Helping Students through Expressive Writing: Effects of Different Types of Writing Instructions on Break-Up Related Distress, Global Perceived Stress, and Self-Esteem

by Alice E. Veksler & Kory Floyd

Abstract
The present research investigates the effects of various forms of expressive writing on college students' stress and self-esteem. Results of study 1 examining the effects of expressive writing on break-up related stress, and study 2 examining effects on global stress, indicate that participants may benefit more from engaging in a communication-based writing task than from private journaling and, on the whole, all participants appear to benefit from the writing activity. Results of study 2 indicate that expressive writing may also increase self-esteem over time.

KEY WORDS: Expressive Writing, Stress, Self-Esteem, Break-up Distress, Narrative

College is often a time of great stress as individuals deal with a wide range of life stressors including social/interpersonal issues (e.g., family strains), money/financial concerns, and of course, academic pressures (Morrison & O'Connor, 2005; Skowron, Wester, & Azen, 2004). When not properly managed, exposure to these life stressors in college often leads not only to academic failure but also to psychological and physiological illnesses such as depression, anxiety, and immunosuppression (Skowron et al., 2004). Furthermore, evidence suggests that for various reasons, college students may be reluctant to take advantage of traditional resources such as counseling centers to help deal with these issues (Boone et al., 2011). It is therefore incumbent upon the research community to investigate the effectiveness of alternative stress-reduction programs that may improve the quality of life for college students and decrease the effects of stress on health (Morrison & O'Connor, 2005). One

such program, that is both low cost and easily implemented, is the expressive writing paradigm (Pennebaker, 1985). The purpose of this research project is to extend the current body of knowledge concerning the expressive writing paradigm to determine whether this activity can be used as a tool to reduce college students' stress levels. To that end, two controlled experiments were conducted.

Expressive Writing

The expressive writing paradigm focuses on the effects of a structured writing activity on various health outcomes (Pennebaker, 1997). Standard protocol involves having individuals write about a traumatic event or issue of great personal concern for 15-30 minutes at a time on at least three occasions. Initially, writing about a traumatic experience or stressful event was thought to significantly decrease the distress associated with the trauma or event and lead to increased health and healing (Pennebaker,

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1985). Pennebaker's (1985) initial argument was that placing emotion in narrative form has salutary effects, whereas inhibiting emotion causes stress. The driving mechanism underlying the expressive writing paradigm was disclosure (Pennebaker, 1985, 1997; Pennebaker & Seagal, 1999). Pennebaker's early research proposed that writing about a traumatic event serves the *same* function as talking about it with another person, and can be used in the place of actual interaction. Pennebaker (1985) proposed the following propositions to support this contention: (a) Not expressing thoughts and emotions to others about a traumatic event one has experienced leads to behavioral inhibition and intrusive thoughts, (b) short and long-term behavioral inhibition leads to physiological effects (e.g., increased heart rate and blood pressure in the short term, and heart disease, cancer, or ulcers in the long term) due to autonomic changes, and (c) translating these thoughts into language through the act of self-disclosure *or* expressive writing allows the person to reduce the physiological effects associated with behavioral inhibition.

Much research on the expressive writing paradigm conducted by Pennebaker and his colleagues over several decades has been consistent with these postulates (see Frattaroli, 2006). In later years, Pennebaker and his colleagues began to question the notion that simply confronting a trauma and expressing the associated emotions are sufficient for healing. Pennebaker and Francis (1996) argued that the inhibition model cannot account for all of the variance explained by expressive writing, adding that cognitive changes serve an important function as well. Early work in this paradigm predicted that increased use of both emotional and cognitive words would be correlated with greater salutary effects (Pennebaker & Francis, 1996). More recent reviews indicate that the use of cognitive words, particularly causal and insight words such as "because," "know," and "understand," correlate with health improvements more strongly than do emotional words such as "happy" or "sad" (Pennebaker & Graybeal, 2001; Pennebaker, Mehl, & Niederhoffer, 2003). While expressing emotion appears to be beneficial, being able to develop a narrative through the use of cognitive words appears to be even more important.

According to Pennebaker and Graybeal (2001), people alter self-perceptions through language. By engaging in expressive writing, people are able to better understand themselves and the trauma, thus putting the emotion into words changes the way people think about the trauma (Pennebaker & Seagal, 1999) and also how the trauma is processed and stored in the brain. Therefore, another proposed explanatory mechanism for the salutary effects of narrative is that traumatic emotions are complex and difficult to understand, but translating them into language serves as a way to organize these thoughts (Lyubomisrky, Sousa, & Dickerhoof, 2006; Pennebaker & Seagal, 1999). Therefore, above and beyond simply reducing the effect of inhibition, writing about the trauma leads to mindfulness and provides insight into the event which, in turn, decreases distress (Brody & Park, 2004; Pennebaker & Seagal, 1999). Most reviews investigating the mechanisms underlying expressive writing have focused on cognitive change, decreased emotional inhibition, increased emotional processing, exposure to trauma, and self-regulation to explain the benefits of expressive writing (Frattaroli, 2006; Sloan & Marx, 2004). All of these are intrapersonal processes, begging the question of whether expressive writing is tantamount to an asocial, non-communicative activity.

