

EXPRESSIVE WRITING, RELATIONSHIPS, AND HEALTH

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This work is dedicated to my mother, Nohelia, and to my father, Andrew, for embedding in me the importance of education and for supporting me in my decision to pursue my doctorate.

I also dedicate this to my husband, Brent Loewen, for his strong emotional support throughout the completion of this endeavor, and for his willingness to be part of a commuter marriage, between Texas and Missouri, for four years, so that I might follow my dreams.

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Abstract

The role of expressive writing in social functioning is investigated; results extend findings regarding benefits of writing about personally significant topics (Pennebaker & Beall, 1986; King, 2001; Niederhoffer & Pennebaker, 2002). Couples ($N = 93$) in romantic relationships wrote about falling in love, trauma, or a control. Implications for health, well-being, and relationship quality were assessed. Writing about love or trauma led to enhanced interactions with partners for one week following, assessed with experience sampling methodology. Writing about love, and having less critical interactions, each led to enhanced life satisfaction 2.5 months later. This effect for interaction quality reduced the direct effect of the love condition on satisfaction. Having lower pretest love scores, in the love condition, marginally predicted break-ups.

Introduction

Among the many goods of life (e.g., Ryff & Singer, 1998a; King, Eells, & Burton, 2004), health, happiness, and warm relations clearly have a privileged place (e.g., King & Broyles, 1997). A wealth of empirical studies have shown that expressive (i.e., self-focused, introspective) writing beneficially influences people's physical health and subjective well-being (SWB). However, the exact mechanisms driving these effects have yet to be fully explained. The present investigation examines two issues with regard to expressive writing. First, does writing have benefits for social functioning, as well as health and SWB? Second, is it possible that the effects of writing on health and well-being might be explained by these potential social benefits?

There is no question that quality relationships affect one's health and SWB. The role of social functioning in health and SWB is well-documented in research on loneliness, social support, and the affective benefits of marriage (e.g., Hawkey & Cacioppo, 2003; Cohen, S., 1988; Myers, 1992). The present study will examine a proposed model that expressive writing gives individuals an opportunity to infuse their lives with meaning, by focusing on close interpersonal relationships, thereby creating a more coherent self. Relationships with close others are a primary source of meaning in life and are instrumental in constructing an optimal self.

More specifically, the present study tested a model (see Figure 1) that integrates three relevant literatures. Prior to formally introducing the details of the model, it may be helpful to briefly summarize these three literatures. The first of these areas is the

expressive writing paradigm which provides the general framework. Second, the vast work on the importance of social networks is acknowledged. Third, the interpersonal process model of intimacy (Reis & Shaver, 1988; Laurenceau, Feldman Barrett, & Pietromonaco, 1998) will provide a foundation for understanding how relationship quality may be affected.

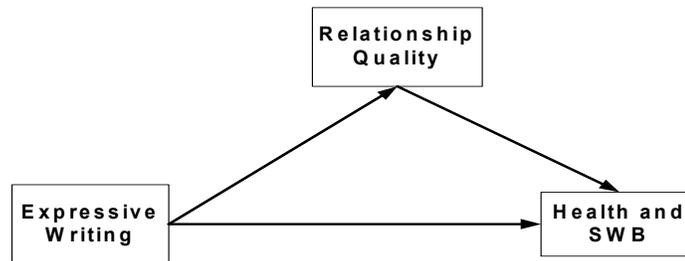


Figure 1. Proposed model.

The Power of Expressive Writing

The beneficial effects of expressive writing on health and SWB have been substantiated by an extensive empirical literature (Smyth, 1998). Writing about a traumatic experience has been shown to improve health (e.g., Pennebaker & Beall, 1986; Lepore & Greenberg, 2002), immune functioning (e.g., Petrie, Booth, Pennebaker, & Davison, 1995), and to lower levels of skin conductance -- a marker of chronic arousal of the sympathetic nervous system (e.g., Pennebaker, Hughes, & O'Heeron, 1987). SWB (e.g., King, 2001), adjustment to life transitions (e.g., Pennebaker, Colder, & Sharp, 1990), success in overcoming adversity (e.g., Spera, Buhrfeind, & Pennebaker, 1994; Solano, Donati, Pecci, Persichetti, Colaci, 2003), and general life functioning and success (Lumley & Provenzano, 2003) have also been beneficially influenced by expressive writing. Initially, active inhibition (Pennebaker, 1989) was deemed to be the explanatory mechanism behind the power of expressive writing. More recently, however, research

has focused on expressive writing as a cognitive event and on the mediating effects of the specific language used in narratives (Pennebaker & Francis, 1996; Klein & Boals, 2001). From this more recent perspective, the process of creating coherent narratives (i.e., those containing numerous insight words) is deemed to change the “cognitive packaging” of the ideas expressed in narratives. This cognitive restructuring is believed to be key for deriving the benefits of expressive writing.

Initially, studies of expressive writing asked participants to recall and recount one’s most traumatic past event, focusing on the thoughts and emotions surrounding the event. However, subsequent research tested, and found benefits using, a wide range of writing topics. Thus, it appears that writing not only allows a person to disclose unpleasant events, but also offers a person an opportunity for self-discovery and self-articulation (King, 2002).

For instance, Greenberg, Wortman, & Stone (1996) found that writing about someone else’s trauma as if it were their own also benefited health. They went on to suggest that writing allows for focused attention on the self, leading to increased understanding of the self, and ultimately the construction of a more comprehensive view of the self. King and Miner (2000) found that participants who wrote only about the positive aspects of their trauma showed the same health benefits as those in the traditional trauma condition while also experiencing less negative affect. The authors posit that writing about positive aspects of trauma may bolster one’s sense of efficacy by causing people to feel more cognitively able to construct a meaningful story from life experience. King (2001) also showed that writing that increases positive affect (using a best possible self topic), as opposed to negative affect, was beneficial not only for one’s health, but

also one's SWB. Likewise, Burton & King (2004) elicited better health for participants writing about intensely positive experiences.

In sum, a growing literature supports the view that writing benefits for health and SWB may be obtained without that writing centering on trauma. Whereas writing about trauma is certainly one way of gaining health and SWB benefits, the studies provide evidence of easier and less disturbing ways to gain these benefits. Common characteristics of writing topics that have elicited health/SWB benefits include being self-relevant and requiring focused introspection. In writing, people are challenged to make meaning out of their thoughts and come up with a coherent story. It is through the process of creating these chapters in one's life story that people essentially build a better understanding of the self (King, 2002).

One of the vital aspects of meaning is our social network. The proposed model for the present study suggests that our close relationships not only add meaning to our lives, but also are a primary source of meaning-making in personal narratives. Therefore, taking a relational perspective in expressive writing (e.g., writing directly about one's primary relationships or integrating relationships into any given topic) may facilitate efforts to create a coherent narrative, just as focusing on one's close relationships in life lends meaning to existence. Furthermore, writing from a relational perspective should lead to more significance being placed on one's close relationships. Stated another way, meaning-making in writing is expected to involve a search for closeness and communion with others.

Writing and Interpersonal Communication

Recent research suggests that expressive writing has important effects on communication processes. Specifically, Pennebaker and colleagues have begun to examine verbal and nonverbal communication style and whether people change their style after expressive writing. Mehl and Pennebaker (2003) explored how people naturally talk to others in their social worlds by having participants wear an Electronically Activated Recorder (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001) that recorded conversation and environment sounds every 12 minutes for thirty seconds. In an initial study utilizing this technology, participants wore the Electronically Activated Recorder two weeks prior to, and two weeks after, writing about trauma. The results of this investigation revealed that those who wrote about trauma talked to friends more and laughed more, as well as used more positive emotion words (described in Niederhoffer & Pennebaker, 2002). Moreover, the speech of trauma participants was focused more in the present than the past. Those who wrote about trauma also showed lower resting diastolic and systolic blood pressure than those who wrote about a control topic.

These initial findings set the framework for conceiving of writing not only as a cognitive phenomenon but also, and perhaps primarily, as a social phenomenon. Theoretically, expressive writing should help people establish richer social relationships by improving the quality of social interactions. To truly understand the social effects of writing, more naturalistic, online studies like those described above are needed. The proposed study seeks to investigate the impact of writing on social variables by utilizing a relationship based topic and tracking post-writing interaction quality between romantic partners, including mutual levels of disclosure, understanding, validation, and caring.

Furthermore, it is expected that the social effects of expressive writing act as a driving force in the well-established link between writing and health/SWB. The well-replicated effect of quality social relationships on health (see Cohen, 2002 for an overview), supports this notion.

Social Relations, Health, & SWB

It is well known that social relationships and social support act as buffers to stress and are an important part of illness prevention (Cohen, 2002). Decades ago, Maslow (1967) conceptualized the healthiest of people, the self-actualizers, as being capable of greater love and better identification with others. Ryff & Singer (1998a) hold that quality relations are integral to optimal human functioning. Much support has also been found for the “belongingness hypothesis” which states that deficits in belongingness are correlated with poor health, adjustment, and well-being (Baumeister and Leary, 1995; Chipuer, 2001). Prospective studies have consistently shown that people with few and/or poor quality friendships have a higher mortality risk. In fact, socially isolated people are more at risk for mortality from various causes, including cancer (Hawkley & Cacioppo, 2003), even more so than smokers (House, Landis, Umberson, 1988). Thus, if relationship quality changes due to writing (for example, via increases in intimacy), it seems probable that these relational changes are at least in part responsible for the changes in health and SWB found after writing.

