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J. N. Andrews Honors Program

Andrews University

HONS 497

Honors Thesis

Express Yourself: A Study on Expressive Writing and State Anxiety

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Abstract

This study is under a larger study on the efficacy of psychological first aid compared to expressive writing as a crisis intervention method for individuals exposed to a traumatic event using a randomized controlled trial (RCT). Research has shown that expressive writing can be beneficial to improve the mental and physical health of patients (Gortner, Rude, & Pennebaker, 2006). Research has shown that the use of positive emotion and insight words through expressive writing can reduce state anxiety (Shen, Yang, Zhang, & Zhang, 2018). This study examined the effect of expressive writing on state anxiety by comparing the intervention with a Superficial writing (control) condition. Using the State-Trait Anxiety Inventory-S Anxiety (Spielberger, 2010) to measure anxiety, subjects' responses were analyzed using a two way ANOVA. Results indicated that there was a statistically significant difference in anxiety over time. These findings support the hypothesis of the study.

Express Yourself: A Study on Expressive Writing and State Anxiety

Introduction

The overall goal of this study was to determine the efficacy of expressive writing as an intervention tool for state anxiety actualizing a randomized control trial (RCT) method. It will look specifically at positive and negative, temporal, and insight words to see the effect they have on the effectiveness of this intervention over time. The hope is that the results obtained from this study can be utilized across the nation to create targeted programs that effectively treat anxiety.

Based on current and past literature, the theoretical framework in which the study is based was developed from the following information:

Anxiety

Anxiety can be defined as excessive apprehensiveness, fear, and worry. However, its definition is complicated by its broad nature. Anxiety has been defined as a trait, a state, a stimulus, a response, a drive, and as a motive (Endler, & Kocovski, 2001). According to psychologist C. D. Spielberger, there are two distinct factions of anxiety known as state and trait anxiety (Endler, & Kocovski, 2001). He likened the relationship between the state and trait anxiety to the relationship between potential and kinetic energy. While potential energy is theoretically conserved power, kinetic energy is actualized power in motion. In the same way, trait anxiety is a personality model that is prone to anxiety in various situations, while state anxiety is situationally specific anxiety brought on by stress-inducing environmental conditions.

This model of anxiety has been widely recognized and largely accepted within the psychological research community. Researcher Laura J. Jillian, Ph.D., conducted research validating the State-Trait Anxiety Inventory, developed by Spielberger in 1983 (Spielberger, 2010). According to

her review, the inventory was adequate in encouraging accurate self-reporting of anxious behavior. It was also useful in determining the severity of anxiety symptoms (Jillian, 2011). This is the model of anxiety and instrument of measurement that will be utilized in the current study.

High levels of anxiety are shown to decrease the quality of life for afflicted individuals. Anxiety can have numerous negative effects on the health and wellbeing of patients, which includes physiological maladies such as higher blood pressure, retarded lung function, and a lowered immune system (Baikie & Wilhelm, 2005). However, anxiety can also negatively influence psychological factors increasing depression and negatively impacting self-esteem, which can lead to the development of serious mood disorders (de Jong, 2002).

Expressive writing

Expressive writing may be an important medium for treating anxiety. It is shown to encourage growth in those dealing with trauma (Baikie & Wilhelm, 2005). It is useful in improving self-esteem, lowering rumination, and decreasing depressive symptoms (Gortner, Rude & Pennebaker, 2006). Writing encourages deep self-expression and provides a level of comfort that other social forms of therapy do not. In addition, expressive writing is a cost-efficient treatment option that can be useful as lower-income populations like undergraduate college students experience the highest levels of anxiety (Sarros, & Densten, 1989).

This study looked at the efficacy of expressive writing as an intervention method to reduce anxiety. It is also part of a larger umbrella study on psychological first aid. Psychological first aid is a method of trauma intervention that employs active listening as a means of treating trauma-stricken subjects. This research team will be evaluating overall PFA usefulness, although this study will primarily focus on the expressive writing component.

Wellbeing Word Factors

Kraus and colleagues (1967) argued that the use of temporal words can be indicative of anxiety levels. That research team found that there was a weak positive correlation between present tense words and anxiety. They also found a slightly larger positive correlation between past and future tenses (Krauss, Ruiz, Mozdierz & Button, 1967). This project seeks to see if such a relationship exists between written temporal words and anxiety levels. Based on previous research, it was expected that the usage of more present tense words should correlate with a lower state of anxiety.

