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## Hypnosis vs. Progressive Muscle Relaxation as Cognitive-Therapeutic Interventions: Insights into Reducing EFL Learners' Test Anxiety

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### ABSTRACT

Among the variety of intervention techniques for treating test anxiety that interferes with students' ability to demonstrate their real knowledge on examinations, cognitive-behavioral methods have been proposed to be effective. The current study aimed to investigate whether two cognitive-behavioral techniques (relaxation & hypnosis) would reduce test anxiety in female high school third year students. A randomized controlled trial was conducted through which 60 female high school third year students were randomly assigned to three groups of relaxation, hypnosis and control. A trained clinical psychologist delivered the relaxation and hypnosis sessions having assured hypnotizability. Each session lasted 40 minutes twice a week within two weeks. The relaxation and the hypnosis groups received progressive muscle relaxation and positive suggestions given to subconscious mind for managing exam anxiety, respectively; while, the control group received no treatment but the Test Anxiety Questionnaire as a pre-test. Matched t-tests run on pre-and post-test results showed that both treatments resulted in reduced test anxiety. Further ANCOVA and follow up Bonferoni test indicated a significant difference among the three groups, with hypnosis intervention as significantly the most successful one. Findings highlight the need to consider the role of psychology and cognitive-behavioral intervention techniques in reducing test anxiety.

**Keywords:** *Cognitive-behavioral therapy, Test anxiety, Hypnosis, Progressive muscle relaxation, EFL*

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### 1. Introduction

In the contemporary world, people are evaluated in terms of their skills, abilities and achievements and such evaluations are determined by their test performance. Tests and examinations at all stages of education have been recognized and employed as effective strategies for decision making about people (Ranna & Mahmood, 2010), leading to a challenge in the educational sector, for they provoke mounting anxiety in students regarding the importance attached to them (Akinsola & Nwajei, 2013). Many high school students, who are no exception, suffer from fear of negative evaluation and a strong emotional reaction (Akca, 2011) or, to use Horwitz, Horwitz and Cope's (1986) terms, *test anxiety or apprehension* in

language classes; these issues may need to be addressed by English as a foreign language (EFL) teachers in their English language classes.

Although the natural phenomenon called anxiety is essential for human existence and fulfills a valuable and vital function of preserving the species (Reed, Carter & Miller, 1992), excessive anxiety with serious physical, emotional, behavioral and cognitive symptoms can result in detrimental effects on performance (Mathur & Khan, 2011) if it exceeds the facilitative level. The fact that some students even faint during exam sessions or take their own lives after they have noticed that they have obtained disappointing results is of great concern (Joy, 2013).



Test anxiety can result from personal traits, lack of strategic competence (Bachman & Palmer, 1996), inaccurate perceptions of test taking skills (Beggs, Shields, & Janiszewski Goodin, 2011), low self-esteem and confidence level, negative attribution and criticism and learned helplessness of the learners (Salend, 2011), and discomfort with the testing situation despite sufficient knowledge of the material (Shapiro, 2014). Thus, test anxious students may be overwhelmed by task-irrelevant thoughts (Zeidner, 1998) that provoke a sense of failure (Oermann & Gaberson, 2009) and these negative feelings cause the students to perceive a test as a threat (Shapiro, 2014). It is suggested that even students who are capable and successful learners may have poor performance because of the debilitating effects of test anxiety (Ainsworth, Torgerson, Torgerson, Bene, Grant, Ford & Watt, 2010; Baker, Ainsworth, Torgerson, & Torgerson, 2009). Literature reveals several interventions for the treatment of test anxiety, among which *hypnosis* and *relaxation* have also been mentioned as effective treatments (Hammond, 2010; Manzoni, Pagnini, Castelnuovo & Molinari, 2008)

## 2. Literature Review

The affective dimensions in language learning have long been a focus of interest for researchers among which anxiety has attracted the most attention (Ellis, 2012). This construct has been researched and considered in attitude and motivation studies or especially in foreign language anxiety studies. However, few studies have been conducted on test anxiety (In'nami, 2006) which belongs to test-takers' characteristics in Bachman and Palmer's (1996) Model.

Since the 1950's, changing trends in the field of psychology have led to various conceptualizations of test anxiety. For example, these conceptualizations consist of *drive model* (Spence & Spence, 1966), *a cognitive-attentional interference model* (Sarason, 1980a), *a skills-deficit model* (Covington & Omelich, 1988), *a self-worth model* (Covington, 1992), *processing efficiency theory* (Eysenck & Calvo, 1992) and *a transactional process model* (Spielberger & Vagg, 1995a).

