

# The Effectiveness of Emotional Freedom Techniques for Optimal Test Performance

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## Abstract

Test anxiety causes, effects, and interventions have been widely studied. This study seeks to determine the efficacy of a single brief intervention—Emotional Freedom Techniques (EFT)—to support participants' ability to shift attention appropriately to achieve optimal levels of both test anxiety and test performance. The initial sample consisted of 168 undergraduates from 3 universities in the inland Northwest United States, who were randomly assigned to 3 different groups. Group 1 learned EFT, Group 2 learned Diaphragmatic Breathing (DB), and Group 3 served as a no-treatment control. Participants in the 2 experimental groups received two 2-hr lessons. The Sarason Reactions to

Tests, Symptom Assessment-45 Questionnaire, and Westside Test Anxiety Scale instruments, as well as a 5-item self-care questionnaire and a request for a qualitative list of individual, test-related concerns, were administered as pre- and posttreatment measures, with a second follow-up at the end of the semester. Subsequent analyses of variance revealed significant improvements in both the DB and EFT groups on most measures, with gains maintained on follow-up.

**Keywords:** Test anxiety, students, Diaphragmatic Breathing, EFT, Emotional Freedom Techniques

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## EFT for Optimal Test Performance

Debilitating test anxiety is a complex, multi-dimensional, global problem that causes significant emotional distress and impairs optimal performance for both children and adults. It affects an estimated 33% of students (Methia, 2004, as cited in Sena, Lowe, & Lee, 2007) and can have serious, detrimental effects on mental health, self-esteem, and career options. Women and girls are disproportionately affected, as are students from minority cultures, those with learning disabilities, and low-to-high clinically anxious persons (Bodas & Ollendick, 2005; Sena et al., 2007; Zeidner & Safir, 1989).

An impressive amount of research dating back to 1952 has been devoted to understanding its causes and devising effective solutions. The original research by Sarason consisted of several studies that established the negative effects high test anxiety had on performance and then explored the theory that learned psychological drives—either task-directed drives or anxiety drives—were responsible for the differences in performance (Mandler & Sarason, 1952; S. B. Sarason & Mandler, 1952; S. B. Sarason, Mandler, & Craighill, 1952, as cited in Hembree, 1988; Stowell, & Bennett, 2010). Other approaches focused on the existence and role of debilitating (impairing) versus facilitating (helpful) anxiety for performance (Alpert & Haber, 1960; Eysenck, Derakshan, Santos, & Calvo, 2007; Rafferty, Smith & Ptacek, 1997). Liebert and Morris (1967) conceptualized test anxiety as having two axes: excessive *worry* (cognitive) and *emotionality* (physiological arousal), in which worry has the larger negative impact on performance except in people who exhibit high levels of physiological arousal with low levels of worry (Hembree, 1988; Stowell & Bennett, 2010). Other theories have

focused on the relationship between *trait anxiety* (neuroticism or personality-level anxiety) versus *state anxiety* (situation-specific), noting that high trait anxiety leads to higher state anxiety, that is, test anxiety (Chamorro-Premuzik, Ahmetoglu, & Furnham, 2007; Gaudry, Vagg, & Spielberger, 1975; Spielberger, 1972; Spielberger, Anton, & Bedell, 1976, as cited in Hembree, 1988). Two other pragmatic approaches have been offered. The first centered on identifying and addressing the deficits that contribute to debilitating test anxiety (motivation, study skills, aptitude, preparation; Stowell & Bennett, 2010; Tobias, 1985, p. 185, as cited in Hembree, 1988). The second is concerned with the attentional disruption inherent in debilitating test anxiety, whatever the cause (Eysenck et al., 2007; Sud & Sharma, 1989, 1990, 1995; Wine, 1971)

Central to test anxiety is the cognitive/emotional complex surrounding fear of doing poorly and its corollaries (how others will judge me; what it means about me) and consequences (what will happen to me as a result). The higher the perceived stakes, the more dire the corollaries—that is, if I do not perform as well as I want to on this test, it means I am (a) not well enough prepared and will be more thorough next time, (b) incapable of doing well in this field, and/or (c) stupid and not good enough to have the life I want—and the imagined consequences—it will lower my GPA, I will lose my scholarship/financial aid, I will get kicked off the team, my parents will be disappointed and pull me out of school, everyone will think I am stupid/worthless/bad and avoid me, I will be unlovable, I will be doomed to fail at everything I try, and/or I will lose everything I love or value. At its core, fear of negative evaluation and/or failure is fear of loss—loss of present and future self-esteem and well-being, loss of hope, loss of social connection and support, even loss of life itself. Meta-analyses (Ergene, 2003; Hembree, 1988; Stowell & Bennett, 2010) have identified some interventions that reduced test anxiety without improving performance but found that combinations with cognitive and behavioral components helped anxiety and performance.

