

## EXPRESSIVE WRITING AND MEDITATION ON TEST ANXIETY AND ACADEMIC PERFORMANCE

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### Abstract

Test anxiety, the emotional fear and wariness over performance that often occurs in specific evaluative situations, causes students to underperform relative to their actual ability, and hence interferes with the test's main objective of assessing students' academic progress and understanding level.

One intervention that has been documented to reduce general anxiety, depression symptoms and ruminative thoughts is expressive writing, a paradigm whereby writers freely write about their feelings and experiences associated with an undesirable situation. Experimented in classroom settings, a short period of expressive writing could help students reduce anxiety level and put up a better performance. However, in recent literature, effects of expressive writing are being challenged as it may not produce the desired effect size, and its impacts on students' performance and anxiety level tend to vary across different population. Therefore, the present study aims to account for underexplored individual characteristics, namely emotional expressiveness and suppression, in a real-stake testing conditions, while comparing expressive writing to another popular emotional regulation intervention: meditation.

Adopting a within-subjects design, the study finds preliminary results that students' ambivalence over emotional expressiveness and emotional suppression are positively correlated with test anxiety level. Treatment effects, although not significant, showed that participants felt less emotionally aroused after doing expressive writing, while their worry levels decreased after a breathing exercise. Moving forward, we aim to replicate the current design and conduct an online survey experiment to further investigate the effectiveness of meditation and expressive writing and the role of emotional suppression on test anxiety.

**Keywords:** *Test anxiety, expressive writing, emotional regulation, meditation, clinical psychology.*

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### 1. Background

Test, quizzes and exams are ubiquitous in education settings nowadays. They account for a significant part of students' education journey, serving as a means of assessing students' knowledge and progress. However, in an increasingly competitive environment where grades can give an advantage, many students find themselves become stressful, anxious and experience "test anxiety" before and during exams, which correlates with lower standardized test score (e.g., SAT, GRE), school GPAs and other educational performance outcomes (e.g., Cassady & Johnson, 2002; Chapell et al., 2005).

Unlike general anxiety which typically refers to an unpleasant emotional state without a specific context/object or trigger, test anxiety involves the emotional fear, failure, and wariness over performance that often occurs in specific evaluative situations (Zeidner, 2007). In the present study, we study anxiety as constructed by emotionality and worry: While the former refers to the heightened physiological arousal or emotional activation, the latter concerns participants' cognitive evaluation of performance, failure and anxiety and lower self-confidence level (Zeidner, 2007).

Expressive writing is a paradigm that encourages writers to freely write about their concerns, feelings or experiences associated with an undesirable situation in a specific amount of time (Pennebaker, 1997). The intervention has been documented to have positive impacts on both physiological and mental health, such as reducing general anxiety, depression symptoms and ruminative thoughts (e.g. Chung & Pennebaker, 2008). In classroom settings, even one short period of expressive writing before taking tests/quizzes can help students reduce their test anxiety level and hence produce better performance (e.g. Park et al., 2014; Ramirez & Beilock, 2011). The effects are often attributed to two different pathways of mechanisms: First, expressive writing helps writers get habituated to ruminative thoughts, unpack the stressful experiences and change their interpretation of the feelings; second, writers are allowed to offload their worries onto papers, hence saving cognitive load when doing things that take lots of cognitive resources like doing exams (e.g. Pennebaker, 1997).

However, results in the literature are mixed. As Myers et al. (2021) and Travagin et al. (2015) point out, expressive writing does not produce the desired effect size; its impacts on students' performance and anxiety level tend to vary. They call for more research on who is going to benefit the most from expressive writing, and the present study responds to that call.

The purpose of the current study is threefold. It first aims to replicate and test the impact of expressive writing in a real stake testing condition. Second, we account for underexplored individual characteristics, namely emotional expressiveness and emotional suppression in Asian population. It is recorded that Asian students oftentimes reported higher level of test anxiety as they suppress negative emotions to greater degree and hence are more ambivalent over their feelings than other ethnic groups (e.g. Lu & Stanton, 2010). Emotional disclosure intervention like expressive writing therefore may benefit this group students more. Third, we also aim to compare expressive writing to meditation, a popular acceptance-based emotional regulation method, to make recommendations for brief interventions in educational contexts. Mindfulness meditation, defined as attending to and observing one's present moment experience in a nonjudgmental and non-elaborative way, has been shown to calm down the mind, increase sustained attention and decrease mind-wandering: A brief 5-minute meditation session can help students focus attention, resolve jumbled thought, reduce anxiety level and ultimately improve their academic performance (e.g. Ramsburg & Youmans, 2014). Comparing the effects of these interventions can provide insights into the effectiveness of emotional regulation versus emotional disclosure interventions in educational settings.

## 2. Methods

### 2.1. Participants

50 undergraduate students, who were enrolled in an introductory psychology course at Duke Kunshan University voluntarily participated in the study.

### 2.2. Procedures

The instructor first came to class and introduced the research project. After the brief introduction, students who wished to participate proceeded to complete an online consent form and complete baseline measures, including Emotional Suppression scale (only Expressive Suppression facet) (Gross & John, 2003), ambivalence over emotional expressiveness (AEQ) (King & Emmons, 1990), Grit-S (Duckworth & Quinn, 2009), and Test Anxiety Inventory short scale (Taylor & Deane, 2002).