The Role of Communication

Some scholars have proposed that the expressive writing manipulation in a laboratory setting (per Pennebaker's protocol) imposes an implicit audience. This is either because the research participant creates an imaginary audience (Brody & Park, 2004), or because he/she anticipates that the researchers will be reading his/her writing, making the act of expressive writing a true act of disclosure as opposed to an intrapersonal activity analogous to journaling (Radcliffe, Lumley, Kendall, Stevenson, & Beltran, 2010). Furthermore, research supports the notion that writing with an audience in mind differs from asocial disclosure (Brody & Park, 2004). For example, expressive writing with the intent to share that writing (as part of a therapist-led, clinical intervention) produces decreases in post-traumatic stress disorder symptoms (Resick & Schnicke, 1992; Snyder, Gordon, & Baucom, 2004), depressive symptoms, state anger, and negative thoughts about one's partner (Snyder et al., 2004). More recent research found that participants who simply *anticipated* sharing their expressive writing samples had significantly lower levels of depression and self-reports of physical symptoms (such as runny nose or abdominal pain) compared to those

who were informed that their writing samples were to be kept private and that they were to destroy them if they wished (Radcliffe et al., 2010).

One possible explanation is that narratives constructed for an intended audience may be more complete, organized, or thorough than those not meant to be shared with another person (Kunkel, 2000). This would suggest that having an intended audience for one's written disclosures plays an important role in the beneficial outcomes of expressive writing. Unfortunately, only a few studies to date have examined the difference between private expressive writing and disclosive writing. Using meta-analysis, Frattaroli (2006) concluded that there was insufficient evidence to draw any conclusions about the effect of an actual or anticipated audience. Provided this information is lacking and that expressive writing continues to be used therapeutically, investigating how to best implement the expressive writing activity is a worthy endeavor.

Thus, the present research has several aims. First, we aim to replicate and extend the findings of prior research to determine whether or not anticipating an audience would confer greater health benefits (i.e., reduction in self-reported stress) than would private expressive writing. Second, we aim to compare the language generated by participants in both conditions to ascertain whether communicative versus private expressive writing differs linguistically. Finally, we aim to examine these effects across a variety of psychological stressors to determine whether expressive writing is an effective tool for helping college students deal with stress. Given these aims, the following hypothesis and research question are extended:

H$_1$: A communication-based expressive writing task produces a greater reduction in psychological stress than does a private expressive writing task.

RQ$_1$: Is there a difference in the linguistic content of communicative versus private expressive writing?

STUDY 1

The first study examined the effects of expressive writing in a restricted context (i.e., limiting participants' focus to one specific stressor). Relational dissolution was selected as the primary stressor under investigation in study 1 because it is a stressor that many college students experience, and because it is likely to be perceived as a social stressor that may significantly impact psychological functioning (Boals & Klein, 2005; Frazier & Cook, 1993).

Method

Participants. Participants were solicited via university listservs and by announcing the study in undergraduate communication courses. Only individuals who *currently* felt some level of distress or emotional pain as a result of their most recent romantic breakup were recruited.

Inclusionary and exclusionary criteria. Frazier and Cook's (1993) self-report measure of dissolution related distress was utilized to screen potential participants. This measure assesses break-up related distress using 5-point scales (1 = not all, 5 = extremely) and asks questions such as "how stressful was the breakup for you?" Students scoring at or above the midpoint, were deemed sufficiently distressed to participate. Once enrolled in the full study, students were asked to complete surveys on three occasions; the day prior to the day of their first lab writing session, the day immediately following the last lab session, and once again two weeks later. Students who completed surveys on at least two of these three collections were included in the final sample yielding a sample size of *n* = 38. The sample was primarily female (*n* = 31) and all participants were over the age of 18. No other demographic data were collected.

Procedure. Qualified students were invited to participate in the study via email and instructed to visit the research laboratory at which point they were randomly assigned to conditions and scheduled for their three writing sessions. Self-report data were collected online. After completing their final survey students returned to the lab to be debriefed about the project.

Instrumentation. Self-reported stress associated with one's breakup was assessed at each time point using the Sprecher, Felmlee, Metts, Fehr, and Vanni (1998) measure of positive and negative emotions associated with break-ups, measured on a 7-point scale with higher scores indicating feeling greater amounts of a given emotion. Whereas Sprecher et al. (1998) created an overall distress measure, we elected to keep the negative and positive emotions separate from one another. Recent evidence suggests that combining negative and positive emotion into a single score incorrectly conceptualizes emotion as a bipolar construct (Zautra, Affleck, Tennen, Reich, & Davis, 2005) though the choice to keep the dimensions separate may have resulted in lower than desirable reliabilities for the positive emotion scales.

