Narrative Medicine in the Native Tongue: The Effect of the L1 as a Moderating Variable of Exam Performance in Experimental Disclosure Therapy

by

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Abstract

There is increasing evidence supporting a link between writing about one’s emotional experiences and alleviating physical and psychological ailments. Recently, in the academic milieu, studies have focused on relieving test anxiety via experiential disclosure (as it is called); however, relevant studies have only focused on uses of the paradigm in monolingual environments. The role of the native language in an English-only environment has so far been vastly ignored by the literature on this paradigm. This is particularly troubling as studies suggest emotivity is more potent in one's native language than in subsequent languages learned (Schrauf, 2000; Dewaele, 2004; Pavlenko, 2002) and emotivity is integral to the efficacy of the benefits found when writing about ailments (Pennebaker & Chung, 2007; 2011).

Three hundred and sixty-two undergraduate students were given measures of cognitive test anxiety, optimism, and depression, and randomized to a control or an experimental grouping. They were asked either to think about unemotional topics or express their emotions about an upcoming test in English or in their L1 (native language) before taking a final exam, respectively. Surprisingly, non-native English speakers asked to expressively write in their L1 scored lowest on their final exam, even lower than non-native
English speakers asked to write expressively in English. This suggests that stereotype threat may be at play when implementing experimental disclosure therapy, in that L1 speakers may be highly attentive to their environment. The findings of this pilot study suggest that further research into how the L1 affects expressive writing and academic performance in an English-only environment is warranted.

Keywords: expressive writing, native language, academic performance, test anxiety
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За мајка ми и Џајко ми.
# Table of Contents

Abstract ........................................................................................................................................... ii

Author’s Biographical Sketch ......................................................................................................... iv

Dedication ......................................................................................................................................... vi

Acknowledgments ............................................................................................................................. vii

Table of Contents ............................................................................................................................. viii

List of Tables ..................................................................................................................................... ix

List of Figures .................................................................................................................................... x

List of Abbreviations ........................................................................................................................ xi

List of Appendices .............................................................................................................................. xii

I. Why Study Student Anxiety? ........................................................................................................ 1

  Stress: An Overview ....................................................................................................................... 3

  Psychological Stress ....................................................................................................................... 10

  Stress in Language Learning Students ....................................................................................... 15

  The (Brief) Benefits of Stress ....................................................................................................... 17

  Threatened By Tests: Cognitive Test Anxiety ............................................................................. 19

  A Note on Terminology: “Stress” versus “Anxiety” .................................................................. 20

  Intervention to Reduce Student Stress: An Overview ............................................................... 21

II. Review of the Literature ............................................................................................................ 25

  Working Definition ....................................................................................................................... 26

  The Emergence of Experimental Disclosure ............................................................................ 27

  Theoretical Background ............................................................................................................... 31

  A Psychosemiotic Model ............................................................................................................. 33

  Existent Theories within the Literature ..................................................................................... 37

  The Relevant Literature ............................................................................................................... 40
List of Tables

Table 1  Phases of Thematic Analysis .................................................................................. 57
Table 2  Demographic Characteristics of Study Participants .............................................. 61
Table 3  Comparison of Outcomes between Six Groups ....................................................... 62
Table 4  Models Predicting the Final Exam Test Scores ....................................................... 64
Table 5  Models Predicting the Final Exam Test Scores ....................................................... 66
Table 6  Model Predicting the Final Exam Test Scores ....................................................... 67
Table 7  Comparison between Non-Native English Speakers ............................................. 68
Table 8  Open and Initial Coding of Written Passages ....................................................... 70
List of Figures

Figure 1  Model of Selye’s General Adaptation Syndrome .................................................. 9
Figure 2  Example of Cognitive Appraisal Process for Test-Taking Anxiety ...................... 12
Figure 3  Cognitive Appraisal Summary Model ................................................................. 14
Figure 4  Model of Yerkes-Dodson Law of Performance and Stress ............................... 18
Figure 5  Break-Down of Sample ....................................................................................... 59
Figure 6  Initial Thematic Map ......................................................................................... 71
Figure 7  Revised Thematic Map ....................................................................................... 72
Figure 8  Final Thematic Map .......................................................................................... 73
## List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTH</td>
<td>Adrenocorticotropic Hormone</td>
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<td>CALP</td>
<td>Cognitive Academic Language Proficiency</td>
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<tr>
<td>CRF</td>
<td>Corticotropin-Releasing Factor</td>
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<td>CUP</td>
<td>Common Underlying Proficiency</td>
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<tr>
<td>GAS</td>
<td>General Adaptation Syndrome</td>
</tr>
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<td>GRE</td>
<td>Graduate Record Examination</td>
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<td>HPA</td>
<td>Hypothalamic-Pituitary-Adrenalcortical</td>
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<tr>
<td>IPA</td>
<td>Interpretative Phenomenological Analysis</td>
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<tr>
<td>LSAT</td>
<td>Law School Admission Test</td>
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<td>MCAT</td>
<td>Medical College Admission Test</td>
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<tr>
<td>NCHA</td>
<td>National College Health Assessment</td>
</tr>
</tbody>
</table>
# List of Appendices

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A</td>
<td>Informed Consent</td>
<td>124</td>
</tr>
<tr>
<td>Appendix B</td>
<td>Demographic Questionnaire</td>
<td>125</td>
</tr>
<tr>
<td>Appendix C</td>
<td>Cognitive Test Anxiety Scale</td>
<td>127</td>
</tr>
<tr>
<td>Appendix D</td>
<td>Optimism Scale</td>
<td>129</td>
</tr>
<tr>
<td>Appendix E</td>
<td>Discouragement about Future - Measure</td>
<td>130</td>
</tr>
<tr>
<td>Appendix F</td>
<td>Instruction for Experimental (English Language) Participants</td>
<td>131</td>
</tr>
<tr>
<td>Appendix G</td>
<td>Instruction for Experimental (Native Language) Participants</td>
<td>132</td>
</tr>
<tr>
<td>Appendix H</td>
<td>Instructions for Control Participants</td>
<td>133</td>
</tr>
<tr>
<td>Appendix I</td>
<td>Debriefing</td>
<td>134</td>
</tr>
</tbody>
</table>
Why Study Student Anxiety

The following is a passage written by a second year post-secondary student in the present investigation, when prompted to “write as openly as possible about your thoughts and feelings” moments before taking a final exam:

Right now I am coming off a weekend as an in-patient for talking about suicide… I feel hollow and hopeless and numb all at the same time… I feel anxious and like a loose cannon just waiting to go off… I cry myself to sleep sometimes because I can’t keep up with it all. I knew [university] would be difficult but I never expected it would be like this… All of my exams and coursework are crammed into a few weeks and it’s like every professor I have is conspiring to make sure all our essays are due at the same time… I’m only [in university] because I’m trying to do well for myself and build a future but how can I when I know realistically none exists… I don’t know what the point is of anything anymore… I don’t even care how I do [on this exam], I just want to get it over with so I can go on to the next assignment, the next essay… I feel destroyed. (83)

In June 2013, Canadian newspapers were abuzz, headlining new information on post-secondary students with a particular focus on the status of their mental health. Led by the American College Health Association, over 33,000 post-secondary Canadian students from over 30 Canadian institutions responded to the National College Health Assessment (NCHA) survey about a variety of topics, from drinking habits and drug use to loneliness, depression
and anxiety. As released by the Canadian Association of Colleges and University Student Services (CACUSS, 2013), the statistics found were alarming, enough to garner major media attention. For instance, 89 percent of students stated being overwhelmed by all they had to do, of which 52.1 percent reported feeling so over the past two weeks alone. Not far behind, “overwhelming anxiety” was felt by 56.5 percent of students asked, 37.5 percent of students felt “so depressed that it was difficult to function” and nearly 10 percent of all 33,000 students surveyed had seriously considered suicide (American College Health Association, 2013).

While shocking, similar results were likewise found in an earlier survey using the NCHA, conducted on over 87,000 American students, noting 86.4 percent of students felt overwhelmed by all they had to do and 46 percent felt hopeless (American College Health Association, 2010).

The topic of student stress is not new. In fact, the idea of post-secondary education as difficult and stressful is a commonly held belief. What has changed, however, is the incidence and extent of mental health issues in North American students, as well as the linkages that have become apparent in the literature (Agarwal, D’Antonio, Roediger, McDermott, & McDaniel, 2014; Backović, Ilić-Živojinović, Maksimović, & Maksimović, 2012; Bonaccio & Reeve, 2010) between being a student, the impact of the requirements of this role on one’s mental wellness, and, recursively, the academic outcomes that arise from being unable to or having insufficient resources to “cope” with the requirements of taking on this role.
As found by the Canadian Council on Learning, mental health issues lead to a variety of poor outcomes, including under-performing academically, dropping out of school, and losing interest in learning (Patterson & Kline, 2008). Ironically, as one would surmise, the main function of a university education is to help foster intelligent, driven and skilled students prepared for the workforce. Instead, as is strongly supported by the data (American College Health Association, 2013), it seems that by the end of their degrees, Canadian universities are sending out anxious and hopeless graduates, who are burdened with extreme stress. As evidence would strongly suggest, with little means available to cope, not only does student stress have a role in statistically diminishing academic performance, but also well-being, thereby affecting the trajectory of the lives of bright individuals.

**Stress: An Overview**

The notion of “stress” is ingrained in both academic and public discourse, creating a popular phenomenological term that is rarely defined. As accurately noted by Selye (1976), the founder of the term as we know it today, “everybody knows what stress is and nobody knows what it is” (p. 692).

The term “stress” emerged out of the field of engineering to describe the actual physical strain put on a structure. In the mid-1930s, however, the paper “A Syndrome Produced by Diverse Nocuous Agents” was published in *Nature* (Selye, 1936), which discussed experiments on rats who were given “acute non-specific nocuous agents”, or, “stressors”, which included exposure to cold, surgical injury, spinal shock, excessive muscular exercise, or sub-lethal drug administration. In his investigation, Selye (1936)
discovered that after a rat was exposed to a stressor, a typical “syndrome” appeared which was not related to the physical damage done by the stressor. Selye noted that regardless of the type of stressor to which the rats were exposed, two stages emerged after exposure. In the first stage, 6–48 hours after the initial injury, amongst a myriad of symptoms, rats experienced a notable decrease in size of the thymus (the organ responsible for producing T cells, critical to immunity strategies). In the second stage, beginning at 48 hours after the initial injury, it seemed the brain structures responsible for the production of the organism’s growth ceased to function in favor of other structures which would be more greatly needed, economizing the body’s resources. Selye's work would be seminal in exploring the biomarkers of stress and provide a catalyst for stress research in general.

Emerging from this study, the stress response proposed by Selye (1976) suggested that three interdependent elements accompanied any specific stressor. These were: hypertrophy in the adrenal cortex (essentially an enlargement in the structure of the brain which stimulates androgen glucocorticoid production), atrophy in the lymphatic system (responsible for the defense of the immune system), and gastrointestinal ulcers.

In noting the abundant health issues derived from “stress”, Selye (1976; 1980) developed the General Adaptation Syndrome (GAS) Model, which suggested that the odd behavioral and physiological reactions to stress are caused by disrupting homeostasis, the body’s natural balance. The GAS model accounts for three distinct phases that activate when one is under stress: the alarm reaction (made up of the “shock” and “anti-shock” phase), resistance stage, and exhaustion stage. Within homeostasis, the body adapts to minor stressors, however when a stressor exceeds the amount of adaptation given in homeostasis, the body enters into the shock phase of the first stage, alarm, where cells in the hypothalamus
begin to activate, the sympathetic nervous system (which regulates the body’s “sympathico-adrenal system”, otherwise known as the “fight or flight” response) is suppressed.

However, in the “anti-shock” phase, when the stressor persists, the sympathetic nervous system is activated, and the “fight or flight” reaction occurs in an attempt to best mobilize the body’s resources in case of danger. This occurs through the activation of the hypothalamic-pituitary-adrenalcortical (HPA) axis. This process, as identified by Smith and Vale (2008) is paraphrased here:

When in contact with a stressor, corticotropin-releasing factor (CRF), the hormone and neurotransmitter responsible for regulating the HPA axis, is released from the hypothalamus (a structure in the brain linked to the endocrine and nervous systems) into the anterior pituitary gland (a structure in the brain which regulates growth and reproduction). This stimulates the release of the adrenocorticotropic hormone (ACTH) into the bloodstream to reach the adrenal cortex which is located on top of the kidney. The adrenal cortex, in response, stimulates glucocorticoids (known as “cortisol” in humans), a steroid hormone which regulates the cardiovascular, immune and behavioral responses. Cortisol then enters into a negative feedback cycle back into the hypothalamus and pituitary in attempt to suppress CRF and ACTH production. While in the short term the release of cortisol is essential and valuable, excessive release is maladaptive and “may contribute to the development of pathologies” (Smith & Vale, 2008, p. 385).

It is in this phase that the “stress” hormones rise and blood supply is flushed to all vital organs to truly prepare the body to either fight the stressor or to flee: Pupils dilate and there is an increase in blood pressure, heart rate, perspiration, and respiration. In this stage of
stress that a racing heart, chest pain, light-headedness and muscle tremors, amongst other symptoms, are encountered (Cannon, 1915).

If the stressor persists, in Selye’s (1976) second phase, resistance, the body adapts to the stressor, but still maintains an increased level of cortisol to sustain alertness. The prolonged release of cortisol here begins to cause headache, muscle spasms or even temporary paralysis. As the activation of the HPA axis and the release of cortisol is a demanding task, much of the body’s resources are now depleted. This is likely the stage most students enter into when studying for evaluative procedures, including tests and final examinations, where studying and worry over the test-taking event takes place over days, if not weeks. If the stressor persists further, the body enters into the final stage of the stress response, exhaustion. Here, the body is no longer able to resist the stressor. The body both physically and psychologically begins to damage itself, and several illnesses begin to form, including ulcers, cardiovascular issues, among others. A visual depiction of the General Adaptation Syndrome can be found in Figure 1.

The essential points of Selye’s model are as follows (Tache & Selye, 1985, p. 13):

1. All life events cause some stress.

2. Stress is not bad per se, but excessive or unnecessary stress should be avoided whenever possible.

3. The stressor is the stimulus eliciting a need for adaptation; stress is the response.
4. The nonspecific aspects of the body’s reaction to an agent may not be as obvious as the specific effects. Sometimes, only disease or dysfunction will make an individual realize that he or she is under stress.

5. Stress should be monitored through a battery of parameters.

6. Stress should not be equated with only ACTH, corticoid, or catecholamine secretions. These seem to manifest the main pathways of nonspecific adaptation; they are but a few of the elements of a very complex scheme, however.


While Selye (1936; 1973; 1980) is credited for introducing the term “stress” as it is known today, his works focused solely on physical stressors. In his original definition, stress is “the nonspecific response of the body to any demand made upon it” (p.692). However, Selye (1976) later modified his definition to encompass the boundaries of his research on physical stress, noting a modified definition suggesting that stress is “a state manifested by a specific syndrome which consists of all the non-specifically induced changes within the biological system” (Selye, 1976, p. 64).

From a medical standpoint, the manifestations of stress, as identified by Benson and Stuart (1993) can cause or exacerbate a myriad of health issues including the following: allergic skin reactions, arthritis, constipation, cough, depression, diabetes, dizziness, headaches, heart problems, such as angina, and even heart attack, and cardiac arrhythmia, heartburn, hypertension, infectious diseases, such as colds or herpes, infertility, insomnia, irritable bowel syndrome, menopausal symptoms, such as hot flashes, nausea, nervousness,
pain of any sort, including backaches, headaches, abdominal pain, muscle pain, joint aches and chronic pain, slow wound healing, fatigue and ulcers (p.35). Nevertheless, while stress may causes these ailments, the relaxation response may relieve them (Benson & Stuart, 1993).
Figure 1. Model of Selye's General Adaptation Syndrome.
Psychological Stress

The American physiologist Mason (1971; 1975) was the first theorist to openly criticize Selye for not taking into account the role of human psychology, notably cognition, perception, and interpretation of the stressor, explaining that Selye’s conceptualization of stress “had little reason at that time to suspect the true degree of sensitivity of the pituitary-adrenal cortical response to more ubiquitous and much less drastic psychological influences” (Mason, 1971, p.325). In his pilot study on psychological stress, Mason deprived two groups of monkeys briefly of food. In the first group, the fasting monkeys were alone, while in the second, the fasting monkeys watched other monkeys receive food. While both groups underwent the same physical stressor of hunger, the monkeys who had observed others being fed evoked a psychological response which led to higher stress hormone levels. Thus, Mason showed that psychological distress was a mediating factor in the stress response.

In his elaboration on psychological stress, Lazarus (1993) added the concepts of cognitive appraisal and coping to stress literature. Cognitive appraisal refers to one’s personal evaluation of the stressor, including the consequence and significance the stressor is expected to have. The appraisal process is further reduced to two types of appraisal: Primary and secondary appraisal.

Primary appraisal consists of three components: The first is goal relevance, wherein one might ask whether the stressor is at all personally impactful. In goal relevance, if a person’s personal goal is at stake (for instance, in the context of academia, getting a high grade in a course) he or she may be more emotionally invested in a testing situation than if he or she
is merely auditing the course for interest. In the second component, goal congruence, a person evaluates whether the stressor is harmful or helpful to the relevant goal. To continue the example above, if a student is faced with having to take a test and cares greatly about his or her grade, the test is seen as harmful to the relevant goal, as it presents an uncertainty impinging on the goal. As the test event is incongruent to the goal, he or she may react negatively. Lastly, the type of ego involvement that is placed within the goal (which might include self-esteem, social esteem, well-being, life goals) determines the specific emotion felt. For instance, if intelligence as measured by scholastic aptitude is valued highly in one’s immediate social circle, and thus earning high grades is important for one’s social esteem, taking a test would be both goal relevant, and goal incongruent (positioned as a threat to earning a high grade). Apart from the “existential emotion” of anxiety, one may feel the intense negative emotion of shame or anger, according to Lazarus (2001) from “the desire to preserve or enhance…social esteem” (p. 57).