Hypotheses deriving from information processing models have also contributed to test anxiety research. In the 1980's, researchers were trying to understand the causal mechanisms through which anxiety impacts upon performance. Information

processing phases such as attention and short and long term memory helped elucidate the effects of anxiety on cognitive capacity (Zeidner, 1998). Research in the area of attention and memory has conceptualized the human information processing system as a limited-cognitive-capacity system (Baddeley, 1986; Baddeley & Hitch, 1974). Attention and working memory are assumed to work with a single general pool of processing resources that can be allocated flexibly to different concurrent or parallel tasks (Eysenck, 1982; Kahneman, 1973; Tobias, 1980). Each capacity can be shared by several concurrent processes, thus constituting a distributable resource. *Processing Efficiency Theory* proposed by Eysenck and Calvo (1992) used limited cognitive capacity to explain the negative effects of anxiety on performance. During the performance of a single task (e.g., a complex verbal reasoning test item) allocation of resources occurs between the cognitive test at hand and worry, conceptualized as a subject-defined task (Humphreys & Revelle, 1984). Therefore, explanations for the effect of test anxiety on academic performance is based on Eysenck and Calvo's processing efficiency theory. Drawing on this theory, Zeidner (1998) argued that the cognitive component of test anxiety (with task-irrelevant information) absorbs degrees for space in the processing system. As a result, a student low in test anxiety may cope with single cognitive task at hand while a high-test-anxious subject has to cope both with the task at hand and cognitive interference as well.

Some studies have indicated statistically significant inverse relationship between test anxiety and students' achievement (Chapell, Blanding, Takahashi, Silverstein, Newman, Gubi, & McCann, 2005; Khalid & Hasan, 2009; Nicholson, 2009). Tayler (2014) also has listed several other studies reporting that test anxiety has had a detrimental impact on academic performance (i. e. Eum & Rice, 2010; Miesner & Maky, 2007; Owens, Stevenson, Hadwin & Norgate, 2012a; Von der Embse & Hasson, 2012). According to Tayler (2014), justifications for this detrimental effect lay in the updated version of processing efficiency theory, namely, *Attentional Control Theory* (Eysenck, Derakshan, Santos, & Calvo, 2007). High test anxious students are inclined to notice and become preoccupied with perceived threats, thus leading to the impaired ability

to process information and control attention effectively. Therefore, based on this theory, high test anxious students become distracted by unhelpful and self-critical thoughts (Tayler, 2014) and they have an attention bias towards threat (Putwain, Langdale, Woods & Nicholson, 2011).

A variety of intervention techniques for treating test anxiety have been developed among which cognitive behavioral methods, basically inspired by attentional control theory, including relaxation and hypnosis have been proposed as effective treatments (Neuderth, Jabs, Schmidtke, 2008, Zeidner, 1998). Because they can launch both cognitive and emotional systems to change perceptions (Dryden, 2008, Haidt, 2012).

Hypnosis is “a psychological state of heightened awareness and focused attention, in which critical faculties are reduced and susceptibility and receptiveness to ideas is greatly enhanced” (Lioffi, Kuttner, Wood & Zeltzer, 2013; p. 560). Through hypnotic interactions, according to Spiegel (2013) focused attention may be separated from negative thoughts leading to the reduction in anxiety which is associated with attentional control (Tayler, 2014). This is certified by Wark (2011) who reviewed several studies conducted between 1954 and 2006 indicating that hypnotic suggestion led to an increase in academic performance. Wark attributed this increase in academic performance to a higher state of attentiveness and concentration.