One could make the distinction that fear of failure in any endeavor can either facilitate a higher level of single-minded effort that enables success or, alternatively, create a downward spiral into distracting thoughts, images, emotions, and physical sensations that make the fear of failure a

self-fulfilling prophecy. So why do some people, at least some of the time, seem to cope much better than others with the prospect of failing or being harshly judged?

The researchers in this study have hypothesized that the primary relationship between evaluative anxiety and its effect on test performance centers on an individual's ability to shift attention from what is feared (not wanted) to what *is* wanted, both before and during a test situation. Research by Eysenck and colleagues (Eysenck, 1979; Eysenck & Calvo, 1992; Eysenck et al., 2007), Wise (1971), I. G. Sarason (1984), and Sud and Sharma (1989, 1990, 1995); Zinta (2008) has supported this view. Eysenck's Attentional Control Theory describes the relationship between cognition and anxiety and "assumes that anxiety impairs the efficient functioning of the goal-directed attentional system and increases the extent to which processing is affected by the stimulus-driven attentional system" (p. 336), particularly threat-related stimuli. They concluded that "Adverse effects of anxiety on processing efficiency depend on two central executive functions: inhibition and shifting." They have noted that anxiety may *not* be detrimental when it leads to "compensatory strategies" (2007, p. 336).

Using this assumption, the most beneficial interventions to reduce test anxiety distress and simultaneously create optimal performance would offer attentional enhancement interventions that improve one's ability to shift quickly from a fear response to a calm, focused, solution-oriented state and to maintain that state as long as needed. Extensive research has indicated that behavioral, including relaxation alone, or cognitive-behavioral combinations were most effective in relieving test anxiety; cognitive, attentional, or study-skill trainings alone did not reduce test anxiety. Performance was enhanced by the addition of study-skill and attentional training to cognitive and cognitive-behavioral interventions, but it was notably unimproved by relaxation training alone (Ergene, 2003; Hembree, 1988; Rovira, Fernandez-Castro, & Edo, 2005; Tryon, 1980). The ideal kind of intervention would be one that addresses cognitive components as well as emotional arousal and is simple, brief, and easily learned and can be self-administered.

This study sought to determine and compare the efficacy of a brief, intervention known as Emotional Freedom Techniques (EFT) to reduce

debilitating test anxiety and improve performance. A study by Sezgin and Ozcan (2009) compared the use of EFT with Progressive Muscle Relaxation in reducing test anxiety and improving test scores in a high school-age sample. There was a significant decrease in anxiety and improvements in test scores from both methods, though EFT provided a much greater effect on reducing anxiety. A pilot study by Benor et al. (2009) compared EFT, Wholistic Hybrid derived from EMDR and EFT (WHEE), and cognitive behavioral therapy (CBT) in the treatment of test anxiety in a college student sample and found equally promising results with only two sessions of EFT or WHEE compared with five sessions of CBT.

EFT can be used in dyadic therapeutic interventions and can also be easily taught for self-administration. It offers a form of desensitization, cognitive repatterning, and anxiety and arousal reduction using a combination of acupressure tapping and guided mental focus. EFT addresses self-concept and self-acceptance, then directs the subject's attention to whatever is feeling problematic as several acupressure points on the face, body, and hands are tapped sequentially. This process allows the subject to release discomfort related to the perceived problem, shifting attention from what is not wanted to what is preferred instead. A parallel intervention was also provided to a different group of subjects that utilized identical instruction in mental focus but was combined with a different relaxation-inducing practice.

## Method

### Participants

The current population of interest is college students, both because of their relatively high accessibility and the importance of performance in college to career opportunities and life success. Students were solicited through posted flyers, by the recruitment of professors of difficult subjects who were asked to make announcements in their classes, through contact with on-campus counseling and testing centers and other student assistance offices responsible for helping test-impaired students, and through soliciting emails sent out by those offices to students using their services.

The initial sample consisted of 168 undergraduate students from three colleges or universities in the inland Northwest, drawn at the beginning of the fall semester. In the second round of data

collection 46 participants completed the survey. After the third round, data from 40 participants were found to be complete. Most of the participants were Caucasian (90%), 14 were men and 26 were women, and 90% were between the ages of 18 and 30 years.

