

# Stress Inoculation Training (SIT) on State-Trait Anxiety of High-Stress Senior College Students

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*Using a quasi-experimental design, this study examined the effectiveness of abbreviated and standard Stress Inoculation Training on the state-trait anxiety of 57 high-stress senior college students in one of the colleges in Mindanao. Multivariate analysis of covariance showed a significant difference between groups on dependent variables post-intervention state anxiety scores and delayed post-intervention state anxiety scores, Wilk's  $\lambda=.84$ ,  $F(4,104)=2.45$ ,  $p=.05$ . Univariate analysis of covariance revealed a significant difference in the post-intervention state anxiety scores,  $F(2,53)=4.78$ ,  $p=.01$  with adjusted means significantly lower for the abbreviated SIT group compared with the no training and standard SIT groups. Multivariate analysis of covariance results further showed no significant difference between groups on the post-intervention trait anxiety scores and delayed post-intervention trait anxiety scores, Wilk's  $\lambda=.88$ ,  $F(4,104)=1.79$ ,  $p=.14$ . Overall, results revealed that abbreviated SIT effectively reduced state anxiety than standard Stress Inoculation Training. However, neither abbreviated SIT nor standard SIT effectively reduced trait anxiety. These findings support the efficacy of abbreviated SIT in reducing state anxiety.*

*Keywords: stress, state-trait anxiety, stress inoculation training, quasi-experimental, senior college students*

## INTRODUCTION

Compared with other year levels in college, senior year is considered distinct and complex. It is a phase in a student's life marked by a unique constellation of challenges. According to the study of Jimenez, Solon, and Turban (2017), senior college students are considered more stressed than students in any other year levels in college. Mock board examinations, pre-board reviews, internships, thesis writing, workloads, social expectations, and financial pressures are just among the many sources of stress and anxiety that significantly demand senior students' ability to cope. Coping plays a significant role in one's experience of stress and anxiety. Individuals with the necessary coping skills are likely to lead a healthy life, while those who lack the ability to cope tend to get overwhelmed and distressed (Lazarus & Folkman, 1984, 1987).

Stress and anxiety are two different but very much related terms because anxiety is an emotional reaction to stress; hence, they are often used interchangeably or mentioned together, as in the case of this study (Anxiety and Depression Association of America [ADAA], 2019). Regarding anxiety, Spielberger (1972) categorized two types: state anxiety and trait anxiety. The former is described as transitory because it is environment-dependent, while the latter is characterized as relatively enduring or permanent because it is a personality trait. Based on Eysenck's (1988) biological personality theory, trait anxiety can be subsumed under neuroticism, a distinct dimension of personality.

Stress and anxiety have been active areas of research since the beginning of the century up until today, primarily because of their impact on individual's health and performance. Literature is replete with studies on the factors, nature, causes, and effects of these variables on individuals (Martinez, 2004; Gandhe, 2014). However, despite the bulk of the information available at this point, people's stress level has been reported to have never gone down (Australian Psychological Society [APS], 2014; American Psychological Association [APA], 2015; Malgorzata, Schneider, & Gonzales, 2009; Hoffman, 2011; Health and Safety Executive, 2018; Velasco, 2013, May 25). Many college students with stress-related mental health problems are now observed to be on the rise (Bueno, 2018; Tomacruz, 2018; Armilla, 2019). Clearly, this indicates that this problem still persists and is, in fact, becoming increasingly critical. The gap could have been that we failed to translate the knowledge that we have gained into practice.

