



## THE PREDICTORS OF SUCCESS IN A HIGH-STAKES TEST: CRAMSCHOOLS, TEST ANXIETY AND SELF-EFFICACY

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### Abstract:

The study's purpose was to determine the relative importance of a number of factors on achievement in a nationwide exam. Westside Exam Anxiety and Academic Self-Efficacy Beliefs Scales were used for data collection purposes. Participants were 143 K-8 students, selected through availability sampling in a city in the inner middle side of the Black Sea Region of Turkey. Fifty-six percent of the students had continued to a cram school for SBS and their latest practice test score and the actual SBS scores were collected from the cram school. The findings indicated that results of the hierarchical linear regression analyses were significant in all four steps. According to the findings, except self-efficacy, three significant predictors explained 60% of variation in SBS scores; the score obtained from the latest practice test was the most effective predictor of students' success in SBS.

**Keywords:** SBS prep courses, cram school, SBS, TEOG, test anxiety, self-efficacy, teaching to the test.

### 1. Introduction

High-stakes tests have an outstanding role in Turkish education system. High-stakes tests (e.g., TEOG, YGS, LYS, KPSS, YDS, and ALES) have been administered for many different purposes by the Turkish Government via Ministry of Education and Student Measurement Selection and Placement Center (OSYM), annually. One of these tests was performed on the 8th grade students for their transition to secondary education. Many kinds of exams were attempted for this purpose up until now since 1998s. By the time 2006, High School Entrance Exam (LGS) was used for the same purpose. Between the years 2007 and 2009, it was changed as the Secondary Education Institution Exam (OKS). Regardless of its name, these national high-stakes tests had been implemented once in a year on the 8th grade middle school students for the same placement purpose.

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Then in 2010-2013 school years, Level Attainment Exam (SBS) replaced OKS. SBS, as the ones before, was delivered on a pre-scheduled date and there were no makeup exams for the ones who missed it. Therefore, students had only one chance. At the beginning, SBS was designed for middle school students, at the end of each grade year through K6 to K8 between 2008 and 2011, then only to seventh and eighth graders in 2012. In 2013, it was given only to eighth graders (Basol & Zabun, 2014) since there was a new test coming instead of it. The number of students participated in 2013 was over one million (1112.604). This can give an idea on how important it is for the students and their families.

There are five types of high schools in Turkey varying heavily both in terms of the quality and curriculum content. According to their rank on the placement exam, students were assigned to Science High School, Anatolian High School, General High School or Vocational High School. It is widely recognized that the higher the exam score, it predicts the better quality of secondary education and therefore, success in The Transition to Higher Education Exam (Yuksekk Ögretim Gecis Sinavi, YGS), another national high-stakes test for college and university entrance in Turkey. According to the structured curriculum published by the Minister of Turkish Education (MoNE) for different type of high schools varies greatly in Turkey. Therefore, the pressure on students regarding the national exams might be inflated by this. Although students are given the same exam, the education program, teacher competencies, teaching hours set by the same course and even the textbooks that were used differ.

The aim of the study was to investigate certain predictors; attendance to a cram school, latest practice test score, test anxiety, and self-efficacy beliefs on K-8 students' achievement on a high-stakes test in Turkey. The subsequent part of the study explains these variables briefly.

## **2. Cram School and Testing**

The cram schools basically provide an additional learning environment for retention purposes (Bandura, 1997). Cram schools, called "dershane" in Turkish, are very common in Turkey as a group tutoring institution focused on enhancing students' test performance in national exams. As a paid instructional aide to prepare students for high-stakes tests, cram schools have founded throughout the country since 1980s. These organizations provide a variety of jobs to e.g. cram school teachers, counselors, administrators, janitors, and finance and management services. A total of 1.2 million students attended to cram schools each year and it provides a handsome income to many parties; each cram school had its own publications from textbooks to trial exams to sheet tests. Cram schools offer test booklets, sheet tests, and regular trial tests consisting of test items similar to the ones on the exam. The goal-based feedback was provided in order to inform students and their family about mis-learned points and the level of course attainment. Additionally subject-level reports for each course are provided after the trial tests. Subsequently, cram school attendees can take the benefit of etudes on the topics that they had missing points. However, most of the low-income

families could not provide this opportunity to their children; while high-income families not only take the advantages of these private institutions, their children also benefit from private lessons. Hence, the inequality issue caused by cram schools makes it hard for children coming from low-income families in the highly competitive national exams. Since a large number of students attend to the cram schools, it was affordable and costs much less than attending to a private school.