Alpha reliabilities for each scale were as follows: time 1 positive emotions α = .69; time 1 negative emotions α = .88; time 2 positive emotions α = .69; time 2 negative emotions α = .94; time 3 positive emotions α = .60; and time 3 negative emotions α = .92, suggesting acceptable reliabilities for the 5-item positive emotion scale and high reliabilities for the 9-item negative emotion scale. At each time point, students were also asked a single question to determine their global assessment of initial distress and one question to determine a global assessment of current distress associated with the breakup (also on a 7-point scale) as was done by Sprecher et al. (1998).

Manipulation. Prior to the start of the laboratory sessions, unlabeled files were created containing a set of writing instructions specific to one of the three conditions manipulating the level of disclosure. The *share* condition informed students that their writing would be kept confidential but would be read by the researcher and provided to the student at the end of the study so that the student could share it with one's former relational partner. The *confidential* condition was also interpersonal (read by the researcher) but not shared with anyone else. The *private* condition was intrapersonal in nature and the instructions indicated that nobody (not even the researcher) would be reading what the student wrote. The research was double blind. Students were scheduled for three lab sessions over the course of seven days. At the start of each writing session, students were seated at a computer with a blank word processing document open on the screen and were instructed to spend 20 minutes engaging in the writing task outlined in their instructions. Each of the three sessions was identical. Permission to analyze the private writing samples was obtained from those in the private group during the debriefing session. All of the students in the private group provided permission.

Results

Hypothesis one predicted that individuals would report greater decreases in psychological distress associated with their breakups when engaging in interpersonal rather than private expressive writing. To test this hypothesis, difference scores were calculated for global perceptions of former versus current distress at each point in time (e.g., "Overall how upset were you after the breakup?" [assessed at time 2] – "Overall how upset are you now about the breakup?"

[assessed at time 2] = perception of change in global distress at time 2). A 3 x 3 mixed-model analysis of variance (ANOVA) on perception of change in global distress (measured on a scale of 1-7, with higher scores indicating greater differences in distress) was conducted. Condition (Confidential, Private, and Share) was the between-subjects factor and time (day before first writing task, day after last writing task, and two weeks after last writing task) was the within-subjects factor (see Table 1). The results showed no significant interaction for condition x time, $F(4, 40)$ = 2.68, p = .05, η^2 = .21. While this finding was not significant using the criterion of an α error probability of 0.05, the effect size was large thus the low sample size could have contributed to a lack of power. As a result, additional investigation into the effect of disclosure on stress reduction over time appears warranted. The main effect for time was not significant, $F(2, 40)$ = 0.28 p = .73, η^2 = .01.

The main effect for condition was significant, $F(2, 20)$ = 5.79, p = .01, η^2 = .58, suggesting partial support for the hypothesis. The examination of the means indicated that those who were instructed that their writing would be completely private experienced less change in global upset than did the confidential and share groups (i.e., the communication-based conditions). Pairwise comparisons (with a Bonferroni correction applied to account for familywise error) indicated that only the difference between the private and the confidential conditions was statistically significant ($p < .01$). Nevertheless, these results suggest that there may indeed be differences between the perceived effectiveness of a communication-based versus private expressive writing task. The size of this effect (η^2 = .58) is particularly noteworthy.

The first hypothesis was also tested by assessing students' self-reports of positive and negative emotions (as related to the breakup) at three points in time. A 3 x 3 mixed-model ANOVA on negative emotion (measured on a scale of 1-7, with higher scores indicating higher levels of that emotion) was conducted. Condition was the between-subjects factor and time was the within-subjects factor (see Table 1). The results showed no significant interaction for condition x time, $F(4, 36)$ = 0.37, p = .79, η^2 = .03. The main effect for condition was also not significant, $F(2, 18)$ = 0.99, p = .39, η^2 = .10. However, the main effect for time was significant, $F(2, 36)$ = 8.85 $p < .01$, η^2 =

.32, and the examination of the means suggested that levels of negative emotions decreased as a function of time. Pairwise comparisons (with a Bonferroni correction applied) indicated that though the difference between time 1 and time 2 was not significant, there was a significant difference between time 2 negative emotion and time 3 negative emotion, $p = .01$. There was also a significant difference from time 1 to time 3, $p < .01$ suggesting that the effect of expressive writing on emotion takes time to emerge.

A 3 x 3 mixed ANOVA on positive emotion (measured on a scale of 1-7, with higher scores indicating higher levels of that emotion) was also conducted. Participant condition and time were again entered as the independent variables (see Table 1). The results showed no significant interaction for condition x time, $F (4, 38) = 0.67$, $p = .62$, $\eta^2 = .05$. The main effect for condition was also not significant, $F (2, 19) = 0.97$, $p = .39$, $\eta^2 = .10$. The main effect for time was significant $F (2, 38) = 5.64$, $p < .01$, $\eta^2 = .22$, and an examination of the means suggested that levels of positive emotions increased as a function of time. Pairwise comparisons (with a Bonferroni correction applied) indicated that though the difference between time 1 and time 2 was not significant, there was a significant difference between time 2 positive emotion and time 3 positive emotion, $p < .01$. There was also a significant difference from time 1 to time 3, $p < .02$, again suggesting that the effect takes time to emerge.