Secondary appraisal is also divided into three components. The first, blame and/or credit, is when one judges who is responsible for the stressor, and depending on the judgment given on the goal congruency or incongruency of the stressor, one reacts with credit or blame, respectively. For instance, a student may become angry and blame a professor for having a test, if the event of a test is appraised as being highly threatening and highly important. Alternatively, if having a test is appraised as being highly important but not highly threatening, the student may feel no blame or anger towards the professor.

The second component, coping potential, refers to the individual’s evaluation of his or her ability to improve the stressful situation at hand. For example, the student may feel anxious about writing a test if he or she feels incapable of scoring highly on it. Alternatively, a
**University Environment**

**Personal Goals**

**Stress Appraisal Primary Process**

**Stressor:** Upcoming Test

- Test will affect grade
- Test has uncertain outcome

- Student feels loss of power over situation.
- Student feels loss of control over ultimate goal.
- Student feels anxiety due to potential loss of social- & self-esteem.

**Personal goals include high academic achievement, gain in personal status, and pleasing parents.**

**Environment values notion of intelligence, as reflected in grades.**

*Figure 2.* Example of Cognitive Appraisal Process for Test-Taking Anxiety.
student who copes by reassuring him or herself of having adequately prepared may feel less anxious to write the test. The final component, future expectations, refers to how one expects the stressor to impact their future. Thus, the student may feel prolonged stress with respect to goal congruence in a university setting, where tests, mid-terms and final exams are plentiful and constantly re-occurring. An additional example of how test-taking may be appraised within the wider university context is found in Figure 2.

In a revised definition of stress, Lazarus and Folkman (1986) note that stress “refers to a relationship with the environment that the person appraises as significant for his or her well-being and in which the demands tax or exceed available coping resources” (p. 63). This is particularly poignant within an academic setting, where one is situated in an environment where intellectual capability is inherently seen as highly valuable, and the stability of this value is maintained throughout time. Within university, the collective value of personal intellectual ability runs high amongst all parties involved (undergraduate students, graduate students, administrators, professors, etc.) and tests are seen as the predominant measure of intellect. Thus, performing well is highly relevant and testing situations are highly incongruent with the overall presumable goal of learning reflected by intellect. Therefore, the cost of performing even marginally subpar on tests is potentially destructive to social-esteem and, according to Lazarus’ model, to self-esteem, causing a host of negative emotions, and moreover, as per Selye’s model, the long-term destruction of one’s body and mind.

However, it is worth noting that while Lazarus believed appraisal preceded an affective response, LeDoux (1996) believed that it accounted for only one potential response: In the “direct pathway”, the activation of a stress response as a result of a stressor begins in the
amygdala (a structure in the brain responsible for emotion processing), which then stimulates the “fight or flight” process. In the indirect, or “appraisal” response, however, the stressor is processed by the thalamus, then the cortex, where the stressor is consciously appraised as threatening or not, which elicits or suppresses the fight or flight response. A classic example given is when walking in a meadow and seeing a long and brown object which could be a snake, but upon closer inspection it is clear that it is a branch and the stress response is suppressed. This process is depicted in Figure 3.

Both Lazarus’ and LeDoux’s models are useful within the academic sector, where the stress response may be lessened by appraising a potential situation, such as a test, as non-threatening.

*Figure 3. Cognitive Appraisal Summary Model.*
Stress in Language Learning Students

Language learning anxiety, or the stress that accompanies language learners in the classroom, is well-established in the literature (Sparks & Ganschow, 2007; Woodrow, 2006; Truitt, 1995), along with the effect this stress has on academic performance (Coulombe 2000; Saito & Samimy, 1996). According to the above-mentioned exemplar in line with Lazarus’ model, if the general sensation surrounding affect within a university setting is considerably stressful, English Language Learners (ELL) would theoretically be at an even greater risk for high stress. This is in accordance with McEwen and Stellar’s (1993) theory of stress, known as the allostatic load.

Following Mason’s (1971; 1975) suggestion of exploring the psychological components behind the biological stress response, McEwen and Stellar (1993) similarly believed that one’s psychological understanding of a situation, whether conscious or unconscious, is the root of all stress and the catalyst for the stress response. In their view, the body’s ability to adapt through stressful events, known as “allostasis” via the stress response is essential to maintaining homeostasis. However, as noted by McEwen (1998):

When these adaptive systems are turned on and turned off again efficiently and not too frequently, the body is able to cope effectively with challenges that it might not otherwise survive. However, there are a number of circumstances in which allostatic systems may either be over-stimulated or not perform normally, and this condition has been termed “allostatic load” or the price of adaptation (p. 33).

Perhaps the increased stress found amongst language learners may be accounted for by one of the three types of allostatic loads (McEwen, 1998): In the first type, the allostatic
system is activated too frequently. Language learners are most likely to be immigrants, who, on the majority, face significant daily stressors that “are likely to be pervasive, intense, and lifelong” through the process of acculturation (Smart & Smart, 1995). These stressors, as outlined by Caplan (2007) fall into three categories which include: Instrumental or Environmental stressors, such as financial stress, language barriers, lack of access to health care, living in unsafe neighborhoods, unemployment, and lack of education; Social or Interpersonal stressors, including loss of social networks, loss of social status, family conflict, intergenerational conflicts, and changing gender roles; and Societal stressors, including discrimination/stigma, legal status and political/historical forces. Thus, one could theorize that engaging in constant acculturative stress could accumulate and cause an over-activation of allostasis.

The two additional types of allostatic loads identified by McEwen (1998) include the inability to reduce allostatic activity (which has been found to lead to obesity and Type II diabetes), and a failure for the proper mechanisms to respond to stress, thus leading to overcompensation by other mechanisms (for instance, inflammation due to an inadequate release of cortisol). These, however, would not be as applicable in accounting for the mass elevated stress found in the data on language learners and anxiety. In line with the nature of these later tenants, allostatic load is determined by a multi-system measure including ten biological parameters testing chemicals released from the neuroendocrine system, autonomic nervous system and immune system in adapting to stress.
The (Brief) Benefits of Stress

While previous models of stress focus primarily on its detrimental nature (Selye, 1936; Mason, 1971; Lazarus, 1993; LeDoux, 1996; McEwen, 1998), stress has also been noted to be beneficial (Yerkes & Dodson, 1908; Cox & Mackay, 1976), but only to a certain degree.

In measuring how mental and physical arousal resulting from stress is related to performance, Yerkes and Dodson (1908) trained 40 mice to complete a maze, then gave them mild electrical shocks to determine whether giving a shock was at all motivating and whether the degree of the shock would make a difference in the mice's performance in completing the maze. It was found that increasing stress through the shocks would initially motivate the mice to complete the maze task at a quicker pace, however up until a certain point; thereafter, it became detrimental and the mice scurried frantically. They concluded that "an easily acquired habit, that is one which does not demand difficult sense discriminations or complex associations, may readily be formed under strong stimulation, whereas a difficult habit may be acquired readily only under relatively weak stimulation" (Yerkes & Dodson, 1908, p. 480). This is now known as the "Yerkes-Dodson law". Thus, while the same level of stress may be present, the optimal level of stress varies for different tasks, such that complex tasks, such as writing an essay or taking a test, would yield an earlier decrease in performance than a simple task, such as listening to a lecture. Later, the term "eustress" would be used to describe the phenomenon of stress being beneficial (Selye, 1976). This process is depicted in Figure 4.
Further elaborating on the concept of eustress and how it relates to performance in occupational settings, Cox and Mackay (1976) similarly found that stress, “a perceptual phenomenon”, begins with a demand, where one perceives the demand and appraises their perceived capability to complete the demand. Stress arises when there is an incapability which produces the emotional response igniting the stress response. Due to these factors, should there be an imbalance, a physiological, psychological and behavioral response is elicited, which is, again, monitored by cognitive appraisal (Mackay, Cox, Burrows, & Lazzerini, 1978). It is the perception of the demand and the capability to meet the demand that affect one's ability to perform. Perceiving oneself as being readily able to meet the demand may give way to boredom, while perceiving oneself as being unable to meet the demand gives way to exhaustion (Cox and MacKay 1976; 1981).

![Figure 4. Model of the Yerkes-Dodson Law of Performance and Stress](image)

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**Figure 4. Model of the Yerkes-Dodson Law of Performance and Stress**
Threatened by Tests: Cognitive Test Anxiety

As highlighted above, testing situations provide ample reason for students to feel anxious: an uncertain outcome, an environment which values intellectual ability, belonging to a society in which degrees and grade point averages are accepted markers of intelligence and a base point for graduate school acceptances and job offers. As the larger capitalist system can be understood to function this way, the assumption of testing situations being accurate markers of both intelligence and efficiency is reinforced, thus test anxiety can be understood, in a Foucaudian sense, discursively as a consequence of this overarching assumption and future results. Therefore in testing, much more is at stake to students than merely a grade. This may be why "during examinations, individuals high in test anxiety are more likely to experience frequent and intense elevations in anxiety as an emotional state, greater activation of the autonomic nervous system, and more self-centered worry and task-irrelevant thoughts that interfere with attention and performance" (Spielberger, 2010; Spielberger, Gonzalez, Taylor, Algaze, & Anton, 1978).

The importance of exploring student anxiety, not only from a medical perspective but also a psychological one, is therefore great, as test anxiety is shown not only to decrease performance, but also to help promote negative behaviors including cheating on tests and feigning illness in order to be absent on testing days (Cassady & Johnson, 2002). Thus, this calls into question whether current evaluation practices are, in fact, at all valid if one’s anxiety is affecting one’s ability to demonstrate knowledge.

The present investigation, which explores students’ psyche in the immediate moments before taking a final exam, seeks to add new knowledge to the field of educational
psychology, which has thus far only explored anxiety from non-imminent, less anxiety-provoking standpoints by asking students to describe their stress in reflection and not moments before the act of test-taking itself. By exploring student test anxiety in this way, it is hoped the findings will help to identify and therefore provide new insight on test anxiety to help mitigate the sources of stress discovered.

**A Note on Terminology: “Stress” versus “Anxiety”**

Defined as “a future-oriented mood state in which one is ready or prepared to attempt to cope with upcoming negative events”, (Barlow, 2002, p.64), the term “anxiety” has been well documented as the term used to capture the affect felt immediately prior to taking a test or examination (Dahbi, 2015; Agarwal, D’Antonio, Roediger, McDermott, & McDaniel, 2014; Encandela, Gibson, Angoff, Leydon, & Green, 2014). Nevertheless, the demarcation between the terms “anxiety” and “stress”, as related both generally and to professional performance (within academia and in industry) is extremely ill-defined and thus used interchangeably in the literature (Backović, Ilić, Živojinović, Maksimović, & Maksimović, 2012; Tan, & Yates, 2011). As noted by McMillan (2008):

The pathways for stress mechanisms and anxiety overlap extensively... CRF elicits a number of responses normally regarded as associated with both anxiety and stress…. [Thus] it is difficult to view stress distinct from the associated emotional states when those states are fear or anxiety... this may be the reason that in everyday discourse, the connotation of stress is most readily equated to anxiety-type emotional states. (p.102)
Both stress and anxiety similarly consider that effects are pronounced in three domains – emotional, physiological, and behavioral changes (Cohen, Janicki-Deverts, Miller, 2007), much like those reported for test-taking anxiety (Salend, 2011). However, stress can generally be thought of as the process taken to respond to an immediate stressor, while anxiety describes the feeling of ease and worry when a stressor is not always clear (Berger, 2015). As the literature uses the terms “stress and “anxiety” interchangeably, this dissertation, with the exception of the quantitative results, will similarly employ both terms. As a matter of technicality, because the scale used to measure student affect in the present investigation is referred to as an “anxiety” scale, when referring to the quantitative results, the term “anxiety” will be used.

**Interventions to Reduce Student Stress: An Overview**

As Silverman, Underhile and Keeling (2008) identify, health education, health services, and a healthy environment create three fundamental components in supporting student mental health, and mental health forms a foundation in driving student success. As noted by Martin (2010), two thirds of students asked found their respective university offered the most assistance in mental health issues, significantly more than family and friends, which led to improved performance and well-being. Therefore, the services provided by universities can be considered extremely important in exploring student mental health.

As the present investigation is being conducted at the University of Toronto, I will briefly review the services available to students at this institution, as outlined on the main "Health and Wellness" University website (http://healthandwellness.utoronto.ca/). The
University offers three main services for students dealing with mental health issues. First, the University offers Counselling & Psychological Services (CAPS), which “offers students short-term individual counseling, assault counseling, psychotherapy, Cognitive-Behavioral Therapy, workshops, and psychiatric medication services.”

Second, the University offers a Health Promotion Program supported by two websites: "More Feet on the Ground" which provides mental health training if one registers themselves and "Thought Spot", a non-profit organization that features a live map of the Greater Toronto Area where students can identify their nearest mental health hub.

The main issue with the methods mentioned above, in particular the need to register to use the "More Feet on the Ground" website, is that anonymity is removed. Identification has been found to be the greatest barrier to students facing mental health issues, so much so that students forgo seeking help because of it (Martin, 2010).

Thus, the University website offers information on "Good2Talk", a free, confidential and anonymous helpline that post-secondary students in Ontario may call. While this is the only anonymous resource, it is depicted on the website as somewhat of a last resort, as it is the only service provided that is qualified by the phrase “Need help now?”.

Under the website's “Counseling Services” tab, there is a subpage on both stress and anxiety, with notes on how to identify and manage both, as well as a list of campus and community resources. The methods identified to cope with stress are vague and rather common-knowledge, as follows:
• Attend workshops to improve learning skills, stress management, time management.
• Sleeping 6-8 hours.
• Spend time with friends, family, or partner.
• Study in segmented blocks for 1 to 2 hours and take frequent breaks.
• Take advantage of resources the university has to offer.
• Identify problems and possible solutions.
• Exercise regularly.
• Eat a balanced diet daily.
• Set realistic goals.
• Know priorities.
• Make a schedule.
• Get involved in some activity or hobby that is enjoyable.
• Focus on good qualities and accomplishments.
• Avoid competition with classmates or co-workers – focus on unique talents.
• Talk with a trusted friend, family member, counselor, or other professional.
• Express your emotions through activities: art, music, writing etc.
• Practice relaxation techniques – breathing, exercises, yoga, or Pilates.

The methods identified to cope with anxiety are even more brief than those outlined for stress, and remain ill-defined and superficial:

• Relaxation techniques: breathing exercises, yoga, Pilates, meditation.
• Talk with a friend or family member.
• Focus and deal with one worry or task at a time.
• Find activities that are calming and enjoyable.
• Find self-help books or be part of a self-help group.
• Gradually expose yourself to situations you avoid.

Certainly, many of the intervention strategies, however basic, outlined above have been noted in the scientific literature as effective methods to reduce stress and anxiety. These include the cognitive, behavioral and mindfulness interventions listed which have been correlated to decreased anxiety, depression and cortisol levels (Regehr, Glancy, & Pitts, 2013). However, students who do not have in-depth knowledge of these methods would be unable to practice them themselves. For instance, cognitive and mindfulness-based therapies require training in order to reap their benefits. One therapeutic activity, however, which is private, low-cost and easily accessible and briefly listed amongst other strategies as one way to "express your emotions through activities" is through the method of narrative medicine. Narrative medicine, which will be better defined in the subsequent chapter, has been shown to reduce anxiety (Gortner, Rude, & Pennebaker, 2006), and will be the main focus of this dissertation as a method of intervention to battle cognitive test anxiety, particularly amongst ELL students.
Review of the Literature

Since its foundation in 1986, the notion of expressive disclosure through writing has garnered the attention of researchers as a creative and novel form of therapy, effective as a treatment of various mental and physical ailments (Pennebaker & Beall, 1986; Pennebaker & Seagal, 1995; Andersson & Conley, 2013). The paradigm continues to reap increasing interest in terms of other potential applications, most recently within the academic milieu, where writing under conditions of duress (such as tests) is often a factor of academic outcomes (Burns & Friedman, 2012; Dalton & Glenwick, 2009). The paradigm has also been tested and adopted under various terms, which include: “narrative medicine”, “expressive writing”, “experimental disclosure”, “emotional disclosure”, and “focused expressive writing”.

In this chapter, the origins, definition, and general findings of experimental disclosure will be discussed, as these sources provide the groundwork for the study conducted on writing in the native language to be described subsequently. Overall, experimental disclosure is a form of therapy that involves the act of writing based on the premise that externalizing a person’s experiences (especially one’s inner thoughts) “discloses” their meaning and adds relevance to a person’s life. One could say, metaphorically, that experimental disclosure is to clinical psychology what dream analysis is to psychoanalysis — it is a channel for bringing out into the open one’s inner thoughts so that they can both relieve inner tensions cathartically and allow the subject to reflect upon their implications for his or her life (Hendrick, 2013).
Working Definition

A working definition of experimental disclosure is that it is a form of expressive behavior that taps into deep psycho-emotive processes channeling them into linguistic texts where they can be analyzed reflectively by the expresser. The “original” task given to participants was as follows (Pennebaker & Beall, 1986):

For the next four days, I would like for you to write about your very deepest thoughts and feelings about the most traumatic experience of your entire life. In your writing, I’d like you to really let go and explore your very deepest emotions and thoughts. You might tie your topic to your relationships with others, including parents, lovers, friends, or relatives, to your past, your present, or your future, or to who you have been, who you would like to be, or who you are now. You may write about the same general issues or experiences on all days of writing or on different traumas each day. All of your writing will be completely confidential.