In addition to time-orientation words, this study will also look at the usage of positive and negative emotion words. An additional goal of the study is to see how the use of these two affective focus words during expressive writing treatment can affect the state of anxiety over time. Previous research has found that people with high levels of state anxiety tend to fixate on negative words, especially in evaluative circumstances (Mansell, Ehlers, Clark & Chen, 2002) and that the expressive writing of more positive emotion words helps to reduce anxiety states (Shen, Yang, Zhang & Zhang, 2018). Therefore, this study expected to see less improvement in those who use a lot of negative words in their expressive writing, compared to control conditions.

Lastly, this study looked at the effect of using more insight words on anxiety stated through expressive writing compared to a control condition. Literature suggests that less anxious people use greater insight words (Pennebaker & Stone, 2003; Shen et al., 2018). As stated previously, expressive writing is effective in reducing anxiety states due to the cathartic element of unburdening the self. One would expect that those who used the most insightful words were largely unburdened due to their unhindered insightful view of the self. Research suggests that those who meet those conditions should

benefit the most from expressive writing therapy and see a significant decrease in their anxiety levels (Baiki & Wilhelm, 2005).

Methods

Participants

The participants were expected to complete a demographic survey at the beginning of the study. This questionnaire assessed the age, gender, ethnicity, number of credits taken this semester, religious affiliation, and the frequency in which they participate in religious practices. Our sample was majority female, Seventh-day Adventists, and in their early twenties. This study utilized the State-Trait Anxiety Inventory-S Anxiety (STAI-S) created by Spielberger in 1983 and reviewed in 2010 (Spielberger, 2010) in order to measure state-anxiety. The STAI-S contains 20-items that utilize a 4-point Likert Scale (1 = almost never, 2 = sometimes, 3 = often, 4 = almost always). Participants were asked to respond to statements that indicate how they feel right now such as, “I feel that difficulties are piling up so that I cannot overcome them” and “I feel nervous and restless.” The STAI-S is demonstrated to have good internal validity and good internal consistency (median alpha: 0.93). (Jillian, 2011)

Group Conditions

Prior to the beginning of this study, the student researcher was trained in the administration of the RAPID PFA and expressive writing administration. For the purpose of this study the participants will be randomly assigned to one of the two following group conditions:

- Expressive writing condition: For this condition the participant will write about a stressful life event for ten minutes. The prompt, as developed by Gortner, Rude, and Pennebaker (2006),

was tailored to fit the writing condition. It reads as follows: “For the next ten minutes I would like for you to write about your very deepest thoughts and feelings about a stressful life experience. You might tie your topic to your relationships with others including parents, lovers, friends, or relatives, to you past, your present or your future, who you would like to be or who you are now. All of your writing will be completely confidential. The only rule is that once you begin writing, you must continue until the time is up.”

- **Superficial writing condition:** This condition is the control group for this study. This means that the subjects assigned to this condition will serve as a basis for comparison to the expressive writing conditions. Their prompt will read as follows: “For the next ten minutes I would like for you to write about your day. Do your best to remain as objective as possible.”

The measures and conditions were presented in the order indicated in the following table:

Table. 1

Group	Baseline	Condition (Treatment)	Immediately After Disclosure	Post Disclosure (30-Minutes)	Post Disclosure (15- days)
1	STAI survey	Expressive writing	STAI survey	STAI survey	STAI survey
2	STAI survey	Superficial writing	STAI survey	STAI survey	STAI survey

Note. Survey (Demographic Questionnaire & RSES)

Design and Procedure

This study is a continuation of a previous project that received Institutional Review Board (IRB) approval under the title 'IRB #16-106' and was renewed on September 6, 2019, to continue collecting subjects. The researchers had been recruiting for the project in several 100 level behavioral science courses. Students were able to sign up for time slots to do the study on the Behavioral Sciences Research Subject Pool's website. After signing up, the subject received a reminder email a day before they are scheduled to participate in the study.

The study took place in the Behavioral Sciences Cognitive Research Lab #3 located in Buller Hall. Once the subject arrived, they completed the demographic survey and STAI-S online after signing the informed consent form. The subjects then had 10 minutes to complete the expressive writing component of the study. Directly after finishing the expressive writing component, the STAI was readministered and then given again after a 30-minute latency period. Subjects returned in 15 days later to complete the STAI-S a final time. Once all of the surveys were completed, the participants were awarded their research credit and \$15 monetary compensation.