So far, a lot of promising techniques and programs have been developed and used to address these issues (Klein, 2018; Hersen, 2005; Erford, 2015; Sadigh, 2012; Ratanasiripong, Ratanasiripong, & Kathalae, 2012; Turner & Barker, 2013; McClellan & Hamilton, 2009; Davis, Eshelman, & McKay, 2000; Gururaja, Harano, Toyotake, & Kobayashi, 2011; Suinn, 2013). One spectrum of techniques that have been proven effective is the Stress Inoculation Training (SIT) developed by Meichenbaum in the 1980s (as cited in Saunders, Driskell, Johnston, & Salas, 1996; Meichenbaum & Deffenbacher, 1988). SIT is a broad-based cognitive-behavioral intervention that employs multicomponent training arranged in flexible interlocking phases: the conceptual or educational phase, skills acquisition and consolidation phase, and application phase (Meichenbaum, 2008; Dobson, 2009). Since its inception, it has been employed successfully in helping individuals cope with various forms of physical and psychological stress using different outcome measures. Moreover, it has been applied to various clinical and non-clinical populations, including medical patients (Moses, 1980; Bosmajian, 1981; Hendrickson, 1983; Warden, 1983; Yepes, 1984; Sax, 1990; Caddick, 1995), students (Lavit, 1982; Chiu, 1983; Blackmore, 1983; Serrano, 1993; Simmons, 1993), teachers (Schmidt, 1982; Guzicki, 1984; Cecil, 1987), nurses (West, 1984; Toloczko, 1989; Admi, 1997), jail, military, and police officers (Johns, 1986; Digliani, 1994; Crago, 1995; Rosmith, 2013; Hourani et al., 2016), and individuals with psychological disorders (McDaid, 2007) and was found to be effective in reducing anxiety and other stress-related conditions with a varying level of efficacy. Interestingly, its effectiveness in the school setting has yet to be extensively explored, especially among senior college students.

To achieve a real gain out of the voluminous data on SIT's efficacy on reducing stress and anxiety, the researcher is motivated to utilize this program to help senior college students learn effective coping skills and accommodate or address senior college students' unique needs. Secondly, SIT as a technique has not been widely used in school settings in the Philippines. The literature is short of information about its applicability among Filipino students, specifically senior college students. In this regard, the researcher would like to contribute to the existing body of knowledge relevant to the program's effectiveness concerning this group. Lastly, considering the bulk of students that need to be given care and attention, one-to-one counseling or psychotherapy is deemed inefficient in addressing the needs of a large population. Hence, the researcher sees the need for a technique that is preventive, amenable to a group setting, efficient, and brief. Based on the literature, brief interventions are no longer just considered alternatives or substitutes to traditional approaches (Capuzzi & Gross, 2013). Nowadays, they are considered viable options. Overall, this background provided the impetus to examine the effects of the abbreviated SIT compared with standard SIT on high-stress senior college students' state and trait anxiety.

### **Theoretical Framework**

The transactional theory of stress and coping (TTSC) by Lazarus and Folkman (1984) provides the foundation for utilizing SIT as a method of intervention to reduce state and trait anxiety of high-stress senior college students. According to TTSC theory, stress is a product of a transaction or interaction among three variables; the person, the environment, and cognitive appraisal. In this transaction process, cognitive appraisal plays a critical role in mediating the person's stress experience. Therefore, the effect that stress has on a person is based more on one's perception of threat, susceptibility, and ability to cope than the experience of the event itself. SIT, as a preventive tool, educates the person on the nature of stress and how

to identify stressors in advance and teaches them how to cope with potential stressors in a safe environment. It allows the person to master coping skills and apply them as they are gradually exposed to real or imagined stressors. This inoculation process hypothesized that by gradually exposing a person to a tolerable amount of stress and teaching him or her how to cope with the experience can eventually build a strong resistance to stress in the future.

In this study, SIT is viewed as a preventive technique that can change high-stress senior college students' physiological, affective, psychological, and neurological systems, primarily by working on the student's cognitive processes, thereby influencing how they would appraise and react to stressors. This program provides an avenue for students to learn in advance how to cope and rehearse how to deal with stressful events or situations. Developing a higher level of ability and mastery to identify and cope with stressful events could increase students' self-efficacy in solving problems, which could lower their anxiety.

### **Conceptual Framework**

This study aimed to determine the effect of the independent variable groups: no training (no\_Trng), abbreviated SIT (abbr\_SIT), and standard SIT (stan\_SIT) on the dependent variables state anxiety and trait anxiety of high-stress college senior students. The no\_Trng group did not receive any form of intervention. The abbr\_SIT group received phase 2 or skills acquisition component, and phase 3 or application or follow-through component of the standard SIT program while the stan\_SIT group received phase 1 or education/conceptualization component, phase 2 or skills acquisition component, and phase 3 or application or follow-through component of the standard SIT program. On the other hand, the dependent variables of this study state anxiety and trait anxiety were measured using the State-Trait Anxiety Inventory by Spielberger (1983). Participants were tested for each outcome measure at three points: pre-intervention, post-intervention, and delayed post-intervention. Overall, this study hypothesized that independently abbr\_SIT and stan\_SIT intervention programs would affect the state and trait anxiety scores of the high-stress senior college students compared with no training.