Today, Pennebaker’s (2004) suggested task for practitioners of the therapy is as follows, with a notable increase in time and generalization in writing topic, though the temporal amount is generally interchangeable between fifteen and twenty minutes:

Over the next four days write about your deepest emotions and thoughts about the emotional upheaval that has been influencing your life the most. In your writing, really let go and explore the event and how it has affected you.
You might tie this experience to your childhood, your relationship with your parents, people you have loved or love now, or even your career. Write continuously for 20 minutes.

In some ways, experimental disclosure parallels Roman Jakobson’s (1960) view that human communication has invariably an emotive function to it. Words are stored by the mind not in terms of semantic fields or alphabetic categories, but in terms of what might be called “experiential contiguity.” This is the concept that words are related mnemonically to each other via the emotional association of experiences. The term “emotive” was also used by Jakobson to refer to the fact that a speaker’s emotions, attitudes, social status, etc. converge to shape the specific way in which he or she will construct a verbal text in a particular context. Jakobson called the effect — physical, psychological, social, etc. — that the verbal text has on the receiver as the “conative function”. In experimental disclosure, the sender and the receiver are one and the same. So the emotive content of the written text becomes a factor in its conative effect, which ends up being therapeutic, according to experimental disclosure theory.

Experimental disclosure is highly dependent upon the strategic and emotional value of words chosen by the writer to draw out inner thoughts and feelings, with the general premise being that divulging one’s emotional secrets through written text are particularly operative in the recounting of traumatic events (Pennebaker, 2004). Thus, one’s affective responses to the events seem to guide the choice of the words and structures used when writing about them.

Experimental disclosure can be defined more narrowly for the present purposes as an expressive, emotive strategy, deployed to bring one’s feelings into the realm of one’s
awareness. It is, however, similar to what Goodwin and Goodwin (1992) have designated “assessments”. These are strategies that “provide participants with resources for displaying evaluations of events and people in ways that are relevant to larger projects that they are engaged in” (p. 181). In a way, experimental disclosure attests to the veracity of the Italian proverb *la lingua batte dove il dente duole* (literally “the tongue touches the hurting tooth”). That is, feeling-states, if given an outlet, will come out.

**The Emergence of Experimental Disclosure**

The emergence of experimental disclosure as a written therapy dates back to the mid-1980s, as developed by Dr. James W. Pennebaker, a psychologist at the University of Texas at Austin. In his research, and that of others who have adopted the paradigm, experimental disclosure studies the links between emotional experiences, natural language, and physical and mental health (Andersson & Conley, 2013). It focuses on how language – as it manifests itself in written texts – reflects basic cognitive, behavioral and emotional processes. Pennebaker’s main premise, corroborated by the now established literature on experimental disclosure, is that short-term emotional and focused writing has beneficial effects on a plethora of subjects (Pennebaker, 2004; Pennebaker & Beall, 1986). This premise emerged from the field of clinical psychology, particularly trauma, where Pennebaker (2004) found that people exposed to trauma who had kept the traumatic event secret visited their physicians nearly 40% more than those exposed to trauma, who had openly discussed it. Thus, through the hypothesis that writing could potentially be as beneficial as orally discussing one’s deepest secrets and related feelings – with greater privacy and without the
In the first ever exploratory study testing the paradigm, Pennebaker and Beall (1986) instructed college students to spend 15 minutes on 4 consecutive days writing about their deepest thoughts and feelings, relating them to stressful experiences. A group of control participants were instructed, instead, to write about trivial topics, such as describing their rooms. Four months later, the participants in the experimental group reported positive outcomes on their physical health. The researchers concluded that “writing about earlier traumatic experience was associated with both short-term increases in physiological arousal and long-term decreases in health problems” (Pennebaker and Beall, 1986, p. 280).

The field of experimental disclosure has since burgeoned. To date, there have been over 200 subsequent published studies replicating and extending the paradigm largely supported Pennebaker and Beall’s (1986) original conclusions, suggesting cumulatively that expressive disclosure through writing would seem to bring about significant emotional and physical health benefits (Seih, Chung & Pennebaker, 2011). For example, it has been found to reduce visits to health care services (Pennebaker & Francis, 1996), to improve immune functioning both in the general population (Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995) and in patients with HIV infection (Petrie et al, 2004), and to lead to clinically significant changes in patients with moderately severe asthma and those with rheumatoid arthritis (S myth, Stone, Hurewitz & Kaell, 1999). Aside from such physical benefits, several studies have found that expressive writing is associated with positive emotional outcomes, including an increase in psychological well-being (Murray & Segal, 1994), a reduction in distress (Barry & Singer, 2001), a decrease in
post-traumatic stress symptoms (Donnelly and Murray, 1991; Lange et al., 2000), and a
decline in absenteeism among employees (Francis & Pennebaker, 1992). Consistency in the
paradigm was demonstrated in Frattaroli’s (2006) meta-analysis of 146 randomized studies
of experimental disclosure, finding the intervention to have a positive, significant effect with
an average r-effect size of .075.

Overall, it can safely be asserted that experimental disclosure is a discovery more
than a speculative framework, given the results it has produced and continues to produce.
The primary reason why this is so is, arguably, because writing pays little or no attention to
propriety: it simply allows subjects to express what is on their minds. Using a simple
Freudian model, it can be said that the emotions in the Id, which are suppressed by the
Superego, are liberated to come to the surface where the Ego can grasp them.

The present paper presents and discusses results from a study examining the validity
of the experimental disclosure construct when the native-language (L1), instead of the non-
native language (English in this case), is employed by subjects before taking an exam in a
university setting. Test-taking among university students tends to be a highly stressful event
(Kurt, Balci, & Kose, 2014) and thus an ideal one for examining the validity of experimental
disclosure theory and how the L1 may affect it. In contrast to all previous studies conducted
from a psychopathological framework, wherein the written fluency of participants was not
been examined or assessed, the present investigation looks at the role of the students’ L1 in
enhancing exam performance.
Theoretical Background

Theories of why and how experimental disclosure works abound, but there is still no real consensus in the field.

Because of the narrative nature of the experimental disclosure paradigm, word choice is also of high importance. As Pennebaker (1997) found, participants using positive-emotion words, less negative-emotion words, and more cognitive words which would imply understanding and reasoning showed the greatest improvement of affect, as determined by his computer software system, Linguistic Inquiry and Word Count, which analyzes the inputted text through 82 predefined categories. These results suggest more broadly that narrative is a universal expressive form to which humans respond instinctively as a meaningfully way of understanding the world. As has been found in a plethora of research (Bamberg, 2008) people universally think of their own lives as narratives of a sort and proceed to tell them as such. In a phrase, the “narrative instinct” is perhaps as fundamental to human psychic life as breathing is to physical life.

A narrative is a text that has been constructed to represent a sequence of events or actions that are felt to be logically connected to each other or causally intertwined in time and space. The sequence may be fact-based or fictional, or a combination of both. It is often difficult, if not impossible, to determine the boundary line between fact and fiction. Even in the recounting of life-stories, fiction is often intermingled with fact in order to give the stories more coherence and credibility. Ekman (2009) has called this the “Othello effect,” defining it as lying in order to emphasize reality. Making sense of a narrative is not a straightforward process of determining the meanings of the individual words with which it is
constructed and adding them together. Rather, it involves interpreting the whole narrative at various levels. One level is the subtext, as it is called in literary theory. This is the main theme or intent of the narrative, which is not announced explicitly by the characters or narrator. It is implicit or becomes understood by the reader from cues within the main text.

Some of these may come in the form of intertexts, which are allusions within the narrative text to other texts external to it. Perhaps one way to explain the benefits of experimental disclosure is that it induces the writer to bring the subtext out into the open.

Another hypothesis involves the notion that cognitive processing is a potential mechanism underlying the process of writing as a means to organize and structure the traumatic memory, resulting in more adaptive, integrated conceptualizations about oneself, others and the world. Understanding what one is doing, often called “metacognition”, allows one to better react to the implications of a situation. From a purely metacognitive perspective, Peverly et al., (2013) note that writing involves generating ideas and transcribing them quickly before they are forgotten. Therefore, in lessening the load put on working memory to remember ideas, writers are more able to use other cognitive resources. Thus, perhaps writing itself allows for the anxiety which floods working memory to be freed enough to allow other cognitive processes needed to flourish.

Each of the proposed theories has supporting and conflicting evidence. Perhaps the mechanism that experimental disclosure activates is a complex one involving several processes in tandem (cognition, narration, and so on). The demonstrated benefits thus might result not from one source but from a combination of factors.
A Psychosemiotic Model

I propose an alternative model from a psychosemiotic perspective which may speak to the efficacy of the experimental disclosure paradigm, such that the act of expressive writing is one of semiosis coming into explicit consciousness. This may be particularly appropriate as, according to Peirce (1894), “we think only in signs”.

Psychosemiotics is defined as “the study of how humans learn, understand, and use signs…grounded in the theory of the sign and semiosis as conceived by Peirce” (Smith, 2007). Peirce, a founder of the field of semiotics, characterized semiosis as the process of creating and interpreting signs in terms of: (1) the sign form itself (the representamen); (2) the object encompassed by the representamen; and (3) the interpretant, the meaning generated (personally, socially, etc.) when the representamen and the object are processed in tandem. Semiosis can be understood, then, as a chaining of interpretants, in which new signs collide with new objects to form new interpretants eventually converging to a belief. Thus, the benefits found via experimental disclosure consist of: emotive words (the representamen); an affective release via the words (the object) and the therapeutic benefits (the interpretant). Thus, in combining the sign form itself (written words) with the objects encompassed by the words (emotional release) the interpretants described provide a new form of meaning to the distressing phenomenon at hand.

However, in opposition of this view, Lacan’s concept of glissement — wherein meaning slips into other forms of meaning such that ‘the distance of what is written’ is far from accurately communicating our inner thoughts (Lacan, 1998, p. 34) — the second notion of points de capiton, wherein the signifier (the sign itself) and signified (the meaning) are
“knotted together”, upholds it. Thus, through expressively writing one’s deepest emotions, perhaps one reaches points de capiton which finally allow for the formation of an accurate understanding of complex events within one’s life. Thus, while Lacan understood that psychosis was the end result for individuals who could not find meaning through joining the signifier and signified, perhaps being prompted to write forces individuals to observe the points de capiton needed, and is the reason behind why experimental disclosure has been found to be particularly effective. Much like a placebo effect, in which one finds improvement through the mere expectation of it, or from a semiotic lens, wherein taking a sugar pill (the signifier) is “knotted” together with feeling better (the signified), perhaps being prompted to write meaningfully about emotional states from which one expects to heal provides the same benefit.

This explanation would not be complete, however, without relating the psycho-semiotic model to cognition in a Peircean sense. According to Peirce, emotion is foundational to thought (Corrington, 1993):

Peirce advances what could be called an “intentional” theory of emotion. Such a theory denies that emotions are purely internal states of affairs that merely serve to color the surface of self-consciousness. Rather, emotions are outward-directed intentions that predicate qualities of objects. To have an emotion is to project (intend) a feeling-state outward onto an objective field. To be angry, for example, is to be angry at some thing or person. Without an external and intentional referent, the emotion could not emerge in the first place. (p. 81)
In this view, the mere act of asking one to project their feeling-state outward could release the fixed belief they may have of the negative emotion being inward. In Peirce’s (1868) semiotic theory of cognition, he defined four premises: First, cognition, or as Peirce termed it, “knowledge of the internal world,” is born out of sensing the external world, which relies on emotion. Second, thoughts are born from previous thoughts (that is, knowledge builds on previous knowledge). Third, without signs one is unable to think and thus discover knowledge. Fourth, we cannot perceive (and thus form thoughts about) anything that is not a sign. Thus, theoretically, if one encounters a negative event from which severe anxious emotions are elicited, subsequent negative thoughts can be induced, from which negative thoughts continue to emerge. The prompt of experimental disclosure therapy, which explicitly asks participants to write how they “feel”, displaces the negative emotion away from the subject’s internal state and into an outward direction, changing the direction of their negative thoughts, thus accounting for the long-term benefit seen in much of the data. This loop was noted early on by Peirce (1877): “Doubt is an uneasy and dissatisfied state from which we struggle to free ourselves and pass into the state of belief” (p. 10). Nevertheless, being potentially prompted to change into the state of “belief” is consistent with neuroscientific data on neuro-plasticity (also known as brain malleability), specifically as a form of structural pliability. Therein, as a result of an experience, or, as the case in experimental disclosure may be, re-experiencing the same event from a different angle or the same emotion from an outward direction, the brain changes itself, regardless of one’s age or previous disposition (Doidge, 2007).

Moreover, the experimental disclosure paradigm requires a continuous stream of writing. As “partial information such as the beginning of a sentence will trigger the
automatic completion of a proverb… or the mention or vision of an object will trigger an association of a paradigmatic or syntagmatic kind” (Bouissac, 1999), continuous expressive writing thus potentially creates an interaction between semiosis, memory and the present state, eliciting multiple cognitive capacities which may be otherwise environmentally constrained (being unable to express inner thoughts due to social pressures, not having an outlet with which to express these thoughts, etc.). Interestingly, no research in experimental disclosure has yet explored whether or not participants re-read their written work once completely produced, or whether one writes by re-reading the sentence at hand, although this could easily be studied with eye tracking software.

It may also be the physical act of writing which may also be understood to further generate the experience as a meaningful one as the kinesthetic cues could, from a psychoanalytical perspective, theoretically recall affect felt in early childhood. For instance, as one’s earliest experiences in writing are usually in a setting similar to that which has been replicated in studies (namely, sitting on a chair, at a desk, and taking pen to paper, all in a presumably safe classroom setting) this may elicit not only procedural memory (that is, how to write), but also episodic memory of early feelings of safety, control and mastery, allowing for a true circular experience of semiosis. This would thus allow one to be both metaphorically and literally (in the sense of motor control and demand on cognitive resources), in control over one’s feelings and the situation at hand.
Existent Theories within the Literature

Within the experimental disclosure literature, several theories have been put forward to provide a viable explanatory framework for the efficacy of the experimental disclosure paradigm. In their review of 27 studies, Sloan and Marx (2004) outline three potential hypotheses called as follows: (a) emotional inhibition; (b) cognitive adaptation; and (c) exposure/emotional processing. Those supporting the emotional inhibition model, including Pennebaker (1989), suggest that writing unlocks one’s emotions that may be at the root of psychological or physical distress. Expressive exposure is thus seen as providing an expressive channel through which individuals loosen their internal restraining forces. This claim has received some empirical substantiation in various studies which link cancer progression to emotional inhibition, correlating it to an increase in sympathetic activation (Fawzy et al., 1993; Gross, 1989; Spiegel, Bloom, Kraemer, & Gottheil, 1987 as reviewed in Sloan & Marx, 2004). Overall, however, there is little empirical substance to support this theory. As Sloan & Marx (2004) observe, “there is no evidence to support the notion that decreases in inhibition mediates the relationship between writing about stressful/traumatic events and improved health” (p. 125).

The cognitive adaptation hypothesis relies on Janoff-Bulman’s (1992) theory that one’s conceptual system is “best represented by a set of assumptions or internal representations that reflect and guide our interactions in the world and generally enable us to function effectively” (p.5). According to this view, three primary modes of awareness, or “assumptions,” reside within each individual. These can be paraphrased as follows: (a) the world is kind; (b) the world is meaningful; and (c) one is worthy. Deriving from these is the inherent assumption that others are benevolent, kind and caring, and that positive
experiential outcomes in life tend to outweigh negative ones. It is only when confronting a traumatic event that these assumptions are “shattered” in such individuals, who tend to conclude that they must either re-interpret the traumatic event to fit their core assumptions, or else adapt the assumptions to fit the traumatic event—a process that is in line with standard cognitive dissonance theory (Festinger, 1962, p. 102). A related or variant version of cognitive adaptation theory, posited by Horowitz et al. (1986, p.104), uses the notion of “completion tendency”, whereby one’s inner set of assumptions is revised or modified by incorporating new information that allows the subject to cope better with the traumatic event. In both cases, it is hypothesized that expressive writing allows the subject to reflect cogently on the traumatic event and thus to re-evaluate it in more emotionally-strategic and beneficial ways. However, like emotional inhibition theory, there is little empirical evidence to support either version of this model. Further research is needed accordingly (Sloan & Marx, 2004).

The third model, exposure/emotional processing, which has its basis in Mowrer’s (1960) two-factor theory of conditioning, suggests that when someone experiences a traumatic event, the result is a conditioned fear response that can then be projected onto subsequent events and stimuli that are unrelated to the original trauma. These, in turn, can produce a similar response by association. In attempting to avoid such “derived negative responses,” the subject adopts an avoidance strategy, that is, he or she attempts to avoid the stimuli, which acts reflexively to prolong fear. In this framework, behavioral therapy is often employed to help the subject dissociate the neutral stimuli (those acquired by association) from the traumatic stimuli which caused the fearful response in the first place. This suggests that careful and controlled re-exposure to a traumatic event may prove beneficial in de-escalating the emotional response to the event. Within this model, expressive writing
purportedly allows the subject to compare the two different events, so as to disconnect them emotionally. The model seems to be particularly effective at explaining the decrease in posttraumatic symptoms following expressive writing. Nevertheless, the research findings have been ambiguous. Some studies show that intrusive thoughts have either recurred in a diminishing fashion (Klein & Boals, 2001; Schoutrop et al., 2002 as reviewed in Sloan and Marx, 2004), while others show no change whatsoever (de Moor et al., 2002; Lepore, 1997; Stroebe et al., 2002; Walker et al., 1999 as reviewed in Sloan and Marx, 2004). More research is needed in this case as well.

