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**Do Higher Exam Grades Predict Higher Standards of Success and More
Test Anxiety?**

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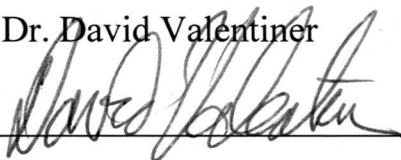
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Do Higher Exam Grades Predict Higher Standards of Success and More Test Anxiety?

Honors Capstone

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Abstract

The current study used a short-term, prospective design to examine the relationships among test anxiety, test performance, students' standards for success, and students' test self-efficacy (i.e., performance expectancies). College freshmen ($N = 171$) enrolled in an introductory psychology course during their first semester of college completed Time 1 questionnaires about one week before their first in-class exam. One hundred two participants (56% of Time 1 participants) completed Time 2 questionnaires up to one week after learning the results of their test scores and about two weeks prior to their second in-class exam. Irrelevant Thinking subscale scores on the Revised Test Anxiety Scale (RTA) predicted second exam scores, even after controlling for first exam scores. High exam scores predicted increases in personal standards but not in perceived instructor's standards, even after controlling for prior standards. High exam scores also predicted increases in personal standards and test self-efficacy (belief in one's ability to perform well on a test) in the low test anxious group but not in the high test anxious group. This study supports past research in so far as it provides evidence that test anxiety predicts lower test performance, but test performance does not predict changes in test anxiety. Among two test anxiety groups (low vs. high), the relationship between exam scores and standards for success as well as the relationship between exam scores and self-efficacy are explored. The implications are discussed in terms of possible self-handicapping behaviors and self-focused attention.

Do Higher Exam Grades Predict Higher Standards of Success and More Test Anxiety?

There is an increasing emphasis placed on the importance of evaluative performances in both academia and the workforce. Current students are submerged in this process of evaluation from the moment they begin attending classes. Pressure to perform well in current academic coursework accumulates as students prepare for future careers by achieving higher education. Testing situations are prevalent and greatly affect grades. Grades, in addition to standardized tests, impact future career opportunities. Testing situations are used to assess and determine the level of competence of prospective employees. Many students experience some degree of test anxiety, a fear of evaluation in an academic performance situation. Test anxiety (TA) has been found to cause poor test performance (Hembree, 1988). Due to its detrimental effects, the current study explores TA as it relates to exam grades, standard setting, and self-efficacy.

The History of Operationalizing Test Anxiety

Although TA does not have its own diagnostic criteria in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)*; American Psychiatric Association, 2000), TA is best categorized as non-generalized social phobia (Bögels et al., 2010). Using this conceptualization, TA may be diagnosed for an individual who experiences an evaluative performance situation (e.g., taking a test) in which he or she fears humiliation (Criterion A), if the evaluative situation provokes anxiety (Criterion B), if the individual recognizes his or her fear as excessive (Criterion C), and if the situation is either avoided or endured with intense distress (Criterion D). Finally, the performance situation must either interfere with an individual's daily routines, occupational or academic functioning, social activities or relationships; or the individual must experience significant personal distress (Criterion E) to warrant a diagnosis (APA, 2000).

Defining TA is continuously evolving, and how to best explain the dimensionality of TA is debatable. Liebert and Morris (1967) established a bi-dimensional model of TA in which worry and emotionality are the main factors. Further factor analyses by Morris, Davis, and Hutchings (1981) supported this categorization of TA. Worry is a cognitive component in which recurrent thoughts about oneself and one's performance occur during the testing situation. Cognitions may include negative self evaluation, anticipation about the results and implications of the evaluative situation, and preoccupation with one's autonomic nervous system arousal. Emotionality refers to the physiological arousal related to anxiety that one's body exhibits during the testing situation. Both cognition and emotionality can be detrimental and function to disrupt the test-taking experience.

Despite the initial bi-dimensional approach to TA, Sarason (1984) proposed a four-dimensional model that comprised worry, test-irrelevant thoughts, tension, and bodily symptoms. In his study, he found that test anxious participants experienced greater irrelevant thinking than did non-anxious participants. Sarason argued that the four-factor model clarifies the way in which TA is conceptualized and that this approach emphasizes the intrusive nature of test-irrelevant thoughts. Sarason's results indicated that it is the preoccupation with intrusive thoughts that distract a socially anxious person from maintaining task-focused thinking. Furthermore, worry is distinct from intrusive test-irrelevant thoughts because it consists of thoughts specific to evaluation. Although a four-dimensional model better specifies the components of the concept of TA, McCarthy and Goffin (2005) contended that the bi-dimensional model subsumes the four-factor model, and that worry and emotionality are the main predictors of cognitive test performance. More specifically, in their personnel selection contexts, factor analyses revealed that the four-dimensional model did not further predict

cognitive test performance. Still, the Revised Test Anxiety Scale (RTA), which is derived from Sarason's (1984) Reactions To Tests (RTT) scale, has demonstrated validity across cultures (Benson & El-Zahar, 1994). Although there is some controversy, given the validity of TA measures based on the four-factor model and the distinction made between worry and test-irrelevant thoughts, it is not yet appropriate to dismiss the four-dimensional approach to TA. Overall, more research may be needed to better understand the construct of TA and its dimensions.