### Measures

Participants were asked to rate their level of *self-care*, using a five-item Likert scale, in the areas of good nutritional practices, adequate rest, regular exercise, and relaxation practices. This scale was created for the study and used because self-care factors have a recognized impact on physical, emotional, and cognitive function and, in the researchers' opinion, ought to be considered when evaluating causes and/or correlations between the interventions being studied and the cognitive/emotional responses measured or reported. The questions, answered from 1 (*not at all*) to 5 (*extremely*), are as follows:

How well do you do in:

Eating a healthy, nutritionally balanced diet?

Getting adequate rest on a regular basis?

Getting a healthy amount of exercise each week?

Practicing healthy forms of relaxation on a regular basis?

Subjects were also asked to create a qualitative list of their particular issues that contribute to their test anxiety, trouble studying, and less-than-optimal test performance. This list was used by the participants as a focal tool while practicing their protocol.

The Sarason Reactions to Tests (RTT) inventory, a 40-item, Likert-style instrument, was used pre- and posttest to quantitatively assess self-reported levels of test anxiety. The higher the participants' score, the greater their anxiety. The goal of this instrument is to measure components of test anxiety relevant to performance impairment. Changes in anxiety scores ought to be predictive of improvements in performance scores. The RTT measures four different components that typically interfere with test-taking success: Test Irrelevant Thinking, Bodily Symptoms, Tension, and Worry. I. G. Sarason (1984) has provided a group of studies that give reliability and validity data for this scale. Cronbach's alpha for these scales were found to be .92, .79, .92, and .85, respectively.

Validity was found to be moderate but significant, with high scores on the RTT inversely proportional to test performance (Benson & Bandalos, 1992).

The Symptom Assessment-45 Questionnaire (SA-45), a brief form of the Symptom Checklist 90, assesses general psychiatric symptoms. Nine domains assessed by SA-45 are Anxiety, Depression, Interpersonal Sensitivity, Hostility, Obsessive-Compulsive, Psychoticism, Paranoid Ideation, Somatization, and Phobic Anxiety. SA-45 has adequate reliability and validity (Davison, Bershadsky, Bieber, Silversmith, Maruish, & Kane, 1997). The first author analyzed the SA-45 cumulative scores.

Westside Test Anxiety Scale is a brief, 10-item instrument. Six items of the scale assess impairment, and four items measure worry (Driscoll, 2007). This scale has adequate reliability and validity. The higher the participants' score, the greater their test anxiety.

None of the measures employed in this study were used as inclusion or exclusion criteria for subjects.

## *Design*

This study was conducted as a mixed method, pretest/posttest experimental design.

## *Procedures*

After Institutional Review Board approval was secured from the schools, a total of 168 college students were recruited during the first three weeks of the fall semester from three major institutes of higher education in Pacific Northwest. Participants signed up and provided all required assessment data and permissions to collect and use their responses and academic course grades through a password-protected website, following links posted on a dedicated website offering information about the study. After participants gave informed consent online, they completed a brief, Likert-scale questionnaire about their self-care habits regarding nutrition, rest, exercise, and relaxation, as well as three pretest assessment instruments: the 40-item Sarason RTT Scale, the 10-item Westside Test Anxiety Scale, and the SA-45. They were also asked to create a qualitative list of the problems as they see them that feed their anxiety or interfere with their studying or test-taking

success. Students were randomly assigned to three different groups.

During the 4th week of the semester, Groups 1 and 2 had two 2-hr training sessions in the use of EFT and in the practice of Diaphragmatic Breathing, respectively. The second author was the instructor, a clinician trained and certified in both EFT and yoga therapy. Group 3 served as a control, receiving no intervention in this initial phase of the study.

EFT utilizes acupressure tapping on a series of points on the skin in combination with guided mental focus directed at different aspects of a problem and self-statements about what one is aware of that feels bad. This intervention contains elements of systematic desensitization, cognitive reprocessing, and self-concept improvement via statements of intentional self-acceptance, relaxation triggering, situational acceptance, and reframing. The Diaphragmatic Breathing protocol utilizes slow, measured breathing for 10 breath cycles at a time while focusing on aspects of a particular problem. This intervention, influenced by the traditional yogic practice of Pranayama (breath control), also contains elements of systematic desensitization and cognitive reprocessing, initiating and pairing a relaxation response with a disturbing thought or belief.