Cram schools include extracurricular activities, leadership opportunities and academic support for the students. They are assigned to a counselor, serving as a study coach to help them develop better learning habits, make a study plan, write down when and how many items from each course they are supposed to solve, and regular meetings are planned to make sure students maintain the plan. The parents are also informed regarding the missed-classes or trial test results, and detailed reports at the course level.

One of the most prominent parts of the cram school was practice exams. This exam creates a competition between students and determines their academic performance on a regular base as often as in a couple of weeks. According to Weiner (1986), students' perceptions about their academic ability influence their task performance. When students believe that their underdeveloped skills, poor habits, or lack of personal effort cause to the lack of success caused by external factors (e.g. lack of teaching and learning facilities, not enough feedback, and bad luck) beyond their control, they tend to give up easily (Weiner, 1986; Mkumbo & Amani, 2012). Receiving powerful feedback on their results motivate students to do better. A chance to perform a task successfully is more likely to assist students to complete the challenge (Slavin, 2003). As the teachers communicate students' results whether their ability is fixed or modifiable, it motivates them to perform better in high-stakes tests (Anderson & Midgley, 1997; Brophy, 1998; Hoffman & Nottis, 2008). Hoffman and Nottis (2008) implied that students' success on a prior practice test affects their subsequent test score. In their study, the participants took similar tests to the real exam prior to the real exam date. The findings indicated that this application helped students become more comfortable with the real items. Weiner (1986) stated that increased student success can be as a result of increased self-confidence through the trial test application. Even if students would feel unsuccessful in the practice tests, they may put extra effort, do more practice, and pay more attention to the exam (Hoffman & Nottis, 2008). Lipowski, Pyc, Dunlosky and Rawson (2014) experimented, testing effects on memory in two groups of elementary school children. They searched whether trial tests enhanced memory by comparing the scores of experimental group, taking trial tests to the control group, with no trial test. The results of the study indicated that memory was enhanced through the use of trial test. Therefore, Lipowski, Pyc, Dunlosky and Rawson (2014) concluded testing as a necessary application to enhance memory in children (Lipowski, Pyc, Dunlosky, & Rawson, 2014).

## 2.1 Test Anxiety

Anxiety has been documented as an important factor for achievement. It is an emotion felt by an individual as a response to a stressful event (Sarason & Sarason, 1990; Sung, & Chao, 2015) that can be investigated under two main groups; physical arousal (e.g. accelerated heart rate and sweating) and emotional responses (e.g. worry and fear) (Sung & Chao, 2015). In a threatening, uncontrollable or unavoidable situation normally the heart rate of a person increases, he/she sweats and feel knots in the stomach as a physical arousal. A great deal of anxiety is generated on students through high-stakes tests. As being related to the personal experiences, previous studies suggested that student characteristics (e.g. anxiety, self-efficacy, self-regulation, motivation, goal orientation etc.) can influence subsequent school related outcomes (Roaser, Midgley, & Urdan, 1996; Shogren, Garnier-Villarreal, Dowsett & Little, 2016). Among these, anxiety is mostly emerged in a testing process in the context of education. Test anxiety attributed to the appraisal of tests, as threatening or anxiety agitating (Zeidner, 1998). Research yields a negative relationship between academic achievement and test anxiety, hence students with higher anxiety performs less compared to the once with less anxiety (Bandura, 2001; Basol & Zabun, 2014; Cassady, 2004; Cassady & Johnson, 2002; Sullivan, 2002). Even at a low level, anxiety may alert students to become more careful and analytic, and therefore, assist learning (Yusoff & Zin, 2013). Increased test anxiety reportedly lowers academic achievement and test performance (Hembree, 1988; von der Embse & Hasson, 2012). Test anxiety, as an inhibition of learning, evolves from being a personal issue to a dilemma in education. Before or during the test, anxious feelings can emerge in all age groups of students (Conneely & Hughes, 2010; Eklöf & Nyroos, 2013). Anxiety may increase as a consequence of many factors (Spielberger & Vagg, 1995). These factors can come from many sources, e.g. the parents' attitude toward children, and students' high expectations, parents' or students' concern of academic success, low self-efficacy beliefs, getting physically ill before the exam, and peer pressure etc. (Basol & Zabun, 2014). Test anxiety could be originated from previous failure. Students with high test anxiety considered exams more frightening (Putwain, 2007). Kumandas and Kutlu (2015) emphasize that preparation for the national exams is a stressful, difficult and expensive process in Turkey. In their study, Nail et al. (2015) investigated the negative impact of anxiety on concentration, it was implied that difficulty in concentration represents an anxiety-related academic impairment.