### **Statement of the Problem**

This study aimed to examine the effects of abbreviated SIT and standard SIT on state anxiety and trait anxiety of high-stress senior college students. Specifically, the current study sought answers to the following questions:

1. Are there significant differences in the post-intervention state anxiety mean scores (postSAS) and delayed post-intervention state anxiety mean scores (delSAS) between groups (no\_Trng, abbr\_SIT, and stan\_SIT) while controlling for pre-intervention state anxiety mean scores (preSAS) of high-stress senior college students?
2. Are there significant differences in the post-intervention trait anxiety mean scores (postTAS) and delayed post-intervention trait anxiety mean scores (delTAS) between groups (no\_Trng, abbr\_SIT, and stan\_SIT) while controlling for pre-intervention trait anxiety mean scores (preTAS) of high-stress senior college students?

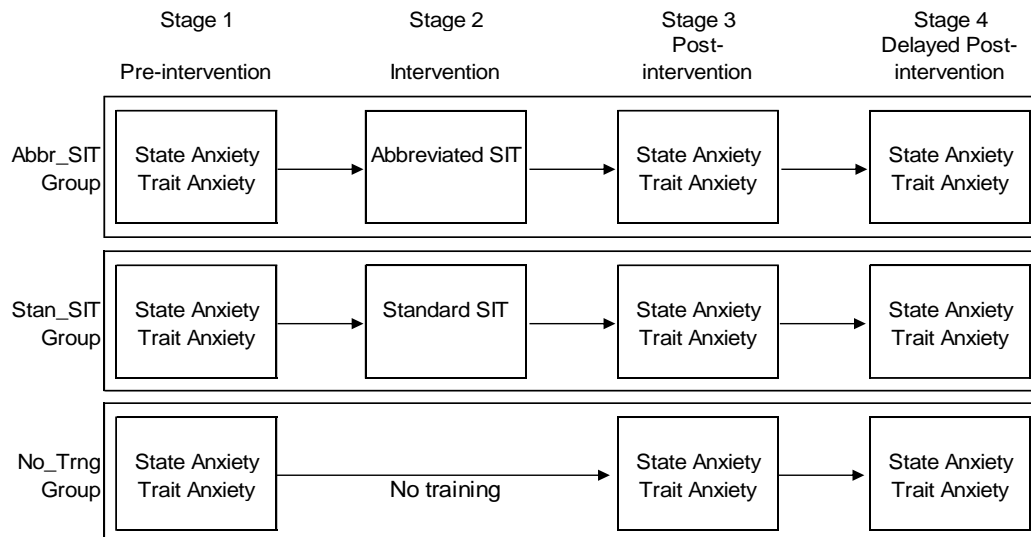
## **METHOD**

### **Design**

This study employed a quasi-experimental between-group design with three unequal groups. The training program was divided into four stages: stage 1 or pre-intervention testing, stage 2 or intervention implementation, stage 3 or post-intervention testing, and stage 4 or delayed post-intervention testing (26 days after intervention termination). Stage 2 was further divided into three phases based on the SIT framework: the education phase, skills acquisition phase, and application or follow-up phase. The entire training consisted of 18 separate sessions or 18 hours that lasted for three weeks. The education phase had nine (9) sessions, the skills acquisition phase had seven (7) sessions, and the application phase had two (2) sessions. For the abbr\_SIT, the education phase was omitted. Therefore, the abbr\_SIT group had nine (9)

sessions or nine hours of training, while the stan\_SIT group received 18 sessions or 18 hours of training. Figure 1 shows the intervention schedule schematic diagram.

**FIGURE 1**  
**INTERVENTION SCHEDULE SCHEMATIC DIAGRAM**



### Participants

The participants of this study were senior college students from a male-dominated academic program in one of the private colleges in Mindanao. Initially, 69 out of the 90 population volunteered to participate in the study; however, only 57 were considered for the final analysis. Twelve were weeded out due to incomplete data. Of the 57, two (2) were females, and 55 were males. Their mean age is 21.35, with ages ranging from 19 to 37. Their mean intelligence score was 46.91, as measured by Raven's Advanced Progressive Matrices (APM). Purposive sampling was employed in selecting the participants. Of the four pre-determined class sections, three were randomly selected and were used as the basis in determining their assignments to the treatment conditions: no\_Trng group (n= 21), abbr\_SIT group (n=16), and 20 stan\_SIT (n=20).