Analysis

This study used a 2X2, between-subjects, repeated measures experimental design. The study will also use the Linguistic Inquiry and Word Count (LIWC) analysis program to compare the differences in anxiety improvement, depending on the use of positive and negative emotion words, insight words, and temporal words. A two way repeated measures ANOVA was used to analyze the differences between the group data and compare the anxiety levels based on word usage over time.

Results

Our main variables were anxiety, time condition, superficial writing, and expressive writing. For our within-subjects effects, we found a significant p-value of 0.00002 for the effect of time. Our η^2 of 0.03773 showed that time had a small effect on anxiety. For our within-subjects effects, we saw the same trend with η^2 of (0.10785) and a slightly significant p-value of 0.00487. For either table, the interaction between time and expressive writing is not significant.

Within Subjects Effects

Table. 2

	Sum of Squares	df	Mean Square	F	p	η^2
Time	753.82730	3	251.27577	8.8114	0.00002	0.03773
Time* Ex/D Write	29.90277	3	9.96759	0.034953	0.78954	0.00150
Residual	4363.08780	153	28.51.691			

Between Subjects Effects

Table. 3

	Sum of Squares	df	Mean Square	F	P	η^2
Ex/D Write	2155.07415	1	2155.07415	8.66811	0.00487	0.10785

Residual	12679.6711	51	248.62100			
	3					

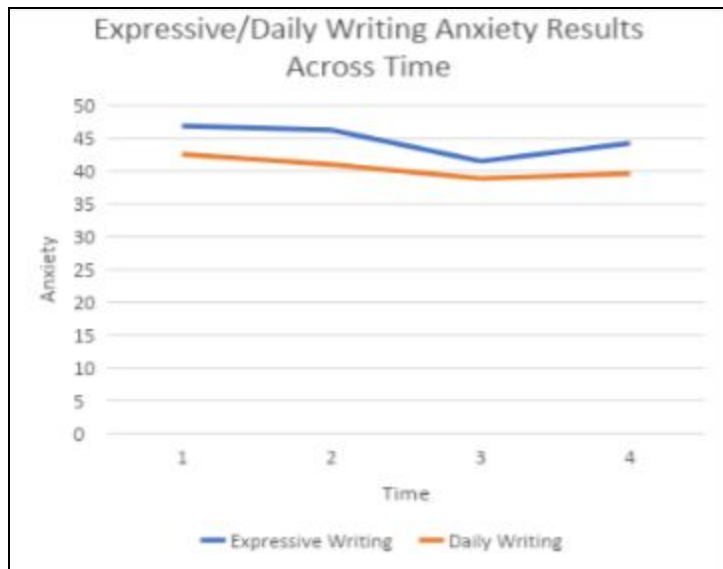


Figure. 1 Graph of Expressive/Daily Writing Anxiety Results Across Time

This table shows the overall trend in our results. We found a decline in anxiety over time for both the expressive writing condition and for the Daily writing condition. Both group’s anxiety levels dropped below baseline measurement. This graph shows that the decline in anxiety was steeper for the expressive writing condition than the control condition. The effect size appears to be very small for both groups. This small effect size was substantiated by the aforementioned η^2 values.

We ran equality of variances tests for our baseline time condition we found a p-value of 0.08128, for our post time condition we found a p-value of 0.71126, for our 30 min post time

condition we found a p-value of 0.48040, and for our 15 day post time period we found a p-value of 0.37327. All of our p-values were above 0.05 which indicates a normal bell-shaped curve.

We also ran a post hoc comparison. we found a significant difference in anxiety between the experimental and control group during our post-intervention time interval. We found that the experimental group measured higher levels. We also saw a significant difference between our 30 min time interval. Here we found that while the daily write still measured lower anxiety, both group's anxiety levels dropped significantly from the Post-intervention measurement. The expressive writing appeared to have had the bigger decrease from post to 30 min. We found a significant increase in anxiety between the 30 min and 15 day period for the control group.