Hammond’s (2010) meta study on hypnosis interventions also demonstrated that hypnosis could be an effective strategy for mitigating situation-specific state anxiety such as test-anxiety and he suggested that it could be a “rapid, cost-effective, non-addictive and safe alternative to medication” (Hammond, 2010, p. 263). Hypnosis has produced similar promising results in alleviating test anxiety in university (Ainsworth, Torgerson, Torgerson, Bene, Grant, Ford & Watt., 2010) and high school students (Brown, Summers, Coffman & Riddell, 1996). Tayler (2014) mentioned one study conducted by Stanton in 1994 which indicated promising results even up to 6 months later. However, according to Ainsworth et al. (2010), all the studies examining the effect of hypnosis on test anxiety have used a small sample or have not included a control group and as regards randomization, very few studies have utilized a randomization procedure. Similarly, Fisch, Brinkhaus and Teut (2017) carried out a systematic review on hypnosis

in patients with perceived stress and found that although six out of nine studies reported positive effects of hypnosis for stress mitigation in comparison with control groups, the results were inclusive. Moreover, as Tayler (2014) maintains, some of these studies have given qualitative reports which render the generalization almost impossible. Experimental bias may also be inherent in most of the above-mentioned studies as the researcher himself/herself has followed the intervention.

Like hypnosis, relaxation training is also short and cost effective with the aid of which, especially, progressive muscle relaxation, students can be trained to cope more effectively with physical and emotional repercussions of test anxiety. (Jorm, Christensen, Griffiths, Parslow, Rodgers & Blewitt, 2004). However, with a few exceptions ( see Prato, 2009) for mixed results, limited research conducted with college and high school students suggests that this technique may be effective in reducing anxiety and increasing self-esteem (Gregor, 2005).

Larson, Ramahi, Conn, Estes and Ghibellini (2010) conducted a review study on the effectiveness of progressive muscle relaxation on psychological distress and anxiety symptoms of people with schizophrenia and concluded that this technique could be a fruitful intervention to reduce the symptoms in individuals with schizophrenia. However, as regards test anxiety, recently, Nwokolo, Blessing and Ekwutos (2017) found that progressive muscle relaxation technique was not effective on secondary school adolescents’ test anxiety in spite of the fact that it significantly reduced the participants test anxiety level. According to Byron (2007), relaxation has been found to be an effective treatment to compare with hypnosis, though it deserves more scrutiny. There was a recent study on the effectiveness of hypnosis versus progressive muscle relaxation in the treatment of premenstrual syndrome (Asgariani, Barat, Moudi, Hamidia & Bijani, 2018). They found that the mean of symptom severity score decreased significantly in the hypnotherapy group in comparison with the muscle relaxation group. Therefore, hypnosis can be effective in the treatment of premenstrual syndrome.

Due to an increasing emphasis on test performance (Ranna & Mahmood, 2010), and the disruptive nature of test anxiety (von der Embse, Barterian & Segool, 2013), test

anxiety research with a main focus on the possible effects of cognitive-behavioral methods to relieve test anxiety and ameliorate test performance (Gregor, 2005) seems warranted, Such studies are specially recommended to be conducted in several contexts as Baker et al. (2009) underlined the need for achieving research-wise finding in other countries.

### Research questions

1. Is relaxation technique effective in reducing EFL learners' test anxiety?
2. Is hypnosis effective in reducing EFL learners' test anxiety?
3. Do two types of techniques including hypnosis and relaxation meant to reduce test anxiety provide different results in test anxiety?

## 3. Method

### 3.1 Participants

Through cluster sampling, firstly, the Educational Department District in Zanjan city in Iran was determined randomly. Secondly, the high school names affiliated to this District were obtained and finally the target high schools, with three random classes, were selected. In each class, there were 30 female third graders within the age range of 17-19 taking English as a foreign language course. Subsequent to screening procedure, a random sample comprising 60 subjects formed the main participants assigned into 3 groups. Each group (hypnosis, relaxation, and control) consisted of 20 students. Random assignment determined which group would receive which treatment (relaxation, hypnosis and no treatment). These high schools were all urban high schools and since random cluster sampling determined these high schools, they were representative samples of Zanjan state high school middle class female population.

### 3.2 Instruments

One instrument, i.e., The Test Anxiety Questionnaire (TAQ) developed by Sarason (1957) was administered twice, once two days before the treatment as a pretest and once two days after the treatment as a posttest index to observe any probable changes due to the treatment. It has 37 items scored on the basis of a 2 point ranking scale 0-1, with No/Yes answers (Appendix A). One point is given to Yes answers and zero to No answers except that items 3, 15, 26, 27, 29 and 33 receive one point for No answers. The larger the score is, the higher is the level of test anxiety. Scores higher than 12 indicate that subject exhibits some

of the characteristics of test anxiety. The validity and reliability of this questionnaire have been measured and calculated in various studies and its Cronbach's Alpha for reliability and validity were reported to be .88 and .72, respectively (Beyabangard, 2007).