Through its wide recognition as a negative predictor of academic achievement, test anxiety gained importance among the educators, psychologists, parents, students, and researchers. For decades, the researchers have been looking for a way to deal with this problem (Hill & Wigfield, 1984; Hoferichter, Raufelder & Eid, 2014). Putwain (2007) indicated that students with high-test anxiety have more "*structured and pervasive 'worry clusters' in long-term memory*", (p. 580). According to Segool, von der Embse, Mata, and Gallant (2014)'s cognitive behavioral model, test anxiety includes cognitive processes, prior learning experiences, environmental contingencies, and social context. In this model, test anxiety might be predisposed to the social context (e.g. teacher anxiety or messaging) and environmental contingencies (e.g. expectation of performance).

Schwartz, Evans, & Agur (2015) mentioned that test anxiety can affect working memory and lead to poor outcomes at high-stakes examinations. Putwain (2007) indicated that increased attention on high-stakes testing is often combined with increased levels of test anxiety. Increased test related stress in children discourage them from learning (Putwain, Connors, Woods & Nicholson, 2012). Similarly, von der Embse, and Hasson (2012) found a negative significant correlation between anxiety subscales and test performance while investigating the prevalence of test anxiety among high school students on a high-stakes test. Students with higher scores in test anxiety gets lower grades than those of with low anxiety levels (Hurren, Rutledge, & Garvin, 2006; von der Embse & Hasson, 2012).

## 2.2 Self-Efficacy

Self-efficacy is another student characteristic that is investigated by researchers as a significant predictor of test anxiety in a high-stakes test context (Segool, von der Embse, Mata, & Gallant's, 2014). In Segool, von der Embse, Mata & Gallant's (2014) model, self-efficacy was a direct predictor of test anxiety; moreover, self-efficacy was the strongest cognitive behavioral predictor of test anxiety. Having a strong sense of efficacy increases the confidence level to make decisions and more successful outcomes (Fox & Peters, 2013). Bandura (1997) suggested that mastery learning experiences is a gain of preparation schools. As another source, vicarious experiences play an important role in students' self-efficacy levels. Trial exams and frequent quizzes provide students with an opportunity to evaluate their knowledge on a regular base before the exam and without the pressure of grading (Basol & Balgalmis, 2016). Verbal persuasion, as the third source involves providing feedback for intended behavior. The feedback systems in cram schools are developed to inform students about their progress in a great number of exams. The last source was physiological and affective states (e.g. anxiety, stress, encouragement, exhaustion, and mood) (Pajares, 1997). Research suggested that an affirmative mood increases perceived self-efficacy, while a negative mood decreases it.

As stated above, Turkish education system involves a number of large-scale high-stakes tests (e.g., TEOG, YGS, LYS, KPSS, YDS, and ALES) from middle school to PhD degree (Basol & Zabun, 2014). The importance of the study arises from investigating the middle school students' SBS success in relation to cram school attendance, test anxiety, and students' self-efficacy beliefs.

## 3. Research Problem

Our research problem is as the following: What is the relative importance of latest practice test score, test anxiety, attendance to a cram school and self-efficacy beliefs on K-8 students' achievement in SBS, a high-stakes test in Turkey?