Relationship Between Test Anxiety and Poor Test Performance

An extensive amount of evidence exists that supports the association between TA and poor test performance. TA is widespread across an array of ages, ethnicity, and school environments (urban and suburban). In their correlational study of 216 first-year undergraduates, Cohen, Ben-Zur, and Rosenfeld (2008) found that TA was inversely related to performance grades. TA in children has also been examined. Turner et al. (1993) distributed the Test Anxiety Scale for Children (TASC) to 168 children primarily from urban and lower socioeconomic communities. TA in children was significantly related to lower academic achievement scores. Since approximately 95% of the school comprised African American students, this study was used as an estimate for TA in African American students in the urban environment. Results suggest that the prevalence of TA in students from an urban setting is similar to that of students in a suburban school setting.

Additionally, in a meta-analysis conducted by Hembree (1988), correlations between TA and aptitude measures as well as TA achievement measures were inversely related. TA and grade point average (GPA) were also inversely related. Seipp (1991) conducted a meta-analysis and found a negative correlation between TA and test performance. High test anxious students, in

comparison to low test anxious students, also had more problems with encoding and higher cognitive interference. Cassady and Johnson (2002) found that cognitive TA negatively influences academic performance measures. McCarthy and Goffin (2005) specifically found that TA negatively correlated with three cognitive ability scales (general knowledge, quantitative, and verbal) and a composite cognitive scale.

Chapell et al. (2005) conducted a large-scale investigation regarding the relationship between TA and poor academic performance, as measured by GPA in undergraduate and graduate students. This study's sample included 4,000 undergraduate and 1,414 graduate students. For both undergraduate and graduate students, a significant yet small inverse relationship between TA and GPA was found. It is noteworthy that TA is most often conceptualized as a fear of an evaluative performance. Although GPA includes tests, GPA also includes other forms of evaluation (i.e. papers and projects). Therefore, the fact that GPA, and not tests, was correlated with TA is an important clarification because GPA does not necessarily represent a testing situation.

Hembree (1988) conducted a thorough meta-analysis that examined the directionality of the relationship between TA and test performance. He concluded that TA causes poor test performance, as evident by TA treatment leading to TA reduction and increased test performance. Whereas behavioral treatments included but were not limited to systematic desensitization (SD) that focused on reducing the emotionality component of TA, cognitive treatments included group counseling and aimed to reduce the worry component of TA. While cognitive-behavioral treatments (CBT) mainly focused on reducing worry, they also aimed to reduce emotionality. Overall, cognitive treatments did not reduce TA, but behavioral treatments and CBT were effective in reducing TA and also accompanied improved test performance. Because behavioral

treatments decreased both emotionality and worry, it was inferred that the construct of TA was considered primarily a behavioral construct.

Several cognitive models have sought to explain how TA leads to poor test performance. Wine (1971) proposed an interference model in which a test anxious person can be categorized as either engaging in task-relevant or self-relevant (task-irrelevant) thinking. A low test anxious person spends more time engaging in task-relevant behaviors which facilitates test performance, whereas a high test anxious person engages in both task-relevant and self-relevant thinking. This division of attention is proposed to be detrimental to test performance because self-relevant thinking directs that person's attention to preoccupations about oneself during the test. Thus, more time is spent focusing on oneself and less time is spent productively engaging in thinking and behaviors which could increase test performance. This cognitive interference model might thus explain how TA accounts for poor test performance.

Tobias (1985), however, offered an alternative explanation by proposing a skills deficit model, in which the test anxious individual lacks either good study skills or test-taking skills, leading to poor test performance. Thus, the skills deficit model proposes that TA is a natural reaction to inadequate skills. Whereas Wine's (1971) interference model suggests that TA is the reason for which the student cannot retrieve appropriate information for the test, the skills deficit model suggests that the individual has no information to retrieve (due to poor study habits) or fails to retrieve information during the test due to their difficulty in taking the test (lack of test-taking skills). Tobias (1985) also proposed an integration of the two models in terms of their compatibility with one another, arguing that high TA is detrimental because it limits cognitive capacity during a test, and better study skills and test-taking skills facilitates test performance because they relieve the cognitive load during a test.