Interpersonal Intimacy

Ryff & Singer (1998b, p69) state that it is important to consider the role of emotion when seeking to understand the qualities of social relationships that are most important to health. Specifically, they call attention to the importance of "how much

love, affection, intimacy, support, approval, [and] nurturance people get from their key others.” Thus, better relationships should be those with high levels of these emotional goods. One key indicator of interaction quality and relationship quality is, then, intimacy. Intimacy can be viewed as a transactional and dynamic process, requiring a reciprocal give and take between individuals (e.g., the Interpersonal Process Model of Intimacy; Reis & Shaver, 1988; Laurenceau, et al., 1998). As such, intimacy is conceived of as occurring on an interaction-by-interaction basis, rather than being solely a stable characteristic of an ongoing relationship. A person experiences intimacy when she or he feels that her or his partner has responded with understanding, validation, and care to personal information that she or he has disclosed. Feeling accepted in this situation is important because by sharing personal information, thoughts, or feelings, a person has essentially revealed core aspects of the self. Therefore, the present study will track levels of disclosure, responsiveness, and perceived acceptance, (among other variables) within couples to investigate changes in these that might arise as a result of writing. By measuring aspects of relationships and interactions, such as affection, intimacy, and support, this study will be able to investigate the hypothesized key roles these play in the link between close relationships and health.

The Present Study

This study builds on previous findings that writing, even about non-traumatic events, is beneficial to well-being, and extends that premise to include relationship well-being, by linking research on expressive writing to research on close relationships. The present study addressed the effects of writing about a particular self-relevant topic (relationship-based) not only on health and SWB (as previous research had done), but

also on relationship quality (an area that has not previously been explored within the writing framework). In this study, romantic couples wrote about trauma, falling in love, or a control topic. Not only did this study examine the influence of writing on relationships, it also assessed the role of relationship variables in “the writing cure”. Thus, relationship variables were examined within the expressive writing framework in several ways.

In particular, relationship variables measured satisfaction, commitment, and passionate love. This study also assessed details about interactions with romantic partners by asking participants to fill out records for all such interactions in the week after writing. These records included ratings of interpersonal intimacy variables, and an array of verbal and behavioral expressions. Gable, Reis, and Downey (2003) note that this diary method has seldom been taken advantage of in studying couples. These researchers also assert that the incorporation of couples should become the standard for studying close interpersonal interactions.

Predictions

These data were used to address four main predictions, separated here by the primary dependent variables of interest.

Psychological and physical health. 1) Writing about relationships and trauma would lead to less self-reported illness and heightened emotional well-being.

Relationship quality. 2) Writing about trauma, and particularly about falling in love, would predict better relationship quality, including higher levels of intimacy in interactions. Falling in love was expected to have stronger effects simply because of the higher similarity between the prompt and the outcome domain.

Mediational predictions. 3) Relationship quality would mediate health and SWB benefits of expressive writing. Given that interpersonal relationship variables were deemed to mediate the health and SWB effects of writing, and that a relationship topic, in particular, was expected to improve relationship quality, the strongest direct and mediated effects of writing condition on health and SWB were predicted with the relationship topic.

Predicted moderation. Some relationships were expected to dissolve.¹ An interaction between pre-test relationship quality and writing topic was expected to predict which relationships ended. This hypothesis was based on the idea that it is not always the best thing for the people involved, to remain in a romantic relationship. Sometimes it is a better option to dissolve an unhealthy relationship and move on to a better functioning one. Thus, those in “bad” relationships who engaged in expressive writing were predicted to be most likely to break up by Time 2.

Method

Participants

At the start of the Fall 2004 Semester, 93 healthy undergraduate heterosexual couples were recruited from the MU campus. Mean age of participants was 21.33 years, ($SD = 3.11$; range = 18 to 40). The majority of participants were Anglo-Americans ($n = 166$; 89%). Also included were 9 Asian-Americans (5%), 4 Hispanic-Americans (2%), 4 African-Americans (2%), and 3 "other" (2%). Most participants were juniors and seniors, 28 (15%) were graduate/professional students, and 12 (7%) were not students. Of the latter, all but one had obtained a bachelor's or a graduate degree. Most of the sample were not engaged or married; however, 19 couples (20%) were. Twenty-six (28%) couples reported living together. The mean length of couples' relationships was 2 years, 1 month (range = 3 months to 10 years, 1 month).

Healthy samples, as well as undergraduate samples, have regularly been used to test for the effects of expressive writing (Smyth, 1998). And, in fact, using healthy individuals is a strong test of the health effects of writing, because regression to the mean is not expected, as might be with a sample chosen for the presence of illness symptoms. Use of couples, rather than simply individuals involved in romantic relationships, adds strength to this study in various ways. The relationship component of the proposed model focuses in part on interaction quality, and it is important to remember that an interaction is by definition a two-way street. The process of communicating necessitates both partners disclose and respond in some form. To truly understand interactions, then, it is important to gain the perspectives of both parties involved. For instance,

involvement of both partners allows the study of not only changes in how "Partner A" discloses and perceives "Partner B's" responses, but also allows study of changes in how "Partner A" responds in the interaction, from "Partner B's" perspective.

Each couple was paid \$50 for their participation (\$25 each). Full participation was estimated at approximately four hours per person. Methods of recruitment included class announcements, posted flyers, and handouts in student gathering areas across campus, which directed those interested to call the lab. When a prospective participant called, they were informed that before any identifying information could be gathered, there was a 5-question anonymous screening to determine eligibility for the study. Eligibility included being in a monogamous, heterosexual relationship of at least 3 months duration with a partner who was local and willing to participate in the experiment. Potential participants were also asked if they or their partners were currently being treated for any ongoing physical or mental illness; if so, they were deemed ineligible for the study. Once eligibility was established, the experiment was described and basic contact information gathered.

Materials

Writing Manipulation

One of three topics (trauma, $n = 56$; falling in love, $n = 52$; control, $n = 78$) was randomly assigned by couple. Thus, each member of the couple wrote on the same topic. The trauma topic instructed participants to "consider a past or current trauma and write about the event along with all the thoughts and feelings associated with it". Participants in the control condition were told to "describe the physical details of their apartment or

dorm room in minute detail”. Those who wrote about falling in love were directed to “describe the process of having fallen in love with your current significant other. This could be something that has already happened, is happening now, or may possibly happen in the future”. All topics instructed participants to get really involved in the process of writing, to try to keep writing for the entire time, and to not worry about grammar or spelling. According to a meta-analysis of studies utilizing the writing paradigm (Smyth, 1998) neither number of writing sessions (1 to 5), nor length of writing exercise (15 to 30 minutes) significantly moderated within-group variance in effect size. Thus, having participants in the present study write once for 30 minutes was deemed to be sufficient.

General Questionnaire Packet

In the description of the study that follows, the “general questionnaire packet” will refer to a compilation of measures assessing three central outcomes of interest: health, SWB, and relationship quality. This was completed two times: at the onset of the study (as a pretest), and as a follow-up, approximately two-and-a-half months post-writing.

Physical health. To measure health, participants reported the number of times they had visited a doctor for illness (averaged over a period of nine months for pretest and twelve months for posttest;² see Table 1 for means and standard deviations at both Time 1 & 2, for this and all questionnaire packet measures). They also completed the PILL, a list of illness symptoms, on which higher scores indicate diminished physical health (see Table 1 for internal reliability alphas at both Time 1 & 2, for this and all

subsequent 2-level outcomes). Example items include, “congested nose”, “headaches”, and “upset stomach”.

SWB. Measures of well-being included the following: the Rosenberg (1965) self-esteem measure (e.g., I am able to do things as well as most other people); the Life Orientation Test (Scheier & Carver, 1985; a measure of dispositional optimism; e.g., In uncertain times I usually expect the best), and the Satisfaction with Life Scale (Diener, et al., 1985; a measure of general life satisfaction; e.g., In most ways my life is close to my ideal).

Relationship quality. To assess a diverse, but central set of relationship quality variables the Hendrick Relationship Assessment Scale (1988; measure of satisfaction; e.g., How well does your partner meet your needs), the Hatfield and Sprecher Passionate Love Scale (1986; e.g., I yearn to know all about [my partner]), and the Investment Model Scale (a measure of commitment; Rusbult, Martz, & Agnew, 1998) were included. This latter scale contains four subscales: Quality of Alternatives (e.g., My alternatives are attractive to me (dating another, spending time with friends or on my own, etc), Satisfaction (e.g., My relationship is much better than other’s relationships), Investment Size (e.g., Many aspects of my life have become linked to my partner (recreational activities, etc.) and I would lose all of this if we were to break up), and Commitment (e.g., I am committed to maintaining my relationship with my partner). The Passionate Love Scale is particularly suitable for this study, given a young adult sample, and a “falling in love” writing condition.

Interaction Records

Ryff & Singer (1998a) emphasize that having fulfilling bonds with others is not an end destination, but rather a dynamic process in which quality connections are created and re-created. Daily experience sampling methods, for example the Rochester Interaction Record (RIR; Reis & Wheeler, 1991), are particularly well suited for measuring this type of dynamic process. Hawkey & Cacioppo (2003) also note that even though it has been established that relationships affect health, the literature still needs to be informed about the mechanisms at work. They state that part of the problem is that relationship variables are typically looked at broadly. Hence, the type of fine-grain detail that can be gathered with the RIR methodology is needed. This methodology is particularly useful for the current study, given the expected effects of relationship variables on health and SWB. It is also important to note that experience-sampling methods provide more accurate data than standard self-report or retrospective measures (Reis & Gable, 2000).