The linguistic inquiry and word count (LIWC) 2007 program (Pennebaker, Booth, & Francis, 2007) was used to analyze the narratives to answer the research question. This software analyzes the language of a given expressive writing sample for total number of words, as well as for frequency of words of theoretic interest. The five word categories under investigation were positive emotion words, negative emotion words, cognitive words, insight words, and causal words. All three writing samples for each participant were analyzed simultaneously and the output for each word category is the percentage of those types of words in the text. ANOVA results indicated that there were no significant differences between groups for any of the word categories (see Table 2).

Discussion

Results of study 1 indicated that different versions of the expressive writing intervention may yield different magnitudes of recovery from distress. Specifically, the results suggest that while any type of expressive writing may have a healing effect, private writing was less effective (i.e., led to a smaller reduction in distress) than was writing that was communicative. This adds to past research on the effects of disclosure. For example, Kunkel (2000) concluded that disclosure was moderately more advantageous than private writing, a finding we were able to replicate. Furthermore, all participants experienced a reduction in negative emotions and an increase in positive emotions. While the effects of writing condition on emotions were non-significant, the means were in predicted directions (the effects were smaller in the private group) and lack of significance may have been due to low power. Consistent with recent research (Primeau, Servaty-Seib, & Enersen, 2013), these results indicate that at least in the context of college students who are distressed about a romantic break-up, expressive writing is beneficial and different sets of instructions may have different effects. There were no significant findings for linguistic content.

STUDY 2

Study 2 was designed to address the lack of a control group in study 1, and to increase the scope of the overall project. To that end, study 2 focused on global stress rather than on a single stressor as was done in study 1. We also added an additional dependent variable to investigate whether expressive writing influenced other aspects of psychological functioning beyond self-reports of stress. Research suggests that self-esteem may play a role in one's ability to manage stress competently (Cohen & McKay, 1984; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). According to Cohen and McKay's (1984) explanation of the stress buffering hypothesis, the psychological stress perspective is that people who perceive that they have the ability to adequately cope with a potential stressor will be "buffered" against the negative effects associated with encountering a given stressor. Cohen and McKay (1984) argue that one of the ways that social support serves as a stress buffer is by raising one's self-esteem. This is particularly relevant in the context of the present study because the types of stressful events that college students tend to experience are often those that elicit the need for self-esteem (Cohen & McKay, 1984). Provided that self-esteem functions to protect an individual against the anxieties associated with daily life (Pyszczynski et al., 2004), it is expected that individuals with higher

self-esteem will report lower amounts of perceived stress. While social support (in general) often leads to increased self-esteem, what is not known is whether self-esteem can also be influenced by expressive writing. Since the scope of study 2 has been expanded to allow writing about a broader range of anxieties, we were interested to see if self-esteem would be affected by expressive writing in the same way as stress is. As a result, the following hypotheses and research questions were examined in study 2:

H_1: A communication-based expressive writing task produces a greater reduction in psychological stress than does a private expressive writing task.
H_2: Higher self-esteem is associated with lower levels of perceived stress.
RQ_1: Does the expressive writing task influence self-esteem over time?
RQ_2: Is there a difference in the linguistic content of communication-based versus private expressive writing?

Method

Although students still came to the laboratory to complete the writing task, all other study-related communication was conducted via email. Potential participants filled out an initial online survey that also served as their time 1 (baseline) assessment. We also used new measures and a modified manipulation. Otherwise, the method was identical to that used in study 1 except that there was no separate screening prior to enrollment.

Participants. To address concerns over power, an a-priori power analysis using the G*Power 3 software program was conducted to determine the necessary sample size (Faul, Erdfelder, Lang, & Buchner, 2007). Power was set to .90. Results indicated that a sample of $n = 48$ ($n = 12$ participants per condition) would be needed to be able to detect a 6% effect size with an α error probability of 0.05. The only screening criterion in study 2 was that students were able to find time for all of the laboratory sessions, and would have email access to complete the follow-up surveys. Of the 82 eligible, 38 were excluded because they declined the invitation to participate or failed to provide an email address leaving 44 participants who were randomized to conditions. One person failed to complete the task and was subsequently excluded. Most of the participants were female ($n = 28$), and ages ranged from 19 to 35 years. No other demographic data were collected.

Instrumentation. The 14-item perceived stress scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) was used to assess perceptions of global stress for the preceding week. The original PSS consists of 14 questions such as "In the last month, how often have you felt nervous and 'stressed?'" measured on a five-point scale ranging from 0 = never to 4 = very often. Because the three assessments occurred within weeks of one another, the instructions were modified to reflect responses based on stress over the course of the last week (rather than over the course of the last month). There is no reason to believe that shortening the recall time from one month to one week would affect the psychometric properties of the measure (Cohen, 2009). To keep the values of the outcome measure in the same range as the individual items and to account for missing data, after reverse-coding the positively worded items, an average PSS score was computed by dividing an individual's total score by the number of items that person responded to on the measure. In the present study, the PSS yielded alpha reliabilities of $\alpha = .78$, $\alpha = .81$, and $\alpha = .85$, for times 1, 2, and 3, respectively.