Students in Groups 1 and 2 were asked to apply their interventions during Weeks 5 through 8 to assist with studying and test-taking for their most challenging, content-rich course. They were instructed to practice their learned intervention for 5 min prior to each study session and again for 5 min in the hour before taking a test. The protocol groups used their self-created, qualitative list of problems as the content for their intervention practice. Midterm exams signaled the end of the mandated practice period, and all three groups completed the surveys again posttest and declared any changes in self-care habits as measured by the initial questionnaire.

At the end of the semester, all remaining participants completed one final round of the surveys, providing a second set of posttest data and additional qualitative information about the perceived usefulness of the protocols. Pre- and posttest scores on the instruments were compared. Previous research has suggested that the protocol groups are likely to show lower levels of test anxiety post-treatment compared with the control group, and

the researchers expected to find that one or both would exhibit the desired combination of a significant increase in test performance paired with a significant decrease in anxiety relative to that of the other two groups.

## Results

After the entire sample completed the pretest, students from each scoring level of the RTT Scale were randomly assigned to three different groups. Sachin Jain conducted an analysis of variance (ANOVA) and found no significant baseline differences between the three groups on the demographic and dependent variables. Gain scores were computed by subtracting the pretest scores from posttest scores. Sachin Jain conducted the statistical analysis.

### *Posttest 1—Pretest*

Group means and standard deviations for all three groups are shown in Table 1. Self-care gain scores between pretest and posttest 1 measures are shown in Table 2, and were analyzed with ANOVA comparing groups (Treatment 1, tapping; Treatment 2, breathing and control), see Table 3. There was a significant difference between the treatments and control groups' gain scores of  $-1.73$  (Tapping),  $1.67$  (Breathing), and  $-1.13$  (Control)  $p < .05$ . Using a post-hoc Sheffe's test, we found that the breathing group had a significantly higher increase in the self-care gain scores than did the tapping or control groups. There was no significant difference in the gain scores for the participants in tapping and control groups.

RTT gain scores between pre- and posttest 1 measures were analyzed with ANOVA comparing groups (Treatment 1, tapping, Treatment 2, breathing and control), see Table 3. There was a significant difference between the treatment and control groups' gain scores of  $-5.55$  (tapping),  $-10.50$  (breathing), and  $7.01$  (control) ( $p < .05$ ). Using a post-hoc Sheffe's test, we found that the breathing group had a significantly higher decrease in the levels of test anxiety than the tapping or control groups. There was also a significant decrease in the levels of test anxiety for the participants in tapping group as compared to the control groups. The most effective intervention in decreasing test anxiety was breathing, followed by tapping. Anxiety increased in the participants of the control group.

Using ANOVA, we found no mean gain score differences for groups for Westside and SA-45 ( $p > .05$ ).

### *Posttest 2—Pretest*

Self-care gain scores between pre- and posttest 2 measures are shown in Table 4, and were analyzed with ANOVA comparing groups (Treatment 1, tapping; Treatment 2, breathing and control), see Table 5. There was a significant difference between the treatment and control groups' gain scores of  $-0.91$  (tapping),  $2.00$  (breathing), and  $-0.74$  (control) ( $p < .05$ ). Using a post-hoc Sheffe's test, we found that the breathing group had a significantly higher increase in the self-care gain scores than did the tapping or control groups. There was no significant difference in the gain scores for the participants in tapping and control groups.

RTT gain scores between pre- and posttest 2 measures were analyzed with ANOVA comparing groups (Treatment 1, tapping, Treatment 2, breathing and control), see Table 3. There was a significant difference between the treatment and control group's gain scores of  $-6.00$  (tapping),  $-15.67$  (breathing), and  $7.83$  (control) ( $p < .05$ ). Using a post-hoc Sheffe's test, we found that the breathing group had a significantly higher decrease in the levels of test anxiety than the control group. There was also a significant decrease in the levels of test anxiety for the participants in tapping group as compared with the control group. The most effective intervention in decreasing test anxiety was breathing, followed by tapping. Anxiety increased in the participants of the control group. After the third round, data from only 40 out of 168 participants who completed the informed consent were found to be complete. There were no adverse events reported.

Using ANOVA, we found no mean gain score differences for groups for Westside and SA-45 ( $p > .05$ ).

### *Qualitative Measures*

Table 6 summarizes the response from participants in their first and second rounds of posttests, respectively.