In a complementary review of the expressive writing research, Baikie and Wilhelm (2005) identify a plausible fourth theory, different from the three discussed by Sloan and Marx (2004), to account for positive outcomes associated with the paradigm. They designate it as coherent narrative theory, where a change in the subject’s language (for example, using different pronouns or emotive words) signals a concomitant change in emotional reaction. Thus, language is connected to emotional states. The linguistic medium is seen as allowing subjects to project their internal complexes onto the verbal details of the expressive narrative and, thus, as constituting a key to internal states.

Although coherent narrative theory is interesting as a general model, like Sloan and Marx (2004), Baikie and Wilhelm (2005) conclude that no single theory can account for the efficacy observed in expressive writing interventions, and that further research is required to provide a more substantive platform on which to assess the paradigm theoretically. A recent article by Dalton and Glenwick (2009) highlights that the models examined by these reviewers dealt only with retrospective traumatic events, assuming therefore that benefits through expressive writing are realized only if subjects revisit a previous traumatic
experience through the contents of their writing. However, several studies have also found that benefits accrue in such impending-stress scenarios as well (Lepore, 1997; Burns & Friedman, 2012; Cohen, Garcia, Apfel & Master, 2006 in Dalton and Glenwick, 2009). This line of investigation has many more applications to different triggers of stress, such as the one that will be of interest here — namely, the stress brought about by a final exam as an evaluation procedure in an academic setting.

**The Relevant Literature**

In a study on experimental disclosure and impending stress, Lepore (1997) asked participants to write their deepest feelings about an upcoming graduate entrance exam, such as the Medical College Entrance Examination (MCAT), the Graduate Record Examination (GRE) and the Law School Admissions Test (LSAT), among others. Participants were asked to write about their stressful feelings for 25 minutes in a laboratory or in an online setting, 10 days before their exams. The researcher also asked the subjects to rate themselves on a standard stress detector of depressive symptoms (a 13-item depressive symptom subscale of the SCL-90-R [Derogatis & Melisaratos, 1983]), and on a scale measuring intrusive thoughts, with modified items from the Impact of Events Scale (Horowitz, Wilner, & Alvarez, 1979) and the Intrusive Thoughts Scale (Lepore, Silver, Wortman, & Wayment, 1996). The same scales were given to a control group. Both groups were administered these scales in three separate periods: 1 month before the exam, 3 days before the exam, and 1 week after the exam.
The ratings of the two groups (experimental and control) were quantified and analyzed. The experimental disclosure group experienced a significant decline in depressive symptoms from 1 month to 3 days before the exam compared to the control group, hence verifying the initial null-hypothesis that experimental disclosure enhances positive outcomes by reducing stress. In a follow-up study, Dalton and Glenwick (2009) hypothesized that experimental disclosure could put the subjects in a better position to do better in testing situations and thus potentially perform at a higher level (including achieving higher grade results). The rationale is that experimental disclosure acts to regulate worrying, which, in the academic sector, leads to poor test performance (O’Neil & Fukumura, 1992; Doctor & Altman, 1969). Thus, experimental disclosure would allow for other cognitive processes that enhance performance and productivity to increase. The researchers found that experimental disclosure participants achieved a mean exam score that was significantly higher than the control group, confirming the initial hypothesis.

Ramirez and Beilock (2011) modified Dalton and Glenwick’s (2009) study, such that the experimental disclosure intervention occurred immediately before several test-taking events. According to the researchers, previous studies allowed for ample time for the subjects to write their texts, in line with Watson and Pennebaker’s (1989) original proposal of using experimental disclosure over several time frames. Ramirez and Beilock (2011) used this modified experimental disclosure approach to test if it attenuated feelings of “choking” under pressure. The researchers created a high-stakes testing environment using a modular arithmetic task, whereby college students were asked to perform as best they could while controlling subjects’ previous experience with the task. Each subject was then told that he or she would be matched with an imaginary partner for the same task, and that they would
receive a monetary reward if they improved in tandem with that partner, irrespective of the actual degree of improvement. This was meant to escalate feelings of anxiety within a “pressure scenario”. After being told that their partner’s score had increased, each student was asked either to sit quietly for 10 minutes or to engage in experimental disclosure before being given another modular arithmetic task. The intervention was found to significantly enhance performance by 5% in comparison to the pre-test score.

A follow-up study, which replicated the first, again showed a significant improvement in performance. Ramirez and Beilock (2011) further corroborated these results with two randomized field experiments, in which ninth-grade students writing their first high-school exam were randomly assigned to an experimental disclosure or a control group. The control group was asked to think about a topic that would not be covered on the exam. Six weeks before the final exam, students’ test anxiety was measured utilizing the Cognitive Test Anxiety Scale (Cassady & Johnson, 2002). A negative correlation was found between test anxiety and exam grades for the control group whereby, the higher one’s test anxiety, the lower the score. In the experimental disclosure group, no such correlation emerged. The authors concluded: “Expressive writing eliminates the relation commonly seen between test anxiety and poor test performance. Moreover, it is not any writing that benefits performance, but expressing worries about an upcoming high-pressure situation that accounts for enhanced exam scores under pressure” (Ramirez & Beilock, 2011, p. 213).
Objectives and Hypotheses of the Present Study

As demonstrated cumulatively by the studies discussed thus far, the simple act of expressing one’s feelings through writing was found to produce benefits in a variety of settings, albeit more research is needed in some cases (Sloan and Marx, 2004). Evidence suggests that when these benefits crystallize, it happens regardless of language or culture. Benefits have been documented in monolingual students in Japan (Yogo & Fujihara, 2008), the Netherlands (Schoutrop, Lange, Brosschot, & Everaerd, 1997), Mexico (Dominguez et al., 1995), and French-speaking Belgium (Rimé, 1995). However, to date, only one study has explored the effect of the different outcomes that might arise between native and non-native speakers involved in an expressive writing intervention situation: Kim (2010) assigned 89 Korean-English and Spanish-English bilingual students to write expressively either in their native language, English, or alternative languages, or engage in a control, on four separate occasions. The study sought to explore how socialization would be impacted by an experimental disclosure intervention. The results indicated that participants who wrote alternating languages (such that they wrote in their native language on one day and English the next) showed the greatest improvements in social engagement in comparison to any experimental or control group. However, the epistemological nature of Kim’s (2010) study must be emphasized, such that it explored the experimental disclosure intervention from a positive psychological framework and was primarily aimed at exploring the social engagement of non-dominant English speakers in America, for which alternating languages would have a vastly different effect and purpose.

The present pilot study, which employed a psychopathological framework, as has been historically used in studies exploring the experimental disclosure intervention, seeks to
determine whether non-native English speakers would reap similar benefits on exam performance via an experimental disclosure intervention as native-English speakers in an English-only environment. In order to be able to truly generalize the effects of experimental disclosure in today’s global village, it is relevant and perhaps even essential to study such differences. There are a number of reasons why results of non-native English speakers may differ from those of native-English speakers: First, individuals who have a better grasp of their L1 might be better able linguistically and conceptually to express themselves. Second, writing in the L1 might be a stronger stimulant of emotional responses — a supposition that is actually supported by studies unrelated to the expressive writing paradigm. For instance, Schrauf (2000) found that childhood memories in the L1 are more highly emotional. Also, as determined by Dewaele (2004), swear words and taboo words were found to be highly emotional in the L1, yet the emotivity gradually lessened in subsequent languages learned when using such words. Most notably, however, Pavlenko (2002) found that the preferred language for emotional expression is one's native language. Thus, in the present study, it was expected that non-native English speakers writing in their L1 would fare better than non-native English speakers asked to write in English by decreasing worry with regard to an impending-stress scenario (a scheduled university exam). It was also anticipated that the experimental disclosure intervention would be effective in decreasing worries in an impending-stress scenario, and therefore, that it would lead to a higher test score in comparison to the control group.

The research also aimed to explore relational factors – namely cognitive test anxiety, optimism, and discouragement about the future – and how they might relate to exam scores. Within these relational factors, three hypotheses were assumed to be at play: (a) optimism
was thought to be a possible protective factor against lower exam scores (Kleijn, Ploeg, & Topman, 1994); (b) test-anxiety was expected to have a negative effect on test scores (Ramirez & Beilock, 2011); (c) discouragement about the future, a factor which contributes to depression, was expected to lead to lowered test scores, given that relevant research has found that depression significantly lowers academic performance (Hammen & Rudolph, 2003; Forehand, Brody, Long, & Fauber, 1988). This factor was included in the study because of the instability of the current economy—an apprehension that has been found to correlate to further depressive symptoms (Vuori, Silvonen, Vinokur & Price, 2002).

In order to test these hypotheses, a randomized controlled trial was conducted. The data collected were analyzed with both quantitative and qualitative procedures.

Participants consisted of a group of second-year anthropology students at the University of Toronto. Two weeks prior to their final exam, students were asked to complete a demographic questionnaire designed to determine their levels of linguistic competence, and were administered several scales including the Cognitive Test Anxiety Scale, the Optimism Scale and an item of depression on Beck’s Depression Inventory, discouragement about the future. On the day of their final exam, immediately prior to writing it, students were randomized into either one of two experimental conditions or a control condition. The study thus was designed to: (a) investigate the extent to which expressive writing affects exam scores in attempt to corroborate the results achieved by Ramirez and Beilock (2011); (b) determine how non-native English speakers perform with an experimental disclosure intervention strategy in an academic, English-only environment; (c) investigate whether non-native English speakers writing in their L1 would reap greater benefits than non-native English speakers writing in English (the L2); and (d) determine the extent to which relevant
background and relational factors (demographics, past test performances, cognitive test anxiety, level of optimism, and discouragement about the future) would affect exam scores.
Methodology

Participants

The study sample consisted of self-selected consenting undergraduate students in a second-year anthropology course at the University of Toronto. Packets were distributed to 425 students. A total of 362 responses were collected for a response rate of 85.2%. The present sample consisted of 161 males (44.5%), 199 females (55%), and 2 who identified themselves as “other” (0.6%). Six of the participants did not satisfactorily complete the expressive writing condition (i.e. did not include words indicating negative emotions, anxiety, and worry), and thus were not included in any of the statistical analyses. The participants ranged in age from 17 to 41 years, with a mean age of 20.83 (SD = 2.63). The sample included 10 (2.8%) participants who identified themselves as African-Canadian, 209 (57.7%) as Asian-Canadian, 85 (23.5%) as Caucasian, 9 (2.5%) as Latino; 2 (.6%) as Aboriginal, 45 (12.4%) “other”, and 2 (0.6%) did not respond. Amongst the participants, 143 (39.7%) identified their native language (L1) as English, 103 (28.6%) identified their native language as Chinese; and 33 (9.2%) identified their native language as Korean. Other languages more commonly identified included Farsi and Urdu, with 10 (2.8%) participants each.

The non-native English speakers rated both their English proficiency (including speaking in English, reading in English, and writing in English) ($M = 3.25, SD = .72$), and their native proficiency ($M = 3.0, SD = .93$), as “good”.
Materials

**Demographic Questionnaire.** A Demographic Questionnaire (DQ) was developed in order to compile standard demographic and social information relevant to the study, including gender, ethnicity, and age. The DQ also sought information on the number of languages spoken, the native language spoken, and language proficiency in both, wherein the scale provided to assess “speaking”, “reading”, and “writing” in English or the L1 could range from 1 (poor) to 4 (excellent).

**Cognitive Test Anxiety Scale.** Cognitive test anxiety was measured using the Cognitive Test Anxiety Scale (Cassady & Johnson, 2002), a 27-item self-reporting scale of the cognitive dimension with a specific aim of identifying “worry”. The questions on the scale correspond to various aspects of worry, including: (a) performance comparisons to peers, (b) perceptions of the consequences of failure, (c) confidence in performance, (d) worry over evaluation, (e) perceptions of preparedness for tests, and (f) loss of self-worth. Respondents are asked to gauge the frequency by which they experience each item in a test scenario, which is measured on a four-point Likert scale, with responses ranging from 1 (not at all typical of me) to 4 (very typical of me). Sample items include: “While taking an important examination, I find myself wondering whether the other students are doing better than I am” (comparison to peers); “I feel under a lot of pressure to get good grades on tests” (evaluating consequences of failure); “After taking a test, I feel I could have done better than I actually did” (one’s confidence in performance); “I lose sleep over worrying about examinations” (excessive worry over evaluation); “When I take a test that is difficult, I feel defeated before I even start” (unpreparedness); “During tests, the thought frequently occurs to me that I may not be too bright” (loss of self-worth). Cumulative scores on the 27-item
scale can range from 27 to 108, corresponding to low to high cognitive test anxiety, respectively. The validity and internal consistency of this test are well established (Ramirez & Beilock, 2011; Cassady & Johnson, 2002).

**Optimism Scale.** The Optimism Scale determines how students perceive themselves and their futures. This self-reported, four item scale contains two questions concerning positive outcomes, and two concerning negative outcomes. Participants use a four response format (1 = Strongly Disagree; 2 = Disagree; 3 = Agree; and 4 = Strongly Agree). Items 2 and 4 are reverse-coded. A total score is then tabulated for level of optimism, though no benchmark determines whether one is, or is not, an optimist. As a subscale of the standard and commonly used Life Orientation Test, constructed by Scheier, Carver, and Bridges (1994), this measure has well-established construct validity. Chosen for its brevity, the reliability of the Optimism Scale has been determined to be a valid measure of optimism since 1986 (Sabatelli, Anderson, & LaMotte, 2005).

**Discouragement about Future.** An additional item from Beck’s Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was employed to assess how participants felt about their future. Participants were asked to rate the item, “I feel discouraged about the future” on a four response format which ranged from 1 (rarely) to 4 (very).

**Study Procedure**

All study procedures were approved by the University of Toronto Research Ethics Board.
After obtaining permission from the course staff, including the Professor and teaching assistants, students were informed of the study in both verbal and written forms. The study was announced in class by the present researcher four weeks prior to the final exam and similar information was posted via Blackboard, an online learning platform accessible by all course enrollees. In both announcements, students were informed that they would have the opportunity to participate in a study on anxiety which would take approximately 20 minutes to complete two weeks prior to the exam, and on the exam day itself. Students were told their responses would be anonymized and their participation in the study would not be evaluated.

Two weeks prior to the final exam, packets were placed on each desk prior to the students entering the classroom and collected in class by research assistants. Students were asked to complete the packet independently and in silence at the beginning of class. Informed consent was obtained via written instruction on the first page. After 20 minutes had passed, the packets were collected by research assistants.

On the day of the exam, the study employed a randomized design, where participants were randomly assigned to one of three examination groups in the University’s examination centre: (1) English expressive writing group; (2) Native language expressive writing group; (3) A control group. Each group was directed towards a specific examination room, and participants were informed by trained research assistants that the study would have no bearing on their time to complete the actual exam, nor would it in any way affect their exam scores. It was further explained that participation was voluntary, and any identifying information would be removed from both the packets previously completed and exam scores before statistical analyses were conducted. A packet containing experimental or control instructions and lined paper for the experimental condition was placed on each desk prior to
the students entering their respective rooms. Informed consent was again obtained via written instruction on the first page. Students were asked to complete the packet independently and in silence.

The students in the English experimental group were asked to “write as openly as possible about your thoughts and feelings regarding the exam you are about to take” and to “explore your emotions and thoughts… [and] relate your current thoughts to the way you have felt during other similar situations at school or in other situations in your life.” Students in the L1 experimental group were given the same instructions, however, they were asked specifically to write in their native language. The instructions were based on those asked by Ramirez and Beilock (2011) and modified slightly. Control students were asked to sit quietly and think about a topic that would not be covered on the exam, following the methods of Ramirez and Beilock (2011). After 20 minutes had passed, the packets were collected by research assistants.

After the test grades were collected, all identifying information was removed prior to statistical analyses and a study number was assigned to each student. The same number was used for both the packet and exam scores.

Analysis

A fixed mixed methods approach which “focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or a series of studies” (Tariq & Woodman, 2013) in an embedded design was used to further examine student anxiety by
expanding the positivist epistemology of the quantitative data produced. As research on student stress has tended to employ a mono-method approach, mixed methods were used given that such an approach is spreading within educational research and is “vastly preferred” for obtaining a rich understanding of a phenomenon, which could not be produced via a qualitative or quantitative approach alone (Teddlie & Tashakkori, 2003, p. 530).

All data was anonymized. For the quantitative analysis, Statistical Package for the Social Sciences (SPSS) software, Version 18 (SPSS, Chicago, IL, USA), was used for all descriptive and inferential data analysis, including the means, standard deviations for the scores on the Cognitive Test Anxiety Scale, the Optimism Scale and one’s discouragement about the future. All tests were conducted within a 95% confidence interval. Cronbach’s alpha was also used to assess internal validity within each scale.

For the qualitative analysis, all expressive writing was typed from written text and stored on a secure server on a password protected computer. Non-English texts were translated by bilingual research assistants through an iterative process, so as to best preserve the participants’ original meaning. All writing was manually coded to ensure the inclusion of objective emotive vocabulary. This included words that implied emotivity, both positive and negative, reflection, and/or self-insight. Examples include “worried”, “stressed”, “overwhelmed”, “peaceful”, “excited”, “understand” and “realize”. Participants in the expressive writing group who did not use specific words pertaining to the above were not included in either quantitative or qualitative analyses.

For the data set of emotive writing produced by participants in the experimental disclosure intervention, the present investigation sought to employ a phenomenologically-
based methodology, derived from humanistic psychology and used widely in the field of health psychology and the social sciences (Smith, Flowers, & Larkin, 2009). A phenomenological framework asserts “the participants’ perceptions, feelings, and lived experiences…are paramount” (Guest, MacQueen, & Namey, 2011, p. 15). Given the aims of the qualitative analysis at hand, an inductive phenomenological framework was thought to be most appropriate, particularly as the nature of the question and the framing of the expressive writing task provided participants with a broad basis on which to provide a rich description of their anxiety. However, the generally accepted phenomenological analytic method of Interpretative Phenomenological Analysis (IPA) generally requires a homogeneous sample, a small data set with a sample size and short, specific questions to produce a detailed account (Smith, Flowers, & Larkin, 2009; Larkin, Watts, & Clifton, 2006; Smith & Osborn, 2008). Thus, because of the large, heterogeneous sample size and the flexible nature of the responsive task asked in the present study, a phenomenologically-informed inductive thematic analysis was chosen. To reiterate, this approach best fits in with the aim of the present investigation to further understand students’ perception of their anxiety and their cognition right before taking a test, beyond what was measured in the Cognitive Test Anxiety scale for a richer understanding of the phenomenon.