The Relationship Between Test Anxiety and Social Anxiety

As previously stated, TA can be classified as a form of performance-related social anxiety. Recent research has shown that successful social events, in addition to unsuccessful social events, are negatively interpreted by socially anxious people (Alden et al., 2008). Certainly, an exaggerated negative interpretation to a successful social encounter is irrational. Although it is logical that an unsuccessful social interaction would be interpreted negatively and a successful social interaction interpreted positively, this is not the case with socially anxious individuals. Research by Alden et al. (2008) revealed that after a positive social event, socially anxious participants expected greater anxiety and worse performance during a second social interaction with the same person. Perhaps an understanding of social anxiety in relation to the interpretation of successful social events is useful to better understand TA and the interpretation of high, or successful, exam grades. Alden et al. raised the question of why socially anxious participants would expect to perform worse after a positive social interaction.

Research has addressed this question, indicating that social standards and social ability (self-efficacy) play a role in Social Anxiety Disorder (SAD). Wallace and Alden (1995) found that socially anxious men perceived a discrepancy between their social ability and others' expectations for them. Positive feedback did not raise self-efficacy in socially anxious men, indicating that positive feedback is not incorporated into socially anxious people's self-appraisals. Socially anxious participants also believed that their social ability would fall short of their personal standards. A follow-up study by Wallace and Alden (1997) was conducted in which the social experience was manipulated to be either a successful and therefore positive experience or unsuccessful and therefore negative experience. Compared to the control group, the social phobic group exhibited a gap between what they believed others' standards for a successful social

encounter were and what they believed their social ability, or self-efficacy, was. Perhaps most importantly, the social phobic group believed that others would expect more from them after a positive social experience. In other words, the social phobic group, in comparison to the control group, believed that others' standards would be higher after a positive social event. If a socially anxious person believes that another person has raised their social standards and if that socially anxious person believes they cannot rise to meet these standards (in other words, they have low self-efficacy), then it makes sense that a socially anxious person would exhibit greater anxiety upon a second social interaction. These findings, if applied to TA, suggest it is possible that test anxious people who experience a successful exam believe that the standards for their next exam are higher and thus greater experience greater amounts of TA. The current study explores standard-setting and self-efficacy among low and high test anxious individuals.

Undoubtedly, it is clear that TA is linked to and causes poor test performance. Furthermore, since TA can be categorized as a non-general social phobia, research on social anxiety, particularly in standard setting and self-efficacy, may help clarify TA as a construct. Thus, we attempted to explore the relationships between TA, exam performance, perceived performance standards, and self-efficacy. The current study addressed these issues in five hypotheses: 1) based on past research, we expected that TA would predict lower exam scores; 2) we similarly predicted that higher scores on an exam would lead to changes in TA; 3) we hypothesized that higher exam grades would predict increases in students' standards for success on subsequent exams; 4) we expected that higher exam grades would predict increases in students' perceived instructor's standards; and 5) we hypothesized that higher exam grades would predict increases in students' self-efficacy.

Method

Participants

Participants were recruited from an introductory psychology course enrolled at a large Midwestern university. Questionnaires were administered during group sessions to freshmen students during their first semester of college. Demographic information was collected at Time 1. The Time 1 sample's ($N = 181$) mean age was 20.1 years ($SD = 3.5$), consisted of 74% female, and had a median family income between \$55,001 and \$60,000. Ethnicity and race data collection paralleled the structure of the 2010 U.S. Census. The race categories were not mutually exclusive. Of the sample, 91% indicated that they were not Spanish/Hispanic/Latino, 69% indicated that they were White, and 20% indicated that they were Black or African American. There were no other significantly represented ethnic or racial groups. Only individuals who participated in the Time 1 questionnaires were eligible to take the Time 2 questionnaires, and only participants who completed Time 1 and Time 2 questionnaires were eligible to take the Time 3 questionnaires. Complete data (RTA, Exam 1, and Exam 2 scores) was collected for participants at Time 1 and Time 2 ($N = 102$).

Procedure

This study used a short-term, prospective design to examine the relationships among TA, test performance, personal standards for success, and test performance expectancies. Participants completed questionnaires about one week before their first in-class exam ($N = 181$ at Time 1), up to one week after learning the results of their test scores ($N = 102$ at Time 2), and about two weeks prior to their second in-class exam ($N = 59$ at Time 3). Questionnaires were administered to the participants by trained NIU graduate and undergraduate students in group sessions, taking approximately 30 minutes to complete. Participants signed an Informed Consent form.