In subsequent weeks, participants were asked to complete a short intervention before taking the quiz. The study followed an A-B-A-C design: participants took an extra 5 minutes to review the quiz content in week 2 and 4 while engaging in the expressive writing exercise in week 3 and the breathing exercise in week 5. After the test, participants were asked to rate their anxiety level on both emotionality and worry sub-component (Brady et al., 2018), and their self-perceived difficulty level of the quiz.

## 3. Results

While ethnicity has no clear impacts, male ( $M = 2.97$ ,  $SD = .60$ ) has a lower average score of ambivalence over emotional expressiveness compared to female ( $M = 3.47$ ,  $SD = .65$ ),  $t(49) = -2.73$ ,  $p = .009$ ,  $d = -.80$ . Emotional suppression is positively correlated with test anxiety level,  $r(48) = .27$ ,  $p = .03$ . Similarly, AEQ positively correlated with average anxiety,  $r(48) = .38$ ,  $p = .003$ . Grit registered a negative correlation with test anxiety,  $r(47) = -.28$ ,  $p = .026$ .

Though not statistically significant, participants' emotionality lowered after doing expressive writing ( $M = 3.96$ ,  $SD = 1.37$ ) compared to first control ( $M = 4.21$ ,  $SD = 1.53$ ) and second control ( $M = 4.19$ ,  $SD = 1.14$ ),  $t(23) = 0.54$ ,  $p = .29$  and  $t(23) = 0.52$ ,  $p = .30$ . The emotionality however slightly increased after doing meditation ( $M = 4.25$ ,  $SD = 1.62$ ),  $t(23) = -0.09$ ,  $p = .53$  and  $t(23) = -0.46$ ,  $p = .68$ . In regards to wariness, despite not statistically significant, average level of wariness after doing meditation ( $M = 3.88$ ,  $SD = 0.79$ ) was lower than that compared to control 1 ( $M = 4.10$ ,  $SD = .70$ ),  $t(23) = 0.97$ ,  $p = .17$  and control 2 ( $M = 3.96$ ,  $SD = 0.71$ ),  $t(23) = 0.42$ ,  $p = .34$ , while higher after doing expressive writing ( $M = 4.23$ ,  $SD = .55$ ),  $t(23) = -0.68$ ,  $p = .75$  and  $t(23) = -0.50$ ,  $p = .69$ .

In further moderation analysis, test difficulty level reports a significant effect on emotionality,  $b = 0.82$ ,  $z = 5.59$ ,  $p < .001$  and level of wariness,  $b = 0.86$ ,  $z = 5.56$ ,  $p < .001$ . Participants' baseline test anxiety level also has a moderating effect on participants' emotionality,  $b = 0.23$ ,  $z = 2.31$ ,  $p = .02$  and wariness,  $b = 0.27$ ,  $z = 2.53$ ,  $p = .01$ . Meanwhile, both emotional suppression (emotionality,  $b = 0.13$ ,  $z = 1.08$ ,  $p = .28$ ; wariness,  $b = 0.07$ ,  $z = 1.35$ ,  $p = .18$ ) and AEQ (emotionality,  $b = 0.13$ ,  $z = 0.58$ ,  $p = .57$ ; wariness,  $b = 0.03$ ,  $z = 0.23$ ,  $p = .82$ ) do not significantly moderate individuals' test anxiety level.

## 4. Discussion

Although not conclusive, the finding suggests that emotional suppression contributes to a heightened level of test anxiety. It is speculated that individuals who suppress their emotions more are less likely to process their internal ruminative thoughts and maintain their sense of authenticity (John & Gross, 2003), from which arise a higher level of emotionality and wariness. This is consistent with previous findings that higher level of emotional suppression often results in anxiety and negative

emotions, especially in emotionally provocative and evaluative contexts (e.g. Srivastava et al., 2009). Similarly, AEQ also predicted the level of test anxiety: those who have internal conflicts in expressing their personal feelings in fear of negative consequences tend to feel more anxious and worry over their performance. Lu & Stanton (2010) came up with similar findings, suggesting that individuals having high emotional suppression and/or AEQ would benefit from emotional disclosure intervention.

The study however did not find statistically significant treatment effects. Neither expressive writing nor meditation reduced students' feelings of test anxiety. Although the results did not align with our speculation, they were consistent with recent studies that also fail to replicate the positive effects of the paradigm (e.g. Myers et al., 2021). Further research could delve deeper into the differences between emotional disclosure and emotional regulation interventions to further determine in which contexts a certain intervention might work better than another.

Regarding limitations, the current sample size provided insufficient statistical power. Besides, the study only asked participants to rate their test anxiety level retrospectively when they already finished the exam. This post-intervention questionnaire may not accurately reflect students' feelings after the interventions or during the test period. Self-report is also unreliable when assessing students' emotional and physiological responses in an evaluative context. In the next phase of the study, we will be recruiting more participants to enlarge our sample size, so that treatment effects could be captured more accurately. We will also be asking participants to report their feelings of anxiety at different time periods: before the intervention, after the intervention and after the quiz exam. Assessing students' experience at multiple points in time will allow us to conduct a further pre-post analysis of their feelings.

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