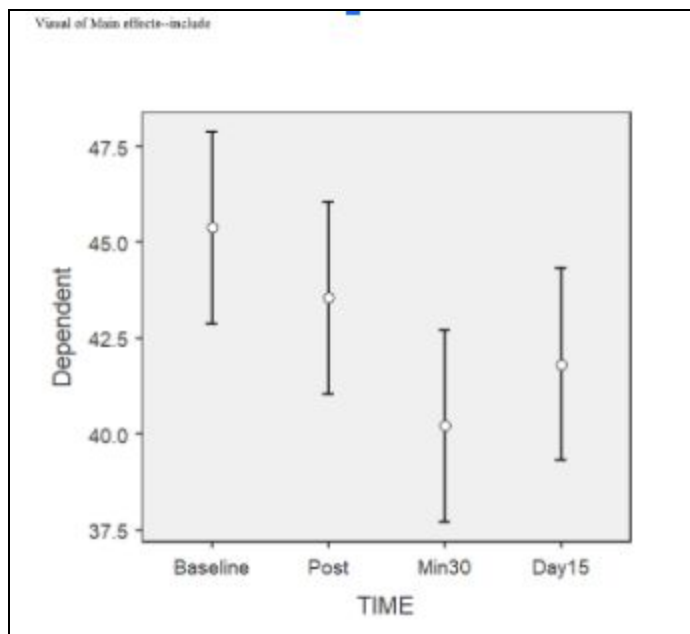


Figure 2. Table of Main effects across all time conditions

The visual of the main effect table measures anxiety scored for both conditions over time. It shows a controlled range of scores for time regardless of group. We can see that the range of scores followed a trend over time for both groups. Overall, this table shows decreased anxiety scores in the postcondition, the thirty minutes postcondition, and the 15-day postcondition. Although the range of scores increases from 30 minutes post-treatment to 15 days post-treatment. The range of scores is still lower than the baseline anxiety levels.

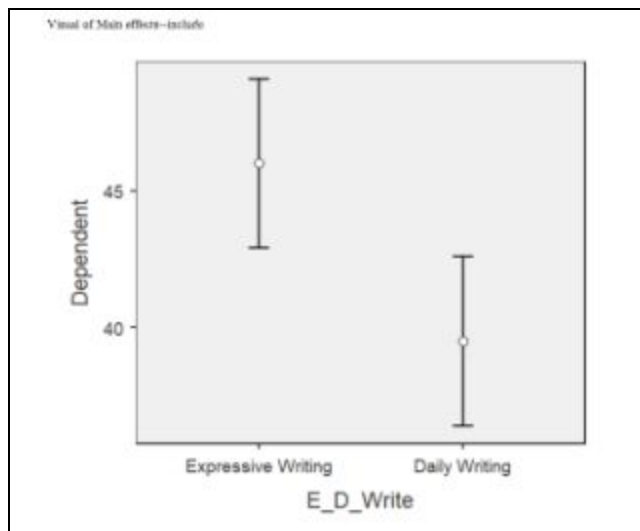


Figure 3. Table of main effects across both writing conditions

This second main effects table is looking at the overall range of scores in the expressive writing and daily writing groups across all-time conditions. This table shows that those in the daily writing condition had overall lower anxiety scores than those in the expressive writing condition. This is not what we expected to find but maybe a result of random bias in the sample. It appears that even from baseline measurements, those in the daily writing group report lower levels of anxiety.

Word Analysis

To analyze the language of the samples we used the linguistic inquiry and word count analysis program. We analyzed writings in both the Daily writing and Expressive writing conditions.

Correlation Matrix											
	Post	Min30	Post-Baseline	Min30-Baseline	Affect	PositiveEmotion	NegativeEmotion	FocusFuture	FocusPresent	FocusPast	Insight
Post	—										
Min30	0.80819 ***	—									
Post-Baseline	0.49050 *	0.56590 **	—								
Min30-Baseline	0.17987	0.58070 **	0.81449 ***	—							
Affect	-0.05635	-0.17584	-0.35243	-0.39436	—						
PositiveEmotion	0.01669	0.07595	-0.20742	-0.18254	0.77145 ***	—					
NegativeEmotion	-0.05026	-0.26062	-0.38672	-0.46066 *	0.92306 ***	0.50672 *	—				
FocusFuture	-0.06178	-0.08294	0.19492	0.17961	-0.16267	-0.31905	-0.07930	—			
FocusPresent	0.10321	0.06058	-0.24357	-0.19218	0.42887 *	0.31468	0.36920	0.26268	—		
FocusPast	-0.13836	-0.18833	0.11167	0.03119	-0.29111	-0.27617	-0.19921	-0.44148 *	-0.82380 ***	—	
Insight	0.22298	-0.18611	-0.31383	-0.49738 *	0.42884 *	0.33151	0.45520 *	-0.33580	0.24574	0.06357	—
CogProc	0.31475	0.03715	-0.21110	-0.33193	0.51644 *	0.42915 *	0.45679 *	-0.23273	0.50468 *	-0.30982	0.80720 ***
Tone	0.03133	0.37118	0.24185	0.41655	-0.37583	0.26240	-0.66769 ***	-0.07157	-0.10126	-0.07655	-0.28422
Authentic	0.00082	-0.17956	-0.07999	-0.24828	-0.25730	-0.53575 **	-0.04837	0.14129	-0.19217	0.30863	0.04646
Clout	-0.14496	-0.02179	0.21548	0.23388	0.05476	0.17055	0.00135	0.06506	-0.29226	0.06019	-0.29119
Analytic	-0.08591	-0.03991	0.41275	0.37489	-0.68600 ***	-0.60162 **	-0.65978 ***	0.40090	-0.43306 *	0.20057	-0.57058 **
Word Count	-0.04420	0.22678	-0.00319	0.09710	0.19002	0.32711	0.10757	-0.29336	0.00943	0.04405	0.13210