In this study, RIRs were used to measure various aspects of all interactions with one's romantic partner, of 10-minute duration or longer, over the course of a week. Participants were instructed to fill out the record within 15 minutes after all such interactions. Records were estimated to take approximately two minutes to complete. First, participants very briefly noted pseudonym, date and time, how long the interaction was, the general location/environment in which it took place, number of people present besides self and partner, and basically what took place (in just a few words). This information allowed for ease of matching each pair of records, for every interaction, which was necessary for analyses. The most popular interaction settings were home (46%), multiple locales (20%), and restaurant/bar/cafeteria (10%). Most interactions

involved only the two romantic partners (68%), although slightly over half did take place in public settings (57%). An average interaction lasted about two hours.

Each record contained eight items covering self and partner disclosure and perceived partner responsiveness (from Laurenceau, et al., 1998). Specifically, participants rated levels of self-disclosure of emotions, thoughts, and facts, partner disclosures, feeling understood, cared for,, and accepted by one's partner, and closeness of the interaction. See Table 2 for means and standard deviations of these and all interaction record outcomes.

Participants also rated how inattentive and how critical they and their partner each were during the interaction. Finally, social support was assessed by asking participants to rate how much they listened to or helped with a problem as well as how much their partner provided either of these forms of support.

Two one-week diary components were included in the study: the first took place the week before the writing manipulation (as a baseline measure) and the second the week after writing, to determine the effects of the manipulation.

Procedure

Once potential participants were deemed eligible to participate via the initial phone interview, they picked up the take-home general questionnaire packet along with return envelopes that they were told to seal and sign across the flap for confidentiality. In addition, all envelopes used for data collection in the study bore a red "Confidential" stamp on the front. (At all stages of the study, one partner was allowed to pick up/drop off materials for both partners, to reduce participant burden.) When general questionnaire packets were picked up from the lab, contact information for participants was gathered.

Participants had up to 1 week to complete and return packets, in person, at which time they received oral instruction for the next phase of the study. For this phase, participants were given a one-week diary activity (using the RIR), and a research assistant fully explained the procedure for completing the records, including defining terms and reviewing exactly what did and did not count as an interaction. The importance of honest reporting was emphasized, as well as the importance of not discussing the study with one's partner or any other study participant. Participants also received written instructions, which included phone and e-mail contact information and a web address for an online reference of frequently asked questions and answers. If one partner picked up materials for both partners, that person was told to deliver the packet and written instructions to their partner within 24 hours, to recount the verbal instructions, and to start record-keeping as soon as both partners had the records in hand. Included with the RIRs were seven envelopes, and participants were told to either drop records off at the lab or to deposit them in campus mail, daily. Participants were e-mailed reminders if three days passed with no records received.

At the end of the seven day period, the diary instructions directed participants to call to schedule a one-time, in-lab, 30-minute writing session. Partners did not have to come in at the same time, but were told to schedule and complete appointments within 48-hours of each other.

Upon leaving the writing session, participants were given another one-week set of diary records with envelopes. If the participant was the first in the couple to complete the writing session, they were informed of their partner's appointment time and instructed to begin record-keeping after their partner had completed the writing session. The second

partner within each couple to write was told to start record-keeping upon leaving their session. Research assistants once again reviewed instructions with each participant, and the second diary week was carried out the same as the first.

Approximately two-and-a-half months after writing (before the end of Fall 2004 semester) participants were contacted to pick up and complete the general questionnaire packet for a second time. In this packet, couples were asked if they were still together ($n = 88$ couples) or had broken up ($n = 5$ couples). If the latter, then they still completed measures of health and SWB, but skipped the relationship quality measures. Questions were also included to probe for percentage of accuracy (i.e., filling out a form every time there was an eligible interaction and doing so within 15 minutes; $M = 77.96$, $SD = 17.42$) and honesty ($M = 95.44$, $SD = 7.76$) during the diary components, as well as how much routine interactions differed (1-7 scale; $M = 2.02$, $SD = 1.23$) as a result of doing the RIRs. Upon receipt of the follow up packet, participants were paid \$25 each.

Results

Descriptions of results are split into two main sections. First, analyses using the posttest questionnaire packet will be reviewed. The results for the diary component of the study (i.e., utilizing daily interaction records) will follow.

Two-Level Analyses

All analyses were handled using multilevel random coefficient modeling (MLM) techniques. Variables measured in the general questionnaire packet were analyzed using two-level models to represent the non-independence of data from individuals (level 1 or L1) nested within couples (level 2 or L2). Given that two individuals were both reporting on the same relationship, their data was correlated and the error components for their data could not be assumed to be independent from one another. Predictors can be added into a two-level model at either, or both, levels. For example, the analyses that follow included a couple-level predictor (writing condition) at L2, as well as, a person-level variable (pretest scores) at L1.

This first section will be further divided into subsections examining each of the following outcomes: relationship quality, SWB, and physical health. Intercorrelations between these variables can be found in Table 3.

The following illustrates the general model that was being fit:

$$Y = \text{Intercept (control condition; } \gamma_{00}) + W1 \text{ (trauma condition, dummy code 1; } \gamma_{01}) + W2 \text{ (love condition, dummy code 2; } \gamma_{02}) + X_{\text{pretest}} (\gamma_{10}) + \text{L1 and L2 errors.}$$

As can be seen, the three writing conditions were represented by two dummy variables, and pretest was included as a control variable. Recall that in this two level model, the lowest level, L1, represented the individual nested within couple. Couple level variables were at L2. Condition was assigned by couple and, as such, was a level two variable. Pretest and posttest scores were computed for each individual, and thus were considered L1 variables. Of primary importance for analyses using this model was whether or not the variables representing the trauma and love conditions (γ_{01} and γ_{02}) were significant. A second, similar model was also run for each dependant variable to examine whether the trauma and love groups significantly differed from one another. Note that these analyses examined the hypotheses that writing about trauma and falling in love should relate to enhanced relationship functioning, as well as, physical health and SWB. It is notable that this study is the first time participants have written about the topic falling in love.

Relationship Quality

It was predicted that writing about trauma, and particularly writing about falling in love, would predict better relationship quality. Various aspects of relationship quality were measured, including satisfaction (Relationship Assessment Scale), passionate love (Passionate Love Scale), and investment, satisfaction, commitment, and quality of alternatives, as they relate to the Investment Model (Investment Model Scale). There were no significant group differences found for any of these six scales at Time 2, controlling for Time 1 scores (t 's(86 to 87) for γ_{01} and $\gamma_{02} = -1.51$ to $.77$, p 's = $.14$ to $.97$; t 's(49-50) for difference between trauma and love groups = -1.17 to $.78$, p 's = $.25$ to $.95$). Ordinary least squares regressions were used to test for sex differences on all relationship quality variables at Time 1 and Time 2. At Time 1, there were no significant sex

differences (t 's(1) = -1.04 to 1.26, p 's = .21 to .79). A marginal sex difference was found for quality of alternatives at Time 2 in which women reported lower quality alternatives ($\beta = -.53$, $t(1) = -1.90$, $p = .06$). No sex differences emerged on the other relationship quality variables at Time 2 (t 's(1) = -1.35 to .44, p 's = .18 to .94). There was no significant interaction between sex and condition on quality of alternatives at Time 2 (t 's(83) .30 & -1.30, p 's = .76 & .20, respectively). In sum, the prediction that expressive writing would enhance relationship quality was not supported.

Psychological Health

Writing about either falling in love or trauma was predicted to result in heightened emotional well-being. Recall that SWB was measured using three different scales of positive functioning: satisfaction with life, self-esteem, and optimism. The correlations for these three variables indicated that they should remain distinct, rather than be combined as a composite score. Each of these variables will be treated in turn.

Women were significantly more satisfied with their lives, compared to men, at both Times 1 and 2 (β 's = .38 & .33, t 's(1) = 2.68 & 2.37, p 's = .01 & .02, respectively). Therefore, sex was included as a covariate on these particular analyses. In terms of the control condition, $\gamma_{00} = 1.18$, $t(90) = 5.20$, $p = .00$. The pretest, $\gamma_{10} = .71$, $t(89) = 17.33$, $p = .00$. Sex, $\gamma_{20} = .05$, $t(89) = .60$, $p = .55$. The trauma condition, $\gamma_{01} = .06$, $t(90) = .82$, $p = .41$. Thus, the trauma condition did not yield a significant effect. However, $\gamma_{02} = .31$, $t(90) = 3.76$, $p = .00$, revealing that writing about love significantly increased satisfaction with life, compared to the control group, approximately two-and-a-half months post-writing, controlling for both sex and Time 1 life. Variance components estimates and standard errors for this and all two-level, significant dependent variables are shown in

Table 4. A sex by condition interaction was also tested for, but was not significant (t 's(83) 1.26 & 1.50, p 's = .21 & .14, respectively). Finally, a significant difference was not found between the trauma and love groups regarding life satisfaction ($\gamma = .06$, $t(52) = .56$, $p = .58$).

Excluding the sex differences, similar results were found for self-esteem. (No sex differences emerged for self-esteem at either Time 1 or 2; t 's(1) = -1.20 & -.43, p 's = .23 & .67.) The control condition, $\gamma_{00} = 1.80$, $t(90) = 6.66$, $p = .00$. The pretest, $\gamma_{10} = .48$, $t(90) = 6.50$, $p = .00$. The trauma condition, $\gamma_{01} = -.03$, $t(90) = -.48$, $p = .63$. Although there was not a significant effect of trauma, there was a marginal effect for the love condition. The love condition, $\gamma_{02} = .10$, $t(90) = 1.71$, $p = .09$. So, writing about love marginally increased self-esteem, compared to the control group, approximately two-and-a-half months post-writing, controlling for self-esteem at pretest. Finally, the love and trauma groups differed significantly from one another in terms of pre-post change in self-esteem ($\gamma = .13$, $t(52) = 2.31$, $p = .02$).