The following statements were taken from participants asked to describe any benefits they noticed, either academic or personal, from the practice of their protocol. Comments provided by

**Table 1: Group Means and Standard Deviations for the Dependent Variables**

Variable	N	Self-Care		Westside Test Anxiety Scale			Symptom Assessment-45			Sarason Reactions to Tests		
		M	SD	N	M	SD	N	M	SD	N	M	SD
Tapping												
Pre-	11	13.64	2.73	11	29.64	6.07	11	78.18	11.20	11	79.36	8.96
Post 1-	11	11.91	2.63	11	27.18	6.91	11	79.00	9.88	11	73.81	19.06
Post 2-	11	12.73	2.90	11	27.09	7.02	11	75.45	9.34	11	73.36	18.23
Breathing												
Pre-	6	12.83	2.93	6	28.17	7.96	6	57.83	7.83	6	72.33	13.84
Post 1-	6	14.5	2.17	6	23.50	8.89	6	58.83	7.70	6	61.83	13.42
Post 2-	6	14.83	2.71	6	22.67	9.73	6	53.00	6.63	6	56.67	15.50
Control												
Pre-	23	13.43	2.52	23	29.96	6.65	23	74.04	19.33	23	76.43	19.81
Post 1-	23	12.30	2.34	23	29.61	6.14	23	77.61	23.39	23	83.56	23.93
Post 2-	23	12.70	2.36	23	30.17	7.06	23	78.74	24.09	23	84.26	24.42

**Table 2: Analysis of Gain Scores From Pretest to Posttest 1**

Variable	Group	N	M	SD
Self	Tapping	11	-1.73	2.37
	Breathing	6	1.67	1.51
	Control	23	-1.13	2.38
	Total	40	-0.88	2.48
West-side	Tapping	11	-2.45	6.73
	Breathing	6	-4.67	9.52
	Control	23	-0.35	3.84
	Total	40	-1.58	5.84
SA-45	Tapping	11	0.82	11.44
	Breathing	6	1.00	3.35
	Control	23	3.57	13.34
	Total	40	2.43	11.71
RTT	Tapping	11	-5.55	17.63
	Breathing	6	-10.50	16.23
	Control	23	7.13	12.04
	Total	40	1.00	15.80

Note. Self: post-pre = + ; Westside (Westside Test Anxiety Scale): post-pre = - ; SA-45 (Symptom Assessment-45 Questionnaire): post-pre = - ; RTT (Reactions to Tests): post-pre = -

**Table 3: ANOVA Comparing Groups (Treatment 1-Tapping, Treatment 2-Breathing and Control) From Pretest to Posttest 1**

Dependent Variable	df	F	P
Self	2	4.646	.016
West-side	2	1.510	.234
SA-45	2	0.247	.782
RTT	2	5.175	.010

Note. Westside = Westside Test Anxiety Scale; SA-45 = Symptom Assessment-45 Questionnaire; RTT = Reactions to Tests.

**Table 4:** Analysis of Gain Score From the Pretest to Posttest 2

Variable	Group	N	M	SD
Self	Tapping	11	-0.91	1.38
	Breathing	6	2.00	1.67
	Control	23	-0.74	2.60
	Total	40	-0.38	2.38
Westside	Tapping	11	-2.55	6.86
	Breathing	6	-5.50	10.82
	Control	23	0.22	5.53
	Total	40	-1.40	6.99
SA-45	Tapping	11	-2.73	11.15
	Breathing	6	-4.83	6.62
	Control	23	4.70	15.94
	Total	40	1.23	14.07
RTT	Tapping	11	-6.00	16.42
	Breathing	6	-15.67	21.64
	Control	23	7.83	15.14
	Total	40	0.50	18.50

Note. Self: post-pre = + ; Westside (Westside Test Anxiety Scale): post-pre = - ; SA-45 (Symptom Assessment-45 Questionnaire): post-pre = - ; RTT (Reactions to Tests): post-pre = -

**Table 5:** ANOVA comparing groups (treatment1-Tapping, treatment 2-Breathing and control) from the pre-test to post-test 2

Dependent Variable	df	F	p
Self	2	4.084	.025
Westside	2	1.878	.167
SA-45	2	1.756	.187
RTT	2	5.995	.006

Note. Westside = Westside Test Anxiety Scale; SA-45 = Symptom Assessment-45 Questionnaire; RTT = Reactions to Tests.