### Measures

To measure the dependent variables, trait anxiety and state anxiety, the State-Trait Anxiety Inventory (STAI) by Spielberger (1983) was used. STAI is a standardized self-report inventory based on a 4-point Likert scale. It has two forms, Form Y and Form X. Form Y or the State-Anxiety form is composed of statements that measure one's state anxiety or how one feels at the moment. On the other hand, Form X or the Trait-Anxiety form measures one's trait anxiety or how one feels in general. Overall, STAI is composed of 40 questions on a self-report basis with 20 questions for Form Y and 20 for Form X. For each individual, the highest possible score generated from this inventory is 80, while 20 for the lowest. For the Trait Anxiety scale or Form X, test-retest coefficients are relatively high (.65 to .86) and low for the State Anxiety scale or Form Y (.16 to .62). The internal consistency for both the S-Anxiety (.86 to .95) and T-Anxiety (.89 to .96) scales are relatively high based on alpha coefficients and item-remainder correlations. The Raven's Advanced Progressive Matrices (APM) was initially used to measure intelligence as one the covariates of this study.

### Ethical Considerations

Before the conduct of the experiment or training, informed consent was obtained to ensure that the participants understood the whole process and did not participate in the study or intervention against their

will. Confidentiality was emphasized during training (Corey, Corey, & Callanan, 2011), testing, and data collection. The identity of the students and school were also protected. For the participants' benefit, testing and training sessions were all conducted by a licensed psychologist and guidance counselor to see that the standard knowledge and skills required to run the program were met. Prior to training, activities were pilot tested at least twice to ensure the quality of the trainer's training and competence. Participants' classes were not disrupted or compromised. To recognize participants' effort and motivate them to complete the whole SIT course, credit points were given by their subject teachers.

## RESULTS AND DISCUSSIONS

Results showed that the state anxiety mean scores of the senior college students tend to vary between groups at post-intervention testing, especially for the abbr\_SIT group ( $M = 38.06$ ;  $SD = 5.53$ ) compared with the pre-intervention and delayed intervention between-group mean scores. The abbr\_SIT group showed a marked reduction in the state anxiety mean scores between pre-intervention and post-intervention testings. However, results showed that the three groups' delayed post-intervention mean scores virtually returned to their pre-intervention level, which suggests that the reduction of the state anxiety scores was not sustained 26 days after the termination of the SIT program. Table 1 shows the means and standard deviations for state anxiety scores between groups measured at three different testing points.

**TABLE 1**  
**MEANS AND STANDARD DEVIATIONS FOR STATE ANXIETY SCORES**  
**BETWEEN GROUPS**

Group	Pre-intervention		Post-intervention		Delayed Post-intervention	
	Mean	SD	Mean	SD	Mean	SD
No_Trng	43.19	7.83	44.48	6.99	43.38	6.76
Abbr_SIT	40.00	6.87	38.06	5.53	41.56	5.83
Stan_SIT	42.75	7.45	40.75	5.50	41.45	7.33
Overall	42.17	7.43	41.37	6.54	42.19	6.67

On the other hand, the results of the three groups' trait anxiety mean scores showed no marked variation at the post-intervention testing except for the abbr\_SIT group ( $M = 43.69$ ;  $SD = 7.79$ ) compared with the groups' pre-intervention and delayed post-intervention means scores. Results also revealed that between-group mean scores nearly reverted to their pre-intervention levels as measured 26 days after the SIT program was terminated. Table 2 shows the means and standard deviations for trait anxiety scores between groups measured at three different testing points.