Results remained consistent when examining optimism. (There were no sex differences found at either time; t 's(1) = -1.50 & -.65, p 's = .13 & .52, respectively). The intercept, representing the control topic, $\gamma_{00} = 1.60$, $t(90) = 5.24$, $p = .00$. The pretest, $\gamma_{10} = .47$, $t(90) = 4.75$, $p = .00$. The trauma condition was once again not significant; $\gamma_{01} = .08$, $t(90) = 1.17$, $p = .24$. And, again, the love condition was marginally significant; $\gamma_{02} = .13$, $t(90) = 1.86$, $p = .07$. This indicates that writing about love marginally significantly increased optimism, compared to the control group, approximately two-and-a-half months post-writing, controlling for pretest scores. Finally, the pre-post change in

optimism for the love group was not significantly different from the change in the trauma group ($\gamma = .05, t(52) = .70, p = .49$).

To summarize, writing about love appeared to have a positive impact on all three measures of positive emotional functioning. This effect was significant for life satisfaction, and marginal for self-esteem and optimism. These results were in line with the prediction that writing about love would lead to enhanced SWB. However, the same prediction for writing about trauma was not supported.

Physical Health

Writing about trauma or falling in love was predicted to result in fewer illnesses. Remember that physical health was measured in two ways, with self-reported number of doctor visits for illness, and with the PILL, an illness symptom inventory.

The number of doctor visits for illness was averaged over a period of nine months for pretest and twelve months for posttest. Higher numbers indicated diminished physical health.² Women reported more doctor visits than men at both Times 1 and 2 (β 's = .04 & .06, t 's(1) = 1.98 & 3.77, p 's = .05 & .00, respectively). For this reason, sex was included as a covariate in the following set of analyses. The control topic estimate, $\gamma_{00} = .03, t(90) = 2.65, p = .01$. The pretest covariate, $\gamma_{10} = .47, t(86) = 9.10, p = .00$. The sex covariate, $\gamma_{20} = .04, t(86) = 3.21, p = .00$. Main effects for the trauma ($\gamma_{01} = .00, t(90) = -.21, p = .83$) and love ($\gamma_{02} = .00, t(90) = -.28, p = .78$) conditions were not significant. Thus, the pre-post change in number of doctor visits did not vary significantly between either of these conditions and the control condition. Neither did the love group differ significantly from the trauma group regarding pre-post change in number of visits ($\gamma = .00, t(52) = .05, p = .96$). However, a marginal interaction was found such that women in

the love condition visited the doctor less frequently after writing, compared to before writing (γ 's = $-.04$ & $-.05$, t 's(84) = -1.46 & -1.82 , p 's = $.15$ & $.07$, representing the sex by trauma condition and sex by love condition interactions, respectively).

Participants also completed the PILL, a list of illness symptoms, rated for frequency of occurrence. (No sex differences existed at either Time 1 or 2 on this measure (t 's(1) = $.21$ & $.42$, p 's = $.83$ & $.68$, respectively). Higher numbers on the PILL also indicate diminished physical health. The control condition, $\gamma_{00} = .05$, $t(90) = 1.10$, $p = .28$. The pretest, $\gamma_{10} = .90$, $t(91) = 15.65$, $p = .00$. There were no significance effects of either the trauma or love topics on symptomology. The trauma condition, $\gamma_{01} = -.01$, $t(90) = -.30$, $p = .76$. The love condition, $\gamma_{02} = .01$, $t(90) = -.27$, $p = .79$. And, the trauma and love groups did not significantly differ regarding pre-post change in symptoms ($\gamma = .00$, $t(52) = .10$, $p = .92$).

In conclusion, the data did not support the hypothesis. Contrary to findings in the literature, writing about trauma did not lead to better physical health. Nor were there any significant physical health benefits associated with writing about love. Although it was not predicted, women were significantly more likely to see the doctor at Time 1 and 2, and this effect was moderated by writing condition, such that women who wrote about love were marginally less likely to see the doctor.

Moderational Prediction

Recall that pretest relationship quality was hypothesized to interact with writing condition to predict relationship stability (coded as 1 = together, 0 = broken up). Although only five couples of the 93 in this study broke up (M 's = $.97$, $.96$, $.88$, for control, trauma, and love groups, respectively), results from a logistic regression analysis

indicated that those who wrote about love were marginally more likely to break up than those in the control group ($\beta = 14.85$, $\text{chi-square} = 2.92$, $p = .09$). This effect was stronger for those who scored low on passionate love at pretest, than for those with higher scores ($\beta = -1.89$, $\text{chi-square} = 2.64$, $p = .10$). Thus, marginal trend in which passionate love at pretest moderates the effect of writing about love on relationship stability is in line with the prediction.

Mediational Analyses

Relationship quality was predicted to mediate the effects of writing condition on physical health and SWB. However, mediational predictions, were unable to be tested due to the non-significance of the physical health and relationship quality variables. The next section will focus on results from the three-level diary data analyses.

Three-Level Analyses

Analyses utilizing variables measured with the daily interaction records (such as intimacy), required a third level of equations (level of interaction record). Given their complex structure, the three-level analyses also required multilevel random coefficient modeling to adequately represent the non-independence of errors. For each reciprocal interaction between individuals within a couple, two RIR responses were generated. Given that the two records were both reporting on the same interaction, the error components for the records could not be assumed to be independent from one another. This was complicated even more by the fact that every individual within a couple, over the course of a week, reported on many interactions over many days. So, all records for any given person also had to deal with the problem of non-random error. Finally, all interactions and all individuals were nested within a particular couple, so that all data for

a given couple was also correlated, with non-independent error components associated with it.

The three levels of analysis in the model were records (L1), cross-classified within individuals (L2) *and* within interactions (L2), nested within couples (level 3 or L3). This structure accounted for the non-independence of data encountered with multiple records for each individual, and two records for each interaction, and individuals and interactions existing within couples.

With a three-level model, predictors are able to be added into the model at any of the three levels. For the purposes of this study, however, of most interest was adding the condition variable at L3, and the L1 predictor designating pre-writing interactions from post-writing interactions (which allowed testing for differences due to writing).

Intercorrelations between significant three-level outcomes can be found in Table 5.

The following model was fit for the three-level analyses using the diary data (i.e., interaction records):

$$L1 \quad Y_{ijk} = \pi_{0jk} + \pi_{1jk} X(\text{pre/post, coded 0/1})_{ijk} + e_{ijk}$$

$$L2 \quad \pi_{0jk} = \beta_{00k} + R_{0jk} + R_{1f(j,k)}$$

$$\pi_{1jk} = \beta_{10k} + R_{1jk} + R_{2f(j,k)}$$

$$L3 \quad \beta_{00k} = \gamma_{000} + \gamma_{001} W1(\text{d1 trauma condition})_k + \gamma_{002} W2(\text{d2 love condition})_k + U_{00k}.$$

$$\beta_{10k} = \gamma_{100} + \gamma_{101} W1(\text{d1 trauma condition})_k + \gamma_{102} W2(\text{d2 love condition})_k + U_{10k}.$$

Combined equation:

$$Y_{ijk} = \gamma_{000} + \gamma_{001} W1(\text{d1 trauma condition})_k + \gamma_{002} W2(\text{d2 love condition})_k + \gamma_{100} X(\text{pre/post}) + \gamma_{101} (\text{d1*pre/post})_k + \gamma_{102} (\text{d2*pre/post})_k + 3 \text{ levels of error terms.}$$

At L1, Y_{ijk} represented the dependent variable with three levels of influence acting on it. Ratings on a record were correlated within individual and as such were a function of π_{0jk} , which represented the mean for an individual within a couple at pretest, and e_{ijk} , representing measurement error or variability across records within an individual. Each record was also coded for being completed either pre-writing or post-writing. Thus, the slope estimate, π_{1jk} , represented the change in an individual's mean from pretest to posttest.

At L2, individuals within couples had correlated data. Thus, individuals' means were a function of β_{00k} , which represented the mean for a given couple at pretest, and R_{0jk} , the individual level variability or the variability across individual's means within a couple. Individuals were also crossed with interactions nested within couples. The error term representing variability across interaction means within a couple was $R_{1f(j,k)}$. Similarly, an individual's pre-post change was a function of β_{10k} , representing the change for a particular couple, and two L2 error terms representing the variability in pre-post change across individuals within couples (R_{1jk}) and across interactions crossed with individuals, within couples ($R_{1f(j,k)}$).

At L3, couples' pretest means were a function of the grand mean of all couples in the control group (γ_{000}), the mean difference between the control and the trauma conditions (γ_{001}), the mean difference between the control and the love conditions (γ_{002}), and U_{00k} , the couple level variability or variability across couple's means. Likewise, couple pre-post change was the function of γ_{100} , the mean pre-post change for all couples in the control group, γ_{101} , the difference in pre-post change between the trauma and

control groups, γ_{102} , the pre-post change in the love versus control group, and the L3 error term, U , that represented couple level variability in pre-post change. In the combined equation, the interaction terms are visible. For the following analyses, these interaction estimates, γ_{101} and γ_{102} , will yield the information most relevant to the hypotheses of this study.