**Table 6:** Posttests

	Not at all	Somewhat	Moderately	Very	Extremely
First round of posttests					
How helpful was this practice in improving your ease of studying?	1	10	6	4	0
Your comfort with test-taking?	3	6	6	0	4
Your scores on tests?	6	9	3	2	0
Second round of posttests					
How helpful was this practice in improving your ease of studying?	2	10	2	2	1
Your comfort with test-taking?	3	11	3	0	1
Your scores on tests?	5	6	5	1	0

both EFT and Diaphragmatic Breathing subjects indicated an enhanced sense of calmness, decrease in anxiety, and evidence of improved focus during study sessions and exams. Following are the participants' quotes:

### *Posttest 1*

- "I feel more relaxed when doing my homework, but I still feel some issues with time when taking tests."
- "I don't attribute any academic benefits. My scores were the same as before. I was a little less stressed and more relaxed during the test."
- "Using the technique helped me get through the reading I did before the test, which I think helped me perform as well as I did on the test."
- "I felt more at ease taking tests, and in a class that wasn't for this study I received a 92% using this protocol."
- "It did relax me a bit more, I didn't really study all that much though ... But it helped me sleep and relax before the test. That was great."

### *Posttest 2*

Quotes reflecting themes similar to Posttest 1 are the following:

- "I recognize that my test grades went up, but because of my inconsistency with studying under the protocol or even practicing the tapping protocol before tests (in front of classmates), I do not know if we can consider this a direct causal relationship. The peace I felt after practicing the protocol and while studying helped a lot though!"
- "I get less distracted during tests than I did before. The only thing I haven't been able to tap away the worry for is getting into graduate school."
- "I credit my practice of the protocol as the sole reason I now can take tests without caring about how my progress is comparing to the others in the room."
- "I was stressing out during my last psychology exam, when I just started breathing like the protocol said to, and felt calmer."

- "After finishing the test, I found out that I received a 96 percent on the test."
- "My confidence increased a little."
- "It helped me relax and remember."
- "The protocol did make me feel more relaxed in general, so it may have helped when I took the tests."
- "It is easier to remind myself to focus a little sooner when day dreaming than before."

## **Discussion**

The results of the study support that both tapping and breathing interventions decreased test anxiety, while focusing on current negative cognitive/emotional states to facilitate neuropsychological repatterning. The protocols given for EFT and for Diaphragmatic Breathing are easy enough for students to follow and administer, therefore, school counselors can help students with test anxiety through educating them in the techniques. EFT and the similar Diaphragmatic Breathing protocol used in this study can therefore help the estimated 33% of students that are affected by test anxiety (Methia, 2004, as cited in Sena et al., 2007), promoting positive mental health, increasing self-esteem and promoting larger career options.

### *Limitations and Recommendations*

Participants for the study were recruited from three different colleges (a 4-year college and two state graduate universities) in the Pacific Northwest. The high dropout rate between the initial and final sample resulted in small group sample sizes for both experimental groups, impairing the generalizability of the findings. Two subsequent replications with modifications in the administration of protocol of the study have been completed in the same location, and the researchers will continue the analysis to improve the validity of the findings. However, replications of this study in other geographic locations will improve its external validity.

## **References**

- Alpert, R., & Haber, R. N. (1960). Anxiety in academic achievement situations. *Journal of Abnormal and Social Psychology, 61*, 207-215. doi:10.1037/h0045464
- Benson, J., & Bandalos, D. (1992). Second-order confirmatory factor analysis of the Reactions to Tests Scale with cross