Both IPA and the thematic analysis method allow us to identify themes in a text thus suggesting a range of appropriate interpretations. However, the thematic analysis method may also involve a positivist approach insofar as the statements are supported by linguistic evidence within the text (Guest, MacQueen, & Namey, 2011). In this light, thematic analysis, systemic in nature and seeking to “find solutions to real-world problems”, (which in the present case, as will later be explored later, includes suggestions to decrease student anxiety
based on the findings), grants specific advantages in providing explanatory insight on the anxiety felt by students (Guest, MacQueen, & Namey, 2011, p.17). Nevertheless, the present analysis maintains a phenomenological base, seeking to explore the lived experience of students facing anxiety immediately before taking an exam.

Following the social constructivist notion in some areas of anthropology and psychology generated by Foucault (2002) that “truth” is largely a matter of the subjective interpretation of reality, the present study is not designed to discover the truth of the matter in any absolute sense, but rather to indicate tendencies in a particular population with regard to the experimental disclosure paradigm. As in much research of this nature, it is subject to researcher bias, given that interpreting any set of data is bound to involve subjective modes of analysis due to the many ways meaning is expressed by individuals, which may be at odds with the ways the researcher processes the same meaning patterns (Rubin & Rubin, 2011). To attenuate the inherent researcher bias here, a rigorous systematic investigation of the data set was employed to identify patterns and themes in the data, based on established frameworks. As the present researcher has undergone similar testing situations, a personal bias may have appeared, wherein the author's own beliefs about stress may have been projected when coding. However, to help mitigate the bias, the technique of indexing was employed, whereby data items were manually coded in a line-by-line way, which, as is claimed, “helps refrain from imputing your motives, fears or unresolved personal issues to your respondents and to your collected data” (Smith et al., 1995, p.37). These efforts helped the investigation be less subjective in nature, however, in line with the social constructivist model, it bears noting that other researchers may have coded the data differently. For instance, through analyzing students' individual accounts of testing situations, Bonaccio and
Reeve (2010) identify three broad domains of students' perceived sources of text anxiety in efforts to develop a framework surrounding that theme. While the present investigation is exploratory, certainly the sub-themes identified could be re-grouped and data which was found relevant here could be deemed irrelevant, had a more directed approach be taken.

Thematic analysis is often regarded as a “poorly demarcated, rarely-acknowledged, yet widely used qualitative analytic method,” (Braun & Clarke, 2006, p.77) but it nevertheless has broad applicability because it “provides a flexible and useful tool, which can potentially provide a rich and detailed, yet complex account of data” (p. 78). In thematic analysis, one examines the data for patterns and recurring themes in order to generate insight and establish an overall synopsis of the phenomena at hand (Glesne, 2010). In the present investigation, the entire data set was analyzed using six phases of thematic analysis, as suggested by Braun and Clarke's (2006), and depicted in Table 1:

- In the first phase, the written data was typed electronically for clearer reading and any writing that was not in English was translated and typed. The data set was printed, read and re-read multiple times. Initial insightful and striking passages were noted in the left and right hand margins and memos were created on index cards.
- In the second phase, during open coding, as shown in Table 1, the data set was systemically reduced via manual coding with different color highlighters used to identify different categories and suggesting potential themes through line- by-line coding.
• In the third phase, highlighted themes were transferred onto the electronic version of the data set and noted passages from each data item were grouped together by each potential theme.

• In the fourth phase, the coded data were reviewed to ensure there was a coherent pattern which fit the theme. The entire data set was then re-read and each theme was generally evaluated in relation the entire set. To aid in this process, a thematic map was created. Adjustments to the themes were made and any themes which did not sufficiently represent the data set were deleted. This further refined the thematic map.

• In the fifth phase, the themes were explicitly defined and further refined by clearly identifying sub-themes and generating theme names aimed to capture the essence of the theme. Again, the thematic map was adjusted to reflect the changes in this phase.

• In the sixth and final phase, representative samples from each theme were extracted.

As has been noted in the first chapter of this dissertation, because of the poorly defined difference between the terms “stress” and “anxiety”, the term “anxiety” will be employed in the quantitative results. However, within the quantitative data, both “stress” and “anxiety” will be employed, as the results may indicate specific stressors, for which the response would be stress.
Table 1

*Phases of Thematic Analysis*

<table>
<thead>
<tr>
<th>Phase</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarization</td>
<td>Data is translated and typed. The data set is read, re-read and initial ideas are noted.</td>
</tr>
<tr>
<td>Open Coding</td>
<td>Manual, line-by-line coding to identify different categories and suggesting potential themes.</td>
</tr>
<tr>
<td>Initial Themes</td>
<td>Codes gathered into potential themes.</td>
</tr>
<tr>
<td>Review of Themes</td>
<td>Entire data set is re-read and each theme is generally evaluated in relation to the entire set.</td>
</tr>
<tr>
<td>Defining Themes</td>
<td>Themes are explicitly defined and sub-themes are clearly identified.</td>
</tr>
<tr>
<td>Reporting</td>
<td>Representative Samples from each theme are extracted</td>
</tr>
</tbody>
</table>
Results

Quantitative Analysis

A number of demographic items were collected, including gender, the number of languages spoken, and the academic performance according to participants’ control or experimental condition. The responses are included in Table 2.

The participant data was divided into 6 categories, as both intervention groups (participants asked to write in their L1 and participants asked to write in English) contained cross-contamination, such that each group consisted of both non-native and native English speakers. The six models were as follows, as depicted in Figure 5:

1. control participants whose L1 is English;
2. control participants whose L1 is not English;
3. experimental disclosure participants writing in English whose L1 is English;
4. experimental disclosure participants writing in English whose L1 is not English;
5. experimental disclosure participants writing their L1, but whose L1 is English;
6. experimental disclosure participants writing in their L1, and whose native language is not English.
Figure 5. Break-Down of Sample
One-way ANOVAs were conducted in order to determine whether there was a difference between each group’s cognitive test anxiety, optimism, and discouragement about the future scores. No difference was found for the scores: Discouragement, $F(5, 351) = 1.63$, $p = .15$, cognitive test anxiety, $F(5, 338) = 1.19$, $p = .31$, and optimism, $F(5, 350) = 1.77$, $p = .12$). This is reflected in Table 3.

To determine whether the intervention affected the final exam scores, factorial ANOVAs were conducted, with the dependent variable being the test results for all models used. Models 1, 2, and 3 explored the intervention’s effects for all six groups. Due to the relatively small sample sizes produced when dividing the sample into six groups, models 4, 5 and 6 show factorial ANOVAs which were conducted to explore only two groups: (1) L1 speakers asked to write in their native language in comparison to (2) all other groups aggregated.

Model 1 explored the experimental disclosure intervention as the only factor predicting the final exam scores. No statistical significance was found, $F(5, 350) = 1.46$, $p = .20$. In addition to the intervention, Model 2, $F(6, 346) = 22.57$, $p < .001$, compared midterm scores to final exam results. No statistical significance was found, $F(5, 346) = 1.11$, $p = .36$. However, significance was found for midterm scores, suggesting the results of midterm scores are associated to results of the final exam, $F(1, 346) = 125.57$, $p < .001$). This association is positive ($\beta = .46$, SE = .04), suggesting prior test results were a good predictor of future test results.
Table 2

*Demographic Characteristics of Study Participants*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Descriptive Statistics, N (%) or M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>161</td>
</tr>
<tr>
<td>(44.5%) Female</td>
<td>199</td>
</tr>
<tr>
<td>(55%) Other</td>
<td>2 (.6%)</td>
</tr>
<tr>
<td><strong>Number of Languages Spoken</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>51 (14.1%)</td>
</tr>
<tr>
<td>2</td>
<td>196 (54.1%)</td>
</tr>
<tr>
<td>3</td>
<td>89 (24.6%)</td>
</tr>
<tr>
<td>4 - 6</td>
<td>24 (6.6%)</td>
</tr>
<tr>
<td>No response</td>
<td>2 (.6%)</td>
</tr>
<tr>
<td><strong>Group</strong></td>
<td></td>
</tr>
<tr>
<td>(1) Control (English)</td>
<td>34 (9.4%)</td>
</tr>
<tr>
<td>(2) Control (Native)</td>
<td>88 (24.3%)</td>
</tr>
<tr>
<td>(3) Exp – English X English</td>
<td>53 (14.6%)</td>
</tr>
<tr>
<td>(4) Exp – English X L1</td>
<td>70 (19.3%)</td>
</tr>
<tr>
<td>(5) Exp – Native X English</td>
<td>46 (12.7%)</td>
</tr>
<tr>
<td>(6) Exp – Native X L1</td>
<td>71 (19.6%)</td>
</tr>
</tbody>
</table>

*Note.* N = 362, Exp. Denotes “Experimental Group”, as explained below.
Table 3

*Comparison of outcomes between six groups, n = 357.*

<table>
<thead>
<tr>
<th>Groups</th>
<th>Discouragement</th>
<th>Cognitive Test Anxiety</th>
<th>Optimism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control participants whose native language is English</td>
<td>2.25 ± 1.02</td>
<td>58.19 ± 11.41</td>
<td>10.36 ± 2.06</td>
</tr>
<tr>
<td>Control participants whose native language is not English</td>
<td>1.86 ± .90</td>
<td>60.83 ± 9.10</td>
<td>10.85 ± 2.50</td>
</tr>
<tr>
<td>FEW participants writing in English whose L1 is English</td>
<td>2.09 ± 1.01</td>
<td>61.49 ± 9.46</td>
<td>10.30 ± 2.90</td>
</tr>
<tr>
<td>FEW participants writing in English whose L1 is not English</td>
<td>1.86 ± .75</td>
<td>59.22 ± 9.75</td>
<td>10.88 ± 2.03</td>
</tr>
<tr>
<td>FEW participants writing in a language other than English, but whose L1 is English</td>
<td>2.17 ± 1.08</td>
<td>62.44 ± 8.84</td>
<td>9.69 ± 2.76</td>
</tr>
<tr>
<td>FEW participants writing in their L1, and whose native language is not English</td>
<td>1.94 ± .95</td>
<td>61.40 ± 9.72</td>
<td>10.44 ± 2.34</td>
</tr>
</tbody>
</table>

ANOVA test results

\[ F(5,351) = 1.63, \; p = .15, \; \eta^2 = .023 \]
\[ F(5,338) = 1.19, \; p = .31, \; \eta^2 = .017 \]
\[ F(5,350) = 1.77, \; p = .12, \; \eta^2 = .025 \]

*Note:* Values reported in the table represent Mean ± Standard Deviation
Model 3 tested the significance of the experimental disclosure intervention and three other factors including anxiety, optimism, and discouragement regarding the future, in order to determine if they affected the final exam score results. Overall, statistical significance was found, $F(8, 327) = 2.22, p = .03$, but the experimental disclosure intervention was not statistically significant, $F(5, 327) = 1.38, p = .23$. However, anxiety was found to be a significant predictor of the final exam results, $F(1, 327) = 8.05, p = .01$, suggesting anxiety has a negative effect on test scores, with higher levels of anxiety being associated with lower test scores, ($\beta = -.05, SE = .02$). Optimism was not found to be a significant predictor of the final exam results, $F(1, 327) = 1.82, p = .18$. Surprisingly, discouragement about the future was found to approach significance, $F(1, 327) = 3.26, p = .07$ with a positive relationship ($\beta = .33, SE = .18$), such that the more students felt discouraged about the future, the higher the final exam score result. Models 1 through 3 are depicted in Table 4.

Model 4 (2 groups) explored the experimental disclosure intervention as the only factor impacting the final exam score results. Statistical significance was found, $F(1, 354) = 4.96, p = .03$, partial $\eta^2 = 1.4\%$. The non-native English speakers asked to write in their L1 were scored, on average, 0.76 units (3.6\%) lower on the final exam score ($M = 20.61, SD = 2.34$) compared to all other participants ($M = 21.37, SD = 2.61$).

In addition to the intervention, Model 5 (2 groups), $F(2, 350) = 67.06, p < .001$, tested the relation of midterm scores to final exam score results. The intervention was found to be approaching significance, $F(1, 350) = 3.47, p = .06$, partial $\eta^2 = 1.0\%$. The midterm scores were thus found to be statistically significant, suggesting that they impacted the results of the final exam, $F(1, 350) = 127.28, p < .001$, with a positive association ($\beta = .46$,
Table 4

Models predicting the final exam test scores, $n = 357$.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEW intervention (6 groups)</td>
<td>$F(5, 350) = 1.46, p = .20, \eta^2 = .020$</td>
<td>$F(5, 346) = 1.11, p = .36, \eta^2 = .016$</td>
<td>$F(5, 327) = 1.38, p = .23, \eta^2 = .021$</td>
</tr>
<tr>
<td>Midterm test scores</td>
<td>$F(1, 346) = 125.57, p &lt; .001, \eta^2 = .266$</td>
<td>$\beta = .46, SE = .04$</td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>$F(1, 327) = 8.05, p = .01, \eta^2 = .024$</td>
<td>$\beta = -.05, SE = .02$</td>
<td></td>
</tr>
<tr>
<td>Optimism</td>
<td>$F(1, 327) = 1.82, p = .18, \eta^2 = .006$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discouragement about the future</td>
<td>$F(1, 327) = 3.26, p = .07, \eta^2 = .010$</td>
<td>$\beta = .33, SE = .18$</td>
<td></td>
</tr>
<tr>
<td>Overall model</td>
<td>$F(5, 350) = 1.46, p = .20, \eta^2 = .020$</td>
<td>$F(6, 346) = 2.57, p &lt; .001, \eta^2 = .281$</td>
<td>$F(8, 327) = 2.22, p = .03, \eta^2 = .051$</td>
</tr>
</tbody>
</table>

Note: Effect size $\eta^2$ reported for each factor represent partial $\eta^2$
Therefore, prior test results were therefore found to be a significant predictor of future test results.

Model 6 (2 groups) explored the experimental disclosure intervention and other factors including anxiety, optimism, and discouragement about the future. Overall, the model found statistical significance, $F(4, 331) = 3.65, p < .01$. The intervention approached significance, $F(1, 331) = 3.72, p = .06$, partial $\eta^2 = 1.1\%$. Anxiety was found to be the only significant predictor of the final exam results, $F(1, 331) = 7.32, p < .01$, and was found to have a negative effect on test scores, with higher anxiety corresponding to a lower test score ($\beta = -.04, SE = .02$). Optimism was not found to be a significant predictor of the final exam results, $F(1, 331) = 1.46, p = .23$. Interestingly, discouragement about one’s future was found to be approaching significance, $F(1, 331) = 3.19, p = .08$, with a positive relationship, ($\beta = .32, SE = .18$). Models 4 through 6 are depicted in Table 5.

In order to explore how other factors (namely, language, gender and ethnicity) may impact the final exam scores, a factorial ANOVA (6 groups) was carried out. Overall, there was no statistical significance $F(11, 338) = 1.00, p = .45$. Specifically, language, $F(3, 338) = .28, p = .84$, gender, $F(1, 338) = .20, p = .66$, intervention, $F(5, 338) = .95, p = .45$ or ethnicity, $F(2, 338) = 1.20, p = .30$, are not significant factors in predicting the final exam results.

In order to compare the two groups, a factorial ANOVA was similarly conducted. Overall, no statistical significance was found, $F(7, 342) = 1.37, p = .22$. Therefore, language, $F(3, 342) = .28, p = .84$, gender, $F(1, 342) = .22, p = .64$, intervention, $F(1, 342) = .31, p = .07$ or ethnicity, $F(2, 342) = 1.85, p = .16$, were not significant factors in predicting the final
Table 5

Models predicting the final exam test scores, n = 357.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEW intervention (2 groups)</td>
<td>$F (1, 354) = 4.96, \quad p = .03, \eta^2 = .014$</td>
<td>$F (1, 350) = 3.47, \quad p = .06, \eta^2 = .010$</td>
<td>$F (1, 331) = 3.72, \quad p = .06, \eta^2 = .011$</td>
</tr>
<tr>
<td>Midterm test scores</td>
<td>$F (1, 350) =$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>127.28, $p &lt; .001,$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\eta^2 = .267$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\beta = .46, SE = .04$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>$F (1, 331) = 7.32,$</td>
<td>$p &lt; .01, \eta^2 = .022$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\beta = - .04,$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$SE = .02$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimism</td>
<td>$F (1, 331) = 1.46,$</td>
<td>$p = .23, \eta^2 = .004$</td>
<td></td>
</tr>
<tr>
<td>Discouragement about the future</td>
<td>$F (1, 331) = 3.19,$</td>
<td>$p = .08, \eta^2 = .010$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\beta = .32, SE = .18$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall model</td>
<td>$F (1, 354) = 4.96,$</td>
<td>$F (2, 350) = 67.06,$</td>
<td>$F (4, 331) = 3.65,$</td>
</tr>
<tr>
<td></td>
<td>$p = .03, \eta^2 = .014$</td>
<td>$p &lt; .001, \eta^2 = .277$</td>
<td>$p &lt; .01, \eta^2 = .042$</td>
</tr>
</tbody>
</table>

*Note:* Effect size $\eta^2$ reported for each factor represent partial $\eta^2$
exam results. Nevertheless, it is worth mentioning that the impact of the experimental
disclosure intervention did approach significance. Models 7 and 8 are depicted in Table 6.