Interpersonal Intimacy Model Variables

Another way to conceptualize relationship quality is as the level of intimacy present in interactions with one's significant other. Interactions were predicted to become more intimate after writing expressively about trauma, and particularly about love. Interpersonal intimacy arises from greater disclosures as well as more positive responses to those disclosures on the part of one's partner. Thus, these facets of intimacy were expected to increase with both expressive writing topics.

Recall that participants rated how much they disclosed emotions, thoughts, and facts. Because of the similarity of these variables and their strong intercorrelations (r 's = .58 to .75, all p 's = .00, n 's = 3861 to 3862) a self-disclosure composite variable was created. Results revealed an interaction between condition and the pre/post variable. Specifically, the difference between the love and control groups at posttest and the same groups at pretest was significantly different ($\gamma_{000} = 3.68$, $t(3857) = 37.38$, $p = .00$; $\gamma_{100} = .02$, $t(3857) = .37$, $p = .71$; $\gamma_{001} = -.04$, $t(3857) = -.28$, $p = .78$; $\gamma_{002} = .01$, $t(3857) = .08$, $p = .94$; $\gamma_{101} = .01$, $t(3857) = .20$, $p = .84$; $\gamma_{102} = .19$, $t(3857) = .72$, $p = .01$). Support was not found for the prediction that writing about trauma would increase intimacy, in terms of self-disclosures. However, in keeping with the prediction, writing about love did lead to significantly greater self-disclosure, compared to the control group. Variance

components estimates and standard errors for this and all three-level, significant dependent variables are shown in Table 6.

Writing about love also interacted with the pre/post variable to affect whether participants felt understood by their partner. The difference between the love and control groups at posttest and the same groups at pretest was significantly different ($\gamma_{000} = 4.09$, $t(3853) = 49.98$, $p = .00$; $\gamma_{100} = -.08$, $t(3853) = -1.60$, $p = .11$; $\gamma_{001} = .04$, $t(3853) = .30$, $p = .76$; $\gamma_{002} = -.14$, $t(3853) = -1.10$, $p = .27$; $\gamma_{101} = .08$, $t(3853) = .94$, $p = .35$; $\gamma_{102} = .19$, $t(3853) = 2.37$, $p = .02$). As before, the trauma group did not differ from the control as hypothesized. But, as predicted, writing about falling in love did lead to feeling significantly more understood by one's partner, compared to the control group.

Contrary to predictions, the other variables included from the interpersonal intimacy model were not significantly affected by writing about trauma or falling in love. These variables were partner disclosure, feeling cared for by one's partner, feeling accepted by one's partner, and closeness of the interaction (t 's(3843 to 3854) for γ_{101} and $\gamma_{102} = -.46$ to 1.42 , p 's = $.15$ to $.96$).

Verbal and Behavioral Expressions

A few additional items were included to obtain more details about the quality of interactions. It was expected that interaction quality improve after expressive writing. Each participant rated her/his own level of criticism and her/his partner's level of criticism, for a given interaction. A composite of these two scores was created for each record ($r = .72$, $p = .00$, $n = 3966$). There was a significant condition by pre/post interaction, such that the difference between the love and control groups at posttest significantly differed from the same at pretest, in terms of how critical partners were with

one another during an interaction. Results showed that after writing about love, participants were significantly less critical of one another during interactions, compared to participants in the control condition. In addition, there was a similar, though marginal, effect for writing about trauma ($\gamma_{000} = 1.80, t(3962) = 18.28, p = .00; \gamma_{100} = .06, t(3962) = .68, p = .50; \gamma_{001} = .00, t(3962) = -.01, p = .995; \gamma_{002} = .15, t(3962) = .99, p = .32; \gamma_{101} = -.24, t(3962) = -1.80, p = .07; \gamma_{102} = -.26, t(3962) = -2.06, p = .04$). The significant effect of writing about love, as well as the marginal effect of writing about trauma, support the prediction.

Writing also had an effect on partners' attentiveness. This variable was also a composite of how an individual rates themselves and their partner, on a given record ($r = .73, p = .00, n = 3968$). Results showed a condition by pre/post interaction, such that writing about trauma significantly lowered ratings of inattentiveness, compared to the control condition ($\gamma_{000} = 2.22, t(3965) = 16.97, p = .00; \gamma_{100} = -.18, t(3965) = -2.00, p = .05; \gamma_{001} = .27, t(3965) = 1.36, p = .18, \gamma_{002} = .16, t(3965) = .80, p = .42; \gamma_{101} = -.33, t(3965) = -2.36, p = .02; \gamma_{102} = .01, t(3965) = .09, p = .93$). In this case, results did not support the prediction for the love condition, but did support the prediction for the trauma condition.

Finally, the variable measuring how much partners listened to each other and helped with problems during an interaction was again a composite based on a participant's ratings of both their own and their partner's behavior ($r = .80, p = .00, n = 3957$). Contrary to predictions, writing about trauma, compared to writing about the control topic, led to a marginally significant decrease in listening and helping ($\gamma_{000} = 4.70, t(3955) = 15.61, p = .00; \gamma_{100} = -.21, t(3955) = -1.57, p = .12; \gamma_{001} = .28, t(3955) = .60, p =$

.55, $\gamma_{002} = .12$, $t(3955) = .24$, $p = .81$; $\gamma_{101} = -.35$, $t(3955) = -1.65$, $p = .10$; $\gamma_{102} = -.03$, $t(3955) = -.12$, $p = .90$). Thus, this analysis did not support the prediction that expressive writing would lead to more listening and helping.

Mediation Revisited

Although mediation could not be tested earlier due to the lack of significant findings for relationship quality and physical health, the significance of the more fine-grain interaction quality allowed for a second look at the mediational model. As previously shown, writing about falling in love led to satisfaction with life (i.e., $A \rightarrow C$ in the mediational chain). And, it was also shown that writing about love resulted in partners being less critical with one another (i.e., $A \rightarrow B$ in the mediational chain). In addition, the two level model in which both writing condition and interaction quality led to SWB, was tested (i.e., both $A \& B \rightarrow C'$). In this model, records were averaged within individual at L1. Utilizing the c-c' test of mediation, $c = .30$ ($p = .00$) and $c' = -.21$ ($p = .24$), and the difference of the absolute estimates was .11. Thus, it appeared that interaction quality (i.e., criticism) might mediate the effect of writing condition (i.e., writing about falling in love) on SWB (i.e., life satisfaction).

However, in multilevel mediation it is necessary that the mediator be at the same level in both equations used (i.e., "B" in $A \rightarrow B$ and $A \& B \rightarrow C'$). Thus, the analysis in which writing condition predicted criticism needed to be rerun with the mediator as a L1 variable in a 2 level model. (In the prior analysis which found writing about love to decrease criticism, the criticism variable was on the record level (i.e., L1 in a 3 level model).) Aggregating the interaction records within person created the new criticism mediator, but it was no longer able to be predicted by writing condition. In conclusion,

one of the required mediational links was not significant, and therefore there was no mediation present.³

Discussion

Close relationships are arguably the heart of human experience. Satisfying relationships are key to a satisfying life. The present study placed the Pennebaker writing paradigm within the context of close relationships to study the effects of expressive writing on close relationships; to test the effects of a relationship topic on important outcomes, and to examine the role of relationship processes as potential mediators in the writing paradigm. In general, it was predicted that writing about falling in love would lead to health and well-being benefits similar to the effects of writing about trauma. In addition to physical and psychological benefits, writing about falling in love or trauma was expected to lead to relationship benefits. The use of an interaction diary methodology allowed for an examination of the implications of writing about falling in love, trauma, or the control topic for everyday interpersonal interactions for romantic couples. Finally, a variety of potential mediators were suggested and examined. Clearly, some goals of the investigation could not be addressed because of the lack of results for physical health. Still, despite this limitation, a number of interesting findings did emerge and these warrant discussion.

Health and SWB Outcomes

First, writing about relationships and trauma were expected to result in fewer illnesses as well as enhanced SWB. Physical health was measured in this study as the number of doctor visits due to illness, averaged over time, as well as the frequency of a variety of common illness symptoms. As mentioned, and contrary to predictions, there were no significant effects found for writing on health. This lack of effect on health may

be due to the operationalization of health. Smyth (1998) shows that physical functioning (e.g., heart rate, natural killer cells, etc.) outcomes have a stronger effect size than physical health markers (e.g., upper respiratory illness, health center records). The list of illness symptoms asked participants to rate how often they experienced each item on a 0 to 4 scale (never/almost never; 2-3 times per year; about once a month; every week or so; 2+ times per week). Similarly, the other health outcome used in this study asked participants for the “number of doctor visits for illness since the beginning of this calendar year”. At Time 1, this was approximately a nine month period; at Time 2 it was a 12 month period. In both cases, asking participants to self-report over such a long period of time may well have resulted in inaccurate data, thus masking the effect.

Because this was the first time the falling in love topic was utilized, it is impossible to know whether the same reasoning can be applied to the lack of health benefits for the love group. In addition, it is notable that participants in this study wrote only one time for 30 minutes. Although according to Smyth (1998) this should be sufficient for the trauma condition, perhaps a longer intervention, spread over a longer time period, would have had stronger effects on health for those in the love condition. More research is needed, using various measures on various timelines, to address whether writing about relationships can enhance physical health. The lack of significant effects on physical health precludes the possibility of considering the provocative mediational model proposed. This model remains for consideration by future research.

