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The Effects of Writing and Drawing and Fear of Social Evaluation on State Anxiety

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Abstract

The present study examined the interaction between the effects of social evaluation and writing and drawing on state anxiety. Students from a small, undergraduate, liberal arts college completed a stress inducing math task, then either wrote or drew for 5 min. Participants believed that either no one would see their responses, the researcher would evaluate their responses, or their peers would evaluate their responses. No significant differences were found for either variable on two self-report measures of state anxiety. However, trends in the data suggest that the expectation of evaluation by the researcher elicits greater anxiety than the expectation of no or peer evaluation when drawing. This and other trends are attributed to differences in how often the participants are engaged in drawing or writing activities in daily life.
The Effects of Writing and Drawing and Fear of Social Evaluation on State Anxiety

People everywhere experience stress and anxiety. These uncomfortable emotions can be reduced in a variety of ways. Within the past few decades, a number of researchers have studied activities such as journaling, drawing, and listening to music and found that each individual activity can reduce stress (Hatta & Nakamura, 1991; Ittayem & Cooley, 2004; Smith, Anderson-Hanley, Langrock, & Compas, 2005). However, little has been done to compare the effectiveness of these activities in reducing state anxiety or to study the effect that social evaluation could have on such reduction.

Anxiety and Music

Research has consistently led to the conclusion that listening to music is an effective way to reduce anxiety. One study found that low-tempo music had arousal-moderating effects on university students in both high and low-arousal stressful task groups (Yamamoto, Naga, & Shimizu, 2007). Participants indicated through physiological measures, such as lower heart rate, that anxiety decreased after listening to low-tempo music. In another experiment, university students were placed in an anxiety-inducing environment: they were made to wait for 20 min in a hot room without instructions (Hatta & Nakamura, 1991). During the waiting time the students in the different treatment groups either sat in silence or listened to recordings of classical music, popular music, or sounds of nature. After the 20 min waiting time, each participant’s anxiety level was measured by a self-report questionnaire. The mean stress scores of the group that sat in silence increased, while the mean stress scores of the classical music, popular music, and nature sounds groups decreased significantly.
While listening to music can be effective in reducing stress, it may not be the most effective stress reducing method. Scheufele (2000) compared the effects of progressive relaxation techniques to the effects of listening to music on relaxation scores in a sample of normal adult males. The participants, who had been recruited by advertising in a newspaper, were asked to spend 15 min preparing to give a 5 min, videotaped speech about their personal faults. Following the preparation period, participants were instructed to sit in silence or to listen to an audio tape of music, progressive relaxation instruction, or attention control instruction. Listening to music was found to increase relaxation measured by behavioral and self-report measures after stress exposure, but the increase in relaxation was smaller than that of groups that used progressive relaxation techniques.

**Anxiety and Writing**

Researchers have also focused on writing and how the content of writing affects stress levels. These studies, however, have had mixed results. Hains (1992) found a significant decrease of both state and trait anxiety in male high school students who participated either of two types of training. Progressive muscle relaxation and deep breathing exercises were compared in effectiveness to exercises in cognitive restructuring. In the cognitive restructuring condition, students recorded daily stressful events, emphasizing self-defeating cognitions and logical and appropriate responses to their negative cognitions. While the cognitive training was not designed to be a journaling activity, the results suggest a possible connection between written descriptions of stressful events and decreased stress levels measured by a number of self-report questionnaires.
More recently, Smith et al. (2005) evaluated the effects of journaling for 43 women newly diagnosed with breast cancer. The women wrote in a journal three times a week for 12 weeks about feelings about their diagnosis and their support group participation. Their journals were analyzed for words representing positive emotion, negative emotion, and cognition. When journal entries were analyzed for content and compared with the participating authors’ anxiety and depression levels, positive relationships were found between anxiety and negative emotion words and depression and negative emotion words. In this case, negative emphases in writing may have had harmful effects on anxiety levels.