Participants also completed the Rosenberg (1989) 10-item measure of self-esteem at all three time periods. This measure asks participants to report the extent to which they agree with statements such as "On the whole, I am satisfied with myself" on a four-point scale wherein 0 = strongly agree and 3 = strongly disagree. As with the PSS, scores were averaged. Reliabilities for the self-esteem measure were $\alpha = .89$, $\alpha = .89$, and $\alpha = .91$, for times 1, 2, and 3, respectively.

As in study 1, the LIWC software was again utilized. Additionally, the first author and a research assistant independently coded the writing samples to identify the main topics addressed by students in their writing. Each coder read each writing sample and listed the main topics present in that sample. Topic codes were assigned to a writing sample if coders agreed on that topic. As a result, each sample received between one and four topic codes (with an average of 3.13 topics present per writing sample). The frequencies of each topic by condition are summarized in Table 3.

Manipulation. The first modification to the overall design of the manipulation concerns the creation of equivalent conditions that accurately reflect the aim of the project. The *share* condition was deleted since

there were no significant differences between the share group and the other two groups in study 1. In the expressive group, participants were free to write about anything that was currently stressful for them. A new comparison group was also added that instructed students to write about innocuous topics rather than about life stressors. This new group was intended to function as a control condition. As a result, the present study is a 2 x 2 fully crossed design with writing (Expressive vs. Innocuous) and level of disclosure (Interpersonal vs. Private) as the independent variables. A manipulation check was added at the end of the final survey to ascertain whether or not the instructions convinced the participants in the private group that nobody would see their writing samples. Unfortunately, all but two people indicated that they thought that someone would read what they wrote, regardless of which set of instructions they received. Although this is a disappointing result, it is possible that the different instructions still subconsciously influenced the content and/or effects of the writing task.

Results

To test hypothesis one, a 2 x 2 x 3 mixed-model ANOVA on perceived stress was conducted. Writing (Expressive and Innocuous), and level of disclosure (Interpersonal and Private), were the between-subjects factors and time was the within-subjects factor (see Table 4). The results showed no significant interactions for writing x disclosure x time, $F(2, 66) = .64$, $p = .52$, $\eta^2 = .01$, writing x time, $F(2, 66) = .47$, $p = .61$, $\eta^2 = .01$, disclosure x time, $F(2, 66) = .15$, $p = .53$, $\eta^2 = .003$, or writing x disclosure $F(1, 33) = .30$, $p = .59$, $\eta^2 = .01$. The main effect for time was significant, and yielded a strong effect size, $F(2, 66) = 10.01$, $p < .001$, $\eta^2 = .23$. Pairwise comparisons (with a Bonferroni correction applied) indicated that although the difference between time 1 ($M = 2.04$, $SD = .52$) and time 2 ($M = 2.05$, $SD = .49$) was nonsignificant, there was a significant difference between time 2 and time 3 ($M = 1.70$, $SD = .42$), $p < .01$. There was also a significant difference from time 1 to time 3, $p < .01$, suggesting that perceived stress does decrease over time, but this effect takes time to emerge. There were no main effects for writing, $F(1, 33) = .64$, $p = .43$, $\eta^2 = .02$ or for disclosure, $F(1, 33) = .18$, $p = .67$, $\eta^2 = .01$. Taken together, these results do not support hypothesis one.

To test the second hypothesis, correlations between self-esteem and PSS at all three time points were examined. Whereas stress and self-esteem had strong inverse correlations with each other at time 1, $r(79) = -.41$, $p < .001$, and time 2, $r(39) = -.58$, $p < .001$, the correlation with self-esteem was nonsignificant at time 3, $r(35) = -.21$, $p = .21$. It is possible that stress and self-esteem covary during times of stress, but once stress decreases, other factors become more salient to one's perception of one's own self-esteem.

To examine whether people who initially differed on self-esteem differed in their assessment of perceived stress over time, a 2 x 3 mixed-model ANOVA on perceived stress was conducted. Participants' initial (time 1) score on self-esteem was dichotomized into low and high categories using a median split. Therefore, self-esteem (low and high) was entered as the between-subjects factor and time was entered as the within-subjects factor (see Table 4). The results showed no significant interaction for self-esteem x time, $F(2, 68) = 1.36$, $p = .26$, $\eta^2 = .03$. There was a strong main effect for self-esteem $F(1, 34) = 32.03$, $p < .001$, $\eta^2 = .49$. An examination of the means (see Table 4) indicates that individuals who had high self-esteem at time 1, had significantly lower levels of perceived stress than did those with low self-esteem. Taken together, these findings provide partial support for hypothesis two.