Measures

Revised Test Anxiety Scale. The Revised Test Anxiety Scale (RTA; Benson & El-Zahhar, 1994) is a cross-culturally validated, self-reported 20-item measure (see Appendix A) that assesses TA by using a four-factor structure. Participants were asked to report how they feel when taking tests in general. Participants were asked to rate the extent to which they felt a given statement pertained to their test-taking experiences using a 4-point scale, ranging from 1 (*almost never*) to 4 (*almost always*). The RTA showed good reliability at Time 1 and Time 2 (.91 and .91, respectively) and consists of four subscales: RTA—Worry, RTA—Irrelevant Thinking, RTA—Tension, RTA—Bodily Sensations. The RTA—Worry subscale assesses the extent to which a person worries during a test, (e.g., “During tests I find myself thinking about the consequences of failing”). The RTA—Worry subscale showed good reliability at Time 1 and Time 2 (.87 and .84, respectively). The RTA—Irrelevant Thinking subscale assesses the extent to which a person thinks about events or things unrelated to the test, (e.g., “While taking tests, I sometimes think about being somewhere else”). The RTA—Irrelevant Thinking subscale showed good reliability at Time 1 and Time 2 (.83 and .86, respectively). The RTA—Tension subscale assesses the extent to which a person experiences various forms of tension regarding tests, (e.g., “I start feeling very uneasy just before getting a test paper back”). The RTA—Tension subscale showed good reliability at Time 1 and Time 2 (.83 and .86, respectively). The RTA—Bodily Symptoms measures the extent to which a person experiences physiological reactions while taking a test, (e.g., “I sometimes find myself trembling before or during tests”). The RTA—Bodily Symptoms subscale showed good reliability at Time 1 and Time 2 (.76 and .77, respectively).

Perceived Standards for Success. The Perceived Standards for Success (PSS) measure is loosely adapted from a 13-point scale (A+ = 1 to F = 13) that was used to assess outcome

expectations for midterm exams (referred to as aspiration scores), where higher scores correlated to a more negative exam outcome (Metalsky et al., 1993). In the study conducted by Metalsky et al., participants' aspiration scores were attained in response to the question, "What grade would you consider a failure on the midterm exam?". The PSS was created to better resemble the full letter grade system used by the large Midwestern university of the target sample. The PSS is a 6-item self-report measure (see Appendix B) that assesses a person's standards for success for an upcoming exam. Participants were asked to report what score (out of 50 possible points) they would need to earn in order for themselves, their teacher, their parents, their classmates, and their friends to view their exam performance as a success. Additionally, participants were asked to report what score (out of 50 possible points) they believed they would actually earn on their upcoming exam. Of particular importance to this study were the following sample items: "What score (out of 50 possible points) would you need to earn on your exam for you to view your exam performance as a success?" (self perceived standards for success); "What score (out of 50 possible points) would you need to earn on your exam for your teacher to view your exam performance as a success?" (perceived instructor standards for success); and "What score (out of 50 possible points) do you think you will actually earn on your upcoming exam?" (perceived exam self-efficacy).

Results

Predictors of Test Anxiety on Exam Grades

To test Hypothesis 1 (that Time 1 TA would predict lower Exam 1 scores), we examined correlations between Exam 1 scores and each RTA predictor. Table 1 includes the partial correlations between Exam 1 scores and each RTA predictor at Time 1, controlling for the remaining three RTA predictors. The variables RTA—Worry (partial $r = -.18$, $p < .05$) and

RTA—Irrelevant Thinking (partial $r = -.16, p < .05$) significantly predicted lower Exam 1 scores after controlling for other predictors. The partial correlations between Exam 1 scores and RTA—Tension, and between Exam 1 scores and RTA—Bodily Sensations, were not significant (partial $r_s = .12$ and $.11$, respectively ns), after controlling for other predictors.

Additionally, to examine Hypothesis 1 (that TA would predict lower Exam 2 scores, controlling for Exam 1 scores), a partial correlational analysis was used. The partial correlations between Time 2 RTA—Worry and Exam 2, between Time 2 RTA—Tension and Exam 2, and between Time 2 RTA—Bodily Symptoms and Exam 2, were not significant (partial $r_s = .32, .48$, and $.30$, respectively ns), after controlling for Exam 1. The partial correlation between Time 2 RTA—Irrelevant Thinking and Exam 2 was significant (partial $r = .06, p < .05$) after controlling for Exam 1.

Predictors of Exam Grades on Test Anxiety

This study's second hypothesis predicted that higher scores on Exam 1 would lead to changes in TA. The partial correlations between Exam 1 scores and Time 2 RTA—Worry, between Exam 1 scores and Time 2 RTA—Tension, between Exam 1 scores and Time 2 RTA—Irrelevant Thinking, and between Exam 1 scores and Bodily Sensations, were not significant (partial $r_s = -.01, .15, -.03$, and $.06$, respectively ns) after controlling for Time 1 RTA predictors.