### 3.3 Hypnotizability

One of the clinical evaluation techniques of the hypnotizability is Hypnotic Induction Profile. This testing instrument uses the pattern of neurophysiological response to signals for Eye Roll (figure 1) as indicators (Spiegel, 1972). As Kaplan and Sadock (2015) mentioned, with the use of this measurement, the mentally damaged people who are not capable of being hypnotized can be distinguished from normal people (hypnotizable). Dr. Dadashi, a qualified clinical psychologist measured the hypnotizability of all the subjects in hypnosis group by using Eye Roll test. All the subjects in this group received higher than 3 which meant that they were hypnotizable.

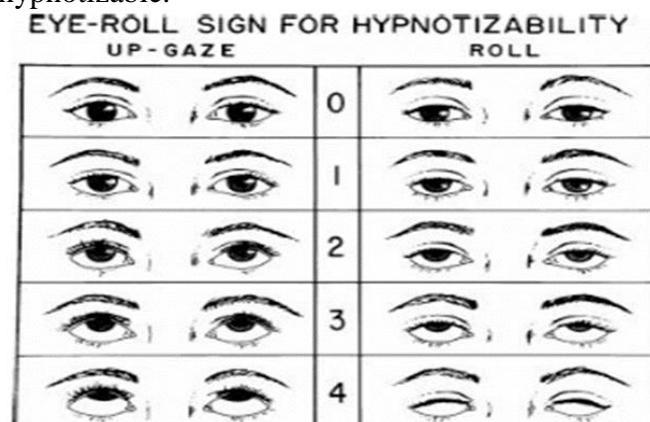


Figure 1 (adapted from Spiegel, 1972, p. 26)

The hypnotic induction profile procedure is as follows:

The subjects are told to do the following instructions, as recommended by Spiegel (1972).

1. They should hold their heads looking straight forward;
2. While holding their heads in that position, they should look upward toward their eyebrows and then toward the top of their heads (Up-Gaze);
3. While continuing to look upward, at same time they should close their eyelids slowly (Roll) (Figure 3.1);
4. They should open their eyes and let them come into focus. The Up-Gaze and Roll are scored on a 0-4 scale.

Procedure

Since the study was an interventional study, first, a code of ethics (IR.umsu.rec.1395.474) and IRCT registration number (Irct ID: IRCT2017051333946N1) were obtained. Then the following necessary measures were adopted.

Having obtained parental consent and written informed consent and having giving an assurance that their data and information would be regarded as strictly confidential, the researcher asked the participants to complete the pre-test instruments. The Test Anxiety Questionnaire was administered once in the first round exam (pre hypnosis and relaxation intervention), and once during the second round exam (post hypnosis and relaxation intervention) to the groups. Afterwards, the students diagnosed with exam anxiety in each group (relaxation treatment group and hypnosis treatment group) were given, on average, a 40-minute session twice a week for two weeks for the relevant treatment.

Relaxation treatment consisted of progressive muscle relaxation (PMR) followed exactly according to the protocol (Appendix B) provided by Hammond (1990). This process involved a sequential tensing and releasing of different muscle groups. The subjects moved through the major muscle groups, starting at the head and neck muscles and moving down the legs to the ankles and this technique was employed by the qualified clinical psychologist who narrated the protocol mentioned in Golfried et al. (1976, p.93-98).

Having been tested by means of the hypnozibility test, the participants in hypnosis group received hypnosis sessions consisting of anxiety management about taking and giving exams and positive suggestions given to the subconscious mind (AppendixC). The hypnosis treatment technique adapted from suggestions cited in Hammond (1990) and Suggestions for Examination Phobia (Waxman, 1990, p. 461) was also employed by the same qualified clinical psychologist. After two week treatments, the researcher administered post- test instruments of the Test Anxiety Questionnaire to examine the effect of the treatment.

#### 4. Results

Having assured the assumption of normality and homogeneity of variance (calculated by Levene's test) in data collection stages including the pre- and post-tests ( $p > 0.05$ ), the researcher ran a series of paired samples *t*-tests and ANCOVA the

summary of which is presented through Tables 1 through 3. The mean score of the pretest anxiety and the standard deviation for the relaxation group were 23.80 and 5.47 respectively. But the mean score of the posttest anxiety and the standard deviation for the same group were 22.5 and 5.92. As regards the hypnosis group, the mean score of the pretest anxiety and the standard deviation for the hypnosis group were 19.60 and 6.36 respectively. But the mean score of the posttest anxiety and the standard deviation for the same group were 15.05 and 6.94.