To test the first research question, a 2 x 2 x 3 mixed-model ANOVA on self-esteem was conducted. Writing and disclosure were entered as the between-subjects factors and time was entered as the within-subjects factor (see Table 4). The results showed no significant interactions for writing x disclosure x time, $F(2, 66) = .01$, $p = .99$, $\eta^2 = .00$, writing x time, $F(2, 66) = .64$, $p = .53$, $\eta^2 = .02$, disclosure x time, $F(2, 66) = 2.43$ $p = .10$, $\eta^2 = .06$, or writing x disclosure $F(1, 33) = .73$, $p = .40$, $\eta^2 = .02$. The main effect for time was significant, $F(2, 66) = 3.87$, $p = .03$, $\eta^2 = .10$. Pairwise comparisons (with a Bonferroni correction applied) indicated that only the difference between time 1 ($M = 2.28$, $SD = .41$) and time 3 ($M = 2.37$, $SD = .47$) was significant, $p = .047$. There were no main effects for writing, $F(1, 33) = 1.76$, $p = .19$, $\eta^2 = .05$, or for disclosure, $F(1, 33) = .69$, $p = .41$, $\eta^2 = .02$.

To examine the second research question, the LIWC software was used to analyze the writing samples produced by those who provided written permission to have their samples analyzed (6 did not). A series of two-way ANOVAs were conducted with

writing and disclosure as the independent variables, and word type as the dependent variables. The results (see Table 5) indicated that there were no significant writing by disclosure interactions for any of the dependent variables. The main effects for writing were significant for all word types, but the main effects for disclosure were not. An examination of the means for writing conditions (see Table 6) indicates that individuals in the expressive condition had significantly higher percentages of each word type in their samples than did those in the innocuous condition.

To extend research question two, correlations were computed to test whether linguistic content was related to changes in perceived stress or self-esteem. A difference score for perceived stress was computed by subtracting time 3 follow-up scores from baseline scores resulting in a value representing the decrease in perceived stress over time. A difference score was also computed for self-esteem in the same way. Results indicate that the correlations between word types and changes in perceived stress or self-esteem were all small and nonsignificant (see Table 7 for a full correlation matrix).

Discussion

These results suggest that structured writing of any kind may decrease perceptions of global stress, and increase self-esteem over time for college students. While expressive writing has been found to influence multiple psychological variables such as major depressive disorder (Krpan et al., 2013), the finding that expressive writing may have an effect on self-esteem is, to our knowledge, a novel contribution to the body of research on expressive writing. Additionally, expressive writing may influence self-esteem and perceived stress independently of one another.

While no conclusions can be drawn about the linguistic differences between communication-based versus private writing, the results of the LIWC analyses indicate that students who engage in expressive (as opposed to innocuous writing) use more cognitive, causal, insight, and emotion words. Surprisingly, and contrary to prior research (see Pennebaker et al., 2003), the use of these types of words was unrelated to reductions in stress or increases in self-esteem. Qualitative analyses of the writing samples in the two conditions indicate that participants in the innocuous condition were not discussing deeply emotional topics requiring much cognitive processing, thus explain-

ing the group differences in word use. Nevertheless, these individuals were still discussing personally relevant and meaningful topics (e.g., upcoming exams, a current argument with a friend or co-worker, etc.). While these topics may not be as deeply traumatic as those discussed in the expressive condition, they may have been more easily resolvable within the time frame of the study. As a result, it is possible that the lack of group differences on stress reduction and self-esteem may be a result of the fact that individuals benefitted in different ways from the writing activity. For the expressive group, their problems may have remained unresolved, but the writing activity may have had a cathartic effect, resulting in less stress and improved self-esteem. On the other hand, the participants in the innocuous group may have used the writing activity as an opportunity to resolve an immediately pressing problem, which benefited them in the short term. Because the reasons for the effects observed were not directly assessed, these conclusions remain largely speculative.

GENERAL DISCUSSION

Perceived Stress

Results of both studies indicate that perceived stress (break-up related stress in study 1, and global stress in study 2) decreases over time for participants who engage in an expressive writing activity. One explanation is that this effect is simply a function of stress decreasing naturally over time (rather than reflecting an effect of expressive writing). On the other hand, the effect of time yielded a strong effect size suggesting that the effect of expressive writing may be beneficial regardless of the prompt. All participants in study 1 were discussing a stressful event and many participants in the innocuous groups in study 2 addressed issues that are likely to be stressful for college students (see Table 3). Therefore, we suspect that the effect of time is due in part to the beneficial effects of writing. Anecdotal evidence provides some support for this contention. As part of the debriefing process, many of the students in both studies indicated that they enjoyed the laboratory activity and/or "felt much better" as a result of engaging in the writing task. Such feedback has been reported by other scholars as well (Krpan et al., 2013). Because this feedback was unsolicited, and no statistics regarding these participants' writing conditions are available, conclusions based on this information are purely speculative.