Note. * p < .05, ** p < .01, *** p < .001

Figure 4. Correlation Matrix for Daily Writing results (LIWC)

For Daily Writing conditions we found significant correlations for the negative emotion and insight word variables. When comparing anxiety differences minute-ten to baseline we found a significant correlation. As negative emotion increases in writing, anxiety decreases. For negative emotions, we found a correlation coefficient: of -0.461 when comparing anxiety measures at baseline and 30 mins post-intervention. This shows a negative moderate relationship. This means that the more negative emotion words people used, the less anxiety they reported when taking the 30 min post-intervention anxiety scale when compared to anxiety reports at baseline. We also see the same trend in the post writing time category but it wasn't significant

For insight words, we found a correlation coefficient of -0.497. This shows a negative moderate relationship as well. This means that as insight words increase, anxiety decreases and is significant.

Many other variables showed relationships in the direction that we expected but these relationships were not significant. We believe that as we increased the power by including more subjects we would have had more significant trends.

Correlation Matrix											
	Post	Min30	Post-Baseline	Min30-Baseline	Affect	PositiveEmotion	NegativeEmotion	FocusFuture	FocusPresent	FocusPast	Insight
Post	—										
Min30	0.80819***	—									
Post-Baseline	0.49050*	0.56590**	—								
Min30-Baseline	0.17987	0.58070**	0.81449***	—							
Affect	-0.05635	-0.17584	-0.35243	-0.39436	—						
PositiveEmotion	0.01669	0.07595	-0.20742	-0.18254	0.77145***	—					
NegativeEmotion	-0.05026	-0.26062	-0.38672	-0.46066*	0.92306***	0.50672*	—				
FocusFuture	-0.06178	-0.08294	0.19492	0.17961	-0.16267	-0.31905	-0.07930	—			
FocusPresent	0.10321	0.06058	-0.24357	-0.19218	0.42887*	0.31468	0.36920	0.26268	—		
FocusPast	-0.13836	-0.18833	0.11167	0.03119	-0.29111	-0.27617	-0.19921	-0.44148*	-0.82380***	—	
Insight	0.22298	-0.18611	-0.31383	-0.49738*	0.42884*	0.33151	0.45520*	-0.33580	0.24574	0.06357	—
CogProc	0.31475	0.03715	-0.21110	-0.33193	0.51644*	0.42915*	0.45679*	-0.23273	0.50468*	-0.30982	0.80720***
Tone	0.03133	0.37118	0.24185	0.41655	-0.37583	0.26240	-0.66769***	-0.07157	-0.10126	-0.07655	-0.28422
Authentic	0.00082	-0.17956	-0.07999	-0.24828	-0.25730	-0.53575**	-0.04837	0.14129	-0.19217	0.30863	0.04646
Clout	-0.14496	-0.02179	0.21548	0.23388	0.05476	0.17055	0.00135	0.06506	-0.29226	0.06019	-0.29119
Analytic	-0.08591	-0.03991	0.41275	0.37489	-0.68600***	-0.60162**	-0.65978***	0.40090	-0.43306*	0.20057	-0.57058**
Word Count	-0.04420	0.22678	-0.00319	0.09710	0.19002	0.32711	0.10757	-0.29336	0.00943	0.04405	0.13210

Note. * p < .05, ** p < .01, *** p < .001

Figure 5. Correlation Matrix for Expressive Writing results (LIWC)

We only found one significant relationship in the expressive writing group. For negative emotions, we found a correlation coefficient of 0.399 from post to baseline. This shows a positive small to moderate relationship. This means that, for the expressive writing condition, the more negative emotions the subject used the more anxious they became.