The results obtained through the matched *t*-test ( $t(19) = -2.25$ ) indicate that there is a significant difference between the mean scores of pre- and post – test (see Table1); this suggests that relaxation treatment has reduced the subjects' test anxiety.

Table 1: Scores of pre and post-test

Pair	M	S	Lo	Up	t	d	Sig(2-
		D	we	per		f	tailed
			r				
Pre-test anxiety (Relaxation group)	1.3	2.2	.09	2.5	2.1	1.9	.036
Post -test anxiety(Relaxation group)	0.7	0.7			5		
Pre-test anxiety (hypnosis group)	4.5	4.3	2.5	6.5	4.1	1.9	.000
Post -test anxiety (hypnosis group)	5.5	5.5			6		

The same pattern of results was observed among the hypnosis group (Table1). In other words, the mean scores of the hypnosis group have decreased drastically. It is more obvious in matched *t*-test results demonstrated in Table1, which suggests that there is a significant decrease in test anxiety in the students receiving hypnosis treatment.

Table 2: ANCOVA Results for Test Anxiety

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power <sup>b</sup>
Group	233.28	2	116.64	13.42	.000	.32	.99
Pre-test anxiety	1622.53	1	1622.53	186.80	.000	.76	1.0
Error	486.41	56	6.86				

The third research question probed whether two types of techniques meant for test anxiety reduction including hypnosis and relaxation provide differential results in test anxiety. As can be seen in the Table 2, there is a significant difference among the three groups in test anxiety scores. Through controlling pretest scores, it can be concluded that this difference is possibly due to the treatments ( $p < .001$ ,  $F = 13.42$ ), thus leading to a positive answer to the third question. Moreover, the statistical power is equal to .99. This means that if the study is



replicated one hundred times, among them, one of them will produce no significant result. The results of the ANCOVA test showed a significant difference among the three groups but it did not show exactly where the difference lay. To find the significant differences among pairs, further Bonfroni test was run.

*Table 3: Bonfroni Test for Test Anxiety (Pairwise Comparisons)*

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
Hypnotism	Relaxation	-3.551*	.975	.002	-5.957	-1.146
	control	-4.733*	.940	.000	-7.054	-2.412
Relaxation	Hypnotism	3.551*	.975	.002	1.146	5.957
	control	-1.181	.946	.650	-3.515	1.152
Control	Hypnotism	4.733*	.940	.000	2.412	7.054
	Relaxation	1.181	.946	.650	-1.152	3.515

The comparison between hypnotism and relaxation groups has resulted in ( $P=.002$ ), therefore, the mean difference is significant. Similarly, the comparison between hypnotism and control group has resulted in  $.000$  which is a significant difference at  $.05$  level. Comparisons between the relaxation group with both control and hypnotism groups has resulted in  $.002$  as well. However, pairwise comparison between relaxation and control group did yield a different result ( $.650$ ). This indicates that the difference between relaxation and control groups is not significant. To sum it up, the results of post hoc analysis indicates that hypnotism treatment has been the best treatment for reducing test anxiety.

## 5. Discussion

The matched t-test of both groups (hypnosis and relaxation) shows that there is a significant difference between the mean scores of pre- and post- test, thus indicating that the two treatments have reduced test anxiety. The results of the ANCOVA test showed a significant difference among the three groups and further Bonfroni test indicated that hypnosis intervention was significantly the most successful one.

The result that there is a significant difference between the mean scores of pre- and post-test in relaxation group suggests that relaxation treatment has reduced the subjects' test anxiety. Therefore, the results support Lohaus and Klein-Hessling (2003), Zaichkowsky and Zaichkowsky (1984), and Zargarzadeh and Shirazi (2014) who reported positive effects of relaxation techniques as far as test-anxiety scores were concerned.

However, results obtained from pairwise comparisons indicated that relaxation had not been significantly effective in reducing test anxiety compared with control group; this is in contrast to Larson, Ramahi, Conn, Estes and Ghibellini's (2010) study which indicated that relaxation intervention had a significant effect in reducing test anxiety in the experimental group in comparison with control group. The finding that relaxation did not lead to a considerable reduction in test anxiety also is in line with Gregor (2005) who included cognitive behavioral therapy without relaxation, relaxation alone, cognitive behavioral therapy combined with relaxation, and attention control groups. Gregor (2005) found that none of the treatments yielded significant reductions in self-reported test anxiety though relaxation alone treatment resulted in reduction in teacher reported anxiety.

