

Emotional Processing versus Cognitive Restructuring in Response to a Depressing Life Event

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Abstract The effects of cognitive restructuring (CR), emotional processing (EP), and their combination were compared after a depressing life event. Individuals at risk for depressive symptoms secondary to the death, injury, or illness of a pet completed 3 days of expressive writing in one of the three conditions: CR, EP, or the combination. One month later, participants in the combined condition showed the greatest recovery from depressive symptoms, followed closely by those in the EP alone condition. For those whose pets had died, CR alone led to increases in depressive symptoms. Content analysis of CR and emotional arousal confirmed significant between group differences. Results suggest that EP might be important in the early stages of reaction to a negative event.

Keywords Emotional processing · Cognition · Depression

Introduction

Since Rachman's (1980) seminal paper defining emotional processing (EP), our understanding of the role of emotional arousal in recovery from emotional distress has grown considerably. The experience of anxious arousal is clearly a crucial component of effective psychotherapy for various anxiety disorders, including obsessive-compulsive disorder, specific phobia, panic disorder, and post-traumatic stress disorder (e.g., Foa and Kozak 1986; Foa and Riggs 1995; Page 1991; Salkovskis and Clark 1991). The role of EP in recovery from depression, however, remains open to question. Nolen-Hoeksema et al. have pointed out that a ruminative coping style, which tends to focus on negative emotional arousal, is likely to exacerbate and prolong depressed mood and simultaneously compromise effective problem solving (e.g., Morrow and Nolen-Hoeksema

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1990; Nolen-Hoeksema et al. 1993, 1994, 1997). In contrast, Pennebaker et al. (1990), Pennebaker (1997), and Pennebaker and Seagal (1999) have found that writing about emotional experiences leads to significant improvements in both mental and physical health. This writing is most beneficial when it entails a moderate amount of negative emotional arousal (reflected by negative emotion words) and when it progresses to more coherent and cognitively driven narrative over time.

Teasdale (1999) has suggested that effective EP, defined as mindful experience or acceptance of emotional states helps to prevent both relapse and recurrence of depression. He hypothesizes that this is due to “changes in the ability of triggering cues to reactivate depressogenic processing cycles at times of potential relapse.” He also suggests that conceptually dominated or activity oriented processing of difficult, negatively valenced material may actually “prevent effective EP and perpetuate depression” in ways akin to Nolen-Hoeksema’s rumination. According to Teasdale, one important difference between helpful EP and harmful rumination is the experience of emotional arousal without self-critical concern about the meaning or implications of one’s feelings.

Hunt (1998) found that encouraging subjects with laboratory induced dysphoria to focus on their emotional experience through expressive writing was beneficial. This EP tended to reduce depressed mood over time more effectively than either pleasure and mastery oriented distraction or conceptual cognitive restructuring (CR). Content analysis of the participants’ written essays suggested that most of the positive impact of the writing experience was due to affective arousal itself. Her findings also provided some support for the notion that emotional arousal facilitated positive cognitive change. Similarly, Segal, Boggards et al. (1999) found that bereaved, elderly subjects who had higher levels of negative emotional arousal in their verbal disclosure about the loss of their spouse experienced greater decreases in depression. Lepore (1997) also found that expressive writing reduced the impact of negative intrusive thoughts, leading to significant declines in depressive symptoms over time.

These findings are curious in light of the efficacy of cognitive therapy for depression (e.g., Hollon et al. 1996) and the mounting evidence for the existence of a stable cognitive vulnerability to depression (e.g., Miranda et al. 1998; Alloy and Abramson 1999). These findings suggest that it is cognitive change, not simply the experience of emotion, that reduces both depressive symptoms and the risk of relapse/recurrence. In support of this, Segal, Gemar et al. (1999) found lower levels of dysfunctional cognitions in response to a mood challenge in recovered depressives who had been treated with cognitive psychotherapy than in those treated with pharmacotherapy. Moreover, heightened dysfunctional cognition predicted future increases in depressive symptoms.

Samoilov and Goldfried (2000) suggest that EP can facilitate clinical change in cognitive-behavioral therapy because affective processes can help to reorganize emotional meaning. They cite evidence from cognitive neuroscience suggesting that subcortical information processing occurs, especially with emotionally relevant material. They then suggest that psychotherapeutic interventions must target both cortical and subcortical levels. That is, therapy must encourage both rational restructuring and emotional arousal.