Predictors of Exam Grades on Cognitive Variables

Hypothesis 3 stated that higher exam grades would predict increases in students' standards for success. The partial correlation between Exam 1 scores and Time 2 Personal Standards for Success for the overall sample was significant (partial $r = -.28, p < .01$), after controlling for Time 1 Personal Standards for Success. Two test anxiety groups (low vs. high) were derived from the original sample using a median split. The partial correlation between

Exam 1 scores and Time 2 Personal Standards for Success for the low test anxious group was significant (partial $r = .40, p < .01$), after controlling for Time 1 Personal Standards for Success. The partial correlation between Exam 1 scores and Time 2 Personal Standards for Success for high test anxious group was not significant (partial $r = .10, ns$), after controlling for Time 1 Personal Standards for Success.

Hypothesis 4 stated that higher exam grades would predict increases in students' perceived instructor's standards for success. For both the overall sample and the two test anxiety groups (low vs. high), the partial correlations between Exam 1 scores and Time 2 Perceived Instructor's Standards for Success were not significant (partial $r_s = .04, .06, \text{ and } .01$, respectively ns), after controlling for Time 1 Perceived Instructor's Standards for Success.

Hypothesis 5 stated that higher exam grades would predict increases in students' self-efficacy. The partial correlation between Exam 1 scores and Time 2 Self-efficacy for the entire sample was significant (partial $r = .24, p < .01$), after controlling for Time 1 Self-efficacy. The partial correlation between Exam 1 scores and Time 2 Self-efficacy for the low test anxious group was significant (partial $r = .51, p < .01$), after controlling for Time 1 Self-efficacy. The partial correlation between Exam 1 scores and Time 2 Self-efficacy for the high test anxious group was not significant (partial $r = .01, ns$), after controlling for Time 1 Self-efficacy.

Discussion

The TA Construct

The first two hypotheses in the current study investigated the relationship between TA and poor test performance. It was hypothesized that TA would predict lower exam scores, and the results supported this hypothesis such that RTA—Worry and RTA—Irrelevant Thinking significantly predicted lower Exam 1 scores after controlling for other predictors. These results

are not surprising and are consistent with past research (Cassady & Johnson, 2002; Chapell et al., 2005; Cohen et al., 2008; Hembree, 1988; McCarthy & Goffin, 2005; Turner et al., 1993).

Additionally, because the Worry and Irrelevant Thinking RTA subscales predicted lower exam scores, these findings provide some evidence for the validity of the four-dimensional model. It might be argued that these findings support the bi-dimensional model, mainly because the bi-dimensional model contends that the Worry dimension is cognitive in nature and encompasses irrelevant thinking (McCarthy & Goffin, 2005). However, our findings revealed that the partial correlation between Time 2 RTA—Irrelevant Thinking and Exam 2, after controlling for Exam 1, was significant. It is noteworthy that the RTA—Worry subscale did not predict low Exam 2 performance after controlling for prior exam scores, particularly because it implies the relevance of intrusive thoughts (as measured by the Irrelevant Thinking RTA subscale) influencing exam performance (Sarason, 1984). If this were not the case, we would have expected to see both the Worry and Irrelevant Thinking subscales predict low Exam 2 performance. Thus, the current findings suggest that a four-dimensional model of TA better clarifies the construct of TA compared to a bi-dimensional approach.

The Relationship Between TA and Poor Test Performance

Based on the literature review conducted by Wine (1971), the cognitive dimension of TA (Worry) functions by directing the test anxious individual's focus away from the test and towards a preoccupation with oneself. The skills deficits model proposed by Tobias (1985) originally suggested an alternative explanation to poor test performance: a lack of preparation or test taking ability causes poor test performance, and an awareness of prior poor test performance can cause TA. Our results for our second hypothesis, that high Exam 1 scores would lead to changes in TA, were not significant. The current study also hypothesized that higher exam scores would predict

changes in TA. Significant results were not found, which is consistent with past research. (Cassady & Johnson, 2002; Chapell et al., 2005; Cohen et al., 2008; Hembree, 1988; McCarthy & Goffin, 2005; Turner et al., 1993). Because this study was correlational, results should be interpreted cautiously. Although it is possible that other variables contributed to poor test performance, collectively, the results from hypotheses 1 and 2 provide evidence for TA influencing poor exam performance but not for poor exam performance influencing changes in TA. Furthermore, the skills deficit model may partially explain our results in so far as poor preparation and study skills may lead to TA and also poor test performance. Overall, our findings do not contradict Tobias' (1985) hypothesis that the cognitive interference model and the skills deficit model both function to cause TA and poor test performance. More research, perhaps directly assessing the test anxious individual during a test, is needed to specify the way in which TA produces poor test performance.