With regard to SWB, and consistent with predictions, writing about falling in love significantly boosted satisfaction with life approximately two-and-a-half months after writing. This finding adds to the literature by replicating the SWB benefits of expressive

writing and, more importantly, by introducing the falling in love topic associated with these benefits.

Writing about trauma, however, did not enhance life satisfaction. Previous research comparing a positive topic (writing about life goals) to traumatic life events (King, 2001) did show SWB benefits for life goals, but not trauma writing. Furthermore, although the effect of writing about trauma on psychological well-being has been demonstrated in the literature (Smyth, 1998), life satisfaction is not one of the specific domains mentioned in Smyth's meta-analysis. This indicates that perhaps past research has not utilized varied enough measures of positive functioning and that there is something to be gained from increasing the breadth of investigation into psychological outcomes.

Particularly, then, writing about falling in love appears to be a more suitable topic than trauma in terms of raising life satisfaction. In addition, there was a supporting trend seen in other areas of well-being, including optimism and self-esteem. Taken together, a one-time 30 minute writing session about falling in love with one's partner can be seen as a salutary shot for one's emotional health. Such an exercise has potential as a remarkably simple and efficient way of increasing some of the essential goods of life that nearly all people seek, namely, hope, happiness, and a sense of worth.

Recall that expressive writing has been viewed both as a cognitive event and a process of self-articulation (e.g., Klein & Boals, 2001; King, 2002). The present findings lend support for the idea that writing is not only a cognitive phenomenon, but also, and perhaps primarily, a social one. Relationships with close others are a primary source of meaning in life and are instrumental in

constructing an optimal self. Just as focusing on one's close relationships lends meaning to existence, writing about love seems to not only allow for increased self-understanding, but also offers an opportunity to directly infuse meaning into life.

Participants who wrote about falling in love, described arriving at a safe place of trust, sharing, and understanding, a place where they could be at ease being themselves. Part of arriving at this place was being able to admit the feelings of love they had for each other and being able to be completely honest with one another. In writing, participants seem to have become re-awakened to how special their significant other is to the meaning of their own life. The next section will address how this meaning-making experience via writing led to intimacy seeking and a willingness to be more accepting in one's close relationships.

Relationship Outcomes

The relationship and trauma conditions were hypothesized to lead to better relationship quality. The love topic was expected to result in the strongest effect because of the similarity of the topic and the outcomes. However, no effects of writing topic on relationship quality variables emerged. One explanation may be that the outcome measures were distributed after an effect had already subsided. Another possibility is that in order to reap relationship benefits, one need write more frequently. Both of these are empirical questions that remain for future studies to address. Finally, it may simply be that general relationship assessment is not altered by writing.

One question that this last consideration poses is, which is more important, a person's actual experience or how they remember it over time? Although it is known that having strong ties to others helps weather serious disease and stave off mortality, the literature remains to be informed as to the processes at work (Hawkley & Cacioppo, 2003). These authors go on to state that part of the problem is that relationship variables are typically looked at broadly. So, in terms of understanding the mechanisms by which relationships mediate SWB (and physical health), it is arguable that the person's online experience is more important. With that in mind, interaction outcomes are discussed next.

Interaction Outcomes. Although writing topic did not influence broad-based estimations of relationship quality it did have an impact on the variables measured in the interaction diary. Writing about falling in love and trauma both had a positive impact on interactions with one's romantic partner for one week following. On the one hand, writing about trauma led to partners being significantly more attentive to one another. On the other hand, couples who wrote about love were significantly less critical toward one another, made significantly more self-disclosures, and reported feeling significantly more understood by their partners. Although, clearly, the prediction regarding relative strength of effects could not be tested as such, writing about love did lead to more varied positive outcomes compared to the trauma condition. It is also interesting that while both topics influenced couples, they did so in different ways. Thus it appears that two separate processes are happening after writing about these topics.

In writing about falling in love, as stated earlier, participants explored how love arose in a climate of sharing, trust, honesty with one's feelings, feeling understood, and at

ease to be oneself. These ideas tie directly into the Interpersonal Process Model of Intimacy (Reis & Shaver, 1988), which states that intimacy occurs in moments of disclosure, understanding, and acceptance. And, as this study found, writing about love did result in partners being less critical toward one another, reporting more self-disclosures of emotions, thoughts, and facts, and feeling more understood by one's partner. It makes sense to think that people who wrote about love realized how their relationship with their romantic partner made their life more meaningful. And, as a result, perhaps spontaneously, sought out more of the moments in which they experienced intimacy.

In writing about trauma, participants intensively examined one particular event. Conversely, in reading the love narratives it was common for people to describe falling in love as something that happens in a series of emotion-tinged moments, similar to how Ryff & Singer (1998a) emphasize that having fulfilling bonds with others is a dynamic process in which quality connections are created and re-created. The discrepant processes that may result from these different topics may both be social in nature, however.

It is proposed that exploring a traumatic event causes people to be more aware and that this extends to treatment of one's partner. In other words, if dealing with a traumatic event causes people to be more attentive to their partner's needs, perhaps it is because re-experiencing the hurt allows them to be more empathic. It seems likely that in relationships of the duration of this sample, partners would share their histories with one another. Knowing a partner's painful challenges, and then having to write about one's

own, may very well incite feelings of protectiveness and wanting to take care of a significant other.

The current findings can be added to the results of two previous studies, similar in nature. In the only other study, to date, to investigate the benefits of writing about relationships on couples, Slatcher and Pennebaker (2004) had one member of a dating couple write about relationships and used a variation of ESM, gathering logs of all instant messages between dating partners pre- and post-writing. These researchers found that both partners used more positive emotion words with each other after one partner wrote about relationships. And, in a study using a trauma topic to investigate implications for how people relate (described in Neiderhoffer and Pennebaker, 2002), participants who wrote about trauma talked to friends more and laughed more, as well as used more positive emotion words (an indication of a more positive interaction) for two weeks after writing. This data was collected by having participants wear the Electronically Activated Recorder (EAR; Mehl, Pennebaker, Crow, Dabbs, & Price, 2001), which turns on for thirty seconds every 12 minutes.

Based upon the findings to date, it is recommended that future studies continue to take advantage of both relationship and trauma topics to research changes in how people relate. Further research is needed to continue to study the effect of writing about relationships on self-disclosures, levels of criticism, and feeling understood by close others, as well as on use of positive emotion words. Likewise, the list social implications of writing about trauma continues to grow and warrants continued study. The benefits for relationships now include being more attentive, in addition to previous findings of talking more with friends, laughing more, and using more positive emotion words.

Future research may also bring to light new positive outcomes for relationships. At this point in time, ESM is recommended as the most likely way to tap relationship benefits. Finally, more work is needed to test whether relationship benefits exist beyond one to two weeks post-writing.

Mediational Predictions

Recall that relationship quality was predicted to mediate the health and SWB benefits of expressive writing. Clearly, the lack of effects of writing topic on health as well as relationship quality rendered this question moot for the present study. However, the results for well-being and interaction quality suggested that an alternative model might be viable. Based on the other findings in this study, it appeared that the three mediational links might all be significant for a model in which writing about love led to less criticism between romantic partners, which in turn, predicted satisfaction with life. However, writing about love did not prove to affect the mean level of criticism reported by individuals. That withstanding, it is still compelling that individual level reported criticism did predict satisfaction with life, even while controlling for the effect of condition. One of the goals of the current research was to provide new information regarding the possible mediating mechanisms by which expressive writing works. Despite the issues laid out, the findings still point toward the importance of interaction quality; and, further study of the effects of interaction quality on SWB may prove very fruitful.

Predicted Interaction

Finally, pretest relationship quality was predicted to interact with writing condition to affect relationship stability. This hypothesis was included to address the fact

that some relationships were expected dissolve. Although only five couples of the 93 in this study broke up, these were able to be predicted with marginal significance.

Specifically, three couples in the love group, as opposed to one, in each of the other groups, broke up. The marginal interaction showed that people who scored lower on passionate love and then were assigned to write about falling in love were more likely to have broken up by Time 2.

The average length of relationships in this study was two years, and one might argue that it becomes difficult to break off a relationship that has become the status quo, even when two people are not on the same page in terms of their feelings. Having the keenness to know when to move on can certainly be considered a good thing, especially in terms of young, college, dating relationships. Studying the six narratives of the three couples who broke up in the love condition, unearthed evidence that one person in each couple wanted to pull away from the relationship. It also revealed that two of the partners, of those who wanted to disengage, noted a sense of lack, in knowing that there was a disconnect between themselves and their partner.

Writing about love seems to have given at least some of these individuals the motivation to take a step toward finding a more suitable mate, arriving at the dissolution the current relationships. Perhaps writing about falling in love lead them to think about this possibility with a more suitable partner. And, leaving a place to search for something exciting is certainly a more inviting prospect than leaving the only thing you know and not knowing what, if anything, you are looking for next.

Limitations

This study had several limitations that should be noted. First, because the sample was primarily white Anglo, young, unmarried, and college educated, it is difficult to assess whether the results could be generalized to a wider population. Second, the operationalization of physical wellness in this study may have limited this study's ability to find health results of expressive writing. Similarly, that participants only wrote once, for a half hour, as well as the fact that the posttest for relationship quality and health was nearly three months later, may have limited the ability to find these respective changes. Third, the ability to predict who would break-up was limited by the fact that only five couples broke up. It is notably difficult to predict such a small effect.