**Anxiety and Drawing**

Ittayem and Cooley (2004) studied the effects of both writing and drawing on stress reduction in female undergraduates. Participants were assigned to one of three task conditions. They were either assigned to write or to draw about significant emotional events or to write about daily events without including emotions for 15-20 min a day for 4 days. After completing their assigned task each day, participants completed the Subjective Units of Disturbance Scale (SUDS). Before beginning the experimental task and at the end of the 4 day period, the participants completed the State-Trait Anxiety Inventory (STAI). In comparison to drawing and narrative writing groups, which had reduced anxiety, the group instructed to write about daily events without mentioning emotions had increased anxiety. SUDS scores decreased significantly over time for the narrative writing and drawing groups. It should be noted that the study, however, failed to find any significant differences in scores on the STAI.
Social Evaluation

While drawing, writing, and listening to music can reduce stress, social evaluation is known to cause an increase in anxiety. Most people are generally concerned about how others perceive them and their abilities, and therefore being evaluated by others is often related to negative affect (Focht & Hausenblas, 2004). Focht and Hausenblas (2004) measured the anxiety felt by female university students with social physique anxiety while exercising in different workout environments. Participants each spent 20 min on an exercise bike in a naturalistic exercise environment, a university gym, with a full-length mirror to intensify perceptions of evaluation by others and 20 min cycling alone in a lab environment with no mirror. Participants felt considerably more evaluative threat while working out in the public workout facility than when working out alone in the lab environment, suggesting that they feared negative evaluation of their body by others.

According to Dickerson, Mycek, and Zaldivar (2008), having an evaluative audience can increase stress in individuals. They had 89 undergraduate college students deliver a speech. Some of these students delivered their speech in an empty room. Another group of participants delivered their speeches while a confederate was in the room but did not look at or acknowledge the participants. The final group delivered their speeches in a room with a two-member evaluative audience. Levels of cortisol, a hormone present in humans’ saliva when they experience increased stress, were measured before and after the participants delivered their speeches. An evaluative audience was found to increases levels of cortisol in participants. However, the mere presence of a non-evaluative confederate did not increase the cortisol response. This suggests that
those who know they will be evaluated experience more stress than those who are not
told they will be evaluated, even in the presence of others.

Andrews et al. (2007) also conducted study involving social-evaluative threat and
cortisol response. In this research, healthy male college students were asked to give a
speech about personal strengths and weaknesses. There were four conditions of
evaluation. Participants were to present their speech to either one or two expert
evaluators who would be seen within the room or be listening, unseen, from the adjacent
room. All conditions elicited a cortisol response, suggesting that having an expectation
of being evaluated increases stress. However, there were no significant differences
between the groups. Neither the number of evaluators nor the visual presence of
evaluators significantly effected anxiety. Results suggest that having a visual presence of
evaluators is not necessary to increase stress. Instead, simply informing participants of
impending evaluation can increase anxiety.

Smith, Houston, and Zurawski (1984) validated another physiological measure of
anxiety stemming from social-evaluative threat when they measured finger pulse volume
before and during an interview with high and low stress conditions in both male and
female undergraduates. In the low stress condition participants were told the research
was examining physiological correlates of listening and speaking, with no mention of
evaluation. In the high stress condition, researchers informed the participants that their
interview would be videotaped and that their answers would be evaluated for levels of
verbal intelligence at a later time. Participants in the high stress condition reported more
anxiety than those in the low stress condition on a self-report measure. Participants in
both groups also reported feeling more anxiety during the interview than the anticipation
period. Both finger pulse volume and self-report measures responded to the manipulation, suggesting that they are valid measures of anxiety from an evaluative trigger.