Based on the skills deficit model, one goal of TA treatment is to develop better study skills and test taking skills due to the idea that a lack of skills (study skills and test-taking skills) is primarily responsible for poor test performance. The cognitive interference model argues that TA is a cognitive construct, and thus, attentional treatments should be the primary treatment used for TA (Wine, 1971). However, Hembree's (1988) argued that TA is a behavioral, not cognitive, construct. This conclusion was derived by Hembree's findings that behavioral treatments for TA, but not cognitive treatments, reduced emotionality as well as worry. Based on the cognitive components of TA (RTA—Irrelevant Thinking) predicting poor test performance, our findings support the importance of the cognitive component of TA. Future research is needed to better clarify the nature of TA.

The Role of Personal Standards in the Testing Situation

Overall, it appears that for individuals who do not experience significant amounts of TA, higher exam scores influence personal standard setting and the belief in one's ability to achieve those standards (e.g., self-efficacy). For hypothesis 3, the results indicated that higher exam grades predicted increases in Time 2 personal standards in the entire sample after controlling for Time 1 personal standards. Thus, one inference is that doing well on an exam influences one's personal standards. The increase in one's personal standards for success may in part be explained by the results to hypothesis 5 (for the entire sample), that higher exam scores also predicted increases in self-efficacy. It is possible that students raised their personal standards as a result of increased self-efficacy after a high exam score. Although these findings are correlational in nature and should be interpreted cautiously, these findings make sense. Higher scores on an exam reflect a higher level of competency of the tested material. Interpreting a high exam score as having a high level of competency may reinforce that student's belief that he or she is capable of performing well on a future test. This pattern was also found in hypotheses 3 and 5 for the low test anxious group: higher exam scores predicted increases in personal standards and self-efficacy.

The results to hypothesis 3 for the low and high test anxious groups suggest a difference in personal standard setting between low and high test anxious individuals. In particular, it was found that high exam scores predicted increases in personal standards among low test anxious individuals but not among high test anxious individuals. Although this study did not directly compare personal standards among high test anxious participants and low test anxious participants, our results are not surprising given past research. Specifically, research has found that socially anxious individuals rate their personal standards for a future evaluative performance

lower than non anxious individuals (Wallace & Alden, 1995). This might be explained by the self-handicapping theory, which state that socially anxious individuals purposefully rate their personal standards low so that they will not have to face failing to achieve high standards (as cited in Wallace & Alden, 1995). Similarly, it is possible that high test anxious individuals intentionally partake in self-handicapping mechanisms or unintentional self-protective behaviors after achieving a high exam score so that they do not have to risk failing to achieve a raised standard. For example, a high test anxious student may have the standard that earning a C on a test is successful; however, self-handicapping would occur if that same student actually received an A on a test but did not raise their standard for the next test, for fear of failing to earn an A on the next exam. Altogether, however, more research should be conducted to ascertain the degree to which test anxious people use these mechanisms, if at all.

The Role of Others' Standards in the Testing Situation

Our findings indicated that students' perceptions of others' standards about their own work, such as their perceived instructor's standards, were not a salient factor in test taking regardless of the individual's level of TA. For hypothesis 4 for the overall sample and the two test anxiety groups (low vs. high), higher exam scores failed to predict increases in Time 2 perceived instructor's standards for success after controlling for Time 1 perceived instructor's standards for success. It is surprising, however, that high exam scores failed to predict increases in students' perception of their instructor's standards among the high test anxious group (hypothesis 4). This is surprising given that TA can be categorized as a form of performance-related social anxiety, or an indirect fear of evaluative situations (APA, 2000). Presumably, the instructor is placing an evaluative judgment on the student. Based on the *DSM-IV-TR* classification of TA as a performance anxiety, one would expect the student's perception of the

instructor's standards for success to have a more profound influence on the test anxious individual. One possible explanation for these results is that the perceived instructor's standards failed to accurately represent others' standards. It would be beneficial if future studies tested the influence of others' standards like those of their friends and family, rather than their perceived instructor's standards. Perhaps the perception of others' standards besides the instructor's standards would clarify the current study's findings.