**TABLE 2**  
**MEANS AND STANDARD DEVIATIONS FOR TRAIT ANXIETY SCORES**  
**BETWEEN GROUPS**

Group	Pre-intervention		Post-intervention		Delayed Post- intervention	
	Mean	SD	Mean	SD	Mean	SD
No_Trng	46.14	6.32	47.14	6.32	46.95	6.07
Abbr_SIT	46.00	8.44	43.69	7.79	44.00	6.56
Stan_SIT	47.30	6.53	47.90	5.24	48.15	5.45
Overall	46.65	7.44	46.44	6.53	46.54	6.13

For the impact of SIT on state anxiety, multivariate (MANOVA) analysis showed that there was a significant multivariate effect of the treatment conditions (no\_Trng, abbr\_SIT, and stan\_SIT) on the state anxiety scores (postSAS and delSAS) of the participants Wilk's  $\lambda = .83$ ,  $F(4,106) = 2.57$ ,  $p = .04$ , partial  $\eta^2 = .09$ . Separate univariate ANOVAs on the dependent variables confirmed a significant main effect for the treatment conditions on postSAS  $F(2,54) = 5.17$ ,  $p = .009$  but a not significant main effect on delSAS  $F(2,54) = .52$ ,  $p = .60$ . When preSAS was added as a covariate in MANCOVA this effect was still significant though a bit weaker Wilk's  $\lambda = .84$ ,  $F(4,104) = 2.45$ ,  $p = .05$ , partial  $\eta^2 = .09$ . Table 3 shows the MANCOVA on post-intervention state anxiety scores and delayed post-intervention state anxiety scores between groups.

**TABLE 3**  
**MANCOVA ON POST-INTERVENTION STATE ANXIETY SCORES AND DELAYED**  
**POST-INTERVENTION STATE ANXIETY SCORES BETWEEN GROUPS**

Source	Wilk's $\lambda$	df	F	p	Partial $\eta^2$
Group	.84	4,104	2.45	.050*	.09
Covariate (preSAS)	.57	2,52	19.43	.001*	.43

\*  $p \leq .05$

Furthermore, two ANCOVAs indicated a significant difference by group on postSAS,  $F(2,53) = 4.78$ ,  $p = .01$ , partial  $\eta^2 = .15$  but a not significant difference on delSAS,  $F(2,53) = .49$ ,  $p = .62$ , partial  $\eta^2 = .02$ . Bonferonni *post hoc* test of the univariate outcomes adjusted for preSAS showed that abbr\_SIT group reported a significantly lower postSAS compared with no\_Trng group ( $p = .02$ ) while no significant difference between abbr\_SIT and stan\_SIT ( $p > .05$ ). These findings lend support to the efficacy of abbreviated interventions to stress and anxiety. Table 4 shows the ANCOVA on post-intervention state anxiety scores between groups.

**TABLE 4**  
**ANCOVA ON POST-INTERVENTION STATE ANXIETY SCORES BETWEEN GROUPS**

Source	SS	MS	df	F	p	Partial $\eta^2$
Covariate(preSAS)	707.15	707.15	1,53	28.73	.001*	.35
Group*postSAS	235.50	117.75	2,53	4.78	.012*	.15

\*  $p \leq .05$

Based on the results, the abbreviated SIT proved to be more effective than the standard SIT in reducing senior college students' state anxiety; nonetheless, standard SIT also showed an almost significant effect. These add to the existing body of findings that provided evidence of the efficacy of abbreviated or brief interventions similar to most standard approaches or programs (Capuzzi & Gross, 2013). Furthermore, these indicate that the omission of the education phase, which is a cognitive component of SIT, did not affect its ability to reduce the participants' state anxiety. These findings diverge from earlier research, which supported the education component of the SIT program (McCordick, Kaplan, Finn & Smith, 1979; Harmon-Bowman, 1981). However, they reinforce the claim of Moses (1980) that the education component was not a significant component of SIT for it to impact stress or anxiety. The context of the current study could elucidate these diverging findings. Phase 1, or the education phase, may not be that significant as participants may already have knowledge about the nature of stress and have identified their stressors before the conduct of the intervention program, as they have been experiencing them while attending school.

On the other hand, though abbreviated SIT showed to reduce state anxiety, its effect was short-term. This can be attributed to the conventional notion of linearity of effect, which suggests that the higher the dose, the longer the effect or, the greater the benefit or vice versa (Howard, Kopta, Krause, & Orlinsky, 1986; Orlinsky & Howard, 1986 as cited in Budman & Gurman, 1988). Consistent with the linearity of

effect explanation, the abbr\_SIT's impact was not stable over time (26 days) because the number of sessions or duration of exposures was relatively fewer or shorter. In addition, the nature of state anxiety, which is transitory (Spielberger, 1972) may play a significant role in the stability of the effect for both the abbreviated and standard SIT.