Table 6

Model predicting the final exam test scores, n = 357.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Model 7 (intervention as 6 groups)</th>
<th>Model 8 (intervention as 2 groups)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEW intervention</td>
<td>F (5, 338) = .95, p = .45, $\eta^2 = .014$</td>
<td>F (1, 342) = 3.31, p = .07, $\eta^2 = .010$</td>
</tr>
<tr>
<td>Language</td>
<td>F (3, 338) = .28, p = .84, $\eta^2 = .002$</td>
<td>F (3, 342) = .28, p = .84, $\eta^2 = .002$</td>
</tr>
<tr>
<td>Gender</td>
<td>F (1, 338) = .20, p = .66, $\eta^2 = .001$</td>
<td>F (1, 342) = .22, p = .64, $\eta^2 = .001$</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>F (2, 338) = 1.20, p = .30, $\eta^2 = .007$</td>
<td>F (2, 342) = 1.85, p = .16, $\eta^2 = .011$</td>
</tr>
<tr>
<td>Overall model</td>
<td>F (11, 338) = 1.00, p = .45, $\eta^2 = .031$</td>
<td>F (7, 342) = 1.37, p = .22, $\eta^2 = .027$</td>
</tr>
</tbody>
</table>

*Note: Effect size $\eta^2$ reported for each factor represent partial $\eta^2$*

Lastly, exploring the chief difference between non-native English speakers asked to write in their native language in comparison to non-native English speakers asked to write in English, the intervention as the only factor impacting the final exam score results was analysed. The intervention was found to be approaching significance, $F (1, 138) = 3.30, p = .07$, partial $\eta^2 = .023$. Therefore, the non-native English speakers asked to write in their L1 scored 0.76 units (3.6%) lower on the final score ($M = 20.61, SD = 2.34$) compared to L1 speakers asked to write in English ($M = 21.37, SD = 2.58$).
Table 7

Comparison between non-native English speakers, \( n = 140 \).

<table>
<thead>
<tr>
<th></th>
<th>Non-native English speakers asked to write in their native language</th>
<th>Non-native English speakers asked to write in English</th>
<th>Difference test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam score results</td>
<td>( M = 20.61, SD = 2.34 )</td>
<td>( M = 21.37, SD = 2.58 )</td>
<td>( F (1, 138) = 3.30, )</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( p = .07, \eta^2 = .023 )</td>
</tr>
</tbody>
</table>

Qualitative Findings

The qualitative analysis adds to a growing body of research on academic stress and anxiety amongst students (Gillen-O’Neel, Ruble, & Fuligni, 2011; Siddiqui, & Rehman, 2014; Kumar, 2013; Kumar, & Tiwary, 2014). Two hundred and forty students in the experimental disclosure condition produced the texts which served as the data set for the qualitative, phenomenological analysis. In applying thematic analysis to understand student anxiety from an inductive lens, two overarching themes surrounding the discourse of anxiety became evident, from which a total of 15 sub-themes could be derived. The two themes involved: (i) The underlying causes of anxiety and (ii) How the student intended to cope with it.

As described in the previous chapter, open coding, was first used. The initial categories and open codes are depicted in Table 8. From there, a thematic map was created to further reduce the data and discover whether potential categories/themes could have linkages (as depicted in Figure 5). The themes were then further adjusted on the thematic map to
ensure proper representation of the data (as depicted in Figure 6). Finally, themes were further reduced to generate a final thematic map (as depicted in Figure 7).

(i) Causes

Nearly every participant (n = 233) identified a specific cause of the anxiety they were feeling. Anxiety was described both in relation to the test at hand and generally. An entire passage written by one student reflects many of the sub-themes identified:

Now that final assignments and exams are beginning, in the past 3 nights I literally cried myself to sleep. I’m so stressed I can barely talk to anyone. I feel like school is too hard, and I have no future because I won’t get into grad school. It should not be this stressful...I’m very nervous about the exam and feel underprepared even though I studied hard despite having no time. I’ve already lost five years of my life from the stress school has given me in my two years at university so far. I got 90’s in high school, now getting to a 70 is a struggle. (57)

Eight sub-themes related to causation could be detected in the texts: (a) Under-Preparedness (b) Time Management, (c) Fear of Forgetting, (d) Exam Structure, (e) Future Uncertainty, (f) Language Proficiency, (g) External Pressure, and (h) Comparison to Others. As per Lazarus’ model of primary appraisal, it is assumed that a major concern of students was their performance, from which many of the themes of causality extend.
#### Table 8

**Open and Initial Coding of Written Passages**

<table>
<thead>
<tr>
<th>Open Code</th>
<th>Properties</th>
<th>Potential Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not having sufficient time</td>
<td>Not having enough study time due to other courses; Not having enough study time due to other commitments; Not having enough time to complete tests/assignments</td>
<td>No control</td>
</tr>
<tr>
<td>Feeling unprepared</td>
<td>Not having studied the correct material; Not having mastered the material needed</td>
<td>Control/Personal</td>
</tr>
<tr>
<td>Forgetting</td>
<td>Afraid of knowing but not remembering the material; Afraid of drawing a blank</td>
<td>Personal</td>
</tr>
<tr>
<td>Workload</td>
<td>Exam weight in relation to other assessment measures; Too many assignments in the course</td>
<td>No control</td>
</tr>
<tr>
<td>University load</td>
<td>Taking too many courses; Not being able to devote self to one course wholly; Full exam schedule</td>
<td>Control</td>
</tr>
<tr>
<td>Exam Content Style</td>
<td>Style of exam; format of exam</td>
<td>No control</td>
</tr>
<tr>
<td>Feeling Pressured</td>
<td>Family pressure; Financial pressure; Pressure over future success</td>
<td>Personality</td>
</tr>
<tr>
<td>Comparison to others</td>
<td>Proximity to other students; Comparing self to friends; Comparing self to classmates</td>
<td>Personality</td>
</tr>
<tr>
<td>Language proficiency</td>
<td>Uncertain about understanding textbook because non-native English speaker; Not having attended lectures because cannot understand professor</td>
<td>Reason for anxiety</td>
</tr>
<tr>
<td>Strategy – Exam related</td>
<td>Using multiple choice questions to prompt thoughts; Remembering key words as cues</td>
<td>Protective Factor</td>
</tr>
<tr>
<td>Strategy – Stress related</td>
<td>Deep breathing; Eating before taking exam; Walking before taking exam</td>
<td>Protective Factor</td>
</tr>
<tr>
<td>Self-motivation</td>
<td>Wishing luck to self in second person; Using motivating language in second person</td>
<td>Personality</td>
</tr>
<tr>
<td>Optimism</td>
<td>Hoping for the best</td>
<td>Personality</td>
</tr>
<tr>
<td>Completion</td>
<td>Looking forward to finishing exam; Rewarding self for exam</td>
<td>Personality/Coping</td>
</tr>
<tr>
<td>Projection</td>
<td>Blaming professor; Blaming parents; Blaming TAs; Blaming University system for being unable to do well</td>
<td>Coping Method</td>
</tr>
<tr>
<td>Reflection</td>
<td>Assessing grades on past tests and assignments; Assessing past strategies for doing well</td>
<td>Personality</td>
</tr>
<tr>
<td>Apathy</td>
<td>Not caring about exam or exam grades</td>
<td>Personality</td>
</tr>
<tr>
<td>Learned Helplessness</td>
<td>Feeling disadvantaged; Feeling unable to do well regardless of study preparedness; Feeling that studying is “pointless”; Wanting to abandon studies</td>
<td>Coping Method</td>
</tr>
<tr>
<td>Incentive</td>
<td>Exams viewed as necessary, but not related to learning</td>
<td>Personality</td>
</tr>
</tbody>
</table>
Figure 6. Initial Thematic Map.
Figure 7. Revised Thematic Map.
Figure 8. Final Thematic Map.
(a) Under-preparedness

The most represented cause (n=119) for anxiety was feeling underprepared to write the test, which students perceived would lead to them scoring a poor grade. Examples of passages include:

…I wish I had started to prepare earlier for this exam. I don’t know the material in a way that makes me feel as if I am well versed and comfortable to write this exam …. (91)

…I did not prepare well for this one. This is a common feeling I have for tests, as I usually never prepare as much as I should. (44)

As might be expected, feelings of preparedness acted to protect against feelings of anxiety with respect to performance (n=23):

….I have spent time studying the meaning of concepts rather than just memorizing them and I feel as though I should be doing pretty well today….. (195)

I do not feel too concerned about this upcoming examination – I have studied and feel prepared… I enjoyed this course and am ready to apply my knowledge. (87)

(b) Time Management

The second most attributed cause for anxiety (n=76) was time management. Some students (n=45) believed that their anxiety was caused by having had insufficient time to prepare, which is different from feeling prepared, because of their overall course workload, which
included having numerous tests, assignments, and/or a full exam schedule in a limited time frame:

I’m angry that all but one of my five exams were put into a span of seven days…I would really like to be calm but how can I when everything is crammed into a couple of weeks…. (172)

Since I had a lot of things that needed to be submitted towards the end of this semester, I was unable to secure enough time to study for this exam…. (3)

…I am more nervous for this [exam]. It’s not that I didn’t want to study for it, I find the topics in this class incredibly interesting but other schoolwork took precedent …. (74)

…I am pretty stressed out by the amount of academic work in all my courses. (189)

Thirty-four students also noted feeling anxious about the time limits set to complete the exam at hand:

…I realize it’s a two-hour long exam, but I need the extra time. It makes me nervous to think of each minute going by. I constantly check my watch in an exam and panic that I’m spending too much time on a question which wastes even more time…I wish the university could understand that some of us just need some extra time to write exams…. (76)

…I wish poor time management during tests makes my anxiety even worse…. (167)

(c) Fear of Forgetting
Another major sub-theme involved students feeling as though they would forget what they had studied while writing the exam (n= 54):

…I feel nervous in the sense that I may forget important information required for the test…. (137)

…I am nervous that my mind will go blank upon seeing the exam and that I will forget all that I have learned. (69)

Although I read everything, I only remember the general concepts and tend to forget the person names [sic]... I usually do not remember the things I just studied right before the exam. My mind just goes blank…. (23)

(d) Exam Structure

Although all students were informed of the exam structure or format, which in this case, was multiple-choice, a number (n = 26) noted that the format was stressful because the evaluative method may not reflect their knowledge, and thus may be perceived as leading to a lower-than-deserved grade:

…Multiple choice tests always make me nervous because they do not test the material in the same way that a short and long answer exam would…. (77)

I’m slightly nervous about the upcoming test, mostly because I have trouble figuring out what types of questions will be asked…. (72)

Every time I receive non-multiple choice questions, I feel more frightened since essays and short answer questions take the majority of the exam time... This anxiety
has negatively impacted my exam performance and my ability to think during the exam…. (5)

Nevertheless, for students who felt comfortable with the method of evaluation (n = 6), the exam structure acted as a protective factor against stress:

…knowing this exam is going to be multiple choices [sic] also makes me more relaxed. (165)

The exam is not that difficult. The content should be straight to the point because the test is multiple choice. (216)

(e) Future Uncertainty

Twenty-three students also noted that feeling uncertain about their futures was a cause of their anxiety.

…Right now, my future is an uncertainty and I do not know what to do…. (40)

…I feel like school is too hard, and I have no future because I won’t get into grad school…. (57)

No matter if [the exam is] easier or hard, taking midterms and exams that will partially determine my future frightens me; as it can either destroy or benefit my future. Even with this exam over, there is still [sic] greater obstacles ahead to face and overcome. (92)

(f) Language Proficiency
Amongst the 141 students whose native language was not self-identified as ‘English’, 17 reported having difficulty with the use of English, which caused them anxiety:

…My native language is Mandarin and Cantonese Chinese and I feel like I need a dictionary while I reading [sic] the textbook of this course …. (20)

I’ve been away for two years from Canada due to military service for my country. After I come back I kind of forgot so much thing [sic] about English… This is my first year after coming back so I’m not actually confident with what I’m doing …. (171)

…I feel more pressure in doing well in this test because I do not have good English. (46)

In one instance, a student noted relief in being able to write in her native language:

I am glad I can write this in Chinese. If only I could write everything in Chinese…. (1)

In another instance, a student noted having sufficient knowledge of the English language, which gave him confidence with regard to his scholastic ability:

…Moreover, I am confident about my English and intelligence level, therefore, I do not worry too much…. (29)

(g) External Pressure

Feeling pressured to do well because of external factors was a sub-theme in only several students (n = 26) who identified themselves as Asian:
I am a Chinese student and I am the oldest in the family. Therefore, my family has high expectations from me and I tend to have a lot of pressure on education. On the other hand, the pressure is also what motivates me to work hard in school … (41)

There is a pressure of not getting good mark in this course because it will affect my OSAP status. I need to do good [sic] in this course … (147)

…I don’t want to disappoint my parents and be an embarrassment to my family…. (209)

(h) Comparison to Others

Only select students who identified themselves as “Asian” (n = 16) focused on comparison to others:

I study a lot but the pressure of writing on exam with other student is just too much… I feel that there are too much expectations placed by my parents, friends, and the other students in the course… The pressure causes me to over think sometimes and therefore I tend to get the wrong answers for some questions even though I know the answer to the question. (199)

…I’m not a bad student, but I always feel like I am. I do pretty well, better than others, but I always compare myself to people and come up short …. (62)

…I already feel so far behind others in my age group so I really cannot afford to mess up my education/GPA any more than I already have. (76)
(ii) Coping

The majority of participants (n = 135) noted specific coping responses within their expressive writing passages. Within this category, seven subthemes emerged: (a) Exam-Related Strategizing, (b) Reduction of Physical Stress Symptoms, (c) Comparison to Past, (d) Hope (e) Temporary Pre-Emptive Relief (f) Learned Helplessness, and (g) Self-Encouragement.

(a) Exam-Related Strategizing

A small number of students (n = 16) noted that they had specific strategies they would use on their exam to help ease the anxiety:

I feel somewhat okay because it will be a multiple choice test, as key words may prime some of the knowledge gained when studying…. (45)

…I don’t think I’ll go blank because I’ll pay attention to the words. Words trigger other words…. the multiple choice questions are bound to remind me of the answers that correspond. (118)

I studied in China for 12 years, and the competitive environment there taught me how to treat tests properly so I do not feel anxious… When writing tests, I will examine each question carefully and try my best to solve the questions I am not sure of …. (29)
(b) Reduction of Physical Stress Symptoms

Some students (n = 22) noted that they intentionally tried to reduce their physical symptoms of anxiety through mindfulness (or meditation-like) techniques, often providing sui generis theoretical assessments of the indicated techniques:

…I can feel my heart starting to race…but will continue to think of test-unrelated things as I wait for the test to commence (a subconscious method of calming down, I suspect). (60).

I’m nervous about this exam but staying calm by breathing. Doing this exercise helps me relax and stay calm before the test because it focuses my energy on how I’m feeling rather trying to rationalize my fears of taking it. I will continue to calm myself by breathing and reviewing what I know until the test begins…. (99)

I’m extremely nervous. I’m trying to remain calm because I know that stress makes it worse. I’m trying to collect my thoughts and relax. My palms are sweaty. I’m reminding myself that everything’s going to be okay... My new haircut makes my hair get into my face and it’s hard for me to see. My wristwatch is too tight… All these factors influence how I will perform on the exam. (115)

…With the upcoming exam, I realize that the only thing I can do is keep a cool composure and not question or second guess myself… I feel relaxed and calm, and refrain from going into some sort of panic attack, because then pressure takes over. (80)
(c) Comparison to Past

A significant number of students (n = 56) reassured themselves by reflecting on relevant past evidence of doing well with regard to similar circumstances so as to better cope with their anxiety:

I got a better grade than I expected on my second test, I was pleasantly surprised. The tests are easy, so I’m not too worried. (1)

The past tests for this course didn’t seem too bad, or at least I end up doing okay for them, so I’m not too scared. (47)

(d) Hope

Having a hopeful outlook was mentioned by 30 students, who believed that this would help ease symptoms of anxiety and thus lead to enhanced test outcomes:

I am usually always a little nervous but I am optimistic and hope for the best end result…. (70)

I know I will do great on this test so I am not that worried. I am staying hopeful…. (43)

I am going to do the best that I can do and hope it gets me a good grade…I am not too worried as worrying doesn’t get you anywhere…. (115)

(e) Temporary Pre-Emptive Relief

I use this novel term to describe the sub-theme typically described as “getting it over with”, which several students (n = 41) noted to help provide temporary relief from their anxiety:
I am looking forward to breezing through the exam and getting it over with... After that I will go home and celebrate with a nice dinner of roast pork tenderloin and grilled zucchini. (61).

The phrase “I just want to get this over with” or its variation appeared 41 times.