Social appraisal theories state that it is the discrepancy between a socially anxious person's low self-efficacy and others' standards that accounts for social anxiety (Wallace & Alden, 1997; Wallace & Alden, 1995). Additionally, much of the research on social anxiety has focused on the role of others' social standards as they relate to social anxiety (Wallace & Alden, 1997; Wallace & Alden, 1995). In essence, the socially anxious person believes that he or she is unable to perform to the social standards of others. It is this gap between social ability (self-efficacy) and others' standards that creates anxiety. The current study found that higher exam scores significantly predicted increases in self-efficacy in the low test anxious group but not in the high test anxious group (hypothesis 5). In other words, only the low test anxious group's belief in their ability to perform well on an exam (self-efficacy) increased following a high exam score. However, in the high test anxious group, high exam scores failed to predict increases in both personal standards (hypothesis 3) and others' standards (hypothesis 4). Based on these results, it is not clear if high test anxious individuals experienced a larger discrepancy in comparison to low test anxious individuals. Low test anxious individuals' self-efficacy increased after a high exam score (hypothesis 5), and high test anxious individuals' self-efficacy did not (hypothesis 5). It is certainly possible that the low test anxious group's low TA was related to

their increased self-efficacy; however, more research must be done to establish the accuracy of social appraisal discrepancy theory.

Self-focused Attention in Test Anxious Individuals

The results to hypothesis 5 suggest self-focused attention in test anxious individuals. Our study's results revealed that high test anxious individuals, in comparison to low test anxious individuals, did not exhibit an increase in their self-efficacy after achieving a high exam score. Research in social anxiety has shown similar patterns. During social interactions, socially anxious individuals focus their attention away from external social cues and towards themselves, which contributes to a negative interpretation and self-appraisal (Clark, 2001). In the case of TA, exam scores can be viewed as external information. Thus, our study's findings from hypothesis 5 suggest that a difference between low and high test anxious individuals exists: low test anxious individuals incorporate external information (e.g., exam grades) into their self-appraisal, or ability to achieve on a test, and high test anxious individuals do not. More research should be conducted to clarify the extent to which test anxious individuals display self-focused attention.

Clark (2001) also noted that self-focused attention enhances awareness of interoceptive information, which has detrimental effects. First, by focusing on oneself, socially anxious individuals simultaneously direct their focus away from important, external social cues. As previously stated, we inferred from our findings that test anxious individuals may indeed exhibit self-focused attention. Secondly, Clark discusses how self-focused attention during the social interaction also has effects on post-event processing. Socially anxious individuals rehearse their perception of the past social encounter and use their anxiety levels during the past social interaction to determine their personal success of that social interaction. Thirdly, the Clark model emphasizes that a large portion of a socially phobic person's self-focus includes a heightened

awareness of interoceptive sensations, or internal bodily cues (e.g., autonomic nervous system arousal). Heightened awareness of interoceptive information maintains and even increases anxiety (Clark, 2001).

Given our findings that high test anxious individuals' high exam scores did not predict increased self-efficacy but low test anxious individuals' high exam scores predicted increased self-efficacy, it is possible that test anxious individuals pay particular attention to interoceptive information. In particular, these results are consistent with the idea that test anxious individuals ignore external information to make judgments about their self-efficacy. Despite earning a high score on a test, high test anxious individuals did not exhibit increased confidence in their ability to do well on a future exam. Therefore, it seems likely that test anxious individuals make erroneous inferences about their test taking ability. It may be that despite one's actual score, because the individual experiences TA, the entire test taking experience is perceived as unsuccessful. Finally, it should be mentioned that research on self-focused attention has primarily centered on the interoceptive physiological information that socially anxious individuals perceive. However, our study's results indicate that irrelevant thinking and not bodily sensations predicted low test performance. Therefore, it may be necessary for future studies to distinguish between behavioral anxiety and cognitive anxiety in which the test anxious individual focuses his or her attention. Such a clarification might have specific implications for TA treatment.

Caveats

This study's sample was relatively small and limited to college freshman who were predominantly Caucasian. Thus, future research should aim to conduct a study with a larger and more ethnically diverse sample. A sample that encompasses a greater age range would also help

the generalizability of the findings. Additionally, the majority of this study's sample was female, and there is ample evidence to suggest that females experience more TA than males (Hembree, 1988). Future research should not only aim to have a more proportionate sample of males and females but should also seek to discover if females do indeed experience TA more frequently than males. If sex differences in TA do exist, coping mechanism for dealing with TA should also be investigated. McCarthy and Goffin (2005) point out that although females exhibited higher mean scores of TA, females also exhibited better coping mechanisms for anxiety compared to males. Similarly, Chapell et al. (2005) found that undergraduate and graduate females have higher TA as well as a higher GPA compared to undergraduate and graduate males. One possible explanation for these findings is that females engage in coping behaviors more often than males, which in turn works to counteract the detrimental effects of TA. Thus, more research needs to be conducted to explore TA and TA coping mechanism between males and females.