We predicted that "teaching to the test" effect through cram school attendance and students' self-efficacy beliefs would positively predict students' actual SBS scores, while the effect of text anxiety would be negative. The effect of many factors on students achievement in high-stakes tests has been studied (Archbald, & Farley-Ripple,

2012; Basol & Zabun, 2014; Lake et al., 2012; Sung & Chao, 2015), however, the cram school attendance did not draw much attention, while it is a very common practice around the globe e.g. de Castro & de Guzman (2014) in Philippines, Cook (2013) in Japan, Liu (2012) in Taiwan, Kim and Park (2010) in South Korea.

#### **4. Method**

A descriptive/correlational model was utilized in the study. Two Likert type scales were used for data collection purposes. The data were gathered through availability sampling by visiting the cram schools in downtown Tokat, a city in the Black Sea region of Turkey. Population of the study was 8th graders coming from 10 middle schools.

The measurement instruments (consisting of a demographic information form and two scales) were delivered to a total of 160 students. The data collection process was taken place a month prior to the actual exam in cram schools during a regular trial test application. Right before the practice test was offered students filled out the measurement instrument with their name on it. The scores were driven from the cram school management after the results were announced. Each measurement set with a missing data rate over 10% and the ones with problems were excluded and the responses from 143 students (who are taken a practice test for SBS) were formed the final dataset. The return rate and the valid response rate was 94% (150/160) and 95% (143/150), respectively. Forty seven percent of the students were girls, while 53% of them were boys. A total of 80 out of 143 students reported that they had continued to a cram school to prepare for SBS. The students reported their latest SBS practice test score by themselves on the data collection form. The data collection process took place in June 2013, a week before SBS. The actual SBS scores, were retrieved from the cram schools for those who attended to a cram school, those who did not attend to a cram school was gathered from their schools.

##### **4.1 Measurement Tools**

A brief personal information form, Westside Test Anxiety Scale (Driscoll, 2007) and Academic Self-Efficacy Beliefs Scale (Mısırlı-Tasdemir, 2003) were used for data collection purposes. The Westside Exam Anxiety Scale (WEAS) was developed by Driscoll (2007) to measure students' exam anxiety with 11 Likert type items (Always Correct to Never Correct). It was adapted to Turkish by Totan and Yavuz (2009) and the single dimension of the scale was confirmed through a Confirmatory Factor Analysis. The reliability of the scale was obtained by Cronbach Alpha internal consistency coefficient and Spearman Brown split half reliability analysis and found satisfactory. In the current study, the reliability of the scale was found satisfactory with a Cronbach Alpha value of .85.

Academic Self-Efficacy Beliefs Scale was developed by Mısırlı-Tasdemir (2003) to measure the self-efficacy beliefs of students with four Likert type items, ranging from Completely Agree to Not Completely Agree. The Cronbach Alpha Coefficient of the

scale was satisfactory with a value of .71 and it was .69 in the current study, close to the criteria of .70, suggested by Nunnally and Bernstein (1994).

#### 4.2 Analysis and Results

Before the analysis, the data were scanned against the outlier points and certain assumptions of Hierarchical Regression Analysis were checked. According to Tabachnick and Fidel (2013), any scores outside of  $\pm 3.29$  bands was a potential outlier. The z scores of two data points for actual SBS scores were over 3.29 and they were deleted before going any further with the analysis. Stevens (1996) suggested using Mahalanobis distances to determine multivariate outliers, and accordingly, one observation with a Mahalanobis distance over 23.72 was removed ( $p=4, .001$ ). The remaining data consisted of 140 students. Standardized errors ranged between  $\pm 3$  bands (min= -2.59, max=2.91), and there were no Cook distances over one (min= 0.00,max= .062). Both the Skewness and the Kurtosis values were less than one for the dependent and the continuous predictor variables. A thorough inspection of the visual graphics did not indicate any problems with normality. Therefore, it was safe to conclude that there was no violation of normality of the data points.

Pearson correlation coefficients for the variables were provided in Table 1.