To test the null hypothesis that there are no significant mean differences in postTAS and delTAS between groups (no\_Trng, abbr\_SIT, and stan\_SIT) before covariate adjustment, MANOVA revealed a not significant multivariate effect on the combined dependent variables postTAS and delTAS across groups: Wilk's  $\lambda = .91$ ,  $F(4,106) = 1.23$ ,  $p = .30$ , partial  $\eta^2 = .04$ . Moreover, when preTAS was added as covariate in MANCOVA, the effect was not significant Wilk's  $\lambda = .88$ ,  $F(4,104) = 1.79$ ,  $p = .14$ . Table 5 shows the MANCOVA on post-intervention and delayed post-intervention trait anxiety scores between groups.

**TABLE 5**  
**MANCOVA ON POST-INTERVENTION AND DELAYED POST-INTERVENTION**  
**TRAIT ANXIETY SCORES BETWEEN GROUPS**

Source	Wilk's $\lambda$	df	F	p	Partial $\eta^2$
Group	.88	4,104	1.79	.14	.06
Covariate preSAS)	.47	2,52	52.00	.001*	.53

\*  $p \leq .05$

Based on the results, neither abbreviated SIT nor standard SIT showed a significant impact on trait anxiety. This is consistent with the conclusion of Digliani (1994) that there were no significant differences between the treatment and control groups on trait anxiety. In addition, this finding can also be linked to the nature of trait anxiety. According to Spielberger (1966), trait anxiety is relatively enduring. Coherent with this definition, trait anxiety is less likely to be affected by any interventions because it is a personality trait therefore relatively permanent (Eysenk, 1988). However, the study of Bosmajan (1981) indicated that SIT could impact trait anxiety in the post-treatment. This suggests that further studies can be done in this area as SIT's impact may depend on the characteristics of the subjects involved, level of anxiety, or duration of treatment.

Overall, the results of this study lend support to the transactional theory of stress and coping (TTSC) of Lazarus and Folkman (1984), which proposes that the experience of stress and anxiety is highly dependent on the interaction of three factors: the person, the environment, and cognitive appraisal. The participants of this study have learned different ways of coping and experienced the use of each through gradual exposure to the recognized stressors; thus, they were inoculated. This inoculation, affected their way of appraising the threat from the environment and their capacity to manage anxiety, specifically state anxiety.

## CONCLUSIONS

It is concluded in this study that abbreviated SIT was far more effective than standard SIT in reducing transitory type of anxiety of high-stress senior college students; however, its impact was not stable over time. Further, it is concluded that neither abbreviated SIT nor standard SIT was effective in reducing trait anxiety of high-stress senior college students. In this study, the standard SIT failed to significantly reduce both state anxiety and trait anxiety of the participants. Nonetheless, abbreviated SIT significantly reduced state anxiety.

## RECOMMENDATIONS

Colleges and universities can further explore the effectiveness of SIT in its abbreviated or standard format using a larger sample of male and female students across various levels and academic programs.

This program can be incorporated into the guidance program as a preventive intervention among students, especially in addressing transitory types of stress and anxiety including mock board examinations, examinations, thesis, research, or practicums.

For further research, it is recommended that studies will include examining or evaluating the efficacy of each activity included in the entire SIT program. The current study only focused on the efficacy of SIT's education component, not on the efficacy of each activity within each component. Furthermore, the investigation of abbr\_SIT and stan\_SIT in combination with other approaches is recommended. This is to examine the possibility of increasing its efficacy when implemented in conjunction with other approaches that are also proven effective.

On the other hand, since this study's sample was taken from a single institution that was relatively small and predominantly male, it is recommended that future research studies consider taking samples from different college institutions and employ a larger sample with males and females population proportionately represented.

This study did not pre-screen the anxiety level of the participants or categorize them into levels. Future studies may focus on this aspect; that is, factor in the levels of anxiety (low, moderate, high) of the participants in measuring the impact of abbr\_SIT and stan\_SIT in reducing stress and anxiety. On the other hand, since SIT is shown to be effective in reducing state anxiety, a temporary type of anxiety, future studies may focus on investigating its impact on a specific source of state anxiety (i.e., mock-board exam or thesis writing).

Finally, since both abbreviated and standard SITs seem to have no impact on trait anxiety but have demonstrated in other studies using different populations or samples, further investigation of these on various subjects is recommended.

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