One major limitation to this study was the use of self-report questionnaires. Participants may have been reluctant to admit that they experience TA, which may have skewed the results. Furthermore, this study did not have a good measure of behavior, instead relying on the participants' word to assess their individual TA. Although the study was prospective in nature, the correlational design is a pronounced limitation to this study. Results regarding the causal relationship between TA and poor test performance should be interpreted cautiously. Future studies should verify if test anxious students partake in self-handicapping or self-protective tendencies and lower their personal standards after doing well on a test. Whether or not test anxious students ignore what they believe to be their instructor's standards for success and instead pay more attention to their personal standards for success should be explored. Finally,

more research needs to be done to assess the nature of self-focused attention exhibited in test anxious individuals.

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Table 1

Simultaneous Regression of First Exam Scores on Time 1 Revised Test Anxiety (RTA) Scales

Predictor	Mean (SD)	Cronbach alpha	First Exam Scores	
			Zero-order Correlation	Partial r
RTA—Worry	7.96 (4.10)	.86	-.18	-.18*
RTA—Tension	7.87 (3.36)	.85	.05	.12
RTA—Irrelevant Thinking	4.43 (2.92)	.85	-.26	-.16*
RTA—Bodily Sensations	2.42 (2.49)	.77	.08	.11

Note: $N = 171$. * $p < .05$. ** $p < .01$. Multiple $R^2 = .12^{**}$. Partial r represents correlation of the predictor with First Exam Scores controlling for the other three predictors.

Appendix A

The Revised Test Anxiety Scale (RTA; Benson & El-Zahhar, 1994)

The following items refer to how you feel when taking a test. Use the scale below to rate Items 1 through 20 in terms of how you feel when taking tests in GENERAL.

1. Thinking about my grade in a course interferes with my work on tests.

almost never *sometimes* *often* *almost always*

2. I seem to defeat myself while taking important tests.

almost never *sometimes* *often* *almost always*

3. During tests I find myself thinking about the consequences of failing.

almost never *sometimes* *often* *almost always*

4. I start feeling very uneasy just before getting a test paper back.

almost never *sometimes* *often* *almost always*

5. During tests I feel very tense.

almost never *sometimes* *often* *almost always*

6. I worry a great deal before taking an important exam.

almost never *sometimes* *often* *almost always*

7. During tests I find myself thinking of things unrelated to the material being tested.

almost never *sometimes* *often* *almost always*

8. While taking tests, I find myself thinking how much brighter the other people are.

almost never *sometimes* *often* *almost always*

9. I think about current events during a test.

almost never *sometimes* *often* *almost always*

10. I get a headache during an important test.

almost never *sometimes* *often* *almost always*

11. While taking a test, I often think about how difficult it is.

almost never *sometimes* *often* *almost always*

12. I am anxious about tests.

almost never *sometimes* *often* *almost always*

13. While taking tests I sometimes think about being somewhere else.

almost never *sometimes* *often* *almost always*

14. During tests I find I am distracted by thoughts of upcoming events.

almost never *sometimes* *often* *almost always*

15. My mouth feels dry during a test.

almost never *sometimes* *often* *almost always*

16. I sometimes find myself trembling before or during tests.

almost never *sometimes* *often* *almost always*

17. While taking a test my muscles are very tight.

almost never *sometimes* *often* *almost always*

18. I have difficulty breathing while taking a test.

almost never *sometimes* *often* *almost always*

19. During the test I think about how I should have prepared for the test.

almost never *sometimes* *often* *almost always*

20. I worry before the test because I do not know what to expect.

almost never *sometimes* *often* *almost always*

Notes: Worry items = 1, 2, 3, 8, 11, 19; Tension items = 4, 5, 6, 12, 20; Test-Irrelevant Thinking items = 7, 9, 13, 14; Bodily Symptoms items = 10, 15, 16, 17, 18.

Appendix B

Perceived Standards for Success (PSS)

The following questions are related to your thoughts about your performance on your next PSYC 102 exam. For each question, please write a number between 0% and 100% in the blank with the score that best represents your thoughts about your performance.

Consider these guidelines:

90% to 100%	=	A
80% to 89%	=	B
70% to 79%	=	C
60% to 69%	=	D
50% to 59%	=	F

- _____ 1. What score (out of 50 possible points) would you need to earn on your exam for **you** to view your exam performance as a success?
- _____ 2. What score (out of 50 possible points) would you need to earn on your exam for **your teacher** to view your exam performance as a success?
- _____ 3. What score (out of 50 possible points) would you need to earn on your exam for **your parents** to view your exam performance as a success?
- _____ 4. What score (out of 50 possible points) would you need to earn on your exam for **your classmates** to view your exam performance as a success?
- _____ 5. What score (out of 50 possible points) would you need to earn on your exam for **your friends** to view your exam performance as a success?
- _____ 6. What score (out of 50 possible points) do you think you will actually earn on your upcoming exam?