Calvo and Miguel-Tobal (1998) found differences between physiological and self-report measures of anxiety in response to a social-evaluative threat. Undergraduates’ anxiety levels were measured by self-report, physiological, behavioral, and performance measures. Participants were asked to perform a motor test and deliver a speech, informed that they would be videotaped. They were told that their video would be evaluated and that they would be assessed in regards to their linguistic and psychomotor abilities and compared to peers. There was more concordance between self-reported and behavioral measures of anxiety in people with high test and trait anxiety. There was no concordance between cognitive and somatic areas in self-reports of anxiety. The results suggest that the most reliable predictor of concordance under social-evaluative conditions is trait anxiety. This may be because people with high trait anxiety are more aware of both their cognitive and physiological symptoms of anxiety. It is also possible that people with low trait anxiety may suppress their thoughts and feelings of anxiety, presenting less anxiety in self-report measures than actually exist.

From the previously mentioned studies, one can see that creative activities such as listening to music, writing, and drawing all have the potential to decrease stress. Since the outcomes of research regarding music and stress reduction are strong and consistent, it is not necessary to repeat such studies at this time. Existing research also suggests that fear of negative evaluation by others can increase anxiety, and both physiological and self-report measures are valid for measuring such stress. Little research has compared the
stress-reducing effects of drawing and writing. In addition, no known research has been conducted to examine the effect of fear of social evaluation related to these creative activities.

**Present Study**

The purpose of the present study is to examine the interaction between stress reducing effects of writing and drawing activities and effects of social-evaluative threat. Participants were asked to complete a stressful math task. Then, participants either wrote or drew pictures to illustrate their activities from the previous 24-48 hours and did so with the expectation that their responses would be evaluated by no one, by the researcher, or by their peers. Finally, participants’ anxiety was measured by a self-report questionnaire. It was hypothesized that there would be no significant differences between the effects of writing and drawing activities and that stress scores would be lowest in groups that expected no evaluation and highest in groups that expected peers would evaluate the responses.

**Method**

**Participants**

Participants, 139 students in Introduction to Psychology classes from Messiah College, took part in the experiment during their class time. The experiment provided a way for students to gain a better understanding of the research process. They were randomly assigned to either the drawing or writing group and to one of three levels of social evaluation: no evaluation, researcher evaluation, or peer evaluation. Writing and drawing groups participated at separate times to avoid participant recognition of the variables.
Out of the 139 participants, one member of the writing/no evaluation condition, two members from the writing/researcher condition, one member from the drawing/researcher condition, and one member of the drawing/peer condition did not fully complete their questionnaires. Because of the incomplete data, responses from those five participants were not included in the analysis of data. Of those with complete questionnaires in the writing condition, 22 participants were in the no evaluation condition, 21 were in the researcher condition, and 22 were in the peer condition. Of those with complete questionnaires in the drawing condition, 24 participants were in the no evaluation condition, 22 in the researcher, and 23 in the peer condition.

Participants were between 18 and 22 years of age. Of the participants, 92 were female and 42 were male. One participant was college senior, 12 were juniors, 23 were sophomores, and 98 were first year students.

**Materials**

For the stress induction math task, 25 questions were displayed on the projection screen, one at a time. Each question was only visible for 4 sec before the next question appeared. Participants recorded their answers to math questions on a response sheet. The math questions varied in difficulty (see Appendix for specific questions used). Participants in the writing and drawing groups were also provided with additional sheets of paper to use for the treatment stage of the study (lined paper for writing groups, blank white computer paper for drawing groups).

The STAI-6, a short-form of the state scale of the Spielberger State-Trait Anxiety Inventory was used to measure current levels of tension and anxiety in the participants (Spielberger et al., 1983). The STAI-6 is a 6-item self-evaluation questionnaire
developed by Marteau and Bekker (1992). Participants responded to statements such as “I am tense” or “I am calm” on a 4-point Likert scale (1 = not at all, 4 = very much). Three of the items were reverse scored. Scores on the STAI-6 could range from 6 to 24. Higher scores indicated greater anxiety. Participants also indicated their level of stress on a Subjective Units of Disturbance Scale (SUDS; Wolpe & Lazarus, 1966). SUDS is a 10-point scale (1 = not at all stressed, 10 = very much stressed). In addition, participants also indicated how positively or negatively they believed their responses would be evaluated by themselves and others using a 7-point scale (1 = very negatively, 4 = about average, 7 = very positively). Each participant was also was given short demographic questionnaire, with questions regarding age, gender, undergraduate major, and number semesters completed in college.

