and testing concerns problems of the individuals during adolescence. In case of such situation, educational support may be useful to improve the skills of memory, focusing and continuity of attention. Nevertheless, while organizing psychological counseling and guidance activities, it may be suggested that the activities related to evaluation and support of cognitive processes in educational guidance activities are structured from the beginning of pre-school period. Raising awareness of any disadvantages affecting academic success of individuals from early age may be an important factor that may increase success. Furthermore, individuals can manage these attention problems over time and this awareness can turn into cognitive, affective and behavioral coping strategies with therapeutic communication. . In this study, the processes regarding the high school entrance exam were analyzed. However, a similar study can also be conducted with young people who are taking the university entrance exam. Comparisons made with samples taken from different age groups can also support studies about test anxiety. Descriptive and relational analyzes of the family, child's social environment, working order and habits can also give information on which factors are influential in this issue. In this way, the studies which aim to reduce test anxiety can be planned more effectively.

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