**Table 1:** Pearson Moments Correlation Coefficients among the Study Variables

Variables	Self-Efficacy	Test-Anxiety	The score obtained from the last practice tests	Cram School Attendance
SBS Score	.380**	-.295**	.677**	.571**
Self-efficacy		-.112	.304**	.273**
Test-anxiety			-.199**	-.099
The score of the last practice tests				.414**

\*\* $p < .05$ , \*\* $p < .001$

According to Table 1, the bivariate correlations between the dependent and predictor variables were significant and they were at moderate levels, the highest one was between SBS scores and the score obtained from the last practice tests ( $r=.68, p<.001$ ), followed by attendance to a cram school ( $r=.57, p<.001$ ) and the lowest was between SBS scores and test anxiety with a negative correlation of  $-.30$  ( $p<.001$ ). The lowest correlation between the predictor variables was the one, between test anxiety and the cram school with a non-significant correlation of  $-.099$ , it was followed by the correlation between test anxiety and self-efficacy ( $r=-.11, p>.05$ ) and the highest correlation was between cram school attendance and the scores obtained from the last practice tests ( $r=.41, p<.001$ ). Therefore, there were no signs of multicollinearity or collinearity problems among the predictors.

A hierarchical regression analysis was performed at four steps, by entering one predictor variable at a time. Alpha level was set at .0125 (.05/4) against the increased Type I error rate. The results of the hierarchical regression analysis were given in Table 2.

**Table 2:** Hierarchical Regression Analysis

Predictor Variables	B	Standard Error	Standardized $\beta$	t	p
First Level					
Self-efficacy	5.55	2.57	.130	2.16	.03
Second Level					
Test-Anxiety	-1.87	.681	-.159	-2.74	.001
Third Level					
The score obtained from the last practice tests	.719	.098	.472	7.296	.001
Fourth Level					
Cram School Attendance	70.71	13.77	.324	5.135	.001

N=140, \* $p < .0125$ , First Step  $R^2 = .144$ ,  $p = .001$ ; Second Step, Change in  $R^2 = .067$ ,  $p = .001$ ; Third Step, Change in  $R^2 = .306$ ,  $p = .001$ , Fourth Step, Change in  $R^2 = .085$ ,  $p = .001$  Constant (9.97), Total  $R^2 = .602$ .

According to the results, at the first step, self-efficacy beliefs explained 14% of the variation in data ( $F(1,127) = 21.42$ ,  $p < .01$ ,  $\eta^2 = .144$ ). At the second step, test anxiety was entered and explained an additional 7% ( $F(1,126) = 10.67$ ,  $p < .01$ ,  $\eta^2 = .067$ ). The score from the last practice tests was explained 31% of the variation at the third step ( $F(1,125) = 79.08$ ,  $p < .01$ ,  $\eta^2 = .306$ ). Finally at the last step, cram school attendance explained an additional 8.5% of the variation in the data ( $F(1,124) = 26.37$ ,  $p < .01$ ,  $\eta^2 = .085$ ). As we reviewed the standardized beta coefficients, it was seen that the score obtained from the last practice tests had the highest standardized beta coefficient with a value of .32. In the current study, test anxiety' standardized beta coefficient was negative, as expected. Findings indicated self-efficacy as the only predictor variable that did not reach statistical significance with a  $p$  value over the critical value of .0125.

## 5. Discussion and Suggestions

In the present study, latest score obtained from a cram school practice test, attendance to a cram school, and test anxiety variables were used to explain the variation in SBS scores. While latest score obtained from a cram school practice test and attendance to a cram school were positive predictors of students' success in a high-stakes test, the test anxiety emerged as a negative predictor of SBS scores. Although causality cannot be established, it is likely that relations between latest score, attendance to a cram school, and high-stakes test performance are reciprocal, such that excessive anxiety contributes to a reduced overall functioning, which negatively affects high-stakes test performance. Among these three variables, practice test score was the most effective predictor of achievement in SBS. The results highlighted the importance of cram school attendance especially "teaching to the test effect" on achievement in SBS. The reason for that can be the excessive extracurricular activities performed in the cram schools to prepare students for SBS.

At the beginning of cram school, students are given a pre-test in order to find out students' pre-knowledge, and assign them to the ability groups, accordingly. In cram school environment, the students get a chance to have frequent testing; therefore, find



out the missing points, review the topics and improve their learning through these regular assessments and re-evaluate their performance. It would not be a mistake to say that the main purpose of the cram schools is to prepare students for a high-stakes test by monitoring their progress through frequent testing and ongoing feedback right after. According to the literature, frequent formative testing was favored over frequent normative assessments for that it provides an opportunity to review the learning rather than having a pressure of making a pass/fail decision (Akom, 2010).