The use of the PSS as the measure of stress in study 2 should be noted. Because the PSS asks about global stress rather than stress specific to the stressor addressed during the writing activity, it is impossible to isolate the effect the writing activity may have had on the specific stressor being addressed by participants. Results of study 1 (in which the outcome measures were stressor-specific) suggested that the effect of writing did have a strong and significant effect on decreasing negative emotions associated with that stressor, and increasing positive emotions associated with that stressor. In light of this finding, it is likely that expressive writing explains at least some of the variance in decreased stress over time in both studies.

Self-Esteem

In study 2, we predicted that higher self-esteem would be associated with lower levels of perceived stress. Indeed, participants who had high levels of self-esteem at time 1 had significantly lower levels of stress than did those who had low levels of self-esteem at time 1. The magnitude of this effect (49%) provides strong support for this hypothesis. While the strong relationship between stress and self-esteem is not a novel finding, it is interesting to note that this relationship is not nearly as strong when stress levels decline. To further investigate the relationship between writing, self-esteem, and stress, the first research question was extended to examine whether the writing activity also influenced self-esteem. While there were no effects of the writing activity on self-esteem by writing condition or disclosure, there was a moderate main effect on time. These results suggest some preliminary support for the contention that engaging in a writing activity may increase self-esteem over time. Taking the topics discussed into consideration, it is reasonable to suggest that any form of personally relevant writing may serve to increase self-esteem over time. Interestingly, although stress decreased from baseline to time 3, and self-esteem increased from baseline to time 3, the relationship between stress and self-esteem at time 3 was nonsignificant. Taken together, these findings suggest that the increases in self-esteem that emerged in the study may not be a function of decreased stress levels, supporting the line of reasoning that stress-reduction is but one of many benefits of increased self-esteem (Pyszczynski et al., 2004). This finding should continue to be examined in future research.

Linguistic Analyses

Based on the LIWC results, there were no group differences in the linguistic content of the writing samples based on disclosure condition in either study. Thus, the question regarding the effect of an audience on linguistic content remains unanswered. While there were no differences on the disclosure condition, results of study 2 indicate that those who were in the expressive writing conditions used more positive emotion words, negative emotion words, cognitive words, insight words, and causal words than did individuals in the innocuous group. This finding is particularly interesting provided that these individuals did not differ on self-esteem or stress over time. An examination of the correlations confirmed that linguistic content was unrelated to changes in stress or self-esteem in this data set. A possible explanation is that the topics that innocuous group participants addressed, required less cognitive or emotional processing, resulting in fewer instances of those words. Nevertheless, the topics addressed by the individuals in these groups may have still reduced stress and increased self-esteem. The fact that most of the individuals in the innocuous groups wrote about personally relevant topics may explain why the writing task was beneficial for these individuals.

Limitations

Despite the fact that participants were offered course credit, monetary compensation, and/or raffle prizes as incentives, and that collectively, the recruitment period for both studies was open for almost two full years, the total number of participants was still lower than we would have liked, which likely limited our ability to detect effects of smaller sizes. This is a limitation that cannot be ignored. Additionally, there was no manipulation check in study 1, and results of the manipulation check in study 2 suggest that most individuals in the private condition were unconvinced that their writing would never be read. Radcliffe et al. (2010) sacrificed the ability to analyze private samples in order to ensure the private condition was properly induced and found significant group differences for the disclosure condition (private versus shared) suggesting that there are group differences to be found. In light of the issues inducing the private condition in the present research, there is a clear need for more innovative designs that serve to induce the perception of privacy *and* allow for the analysis of all writing samples.

CONCLUSION

Expressive writing has a long history of being used in conjunction with traditional counseling/ therapy (Adams, 2013). Taken together, the results of our studies indicate that expressive writing may provide beneficial effects for college students outside of a therapeutic/clinical setting. Furthermore, different types of writing instructions may influence the magnitude of the effect of the writing activity. Not all individuals may benefit equally, and it is possible that those who dislike, or are uncomfortable with writing, may not benefit at all. Furthermore, due to the limitations noted above, the conclusions we draw are preliminary in nature and need to be confirmed in future studies. Nevertheless, the implication of these studies is that the expressive writing activity may decrease stress and increase self-esteem. It also does not appear to increase distress for those who choose to use it. Furthermore, this activity may be particularly useful for students who are reluctant to seek traditional counseling (Boone et al., 2011). Provided that mental health treatment is often underutilized in college settings (Boone et al., 2011), and that "alternative methods of support" for those in need of mental health services are often necessary, the potential benefits of suggesting writing as an option for college students dealing with stress should not be overlooked.

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Table 1
Study 1 Means and Standard Deviations

Condition	Mean change in Distress			SD			Sample size
	T1	T2	T3	T1	T2	T3	
Confidential	3.11	3.67	3.56	1.17	1.32	1.42	9
Private	2.63	2.25	0.88	1.19	1.39	1.89	8
Share	2.83	3.00	3.67	0.75	1.67	1.37	6
Condition	Mean negative emotion score			SD			Sample size
	T1	T2	T3	T1	T2	T3	
Confidential	4.40	3.58	3.25	1.15	1.61	1.63	8
Private	3.68	3.43	2.92	1.97	1.74	1.38	7
Share	3.21	2.89	2.19	1.06	0.70	0.99	6
Condition	Mean positive emotion score			SD			Sample size
	T1	T2	T3	T1	T2	T3	
Confidential	3.15	3.33	3.93	1.12	1.04	0.98	8
Private	3.03	2.93	3.23	1.25	0.78	0.61	8
Share	3.33	3.33	4.30	1.52	1.09	0.33	6

Note. Higher values indicate greater levels of change. T1 = day prior to first writing task, T2 = day after last writing task, T3 = Two weeks after last writing task.