**Procedure**

Participants were introduced to the experimenter and the purpose of the study. They were told that they were to be involved in a study on the psychological effects of various activities. Following the introduction, the participants were given instructions involving the stress-induction math task. The participants were specifically informed that their effort on the math task was extremely important to the results of the study.

Immediately after the math task was completed, participants were instructed to follow the written directions provided for them. Participants in the writing groups were instructed to spend the next 5 min writing about activities that they were involved in within the last 24 to 48 hours on the paper provided. Participants in the drawing groups were instructed to spend the next 5 min drawing pictures of activities they were involved in within the last 24 to 48 hours on the paper provided. Instructions also indicated
whether their responses would be seen by no one, be seen and evaluated by the researcher, or be seen, evaluated for content, and discussed by their peers. After 5 min passed, participants in all groups were instructed to fill out their questionnaires. Once the questionnaires were complete, participants were elaborately debriefed on the purpose and variables of the experiment.

Results

The mean and standard deviations of the self-reported anxiety scores (STAI-6 & SUDS) are found on Table 1.

STAI-6

A 2 X 3 (Activity X Social evaluation), all between-subjects ANOVA was performed on the STAI-6 scores. Analysis revealed no main effect for activity (writing or drawing), $F(1, 128) = .00, p = .95$, nor a main effect for social evaluation (no evaluation, researcher, or peer), $F(2, 128) = .26, p = .77$. Neither was there an interaction, $F(2, 128) = .28, p = .76$.

SUDS

A 2 X 3 (Activity X Social evaluation), all between-subjects ANOVA was performed on the SUDS scores. Analysis revealed no main effect for activity (writing or drawing), $F(1, 128) = 1.53, p = .22$, nor a main effect for social evaluation (no evaluation, researcher, or peer), $F(2, 128) = .29, p = .75$. Neither was there an interaction, $F(2, 128) = 1.65, p = .20$.

Discussion

The results of the present study partially support the original hypotheses. It was hypothesized that the effects of writing and drawing would be similar. The lack of
significant difference between these conditions supports this hypothesis and reflects what was found in the study by Ittayem and Cooley (2004). It seems that both writing and drawing provide an opportunity for creative expression, which may lead to lower anxiety scores.

While the statistical analysis of the data revealed no significant differences between mean anxiety scores, the results revealed trends towards significance away from the predictions in regards to social evaluation. It was hypothesized that the participants who believed no one would see their responses would report the lowest amount of anxiety and that the participants who believed that their peers would see and discuss their response would report experiencing the greatest amount of anxiety. This hypothesis was based on the assumption that the threat of being negatively evaluated by peers would be stronger than the threat of being evaluated negatively by the researcher. The results, however, indicated that participants in the drawing condition who were expecting that the researcher would evaluate their response experienced the greatest amount of stress.

Results of the STAI-6 and SUDS were similar. Both self-report measures indicated that participants in the writing/no evaluation and writing/peer conditions experienced more anxiety than those in the drawing/no evaluation and drawing/peer conditions. The reverse was found with the researcher conditions. Participants in the drawing/researcher condition reported more anxiety than did participants in the writing/researcher condition. Also, the drawing/researcher condition resulted in more anxiety than drawing/no evaluation and drawing/peer conditions on both measures. This is interesting, as the writing conditions did not follow the same trend (see Figures 1 & 2).

These intriguing differences between the results for drawing and writing call for
exploration of the nature of those activities. Writing is a common, everyday occurrence in the lives of college students. Students are accustomed to having both peers and authority figures evaluate their writing. They receive criticism in the form of peer editing and professors grading their written responses on a regular basis. Although writing may still induce stress amongst college students, it seems that the commonplace expectation of evaluation decreases the chances that expectation of evaluation from a specific person or group of people would elicit an abnormally large amount of anxiety.