Discussion

The overall results of this study match our hypothesis. We hypothesized that we would see a decrease in anxiety over time for those who were in the expressive writing group condition. That is exactly what we found. We saw decreases in anxiety across the board, and even when anxiety levels rose

they never surpassed the original baseline. We didn't expect to find the same trend in the Daily writing condition. However, we did see a similar result for that condition as well.

We believe the reason for these unforeseen results may be because the participants didn't follow the instructions and wrote emotionally during their intervention. So in effect, the two conditions may have both allowed for emotional purging and stress-relief. Yet, we saw that anxiety levels for the daily writing group increased significantly after the fifteen day waiting period. This suggests that while both forms of writing were able to lower anxiety short term, expressively writing about deep emotional content creates more lasting changes.

If both groups of subjects were writing expressively, it would also explain the relationships that we found when looking at the LIWC results. We found that when people in the Daily writing group used more insight and negative emotion words they showed a significant drop in anxiety. This result fits with expected trends because using emotional words when describing their past two weeks may have allowed them to mentally unburden themselves and receive the same benefits as an expressive writing intervention.

On the other hand, we found that using negative emotion words increased anxiety for those in the expressive writing group right after the intervention. This is on par with what we expected. We expected to see an increase in anxiety directly after the disclosure for those writing expressively. Which our post hoc comparisons confirmed. This is because participants who were writing expressively would be mentally revisiting traumatic situations. Revisiting an emotionally traumatic experience causes subjects to re-experience that stress. Using more negative emotion words means they were being very descriptive and coming into close proximity to their original emotional experience. As a result, it

makes sense why they showed higher levels of anxiety directly after disclosure. However, we saw from the overall effect data that after that period their anxiety levels decreased significantly over time.

These LIWC results are different from what we expected. However, the results that we got fit with our overall anxiety trends. I believe that our previous interpretation of the literary framework looked at how word usage correlated with current levels of anxiety and didn't account for the fluctuations in anxiety that occur after the intervention. The literature stated that those who use less negative words show less anxiety. Our study found the same trend immediately after disclosure. However, we didn't take into account that using negative words in this intervention leads to catharsis and lowers anxiety over a longer time period. So while using more negative words does increase anxiety immediately, looking at the context of expressive writing using more negative words will decrease anxiety over time.

Overall, this data shows that expressive writing is effective for lowering state anxiety over time. Because we did not get many significant relationships for our word association data, we can not make definite claims about all of the language quality variables we looked at. However, we can say that using negative emotion words and insightful words in your writing can help you lower anxiety over time. Of course, adding the disclaimer that if you are using negative emotion words to describe a stressful past situation you may experience an immediate but temporary elevation in anxiety.

Limitations

There were many limitations to this study. For one thing, the sample was very limited to a select demographic of people which is Seventh-day Adventist college students. The study was underpowered because we did not have enough subjects to have significant correlations with our word association data. The biggest limitation was the aforementioned control writing group. The group was

not directly regulated, as a result, they wrote expressively when they were supposed to write objectively. This definitely had an effect on our results.

There is a lot of room for further research to continue this study. For one thing, we hope that the addition of more subjects to this study could lead to more significant results for the Linguistic Inquiry and word count analysis results. We found many correlations that leaned in the direction we expected but they were not significant enough to include. We hope that in future studies, more definitive statements can be made about specific qualities of writing that aid in lowering state anxiety.

Implications

This study will add to the literature on the use of expressive writing to reduce state anxiety through a randomized control trial method. This is significant because anxiety is degradational to health (Baikie & Wilhelm, 2005) and expressive writing is a simple and cost-effective method to reduce anxiety. Furthermore, the present study hopes to provide continued evidence for how the use of certain word categories can reduce acute anxiety states associated with experiencing stressful life events and on performance tasks such as taking tests, public speaking, and completing math problems.

We hope that our results can validate expressive writing as a simple and cost-effective method to reduce anxiety. In theory, we posit that researchers can use the results of our study guide therapists in helping people manage their anxiety states better by creating targeted programs to lower state anxiety.

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