(f) Learned Helplessness

Though a negative coping mechanism, a small subset of students (n = 12) indicated that they experienced feelings of helplessness, including apathy and defeat, leading to a sense of resignation:

…I’m extremely distracted lately and feel like nothing is going my way so there is a sense of defeat…. (62)

…Whereas before, I may have worried a lot about my performance on this exam, I now feel somewhat apathetic about it. I feel fed up with school and am only continuing as that I can receive my bachelor’s degree… I have completely lost interest in being in a post-secondary educational environment. (84)

UofT has made me question what I want to do or what I even can do in the future… I want to work with deaf children but my grades tell me I’ll be working at McDonalds even in courses I love and really try at. Luckily, my parents know about UofT’s grading reputation and support me, but the feeling of impending failure never ceases to haunt me in the darkest corners of my mind. A high salary I can live without, but not doing something I like or find interesting would be hell. As a weak person with a
history of weakness, I’d probably die (literally). I am unable to change anything about it, either way…. (58)

…I don’t care how I do…University is a high pressure cooker that aims or emphasizes to find/discover the ultimate victors of a brutal academic game; however in spite of providing academic knowledge it can shatter the dream of those who enter this institution…. (111)

*(g) Self-Encouragement*

Interestingly, while all passages of expressive writing in the data set were written in the first person, only Chinese student writers, writing in their native language (n = 10) employed the second-person voice and only for the purpose of self-motivating. An example of an entire passage is the following:

I am more nervous about this test than the previous one, probably because I did not prepare for it enough. The majority of the test material is on hypothesis and conceptual metaphors, and I don’t remember very much of it. I will work harder in the future! You can do it! Don’t be nervous! Just treat it as the tests that you have taken before! Easy job for you! (35)

A variation of the phrase “good luck to you” (“you” being self-referential) appeared 9 times in the relevant texts.
Discussion

Overview

Overall the findings produced by the present experiment were inconsistent with the general findings within the experimental disclosure paradigm. The straightforward task of writing about feelings over the upcoming exam were essentially a variation on previous studies with university students, but with the native-versus-non-native language dichotomy. Reasons for this outcome will be discussed in this chapter. An analysis of the qualitative results, however, reveal that students suffer from considerable distress. This chapter will conclude with limitations and issues to consider from the findings.

Discussion of Quantitative Findings

The present study primarily sought to determine whether a written disclosure intervention aimed to alleviate test anxiety would lead to better performance if the native language (L1) was involved. This hypothesis was not supported: A non-native English speaker writing in the L1 on an experimental disclosure task showed significantly decreased performance compared to all other groups combined. Even when comparing non-native English speakers asked to write in their L1 to non-native English speakers asked to write in English, the participants asked to write in their L1 scored lower. This seems particularly surprising in light of research on the connection between the L1 and emotion (Pavlenko, 2002; Schrauf, 2000; Dewaele, 2004).
A potential explanation for this is that asking non-native English speakers to identify their ethnicity and English language proficiency may have emphasized their status in an English-only academic environment, leading to feelings of stereotype threat. According to Steele and Aronson (1995), stereotype threat exists when one feels “at risk of confirming, as self-characteristic, a negative stereotype about one's group” (p. 797). As the background and linguistic characteristics of the experimenter, research assistants, course instructor and teaching assistants, who were all present and Caucasian with native proficiency in English, this may have further reinforced these feelings of those subsequently asked to expressively write in their L1, thus leading to decreased performance — a finding that emerges elsewhere in the literature (Steele & Aronson, 1995; Spencer, Steele, & Quinn, 1999; Taylor & Walton, 2011). While Burns and Friedman’s (2012) study found that experimental disclosure intervention decreased the negative effects of stereotype threat when explicitly writing about feeling stereotyped against, the results of the present study indicate that in situations where students may feel threatened against, these feelings should be directly addressed through the experimental disclosure prompt, in addition to the writing prompt (writing about test anxiety, for instance) at hand.

With the exception of the above-mentioned result, no significant difference was found between those in the experimental disclosure intervention and the control groups. Several previous investigations using written disclosure have similarly found no effects, including studies on test performance on the GRE (Frattaroli, Thomas, & Lyubomirsky, 2011), on the effects on physical and psychological health on the part of both sexual abuse survivors (Batten, Follette, Hall, & Palm, 2002) and third year medical students (Austenfeld, Paolo, & Stanton, 2006), and those adjusting to loss in bereavement (Stroebe et al., 2002). An
experimental disclosure intervention has been found to yield detrimental effects, particularly in those with severe psychological trauma (Gidron, Peri, Connolly, & Shalev, 1996) or with psychiatric disorders (Richards, Beal, Seagal, & Pennebaker, 2000). Though it is unlikely that trauma may be a confounding factor considering the environment and goals of the present investigation, the effects of trauma or psychiatric disorders were not queried, which may be a limitation in the experimental design. Thus, future studies should administer PTSD scales and ask for past psychiatric and trauma history, as it may have constituted a hidden (although unlikely) confounding variable.

Participants’ L1, gender, or ethnicity had no effect in predicting exam results. As found in the literature, the effect of prior student performance, demonstrated by the midterm results, was found to be a significant predictor of exam results (Overall & Marsh, 1979). As hypothesized, an inverse relationship was found between anxiety and exam scores, such that higher anxiety had a negative effect on exam scores (Ramirez & Beilock, 2011). Interestingly, discouragement about one’s future, a factor in depression, was found to have a slight effect, suggesting that the more discouraged the participants felt, the higher their exam score. As participants were asked to evaluate their futures as encouraging or not, a potential explanation for this unexpected finding may be that participants with a realistic expectation of their futures in a downturned economy may put in increased effort in their studies. This possibility is in line with the conclusions of Grunberg, Anderson-Connolly, and Greenberg (2000), who found that work commitment and job performance increased in employees who had survived layoffs (and would thus likely feel discouraged about their future in the company). Optimism was found to be unrelated to the final exam scores, which has similarly
been noted in a previous study exploring the effect of optimism on academic performance (Siddique, LaSalle- Ricci, Glass, Arnkoff, & Díaz, 2006).

Discussion of Qualitative Findings

While the overall goal of the present investigation was to determine whether a written intervention in the L1 aimed at alleviating cognitive test anxiety would lead to better academic performance in a testing scenario, the themes produced through exploring the qualitative data suggest that perhaps a difference in stressors (including language proficiency, comparison to others, and facing external pressure) in non-native English speaking students might account for why the intervention was maladaptive.

As noted in several studies, anxiety amongst students is an important subject requiring heightened attention (Ongori & Agolla, 2008; Colligan & Higgins, 2006; Stevenson & Harper, 2006). However, over the last twenty years, research focusing on student affect has been set aside in favor of a focus on occupational stress in the professional workplace (Busari, 2014).

As found in the current analysis, much like in previous research, students continue to undergo a significant amount of distress. According to Salend (2011), serious physical, behavioral and affective symptoms arise during test-taking anxiety making it difficult for students to perform well. For instance, with respect to test anxiety specifically, students may suffer from physical symptoms such as excessive perspiration, sweaty palms, unexplained headache or stomach ache, nausea, shaking body parts, rapid heartbeat, dizziness and light-headedness, tics, and difficulty sleeping and eating amongst others. Behavioral symptoms, amongst many, include forgetting information and having mental blocks, feeling
overwhelmed, experiencing difficulties with concentration, attention, and memory. These symptoms cause the student difficulty in reading and understanding test directions, retrieving necessary information and organizing thoughts, thus resulting in poor performance despite knowledge of the material (as is demonstrated in non-testing activities). Cognitively, students suffering from test anxiety may feel apathetic and unmotivated, compare themselves to others, and make negative self-statements during the test. Each of the cognitive symptoms, and many of the behavioral and physical symptoms were reported in the present research.

Indeed, the most represented cause of anxiety in the present study was students feeling under prepared to write the exam. This is supported by a plethora of research (Bonaccio & Reeve, 2010; McDonald, 2001; Pekrun, 2006; Pekrun et al., 2004), suggesting that this may be a major cause in anxiety syndromes in test-taking situations.

The second most noted cause of stress is that of time management. The current investigation found that time management related to both university workload, and, to a lesser extent, to the test-taking task at hand. As similarly noted by Polychronopoulou and Divaris (2009), academic workload is a main cause of academic stress. This corroborates Ongori and Agolla’s (2009) findings, where academic workload was named as a major source of stress for 48.4% of the 320 students surveyed. Since no student in the present study had been registered with accessibility services, this suggests that perhaps the allotted time needed for the average student to keep pace with the workload required, as well as to complete an exam, may not be sufficient. Not having sufficient time to complete tests was also found to be a significant source of stress in Kurt, Balci and Kose’s (2014) survey of 1250 students.
A number of students also felt as though they would forget the content they had studied while in the process of writing the test. The fear that one's "mind would to go blank" was mentioned a number of times, however it was not mentioned in relation to time management nor preparation. Thus, being fearful of an inability to evoke studied material during a test may therefore reflect students’ insecurity surrounding their own potential and abilities (Reeve et al., 2008; Zohar, 1998), but may also relate to studying strategies. This certainly falls in line with Lazarus’ (1993) appraisal model, as discussed in Chapter 1 of this dissertation. Neither of these potential reasons were involved in the present study, however they may be worth investigating for future research.

As noted in similar studies (Bonner, 2013; Crocker & Schmitt, 1987), the structure or format of exams has been shown to affect performance and is thus, not surprisingly, a cause of anxiety for students who are uncomfortable with the format at hand, as well as a protective factor for students who are. This suggests that students have an individual preference in terms of evaluative methods and this preference may be reflected in performance results (Crocker, Karpinski, Quinn, & Chase, 2003). In Ramirez and Beilock’s (2011) study on the efficacy of experimental disclosure on academic performance in ninth grade students, the format of test given was not specified. Therefore, perhaps the general results of the current experiment may have differed if the format of the test were more attuned to the testing preferences indicated in the written passages (such as essay question, short answer, fill-in-the-blank, or a combination).

Feeling uncertain about the future, from a pessimistic or stress-induced stance, was also found to be a source of anxiety in the qualitative results. This supports Ongori and Agolla’s (2009) finding that feeling uncertain of securing a job after graduation accounted
for what 3.1% of respondents consider their major source of stress. This is particularly interesting as the quantitative portion of the study also asked students to reveal, on a Likert scale, how they felt about their futures, specifically whether they felt discouraged or not. As previously mentioned, the results indicate that students who felt discouraged about their futures in fact performed better on the final examination. It is possible that uncertainty surrounding one's future, and the lack of coping methods noted in tandem, may cause euphoric stress, though this was not explicitly mentioned in the qualitative data set. Thus, as mentioned above, feeling discouraged about the future may in fact work to benefit students by feelings anxious enough to better prepare for an uncertain future.

The non-native speakers of English who claimed to experience difficulty with the use and comprehension of English, indicated this was a major cause of anxiety and specifically noted the sense of relief in being able to write in their native language for the experimental disclosure task. This suggests that students may feel anxious if they do not have a proper grasp of the English language. This has similarly been found in much of the literature on classroom anxiety of non-native English speakers (Woodrow, 2006; Argaman & Abu-Rabia, 2002; Horwitz, Horwitz, & Cope, 1986). In the present quantitative results, no significant differences were found in scores of Cognitive Test Anxiety between students who identified as Chinese and other students. However, a study by Parr, Bradley and Bingi (1992) on general student stress reported the opposite. They found that in comparison to European international students in U.S. college campuses, Chinese students reported more stress, though this may be due to acculturative stress, which, as mentioned in Chapter 1, is a form of stress which arises from the adapting to a new culture (Ben-Sira, 1997). Perhaps Chinese students in the present sample are relatively less-stressed than Chinese students in other
metropolitan cities in North America, thus limiting the generalizability of the present investigation.

Amongst students who identified themselves as Asian, they noted feeling external pressure to do well, particularly family pressure. As noted by in Liao and Wei (2014) “a core Asian value is family recognition through achievement which refers to the importance of bringing honor to the family by achieving academically” (p.108), thus suggesting that pursuing academic excellence may be cause for particular stress, which was found in the qualitative findings of the present study. Further, it is perhaps due to the Asian collectivist culture which caused only Asian students to worry over their relative position to their peers, as pursuing “culturally mandated goals” is of particularly great importance (Yu & Yang, 1994 in Liao & Wei, 2014). Generally, competition with fellow colleagues as a source of stress is also consistent with previous research on workplace performance (Colligan & Higgins, 2006) and familial pressure (Polychronopoulou & Divaris, 2005). This was found in the present study, as only students who identified themselves as Asian wrote about comparing themselves – and subsequently feeling inadequate – to others, both within their class and wider community. The present study did not probe students on how they felt in comparison to others, and this too may be worth studying in future research.

While the experimental disclosure participants were only instructed to write about their feelings surrounding anxiety within their expressive writing passages, the majority of participants also detailed specific coping strategies they used or could use to mitigate their stress. Students noted several coping strategies including both problem-focused and emotion-focused coping strategies to attenuate feelings of anxiety (Lazarus & Folkman, 1984). Problem-focused coping involves developing strategies which reduce the cause of the anxiety
in question, and is thus found to be effective in reducing negative affect, including anxiety
(Folkman & Lazarus, 1988). Emotion-focused coping, alternatively, involves reducing the
emotional reaction instead of the problem itself, which paradoxically leads to greater feelings
of negative affect (Lazarus & Folkman, 1984).

Students noted having a specific strategy to handle the exam was a protective factor in
otherwise feeling anxious. Thus, by alleviating the problem causing their anxiety (which may
have perhaps been the exam structure) and employing a known strategy (which may be using
key words in the multiple choice questions to identify the correct answer), the anxiety may
have been reduced or their strategies worked well enough to afford them a good grade
(Lazarus & Folkman, 1984; 2004). Indeed, test-taking strategies have been found to improve
test scores (Dodeen, 2008). However, as noted by Peng, Hong, and Mason (2014), increased
test anxiety leads to less use of test-taking strategies potentially due to the resulting inability
to expend cognitive effort on the learned strategy. Therefore, test-taking strategies may be
effective and employable, but only for students who suffer from mild test anxiety, not severe.

Some students also noted a purposeful method to reduce their physical symptoms of
stress. This holds a twofold significance, suggesting, first, that students are aware of the fact
that they are experiencing anxiety before examinations, and second, the anxious experience
is so heightened that the feel they must intentionally strategize a way of reducing their
resultant physical symptoms. All of the strategies discussed by students centered around
mindfulness techniques, where students focused on becoming aware of each of their bodily
movements, such as their heart racing or chest pounding, and practiced meditative techniques
(such as deep breathing) to alleviate these symptoms. This is corroborated with results found
in Regehr, Glancy, & Pitts’ (2013) meta-analysis of 24 studies on stress reduction amongst
university students, which suggest that mindfulness interventions are amongst the most effective at decreasing student anxiety.

Within the emotion-focused category, which has traditionally been viewed as a defense mechanism to distract oneself from the negative emotion at hand (Lazarus, 1993), several students mentioned wanting to simply “get it over with”, referring to their test. A survey of the relevant literature has not located any specific term employed to describe this response. The closest literature is in the realm of psychology of death, where the researcher describes this notion as serving “to reduce intra-psychic tension, at least for the moment” (Kastenbaum, 2000, p. 86). As a number of students mentioned this feeling, it is worth noting that a new term, which has here been termed “temporary pre-emptive relief”, may be of benefit, and that this under-explored area within affect is worth further investigation.

A sense of learned helplessness — a psychological concept developed by Seligman (1972), characterized by lack of motivation and willingness to learn, in which, due to past experiences, one believes he or she has no control over the outcome of a subsequent event — was also found in a small subset of students. This maladaptive coping strategy is self-handicapping, such that as students felt as though they could not do well because of past experiences, they create a sense of apathy and defeat towards a university education, handicapping their ability to do well. This self-defeating behavior, correlated with lowered academic achievement, has also been previously noted in the literature (Fincham, Hokoda & Sanders, 1989; Yates, 1998; Boggiano et al., 1992).

While the quantitative methods here only tested for optimism (which was not found to relate to performance), in the qualitative analysis, it was found that feelings of hope acted as
a protective factor against anxiety for a subset of students. In Rand, Martin, and Shea’s (2011) longitudinal study exploring the association of hope, optimism and academic performance of 86 first-year law students, it was found that hope, but not optimism, predicted grade expectancy. This result was also corroborated in Rand’s (2009) study of 345 university students.

Students also reassured themselves by reflecting on their previous test scores, or how they scored under similar circumstances. They noted that they did well on previous tests and thus were not particularly worried. Self-efficacy, Bandura’s (1994) term for “people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” has been found to relate strongly to academic performance (Chemers, Hu, & Garcia, 2001; Meece, Wigfield, & Eccles, 1990) and workplace performance (Stajkovic & Luthans, 1998). In Barrows, Dunn, and Lloyd’s (2013) study of test anxiety, exam grades and self-efficacy on 110 college students showed that self-efficacy moderated the effects of anxiety. While self-efficacy was not measured in the quantitative portion of this study, the qualitative analysis revealed that it is a factor certainly worth pursuing in future work.

Lastly, only the Chinese students were found to be explicitly self-motivating — a finding that is in line with several previous work: In Yip's (2007) study of 180 Hong Kong University students, results indicated that the strategies of high achieving students had, among other factors, greater self-motivation, which was found in the qualitative results reported here. Haynes, Comer, and Hamilton-Lee (1988) similarly found that self-motivation was a prime factor in determining academic achievement. Interestingly, in the present sample, Chinese students would switch from writing in first person to encouraging
themselves in second person. In a study exploring perspective-switching in an experimental disclosure intervention, Seih, Chung and Pennebaker (2010) found that writing from a second-person perspective was less beneficial than writing in first person. Given the results of the current study, perspective switching in the second person for the purposes of self motivation may thus have accounted for the inefficacy of the experimental disclosure intervention, at least for Chinese writers. However, in three experiments exploring self-talk and behavioral intention, Dolcos and Albarracin (2014) found that using “self-talk strengthens both actual behavior performance and prospective behavioral intentions more than first-person self-talk” (p.636). Therefore, perhaps writing motivational phrases in the second person, in lieu of simply engaging in self-talk in the second person, may be an ineffective coping mechanism. As only Chinese students engaged in motivational perspective switching, the findings looks to be cultural. As Pratt, Kelly and Wong (1999) note: "From a traditional Chinese perspective, if I am a good student, it is because I had a good teacher; if I am a poor student, it is because I have not tried hard enough" (p. 251). In Western society, however, the teacher is seen as largely responsible for student learning (Pratt, Kelly, & Wong, 1999). Thus, perhaps motivational phrases are used more in Chinese school systems and these phrases then become internalized in students in the way in which the teacher presents them (i.e. through the use of "you"). Perhaps in allowing one's working memory to be temporarily freed from anxious thoughts by focusing on viewing the self as an "other", this could be a particularly effective motivational tool, however, given the results of the present study, further research is needed to explain this phenomenon and further investigate the efficacy of self-motivating through writing in the second person.
Limitations

A number of limitations may account for the varied results of the present investigation. Despite setting inclusive parameters for the experiment, there was no manipulation check, which could have shed light on the extent to which the contents of participants’ writing was personal, emotional, and meaningful to them (Lepore, 1997). Also, the importance and weight of the exam (worth 30% of the final grade) may not have been great enough to induce sufficient stress in participants. Inducing sufficient stress was a key component in the first of Ramirez and Beilock’s (2011) two studies. Moreover, the discipline being tested was anthropology, suggesting that the cognitive tasks involved in studying and writing an anthropology exam may be substantially different than those examined in previous studies, which involved a scientific or mathematical component (Ramirez & Beilock, 2011; Dalton & Glenwick, 2009). Therefore, it is not unreasonable to expect differing results related to the nature of the academic discipline.