Drawing, however, is not as common in a college setting. Although many young adults claim that they have poor drawing abilities, they may expect that the same would be true of their peers. This could explain why participants expecting peer evaluation would report experiencing less anxiety than those expecting evaluation from the researcher. The researcher’s drawing abilities were unknown to most, if not all, of the participants. However, participants may have been concerned that the researcher would be more negative in evaluations than peers would be.

It is important to note that the generalizability of the results are limited due to the small sample size and a majority of the participants’ statuses as first-year students. The present study operates on the assumption that drawing and writing decreased anxiety from higher levels directly following the math task. It certainly appeared that math task induced anxiety amongst the participants and that their anxiety levels decreased following either drawing or writing, but the procedures did not include a pretest to confirm that anxiety decreased. There is also some concern over the accuracy of self-report anxiety measures. Previous research has shown that concordance between cognitive and somatic aspects of anxiety is limited in self-report measures (Calvo &
Miguel-Tobal, 1998). This study did not include examination of either the STAI-6 or the SUDs, but it should be noted that the STAI-6 includes cognitive and somatic aspects of anxiety, whereas the SUDS does not. It would be beneficial to make use of physiological measures of anxiety along with the self-report measures in future research. The use of physiological measures of anxiety would also provide a way to pretest for anxiety levels without revealing to the participants what concept was being measured.

The present study focused on the basic effects of simple writing and drawing activities on anxiety. While the basic nature of the study may not allow the results to be directly applicable to treatment of anxiety, future research in this subject may prove valuable. Therapists may ask their clients to journal or draw as a short-term coping strategy for dealing with anxiety. However, one must question whether fear of evaluation, by the therapist or by peers in a group therapy setting, would nullify the potential stress-reducing effects. In order to answer this practical question, researchers should aim to design ecologically valid experiments that are longer in duration and include emotional subjects in drawing or writing. The present study may act as a foundational baseline to compare future research in this area.
References


### Table 1

Means and Standard Deviations for STAI-6 and SUDS

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Writing</th>
<th>Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>STAI-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No evaluation</td>
<td>12.05</td>
<td>4.57</td>
</tr>
<tr>
<td>Researcher</td>
<td>12.00</td>
<td>3.38</td>
</tr>
<tr>
<td>Peers</td>
<td>11.91</td>
<td>3.45</td>
</tr>
<tr>
<td>SUDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No evaluation</td>
<td>5.18</td>
<td>3.32</td>
</tr>
<tr>
<td>Researcher</td>
<td>4.48</td>
<td>1.75</td>
</tr>
<tr>
<td>Peers</td>
<td>4.59</td>
<td>2.18</td>
</tr>
</tbody>
</table>

*Note.* Higher numbers indicate higher anxiety.
Figure 1. Mean SUDS Scores. Higher numbers indicate higher anxiety.
Figure 2. Mean STAI-6 scores. Higher numbers indicate higher anxiety.
Appendix

Math Task Questions

1. $2 + 4$
2. $200/25$
3. $364 + 24 - 64$
4. $6 - 2$
5. $12 = 3x + 3$
6. $22 \times 4$
7. $75 - 25$
8. $(4 + 3)(5 - 2)$
9. $67(3 \times 0)$
10. $2,268/7$
11. $5 \times 5$
12. $126/6$
13. $2x = 51 + 5$
14. $11 \times 8 + 12$
15. $(19 - 13)/2$
16. $999 + 2$
17. $2(6x - 7) = 22$
18. $51 - 37$
19. $2x = 8$
20. $4 \times 103$
21. $94 - 3 + 9$
22. $-3 - 15$
23. $40 \times 1.5$
24. $4 + 27 - 3$
25. $8 - 54$