Concluding Remarks

The current study explored various aspects of the expressive writing paradigm from a social perspective. Employing couples, tracking daily experiences, as well as utilizing standard self-reports of health, SWB, and relationship quality allowed for an examination of possible social mediators of writing benefits. Falling in love was introduced as a new topic, and shown to yield benefits for SWB and interaction quality. Writing about falling in love, then, appears to be a remarkably simple and efficient way to infuse positive elements into one's relationship and life. It is reasoned that in writing about meaningful relationships, people experience a renewed sense of appreciation for the role of a significant other in having a fulfilling life. And, that as a result of this, people instinctively behave in ways that provide more opportunities for intimacy. The effects of having better interactions is then seen on life satisfaction. Taken together, this study suggests a compelling, new perspective on the processes at work in writing.

General Questionnaire Packet

PSEUDONYM _____

1. Sex: _____

2. Age: _____

3. Ethnicity:

_____ Anglo/Caucasian

_____ Black/African-American

_____ Hispanic/Hispanic-American

_____ Asian/Asian-American

_____ Other (please specify) _____

4. Year in college (if applicable):

first-year _____ sophomore _____ junior _____ senior _____

graduate/professional student _____

5. If you are **not currently a student**, what is your highest level of education?

Grade school _____ High school _____ Some college _____ Associate's degree _____

Bachelor's _____ Master's _____ Ph.D. _____ M.D./J.D. _____

Other (please explain) _____

6. Are you engaged or married? Yes _____ No _____

7. Currently, my partner and I...

_____ live together

_____ live separately

8. I have currently been with my significant other for (specify length of relationship, for example, 1 year, 6 months) _____ year(s) _____ month(s).

Section A

Measure 1

Rate how frequently you experience each symptom, using the following scale:

0	1	2	3	4
Never / Almost Never	2-3 Times per Year	About Once a Month	Every Week or So	2+ Times per Week
___ 1. Eyes water				___ 28. Swollen joints
___ 2. Itchy eyes or skin				___ 29. Stiff or sore muscles
___ 3. Ringing in ears				___ 30. Back pains
___ 4. Temporary deafness or hard of hearing				___ 31. Sensitive or tender skin
___ 5. Lump in throat				___ 32. Face flushes
___ 6. Choking sensations				___ 33. Tightness in chest
___ 7. Sneezing spells				___ 34. Skin breaks out in rash
___ 8. Running nose				___ 35. Acne or pimples on face
___ 9. Congested nose				___ 36. Acne/pimples other than face
___ 10. Bleeding nose				___ 37. Boils
___ 11. Asthma or wheezing				___ 38. Sweat even in cold weather
___ 12. Coughing				___ 39. Strong reactions to insect bites
___ 13. Out of breath				___ 40. Headaches
___ 14. Swollen ankles				___ 41. Feeling pressure in head
___ 15. Chest pains				___ 42. Hot flashes
___ 16. Racing heart				___ 43. Chills
___ 17. Cold hands or feet even in hot weather				___ 44. Dizziness
___ 18. Leg cramps				___ 45. Feel faint
___ 19. Insomnia or difficulty sleeping				___ 46. Numbness/tingling in any part of body
___ 20. Toothaches				___ 47. Twitching of eyelids
___ 21. Upset stomach				___ 48. Twitching other than eyelids
___ 22. Indigestion				___ 49. Hands tremble or shake
___ 23. Heartburn or gas				___ 50. Stiff joints
___ 24. Abdominal pain				___ 51. Sore muscles
___ 25. Diarrhea				___ 52. Sore throat
___ 26. Constipation				___ 53. Sunburn
___ 27. Hemorrhoids				___ 54. Nausea

Measure 2

_____ 1. How many times have you visited a *physician for illness* since the *beginning of this calendar year*?

Section B

Measure 1

The following items deal with how you perceive yourself. Mark each statement according to how much you agree or disagree, using the scale below.

1	2	3	4	5	6
Strongly Disagree	Disagree	Sort of Disagree	Sort of Agree	Agree	Strongly Agree

- _____ 1. So far I have gotten the important things I want in life.
- _____ 2. I am satisfied with my life.
- _____ 3. If I could live my life over, I would change almost nothing.
- _____ 4. In most ways my life is close to my ideal.
- _____ 5. The conditions of my life are excellent.
- _____ 6. I feel that I'm a person of worth, at least on an equal basis with others.
- _____ 7. I feel that I have a number of good qualities.
- _____ 8. All in all, I am inclined to feel that I am a failure.
- _____ 9. I am able to do things as well as most other people.
- _____ 10. I feel I do not have much to be proud of.
- _____ 11. I take a positive attitude toward myself.
- _____ 12. On the whole, I am satisfied with myself.
- _____ 13. I wish I could have more respect for myself.
- _____ 14. I certainly feel useless at times.
- _____ 15. At times I think I am no good at all.
- _____ 16. In uncertain times I usually expect the best.
- _____ 17. If something can go wrong for me it will.
- _____ 18. I always look on the bright side of things.
- _____ 19. I'm always optimistic about my future.
- _____ 20. I hardly ever expect things to go my way.
- _____ 21. Things never work out the way I want them to.
- _____ 22. I am a believer in the idea that "every cloud has a silver lining."
- _____ 23. I rarely count on good things happening to me.

Measure 2 (This measure was only included in the posttest packet.)

The next few questions concern the interaction forms you were to complete. Remember, your responses are confidential and will not affect your reimbursement for the study.

1. Give an *overall* percentage of how *accurate* you were (i.e., did you fill out a form every time one was supposed to be filled out, and do so within 15 minutes of the interaction ending?): _____% **accurate**

2. Give an *overall* percentage of how *honest* you were in your reported answers:
_____ % honest

3. On a scale of 1 (*not at all*) to 7 (*completely*), how much did your *routine interactions differ* as a result of doing the interactions forms? _____

Section C

Measure 1 (This measure was only included in the posttest packet.)

Are you still in a monogamous relationship with the same partner you were with at the start of this study? (Check ONE.)

_____ Yes, we're still together. **Please continue with the next measure.**

_____ No, we have split up. **You have finished this packet.**

If you answered **YES**, that you are still in the relationship, please continue below.

Measure 2

As you complete this section of the questionnaire keep in mind your current romantic partner. ***Imagine your partner's name in each statement's blank.***

1	2	3	4	5	6	7	8	9
Not At				Moderately				Definitely
All True				True				True

- ___ 1. Since I've been involved with _____, my emotions have been on a roller coaster.
- ___ 2. I would feel deep despair if _____ left me.
- ___ 3. Sometimes my body trembles with excitement at the sight of _____.
- ___ 4. I take delight in studying the movements and angles of _____'s body.
- ___ 5. Sometimes I feel I can't control my thoughts; they are obsessive on _____.
- ___ 6. I feel happy when I am doing something to make _____ happy.
- ___ 7. I would rather be with _____ than anyone else.
- ___ 8. I'd get jealous if I thought _____ were falling in love with someone else.
- ___ 9. No one else could love _____ like I do.
- ___ 10. I yearn to know all about _____.
- ___ 11. I want _____-physically, emotionally, mentally.
- ___ 12. I will love _____ forever.
- ___ 13. I melt when looking deeply into _____'s eyes.
- ___ 14. I have an endless appetite for affection from _____.
- ___ 15. For me, _____ is the perfect romantic partner.
- ___ 16. _____ is the person who can make me feel the happiest.
- ___ 17. I sense my body responding when _____ touches me.
- ___ 18. I feel tender toward _____.
- ___ 19. _____ always seems to be on my mind.
- ___ 20. If I were separated from _____ for a long time, I would feel intensely lonely.
- ___ 21. I sometimes find it difficult to concentrate on work because thoughts of _____ occupy my mind.
- ___ 22. I want _____ to know me-my thoughts my fears, and my hopes.
- ___ 23. Knowing that _____ cares about me makes me feel complete.
- ___ 24. I eagerly look for signs indicating _____'s desire for me.
- ___ 25. If _____ were going through a difficult time, I would put away my own concerns to help him/her out.
- ___ 26. _____ can make me feel effervescent and bubbly.
- ___ 27. In the presence of _____, I yearn to touch and be touched.
- ___ 28. An existence without _____ would be dark and dismal.
- ___ 29. I possess a powerful attraction for _____.
- ___ 30. I get extremely depressed when things don't go right in my relationship with _____.

Measure 3

Answer the following questions using a 1-5 scale,
with 1=low OR negative response and 5=high OR positive response.

- ___ 1. How well does your partner meet your needs?
- ___ 2. In general, how satisfied are you with your relationship?
- ___ 3. How good is your relationship compared to most?
- ___ 4. How often do you wish you hadn't gotten into this relationship?
- ___ 5. To what extent has your relationship met your original expectations?
- ___ 6. How much do you love your partner?
- ___ 7. How many problems are there in your relationship?

Measures 4a-4g: For measures 4a – 4g, please use the scale provided with each measure to rate how much you agree with each statement. Where it refers to "my partner" or "our relationship", please answer regarding your current relationship.

Measure 4a

0	1	2	3
Don't Agree At All	Agree Slightly	Agree Moderately	Agree Completely

- ___ 1. My partner fulfills my needs for intimacy (sharing personal thoughts, secrets, etc.).
- ___ 2. My partner fulfills my needs for companionship (doing things together, enjoying each other's company, etc.).
- ___ 3. My partner fulfills my sexual needs (holding hands, kissing, etc.).
- ___ 4. My partner fulfills my needs for security (feeling trusting, comfortable in a stable relationship, etc.).
- ___ 5. My partner fulfills my needs for emotional involvement (feeling emotionally attached, feeling good when another feels good, etc.).