Other potential shortcomings of this study include the following: The relatively small sample size of each group likely accounts for some of the statistical limitations, such as approaching significance, which would have been addressed more directly through a larger sample. The study design, being cross-sectional, might be unable to detect causal association between the variables and exam scores. Cross-sectional studies only measure the prevalence of emotional states at one point in time, thus, the scores obtained may not be a true reflection of the cognitive test anxiety, optimism and discouragement about the future levels felt by participants. Third, the data collected was reported in the aggregate, but participants may nonetheless have felt unsure that their anonymity and confidentiality would be maintained, and thus may have tailored their responses strategically, particularly the participants in the
experimental group. Fourth, a selection bias may have been present, since only self-selecting students participated. Therefore, the sample may not have been representative.

In future work, it is necessary to obtain more information regarding the preparation which went into studying for the exam. This might be extracted through self-reports of study time and attendance, as well as further details regarding participants’ stress, which might include measures both before and after the exam, constituting a pretest and post-test study format. Obtaining anxiety levels at multiple times during the semester, as well as asking participants to write expressively throughout the semester, might also be incorporated as procedures in future work. Pennebaker and Beall (1986) found that expressive writing results in immediate physiological and psychology arousal, acting to increase distress. However, these effects dissipate over time and in fact are related to long-term decreases in health problems. As there was no follow-up study, it remains unknown whether this may have been the case for the present participants. Therefore, revising the experimental instructions, increasing the duration of the writing sessions, as well as the number of writing sessions may yield beneficial results in a future study exploring the experimental disclosure intervention.

Despite all such limitations, the results indicate that there are potential discrepancies to the experimental disclosure intervention, particularly when multiple languages are involved. Clearly, careful screening and testing of the theory in multilingual academic settings needs to be taken into account in future work. This study suggests that the present procedures and materials used in the experimental disclosure intervention are skewed towards monolingual populations and may not be sensitive to linguistic and cultural diversity. They will have to be revised and modified accordingly at least in the context of test-taking anxiety, perhaps requiring that the intervention prompt note that one should write
in "the language you are most comfortable in", the dominant language in the given domain, or through carefully choosing facilitators who may be less likely to elicit stereotype threat.

As noted by Bonaccio and Reeve (2010), “there is limited understanding of which factors students themselves consider to be the most important or most likely to give rise to their test anxiety” (p. 617). These factors were identified in the current study. Nevertheless, limitations of the present qualitative analysis include that a grounded theory approach was not utilized in the analysis. As mentioned in the third chapter of this dissertation, thematic analysis was intentionally employed, however, Glaser and Strauss’s (1967) classic grounded theory approach, which requires a constant comparative analytic method with subsequent sampling, may have developed a framework similar to the qualitative findings of Bonaccio and Reeve (2010). Using this approach, three sources of test anxiety were determined. These include students' perceptions of the test, self-perceptions, and perceptions of the test-taking situation, such as prior experience taking tests (Bonaccio & Reeve, 2010).

**Issues to Consider**

As found in the current research, students undergo significant anxiety prior to test-taking situations which affect performance, and some have intentionally employed strategies to cope with their anxiety. These findings highlight that strategic programs aimed to reduce stress may be of particular benefit.

As noted by Zhao, Selman and Haste (2015), a potential way of preventing high stress would be via the integration of an intervention program, particularly focused on social
development, into an existing academic curriculum, primarily via modeling pro-social behaviors such as perspective taking and empathy to increase student friendships which then decrease stress. However, it should be noted that seeking social support has also been found to relate to higher levels of test anxiety (Edelmann & Hardwick, 1986). Thus, prior to entering University, it may be of benefit to offer students stress-reduction techniques throughout their high school curricula.

Findings by Dzieglelewski, Turnage and Roest-Marti (2010) suggest that providing undergraduate students with a 45-minute seminar which addresses and offers students techniques on how to better handle stressful situations could lead to significant beneficial changes in reducing reported levels of stress. A number of other studies have also found that offering stress and depression management training constitutes a beneficial means of decreasing symptoms (Koutra, Katsiadrami, & Diakogiannis, 2010; Kim, Oliveri, Riingen, Taylor, & Rankin, 2013; Jones & Johnston, 2000) and an increase in productivity (Hung, Chang, & Lin, 2011). Thus, it would be beneficial to offer students within university specific stress related management courses. Aromatic stress treatment, including inhaling rosemary incense before and during a test has been shown to decrease test anxiety while increasing concentration and focus (McCaffrey, Thomas, & Kinzelman, 2009). This would be an economically sound method of stress reduction, aimed at specifically targeting test anxiety.

Mindfulness interventions (Regehr, Glancy & Pitts, 2013; Fiebert, & Mead, 1981), cognitive interventions, including distraction and relaxation methods (Edelmann & Hardwick, 1986) guided reflection (Beggs, Shields, & Goodin, 2011), and behavioral interventions such as acceptance-based behavior therapy (Brown, Forman, Herbert, Hoffman,
Yuen, & Goetter, 2011) have been shown to reduce symptoms of test-taking anxiety and improve performance.

In a fundamental way, this type of study suggests that the native and non-native language form a system whereby transference from the L1 to the expected academic tasks might prove to be highly beneficial. This would lend even more corroboration to Cummins’ CALP (Cognitive Academic Language Proficiency) model. CALP includes listening, speaking, reading, and writing about subject area content and it has been found that the level of language learning is essential for students with a different L1 than the school language to succeed in school. The experimental disclosure work might also corroborate Cummins’ idea that there is a common underlying proficiency (CUP) between two languages. Skills, ideas and concepts students learn in the L1 might be transferred to the second language (Cummins, 1980; 1981).

While this was not an objective of the present study, it is certainly a concept that needs to be taken into account in multilingual university settings such as that of the University of Toronto. Getting students to feel comfortable through the use of the L1 in a classroom setting, even in a simple expressive writing task, might bear many more benefits, so long as the work is not being evaluated or otherwise coupled with a threatening, emotional situation.

**Conclusions**

Though the hypothesis that an experimental disclosure intervention would be as if not more beneficial in lowering test anxiety to non-native English speaking students writing in their native language was not supported, the results from the present investigation
nonetheless offer strong support that University students undergo significant anxiety prior to
taking an exam, and the reasons for that anxiety differs depending on whether one is a native
or non-native English speaker. The qualitative results therefore suggest that alternative
approaches, particularly interventions aimed at targeting specific student-identified causes
for anxiety within the L1 learner population and more generally could cause a significant
decrease in anxiety and thus an increase in performance.
REFERENCES


*Journal of Educational Psychology*, 90, 330–340.
APPENDIX A
Informed Consent

Please consider this information carefully before deciding whether to participate in this research.

**Purpose of the research:** You are invited to participate in a research study on language learning and anxiety.

**What you will do in this research:** If you decide to participate, you will first be asked to complete some demographic questions. You will then be asked to answer a set of questions about stress you may have encountered in your academic life, as well as a follow up activity.

**Confidentiality:** Your responses will be anonymous. Any identifying information will be destroyed. When research results are reported, responses will be aggregated (added together) and described in summary.

**Time required:** The survey and activity will take approximately 10 minutes to complete.

**Risks:** There is minimal anticipated risk associated in this study; some questions may cause mild discomfort.

**Benefits:** There are no direct benefits, but you may find it interesting to consider your responses about how you are impacted by your academic work. You will also be contributing to our overall knowledge about student life. We will also make the results of this study available to you. For a summary of the results, please contact the researcher after March 15. Because there is no recent research on this topic, you have the opportunity to be part of cutting edge research.

**Compensation:** You will not be compensated for your participation in this study.

**Participation and withdrawal:** Your participation is completely voluntary, and you may quit at any time without penalty. Your completion of this study gives your consent.

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**To Contact the Researcher:** If you have questions or concerns about this research, please contact Mariana Bockarov, m.bockarov@utoronto.ca, or her supervisor, Marcel Danesi, marcel.danesi@utoronto.ca
APPENDIX B

Demographic Questionnaire

**Instructions:** Please fill out the following:

My age is: ______ years old. I am: ☐ male or ☐ female?

My native/first language is (eg: Chinese, Spanish, English, etc.): __________________________

I speak this many languages (please circle): 1  2  3  4  5  6

I consider myself:
  a. African-Canadian
  b. Asian-Canadian
  c. Caucasian
  d. Hispanic-Canadian
  e. Aboriginal
  f. Other (specify): __________________________

**Instructions:** How well do you speak/read/write? Please check one.

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**Instructions:** Please rate your language proficiency by circling one of the following:

What language do you think in?
  a) I think in my native language all the time
  b) I think in my native language most of time
  c) I think in my native language and English equally
d) I think in English most of time
e) I think in English all the time

What language do you speak with your family in:
   a) I speak in my native language all the time
   b) I speak in my native language most of time
   c) I speak in my native language and English equally
   d) I speak in English most of time
   e) I speak in English all the time

What language do you speak with your friends in:
   a) I speak in my native language all the time
   b) I speak in my native language most of time
   c) I speak in my native language and English equally
   d) I speak in English most of time
   e) I speak in English all the time
APPENDIX C

Cognitive Test Anxiety Scale

Instructions: Read each statement, then fill in how typical the statement is for you.

<table>
<thead>
<tr>
<th></th>
<th>Not typical of me</th>
<th>Only somewhat typical of me</th>
<th>Quite typical of me</th>
<th>Very typical of me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I lose sleep over worrying about examinations.</td>
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<tr>
<td>2. While taking an important examination, I find myself wondering whether the other students are doing better than I am.</td>
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<tr>
<td>3. I have less difficulty than the average college student in getting test instructions straight.</td>
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<td>4. I tend to freeze up on things like intelligence tests and final exams.</td>
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<td>5. I am less nervous about tests than the average college student.</td>
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<td>6. During tests, I find myself thinking of the consequences of failing.</td>
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<td>7. At the beginning of a test, I am so nervous that I often can’t think straight.</td>
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<td>8. The prospect of taking a test in one of my courses would not cause me to worry.</td>
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<tr>
<td>9. I am more calm in test situations than the average college student.</td>
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<td>10. I have less difficulty than the average college student in learning assigned chapters in textbooks.</td>
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<td>11. My mind goes blank when I am pressured for an answer on a test.</td>
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<tr>
<td>12. During tests, the thought frequently occurs to me that I may not be too bright.</td>
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<td>13. I do well in speed tests in which there are time limits.</td>
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<td>14. During a course examination, I get so nervous that I forget facts I really know.</td>
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<td>15. After taking a test, I feel I could have done better than I actually did.</td>
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<tr>
<td>Statement</td>
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<td>------------------------------------------------------------------------------------------</td>
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<tr>
<td>16. I worry more about doing well on tests than I should.</td>
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<tr>
<td>17. Before taking a test, I feel confident and relaxed.</td>
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<tr>
<td>18. While taking a test, I feel confident and relaxed.</td>
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<td>19. During tests, I have the feeling that I am not doing well.</td>
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<td>20. When I take a test that is difficult, I feel defeated before I even start.</td>
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<td>21. Finding unexpected questions on a test causes me to feel challenged rather than panicky.</td>
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<tr>
<td>22. I am a poor test taker in the sense that my performance on a test does not show how much I really know about a topic.</td>
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<tr>
<td>23. I am not good at taking tests.</td>
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<td>24. When I first get my copy of a test, it takes me a while to calm down to the point where I can begin to think straight.</td>
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<tr>
<td>25. I feel under a lot of pressure to get good grades on tests.</td>
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<tr>
<td>26. I do not perform well on tests.</td>
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<tr>
<td>27. When I take a test, my nervousness causes me to make careless errors</td>
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</tbody>
</table>
**APPENDIX D**

**Optimism Scale**

**Instructions:** Read each statement, then fill in how typical the statement is for you.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not typical of me</th>
<th>Only somewhat typical of me</th>
<th>Quite typical of me</th>
<th>Very typical of me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In uncertain times, I usually expect the best.</td>
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<tr>
<td>2. I rarely count on good things happening to me.</td>
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<tr>
<td>3. I’m always optimistic about my future.</td>
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<tr>
<td>4. I hardly ever expect things to go my way.</td>
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</tr>
</tbody>
</table>
130

APPENDIX E

Discouragement about Future – Measure

<table>
<thead>
<tr>
<th>1. I felt discouraged about the future</th>
<th>Not typical of me</th>
<th>Only somewhat typical of me</th>
<th>Quite typical of me</th>
<th>Very typical of me</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐</td>
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</tbody>
</table>
APPENDIX F

Instructions for Experimental (English Language) Participants

THIS SHORT ASSIGNMENT WILL NOT BE GRADED.

We would like YOU to take the next 10 minutes to write as openly as possible about your thoughts and feelings regarding the exam you are about to take. In your writing, I want you to really let yourself go and explore your emotions and thoughts as you are getting ready to start the exam. You might relate your current thoughts to the way you have felt during other similar situations at school or in other situations in your life. Please try to be as open as possible as you write about your thoughts at this time.

You and your classmates are about to start your examination. However, before beginning the exam, everyone will take the next 10 minutes to complete a short exercise related to the exam.

During this exercise, some students will be asked to just think about the upcoming exam and other students will be asked to put their thoughts down in writing. Every student is being asked to do something a little different.

There will be no identifying information on your essay. None of the course staff (Professor, TAs) can link your writing or any other information to you. If you finish early, please just sit quietly and wait for instructions. You may end up sitting quietly for several minutes while your classmates finish the tasks they were asked to do. You will be given plenty of time to complete the upcoming exam. This task will only take about 10 minutes in total. Please begin.

[Please write on the next sheet]
APPENDIX G

Instructions for Experimental (Native Language) Participants

THIS SHORT ASSIGNMENT WILL NOT BE GRADED.

We would like YOU to take the next 10 minutes to write as openly as possible about your thoughts and feelings regarding the exam you are about to take in your native language. In your writing, I want you to really let yourself go and explore your emotions and thoughts as you are getting ready to start the exam. You might relate your current thoughts to the way you have felt during other similar situations at school or in other situations in your life. Please try to be as open as possible as you write about your thoughts at this time.

You and your classmates are about to start your examination. However, before beginning the exam, everyone will take the next 10 minutes to complete a short exercise related to the exam.

During this exercise, some students will be asked to just think about the upcoming exam and other students will be asked to put their thoughts down in writing. Every student is being asked to do something a little different.

There will be no identifying information on your essay. None of the course staff (Professor, TAs) can link your writing or any other information to you. If you finish early, please just sit quietly and wait for instructions. You may end up sitting quietly for several minutes while your classmates finish the tasks they were asked to do. You will be given plenty of time to complete the upcoming exam. This task will only take about 10 minutes in total. Please begin.

[Please write on the next sheet]
You and your classmates are about to start your examination. However, before beginning the exam, everyone will take the next 10 minutes to complete a short exercise related to the exam they are about to take.

During this exercise, some students will be asked to just think about the upcoming exam and other students will be asked to put their thoughts down in writing. Every student is being asked to do something a little different.

We would like YOU to take the next 10 minutes to sit quietly and think about one topic that you feel will NOT be covered on the exam you are about to take. Think about various reasons why this topic might not be covered in a very factual manner (i.e. it is not the professor's favorite topic, we spent a short time on it). Once you have done this, please just sit quietly and wait for further instructions.

You may end up sitting quietly for several minutes while your classmates finish the tasks they were asked to do. You will be given plenty of time to complete the upcoming exam. This task will only take about 10 minutes in total. Please begin.
APPENDIX I

Debriefing

Thank you for participating in the study.

This study is concerned with how expressive writing affects anxiety. The research on this topic is very limited, and the current study aims to increase our knowledge.

How is this being tested?
In this study, you were asked to complete validated measures of dispositional optimism, self-assessment on language proficiency, as well as a measure of anxiety symptoms and a task. You might have been asked to think about the exam or write expressively in your native language or English.

Why is this important to study?
It is important to study expressive writing and anxiety, as it could be a cost-effective measure of reducing anxiety. This study will also present a foundation for future researchers who wish to study expressive writing and anxiety among academic and/or professional populations.

How to learn more:
If you are interested in learning more, you may want to consult:


If you experience significant distress, you may want to consult:

Counseling and Psychological Services (CAPS) at the University of Toronto at:
214 College Street, Main Floor, Room 111
Koffler Student Services Centre
Phone: 416-978-8070

How to contact the researcher: If you have questions or concerns about your participation or payment, or want to request a summary of research findings, please contact the researcher, Mariana Bockarov at: m.bockarov@utoronto.ca or her supervisor, Marcel Danesi at marcel.danesi@utoronto.ca

Please do not disclose research procedures and hypotheses to anyone who might participate in this study between now and the end of the data collection (January 28, 2013) because this could affect the results of the study.

Thank you for your participation!