Table 2
Study 1 ANOVA for Word Category

Word category	df	F	η²	p
Positive emotion	2, 35	2.05	.10	.14
Negative emotion	2, 35	.94	.05	.40
Cognitive	2, 35	.32	.02	.73
Insight	2, 35	1.92	.10	.16
Causal	2, 35	.53	.03	.59

Table 3
Study 2 Writing Sample Topics and Frequencies by Condition

	IP/Exp	Private/Exp	IP/Innoc	Private/Innoc
Weekend plans/Plans for the day/Events for the last 24 hrs			18	22
Life goals/Future plans	4	4	5	1
Financial troubles	4	4	2	1
Family troubles/concerns	8	7	1	1
Moving/Relocating				1
School/Academic stress	2	6	9	8
Work stress			4	3
Romantic relationship problems	4	5	0	4
Outlook/Insight on self	3	8	1	2
Room/House decor			5	7
Loss of friends/Friend conflict	6	5	2	5
Misc. (e.g., racism, religion, politics, sex)	1	3	2	1

Note. "IP" indicates interpersonal writing, "Exp" indicates expressive writing, and "Innoc" indicates innocuous writing.

Table 4

Study 2 Means and Standard Deviations

Condition	Average PSS			SD			Sample size
	T1	T2	T3	T1	T2	T3	
Interpersonal/Expressive	1.95	2.19	1.69	.61	.33	.56	7
Private/Expressive	1.92	1.89	1.65	.42	.38	.38	10
Interpersonal/Innocuous	2.13	2.04	1.75	.67	.44	.47	8
Private/Innocuous	2.14	2.12	1.71	.47	.65	.39	12
Initial Self-Esteem	Average PSS			SD			Sample size
	T1	T2	T3	T1	T2	T3	
Low	2.32	2.35	1.84	.53	.48	.34	17
High	1.75	1.77	1.51	.30	.31	.37	19
Condition	Average Self-Esteem			SD			Sample size
	T1	T2	T3	T1	T2	T3	
Interpersonal/Expressive	2.36	2.43	2.59	.18	.34	.35	6
Private/Expressive	2.44	2.47	2.48	.42	.43	.38	10
Interpersonal/Innocuous	2.23	2.43	2.47	.31	.45	.40	8
Private/Innocuous	2.13	2.21	2.13	.50	.48	.55	13

Note. Higher values indicate greater stress. T1 = day prior to first writing task, T2 = day after last writing task, T3 = Two weeks after last writing task.

Table 5

Study 2 ANOVA Results for Word Type

Word category	df	F	η²	p
		Writing x Condition		
Positive emotion	1, 31	.44	.01	.51
Negative emotion	1, 31	.14	.002	.72
Cognitive	1, 31	.23	.003	.63
Insight	1, 31	.01	.0001	.92
Causal	1, 31	.47	.01	.50
		Main Effects for Writing		
Positive emotion	1, 31	7.09	.17	.01
Negative emotion	1, 31	48.29	.60	<.001
Cognitive	1, 31	56.45	.64	<.001
Insight	1, 31	55.65	.63	<.001
Causal	1, 31	11.79	.27	.002
		Main Effects for Disclosure		
Positive emotion	1, 31	3.28	.08	.08
Negative emotion	1, 31	1.59	.02	.22
Cognitive	1, 31	0	n/a	.99
Insight	1, 31	2.05	.02	.16
Causal	1, 31	1.31	.03	.26

Table 6

Study 2 Means and Standard Deviations for Word Type by Writing Condition

	Expressive		Innocuous	
	M	*SD*	*M*	*SD*
Positive Emotion	3.73	.98	2.89	.91
Negative Emotion	2.37	.61	1.00	.55
Cognitive	20.39	2.00	15.12	1.97
Insight	3.04	.71	1.38	.61
Causal	1.92	.42	1.40	.44

Table 7

Study 2 Correlations for Word Type and Change in PSS and Self-Esteem

	PSS	SE	Positive Emotion	Negative Emotion	Cognitive	Insight	Causal
PSS	-						
SE	.17	-					
Pos. Emotion	-.03	-.18	-				
Neg. Emotion	-.12	-.01	.49*	-			
Cognitive	.05	-.22	.63*	.72*	-		
Insight	-.11	-.28	.55*	.72*	.86*	-	
Causal	-.10	-.15	.26	.55*	.51*	.45*	-

Note. PSS = decrease in perceived stress from time 1 to time 3, SE = increase in self-esteem from time 1 to time 3.

* $p < .0$