- validation. *Multivariate Behavioral Research*, 27, 459–487. doi:10.1207/s15327906mbr2703\_8
- Benor, D. J., Ledger, K., Toussaint, L., Hett, G., & Zaccaro, D. (2009). Pilot study of Emotional Freedom Techniques, wholistic hybrid derived from Eye Movement Desensitization and Reprocessing and Emotional Freedom Technique, and cognitive behavioral therapy for treatment of test anxiety in university students. *Explore: The Journal of Science and Healing*, 5, 338–340.
- Bodas, J., & Ollendick, T. (2005). Test anxiety: A cross-cultural perspective. *Clinical Child and Family Psychology Review*, 8, 65–88. doi:10.1007/s10567-005-2342-x
- Chamorro-Premuzik, T., Ahmetoglu, G., & Furnham, A. (2007). Little more than personality: Dispositional determinants of test anxiety (the Big Five, core self-evaluations, and self-assessed intelligence). *Learning and Individual Differences*, 18, 258–263. doi:10.1016/j.lindif.2007.09.002
- Davison, M. L., Bershady, B., Bieber, J., Silversmith, D., Maruish, M. E., & Kane, R. L. (1997). Development of a brief, multidimensional, self-report instrument for treatment outcomes assessment in psychiatric settings: Preliminary findings. *Assessment*, 4, 259–275.
- Driscoll, R. (2007). *Westside Test Anxiety Scale validation*. Retrieved from ERIC database. (ED495968)
- Ergene, T. (2003). Effective interventions on test anxiety reduction: A meta-analysis. *School Psychology International*, 24, 313–328. doi:10.1177/01430343030243004
- Eysenck, M. W. (1979). Anxiety, learning, and memory: A reconceptualization. *Journal of Research in Personality*, 13, 363–385. doi:10.1016/0092-6566(79)90001-1
- Eysenck, M. W., & Calvo, M. G. (1992). Anxiety and performance: The processing efficiency theory. *Cognition and Emotion*, 6, 409–434. doi:10.1080/02699939208409696
- Eysenck, M., Derakshan, N., Santos, R., & Calvo, M. (2007). Anxiety and cognitive performance: Attentional control theory. *Emotion*, 7, 336–353. doi:10.1037/1528-3542.7.2.336
- Gaudry, E., Vagg, P., & Spielberger, C. D. (1975). Validation of the state-trait distinction in anxiety research. *Multivariate Behavioral Research*, 10, 331–341. doi:10.1207/s15327906mbr1003\_6
- Hembree, R. (1988). Correlates, causes, effects, and treatment of test anxiety. *Review of Educational Research*, 58, 47–77.
- Liebert, R. M., & Morris, L. W. (1967). Cognitive and emotional components of test anxiety: A distinction and some initial data. *Psychological Reports*, 20(Pt. 1), 975–978. doi:10.2466/pr0.1967.20.3.975
- Mandler, G., & Sarason, S. B. (1952). A study of anxiety and learning. *Journal of Abnormal and Social Psychology*, 47, 166–173. doi:10.1037/h0062855
- Rovira, T., Fernandez-Castro, J., & Edo, S. (2005). Antecedents and consequences of coping in the anticipatory stage of an exam: A longitudinal study emphasizing the role of affect. *Anxiety, Stress & Coping*, 18, 209–225. doi:10.1080/10615800500134654
- Sarason, I. G. (1984). Stress, anxiety, and cognitive interference: Reactions to tests. *Journal of Personality & Social Psychology*, 46, 929–938. doi:10.1037/0022-3514.46.4.929
- Sarason, S. B., & Mandler, G. (1952). Some correlates of test anxiety. *Journal of Abnormal and Social Psychology*, 47, 810–817. doi:10.1037/h0060009
- Sarason, S. B., Mandler, G., & Craighill, P. G. (1952). The effect of differential instructions on anxiety and learning. *Journal of Abnormal and Social Psychology*, 47(Suppl. 2), 561–565.
- Sena, J. D. W., Lowe, P. A., & Lee, S. W. (2007). Significant predictors of test anxiety among students with and without learning disabilities. *Journal of Learning Disabilities*, 40, 360–376. doi:10.1177/00222194070400040601
- Sezgin, N., & Özcan, B. (2009). The effect of Progressive Muscular Relaxation and Emotional Freedom Techniques on test anxiety in high school students: A randomized controlled trial. *Energy Psychology: Theory, Research, and Treatment*, 1(1), 23–30. doi:10.9769.2009.1.1.NS
- Spielberger, C. (1972). Anxiety as an emotional state. In C. D. Spielberger (Ed.), *Anxiety: Current trends in theory and research* (Vol. 1, pp. 23–49). New York, NY: Academic Press.
- Spielberger, C., Anton, W., & Bedell, J. (1976). The nature and treatment of test anxiety. In M. Zuckerman & C. C. Spielberger (Eds.), *Emotion and anxiety: New concepts, methods, and applications* (pp. 317–345). Hillsdale, NJ: Erlbaum.
- Stowell, J. R., & Bennett, D. (2010). Effects of online testing on student exam performance and test anxiety. *Journal of Educational Computing Research*, 42, 161–171. doi:10.2190/EC.42.2.b
- Sud, A., & Sharma, S. (1989). Test anxiety, intrusive thoughts, and attentional process. *Journal of Personality and Clinical Studies*, 5, 139–145.
- Sud, A., & Sharma, S. (1990). Two short-term, cognitive interventions for the reduction of test anxiety. *Anxiety Research*, 3, 131–147. doi:10.1080/08917779008248748
- Sud, S., & Sharma, S. (1995). Effects of test anxiety, ego stress, and attentional skills training on arithmetic reasoning: An experimental evaluation of a brief counseling strategy. *Anxiety, Stress & Coping: An International Journal*, 8, 73–84. doi:10.1080/10615809508249365
- Tobias, S. (1985). Test anxiety: Interference, defective skills, and cognitive capacity. *Educational Psychologist*, 20, 135–142. doi:10.1207/s15326985Sep2003\_3
- Tryon, G. S. (1980). The measurement and treatment of test anxiety. *Review of Educational Research*, 50, 343–372.
- Wine, J. (1971). Test anxiety and direction of attention. *Psychological Bulletin*, 76, 92–104. doi:10.1037/h0031332
- Zeidner, M., & Safir, M. P. (1989). Sex, ethnic, and social differences in test anxiety among Israeli adolescents. *Journal of Genetic Psychology*, 150, 175–185. doi:10.1080/00221325.1989.9914589
- Zinta, R. L. (2008). Effectiveness of guided mastery treatment for reducing test anxiety among self-efficacious students. *Journal of the Indian Academy of Applied Psychology*, 34, 233–239.