As regards hypnosis intervention, the research finding suggests that it is the best treatment in comparison with relaxation and control groups which lends support to Patterson (2014) who conducted a qualitative study and found that the participants reported a reduction in test-anxiety and they also felt that their worry reduced. The finding is also in line with Stanton (1993) and Stanton (1994), and Tayler (2014). Stanton (1993) investigated the impact of hypnosis on test anxiety in college students and found it effective. He observed the same result among school aged children. Similarly, Tayler investigated the effect of manualised hypnosis on test anxiety and found that test-anxiety in secondary school aged children was reduced by using hypnosis delivered by a trained person. The results are also consistent with qualitative results achieved by Ainsworth et al. (2010) in which participants portrayed hypnosis experience as both helpful and useful in reducing test anxiety.

Our study gives support to the findings provided by Baker et al. (2009). Baker et al. (2009), in their review study, included five randomized control trials examining the effect of hypnosis on exam anxiety. They concluded that hypnosis was moderately effective in test anxiety reduction. These studies were Boutin and Tosi (1983), Gruzelier, Smith, Nagy, and Henderson (2001), Kiecolt-Glaser, Marucha, Atkinson, and Glase (2001), Sapp (1990) and Whitehouse et al. (1996) for which Baker et al (2009) calculated effect size and obtained

.39 that was statistically significant at .05 level.

## 6. Conclusion

Due to an increasing emphasis on test performance (Ranna & Mahmood, 2010), and the disruptive nature of test anxiety (von der Embse, Barterian & Segool, 2013), this study, with a main focus on the possible effects of cognitive-behavioral methods was an attempt to find ways to relieve test anxiety and ameliorate test performance. There are multitudinous forms of cognitive behavioral interventions evidenced by various studies to be effective in alleviating test anxiety (Shapiro, 2014). The findings of the current study involving high school students had corroborative evidence that these treatments (hypnosis and relaxation training) were effective in reducing test anxiety. However, as ANCOVA results showed, hypnosis was more effective than relaxation training. With regard to research with high school students, the results of the study indicated that reduced test anxiety was feasible with the help of hypnosis and more importantly, hypnosis was a safe and desirable treatment for test anxious high school students or to use Hammond's words, it was a "rapid, cost-effective, non-addictive and safe alternative to medication" (Hammond, 2010, p. 263). Therefore, the findings also can partly dispel popular misconceptions about hypnosis that Wagstaff (2008) believes, has stemmed from stage hypnosis shows.

The findings of the present study imply that this therapeutic intervention (hypnosis) can be delivered effectively in schools for reducing test anxiety. Schools can be equipped with these programs delivered by psychologists or trained school staff or teachers. An obvious advantage of therapeutic interventions being delivered by teachers in schools is the large number of high school students' easy access to the intervention. Therefore, delivered in schools, hypnosis can be an affordable treatment.

In EFL practice, it has been recommended to change numerical scores to grading system or involve the students in test development to reduce anxiety among students (Joy, 2013). The findings of the present study which has been conducted in EFL high school classes, in addition to the mentioned strategies, highlight the need to consider the role of psychology and cognitive-behavioral techniques in reducing test anxiety. With this insight, proper recognition of intervention techniques will be gained and the misconceptions about

hypnotism will be changed. In addition, this recognition will bridge the gap between this branch of the psychology and education in general and TEFL in particular.

The results confirmed some implications for educational psychology policy. Accordingly, firstly, the findings can make a case for in-service programs to consider the role of cognitive behavioral treatments in training the relevant psychologists so that they can deliver these therapeutic methods for high school students.

In spite of the interesting results we obtained, conducting the research in a busy school following its normal course of events made doing the research demanding. Busy and noisy classrooms and shortage of facilities needed for interventions were barriers to and limitations of research on hypnosis. This study faced with some inherent limitations. Due to the logistical problems related to the school time limitations, the participants could not be followed for a longer duration. Further research is suggested to treat participants for a longer duration. The findings of the current research also highlight the need for further investigations involving both male and female junior high school and elementary school students. This study investigated only the effect of the treatments on test anxiety. The effect of the treatments on test performance can also be examined in further studies.

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