In general, cram school teaching activities reflect on the testing format of the subject area (Au, 2007). According to number of content analysis studies carried by Turkish researchers on nationwide exams, the tests are mainly focused on students' procedural knowledge (Başol, G., Balgalmış, E., Karlı, M. G., & Öz, F. B., 2017; Basol & Turkoglu, 2006). The items in high stakes tests are mainly at drill and practice levels with a very few number of items at higher comprehension levels.

The reasons to this can be many, either the limitations from the physical conditions such as high class size to cultural adjustment problem after many centuries of drill based teaching and learning activities. Hence, Ministry of Turkish Education have reevaluated traditional teaching methods occupied in public schools and readjusted program contents to be aligned with the constructivist approach to teaching since 2004. However, high-stakes tests on many courses, with broad subject areas in Turkey refrain teachers from applying constructivist-teaching methods. Most probably, due to the use of traditional instruction strategies and materials and the limited time and large curricular content constrains, students learn via memorizing the rules, facts and other concepts. Therefore, they get used to ongoing testing applications and spent more time for drill and practice to prepare to high-stakes tests. As another dilemma, crowded classrooms burden teacher with additional grading and scoring activities. There are some precautions taken by Turkish Ministry of Education to prevent test-centered teaching, although one can argue its use. According to the new regulations, written exams should be implemented at least once for the one and two credits course, no less than three times for the courses with three and more credits. No one can guarantee the reliability of the written exams in crowded classrooms.

Our findings suggested that attendance to a cram school is the second important predictor of high-stakes test achievement. As another problem related to the national exams, content analysis studies of the high-stakes test in Turkey indicated that the items were not a representative and sufficient sample of the topics in public school programs as in KPSS exam example in Basol and Turkoglu (2006). This result is consistent with the literature; Guimaraes and Sampaio (2013) analyzed a unique dataset on students' academic scores in a Brazilian national exam, which includes information on students' standardized entrance scores and personal characteristics (e.g. age, gender, race, religion, family income, parents' education, family size, school attended, and tutoring classes). The analysis indicated that students attending preparation courses increased their scores significantly. This was also the case for those receiving public tutoring. Interestingly, the effect was twice as large for private tutoring classes. Basol and Zabun

(2014) also stated that achievements in SBS were closely related to attendance to the cram schools.

In the present study, the test anxiety noted as the third significant variable, negatively related to SBS scores. The literature is also in line with these finding; students who suffer from test anxiety have lower achievement scores on high-stakes tests (Nail et al., 2015; Putwain et al., 2015; Weems et al., 2013). Test anxiety needs to be addressed in relation to high-stakes test as it may lower student's performance. Though it is highly regarded throughout the literature, the self-efficacy did not surface as an important factor on students' test performance in the present study. Bandalos, Yates and Thorndike-Christ (1995) suggested that self-efficacy in math reduces test anxiety and possibly increases the performance. The studies on test anxiety did not always resulted in negative findings. For example, Putwain et al. (2015) tested a model to predict reciprocal relations between test anxiety and academic buoyancy and stated that academic buoyancy was positively related to exam performance. According to Putwain et al. (2015), academic buoyancy protects against the appraisal of examinations by influencing self-regulative processes and enables better examination performance. In the current study, self-efficacy was not a factor explaining students' academic achievement in SBS. We propose researchers to test a model on self-efficacy in relation to school achievement rather than a high-stakes test. Future research may focus on the influence of additional variables (e.g. self-regulation, motivation, self-confidence, goal orientation and etc.) on test anxiety and test performance.

The correlational nature of study could be given as a study limitation. Hence, we cannot imply a causal relationship between the cram schools and high-stakes test achievement. Although causality cannot be established, our findings provided a stepping stone to more complex designs by suggesting that SBS achievement is related to the latest score obtained from a cram school practice test, attendance to a cram school, and test anxiety. Finally, the current study yielded cram schools as an important factor on students' achievement in high-stakes test. Additionally, cautions are presented for educational administrators to put learning goals in forward rather than solely aiming higher scores in high-stakes test.

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