Description of EFT protocol: Acupressure tapping combined with guided mental focus and self-statements about what one is aware of that feels bad. This intervention contains elements of systematic desensitization, cognitive reprocessing, and self-concept improvement via statements of intentional self-acceptance, relaxation triggering, situational acceptance and reframing.

Acupressure tapping is based on the ancient Chinese medicine concept of negative emotion and disease as manifestations of disruptions in the free flow of energy through meridian pathways. One can alternately appreciate the potential of applying kinesthetic stimulation to different neurologically-sensitive points on the body while focusing on current negative cognitive/emotional states to facilitate neuropsychological re-patterning.

Description of Diaphragmatic Breathing protocol: Slow, measured, conscious breathing for ten breath cycles while focusing on aspects of a particular problem. This intervention, influenced by the traditional Yogic practice of Pranayama, also contains elements of systematic desensitization and cognitive reprocessing, initiating and pairing a relaxation response with a disturbing thought or belief

### EFT Protocol

1. **Assess your level of distress about the problem you are addressing...** from 0 (*no distress*) to 10 (*extreme distress*).
2. **The Setup Statement...** Repeat a targeted self-acceptance affirmation 3 times while continuously tapping the Karate Chop point. As much as possible, avoid global statements. Zero in on the worst part of the thing that is bothering you. “*Even though I [have this problem, feel this pain--whatever is bothering you], I accept myself*” (or “*I want to be okay with me*” or “*I deeply and completely accept myself*”—*whichever is true for you right now on this issue*).
3. **Create an appropriate Reminder Phrase...** that keeps you focused on the specific part of the problem you are addressing.
4. **The Sequence...** Tap about 7 times on each of the following energy points **while repeating the Reminder Phrase at each point**. **FACE:** Eye Brow, Side of Eye, Under Eye, Under Nose, Chin; **BODY:** Collar Bone, Under Arm, Ribs; **HAND:** Thumb, Index Finger, Middle Finger, Pinkie, Karate Chop.
5. **Assess distress level...** If same or higher, clarify specific aspect causing distress and repeat steps 2.–4. with modified Reminder Phrase reflecting revised topic of focus. **If distress is lower but still not gone,**
6. **The Sequence (again)...** Repeat step 4 until distress about the problem is gone.
7. **Assess distress regarding original problem...** If different aspect of problem is still troubling, create a new Setup Statement and Reminder Phrase and repeat steps 4.–5. as needed until problem feels resolved.
8. **Go on to the next problem...** and repeat steps 1.–8. until you have addressed all relevant problems.

### Diaphragmatic Breathing Protocol

1. Sit comfortably upright with your spine lengthened. Make sure you have a good support behind your back if you need one. Arrange your legs so they are also comfortable and relaxed.
2. Place one hand on your stomach. Notice how much the hand on your stomach is moving as you consciously slow your breath down a little. Begin to count to 4 while you inhale, pause, then count to 4 as you exhale, and pause. When you are comfortable with that slow, easy breathing pattern...
3. Bring to mind the problem you want to address.
4. Assess your level of distress about the problem you are addressing, from 0 (*no distress*) to 10 (*extreme distress*).

5. Create an appropriate Reminder Phrase that keeps you focused on the specific part of the problem you are addressing.
6. Repeat the Reminder Phrase silently with each breath for ten breath cycles.
7. Assess distress level again. If the same or higher, clarify specific aspect causing distress and repeat steps **5.–6** with modified Reminder Phrase reflecting revised topic of focus.
8. Assess distress regarding original problem ... If different aspect of problem is still troubling, create a new Reminder Phrase and repeat steps **5.–7** as needed until problem feels resolved.
9. Go on to the next problem and repeat steps **4.–9** until all relevant problems have been addressed.