Measure 4b

0	1	2	3	4	5	6	7	8
Do Not Agree At All				Agree Somewhat				Agree Completely

- ___ 1. I feel satisfied with our relationship.
- ___ 2. My relationship is much better than other's relationships.
- ___ 3. My relationship is close to ideal.
- ___ 4. Our relationship makes me very happy.
- ___ 5. Our relationship does a good job of fulfilling my needs for intimacy, companionship, etc.

Measure 4c: Please note that the next five items ask whether you *could be* fulfilled by "alternative relationships" (e.g., by a different dating partner, friends, or family).

0	1	2	3
Don't Agree	Agree	Agree	Agree
At All	Slightly	Moderately	Completely

- _____ 1. My needs for intimacy (sharing personal thoughts, secrets, etc.) could be fulfilled in alternative relationships.
- _____ 2. My needs for companionship (doing things together, enjoying each other's company, etc.) could be fulfilled in alternative relationships.
- _____ 3. My sexual needs (holding hands, kissing, etc.) could be fulfilled in alternative relationships.
- _____ 4. My needs for security (feeling trusting, comfortable in a stable relationship, etc.) could be fulfilled in alternative relationships.
- _____ 5. My needs for emotional involvement (feeling emotionally attached, feeling good when another feels good, etc.) could be fulfilled in alternative relationships.

Measure 4d

0	1	2	3	4	5	6	7	8
Do Not Agree				Agree				Agree
At All				Somewhat				Completely

- _____ 1. The people other than my partner with whom I might become involved are very appealing.
- _____ 2. My alternatives to our relationship are close to ideal (dating another, spending time with friends or on my own, etc.)
- _____ 3. If I weren't dating my partner, I would do fine--I would find another appealing person to date.
- _____ 4. My alternatives are attractive to me (dating another, spending time with friends or on my own, etc.).
- _____ 5. My needs for intimacy, companionship, etc. could easily be fulfilled in an alternative relationship.

Measure 4e

0	1	2	3
Don't Agree	Agree	Agree	Agree
At All	Slightly	Moderately	Completely

- _____ 1. I have invested a great deal of time in our relationship.
- _____ 2. I have told my partner many private things about myself (I disclose secrets to him/her).
- _____ 3. My partner and I have an intellectual life together that would be difficult to replace.
- _____ 4. My sense of personal identity (who I am) is linked to my partner and our relationship.
- _____ 5. My partner and I share many memories.

Measure 4f

0	1	2	3	4	5	6	7	8
Do Not Agree				Agree				Agree
At All				Somewhat				Completely

- _____ 1. I have put a great deal into our relationship that I would lose if the relationship were to end.
- _____ 2. Many aspects of my life have become linked to my partner (recreational activities, etc.) and I would lose all of this if we were to break up.
- _____ 3. I feel very involved in our relationship--like I have put a great deal into it.
- _____ 4. My relationships with friends and family members would be complicated if my partner and I were to break up (e.g., partner is friends with people I care about).
- _____ 5. Compared to other people I know, I have invested a great deal in my relationship with my partner.

Measure 4g

0	1	2	3	4	5	6	7	8
Do Not Agree				Agree				Agree
At All				Somewhat				Completely

- _____ 1. I want our relationship to last for a very long time.
- _____ 2. I am committed to maintaining my relationship with my partner.
- _____ 3. I would not feel very upset if our relationship were to end in the near future.
- _____ 4. It is likely that I will date someone other than my partner within the next year.
- _____ 5. I feel very attached to our relationship--very strongly linked to my partner.
- _____ 6. I want our relationship to last forever.
- _____ 7. I am oriented toward the long-term future of my relationship (for example, I imagine being with my partner several years from now).

Interaction Record

Pseudonym _____

Date ____/____/____ (MM/DD/YY) Time ____:____ (circle one) AM PM

Day of the week: (circle one) SUN MON TUE WED THUR FRI SAT

On a scale of 1 (not at all) to 5 (very much):

I disclosed my *emotions* _____

I disclosed my *thoughts* _____

I disclosed my *facts* _____

My *partner* disclosed *thoughts & feelings* _____

My partner *understood me* _____

I *felt cared for* by my partner _____

My partner *saw me as acceptable* _____

The interaction was *close* _____

Length: _____ hours _____ minutes

Location/ environment: _____

How many other people were *around* (#)? _____

How many other people were *actively involved* (#)? _____

In a few words, briefly describe *what took place*:

On a scale of 1 (not at all) to 10 (very much) rate your & your partner's behavior:

How *inattentive* SELF _____ PARTNER _____

How *critical* SELF _____ PARTNER _____

Listened or helped with a problem SELF _____ PARTNER _____

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Footnotes

1. Murray & Holmes, 1999, found that twelve months after the initial reporting, 34% of their sample-- that had initially been dating for at least three months-- had terminated their relationships. There was no manipulation used in that study.
2. The Time 2 frequency distribution revealed two extreme outliers on average number of doctor visits per month. These two participants were dropped from the analyses for doctor visits. The outlying scores were 1.08 and .67. These can be compared to .42, which demarked the 98th percentile. Both these scores were more than four standard deviations above the mean.
3. The *ab* test of mediation along with the Sobel standard error test of significance was also tried. But, results remained the same.

Table 4

Variance Components Estimates and Standard Errors for 2-Level Analyses

	<u>L1 error</u> <u>(SE)</u>	<u>Random</u> <u>Intercept</u> <u>τ_{00} (SE)</u>	<u>Covariance</u> <u>(τ_{00}, τ_{11})</u> <u>τ_{01} (SE)</u>	<u>Random</u> <u>Pre-Post</u> <u>Slope τ_{11}</u> <u>(SE)</u>
<u>SWLS</u>	.32 (.05)	.83 (.64)	-.10 (.12)	.01 (.02)
<u>ROSEN</u>	.10 (.01)	n/a	n/a	.00 (.00)
<u>LOT</u>	.20 (.03)	1.92 (1.11)	-.65 (.38)	.22 (.13)
<u>DR</u>	.01 (.00)	.00 (.00)	-.01 (.01)	.53 (.16)

Note. SWLS = Satisfaction with Life Scale, ROSEN = Rosenberg Self-Esteem Scale, LOT = Life Orientation Test, DR = number of doctor's visits for illness. N/A indicates that the random intercept for the equation was dropped after inclusion of the term resulted in zero variance estimates with no standard errors.

Table 5

Intercorrelations Among Dependent Variables for 3-Level Analyses

	<u>INATTEN.</u>	<u>LISTEN/HELP</u>	<u>CRITICAL</u>	<u>UNDERSTOOD</u>	<u>DISCLOSE</u>
<u>INATTEN.</u>	1	-.12***	.39***	-.32***	-.14***
<u>LISTEN/HELP</u>		1	-.02	.26***	.29***
<u>CRITICAL</u>			1	-.38***	.02
<u>UNDERSTOOD</u>				1	.39***
<u>DISCLOSE</u>					1

Note. *N*'s range from 3842 to 3977. * indicates $p \leq .05$, ** indicates $p \leq .01$, *** indicates $p \leq .001$. Inatten. = Composite of "Both" self and partner for inattentiveness; Listen/Help = Self/Partner composite for listening or helping with a problem; Critical = Self/Partner composite for being critical; Understood = feeling understood by one's partner; Disclose = Self-disclosures of emotions, thoughts, and feelings composite.

Table 6

Variance Components Estimates and Standard Errors for 3-Level Analyses

	<u>L1 error</u> <u>(SE)</u>	<u>L2 Random</u> <u>Intercept for</u> <u>Individuals τ_{00}</u> <u>(SE)</u>	<u>L2 Random</u> <u>Intercept for</u> <u>Interactions</u> <u>τ_{00} (SE)</u>	<u>L3 Random</u> <u>"True"</u> <u>Intercept for</u> <u>Couples τ_{00}</u> <u>(SE)</u>
<u>INATTENTIVE</u>	2.18 (.07)	.71 (.12)	.49 (.07)	.16 (.11)
<u>LISTEN/HELP</u>	3.64 (.13)	1.75 (.28)	1.78 (.14)	2.31 (.52)
<u>CRITICAL</u>	1.07 (.04)	.25 (.05)	.98 (.05)	.11 (.05)
<u>UNDERSTOOD</u>	.55 (.02)	.17 (.03)	.27 (.02)	.12 (.04)
<u>DISCLOSE</u>	.44 (.02)	.32 (.05)	.21 (.02)	.18 (.06)

Note. Inattentive = Composite of “Both” self and partner for inattentiveness; Listen/Help = Self/Partner composite for listening or helping with a problem; Critical = Self/Partner composite for being critical; Understood = feeling understood by one’s partner; Disclose = Self-disclosures of emotions, thoughts, and feelings composite.

VITA

Jennifer Emilia Eells was born March 14, 1975, in Ft. Lauderdale, Florida, to a Venezuelan mother and an American father. She graduated from St. Thomas Aquinas High School in Ft. Lauderdale in 1993 and then moved to Dallas, Texas to attend Southern Methodist University on a full-tuition academic scholarship. She graduated with a B.A. in 1997, majoring in Psychology and minoring in Spanish. In August 2000, she commenced her graduate studies under Dr. Laura A. King. Her dissertation work was funded by a predoctoral fellowship from the National Institute of Mental Health. Jennifer received her Ph.D. in Psychological Sciences with a concentration in Social/Personality Psychology in 2006. She is married to Brent Loewen of Bethalto, Illinois. They currently reside in Dallas, Texas with their golden retriever, Riley.