Beck (personal communication, 2002) also suggests that “emotional arousal is an essential part of cognitive therapy...[I]f we are going to change the cognitions we need to have “hot cognitions” and that involves emotional arousal...[I]n the case of depression the hot cognitions are there all along. The patients are continually in a state of arousal and as they discuss troubling topics during the session, their arousal becomes greater and that then provides a strong base for cognitively restructuring.” Interestingly, Segal

et al. (2001) found that bereaved, elderly subjects with higher levels of negative affect in their verbal disclosures regarding the loss of their spouse also showed higher levels of cognitive modifications over time. This finding suggests a critical relationship between EP and CR. It seems plausible that emotional arousal facilitates cognitive change, either by making underlying depressive cognitions more accessible and therefore more malleable, or by promoting habituation of the “subcortical” negative emotional response so that the same objective events or cognitions no longer arouse such salient affective reactions (Samoilov and Goldfried 2000).

The current study was designed to clarify the relationship between EP and CR, using an experimental dismantling method in a community sample at risk for depressive symptoms. We choose to recruit individuals from the waiting areas of the Veterinary Hospital at the University of Pennsylvania. Coping with the injury, terminal illness, or loss of a pet can be a traumatic and depressogenic event (Quackenbush and Graveline 1985; Sharkin and Knox 2003; Hunt and Padilla 2006). Pet owners who are experiencing sorrow, loss, and guilt are at an additional disadvantage because others often ridicule or do not understand their level of attachment. Thus, the population of individuals with ill, injured, or recently deceased pets was presumed to include individuals who would be at risk for increases in depressive symptoms.

All participants were asked to participate in a 3-day expressive writing intervention for dealing with a stressful situation with a pet. Participants were then randomly assigned to one of three conditions: CR, EP, or EP combined with CR (EPCR). Quackenbush and Graveline (1985) identified a number of faulty beliefs bereaved pet owners sometimes hold. We adapted these materials to form the core of the two CR conditions. Both of these expressive writing exercises encouraged participants to identify and challenge faulty beliefs they might have related to their pet’s situation.

The EP alone condition encouraged participants to write about their deepest thoughts and feelings on day 1 and to simply copy over their essay on subsequent days of the intervention. This procedure was designed to encourage habituation and to minimize conscious or intentional attempts at CR.

We hypothesized that the combined condition would lead to the greatest reduction in long-term depressive symptoms, consistent with the notion that emotional arousal would facilitate positive cognitive change. On the basis of past results, we also expected the EP group to experience a greater reduction in depressive symptoms than the CR alone group.

We followed the experimental manipulation with content analyses of participants’ essays. This allowed us to conduct manipulation checks that assured us that participants had read and followed the essay instructions. The variables we examined included intensity and quantity of negative emotional arousal, and the quality and quantity of CR. We expected negative emotional expression to be highest in the EP group, followed by the EPCR group, and then by the CR group. CR, on the other hand, was expected to follow the opposite pattern, showing the highest frequency in the CR group, followed by the EPCR group, and then by the EP group. Finally, we predicted that both moderate negative emotional arousal and high quality CR would be associated with reductions in depressive symptoms over time for all groups.

It should be noted that we do not believe it is possible to completely separate the processes of emotional arousal and cognitive change because we cannot control what participants think about during the procedures or between writing sessions. Moreover, the CR interventions that we used do not approximate the work that takes place during cognitive therapy with a competent psychotherapist. That is, we do not intend the

interventions to be a true analogue of CR interventions as they are used clinically. Nevertheless, we did attempt to anticipate and address the sorts of negative and dysfunctional beliefs our participants were likely to experience. We also attempted to measure the mental processes they engaged in, at least as they were captured in the written record we had available to us. Finally, we believe that people naturalistically combine EP with cognitive change. The purpose of this study, however, was to attempt to experimentally disentangle the relative contributions and interactions of these mental processes.

Methods

Overview

The study was associated with the Veterinary Hospital of the University of Pennsylvania (VHUP). Participants were pet owners (34 females and 7 males) who sought help for their pets from VHUP. Posters and flyers were placed throughout the waiting rooms at VHUP advertising the study. Experimenters also spent 3 h a week stationed in the waiting rooms of the hospital and emergency room. The experimenters approached pet owners at random and briefly discussed the current situation with their pet. If the pet owner had a sick, injured, or dying pet and described the situation as being distressing, the participants were informed of the opportunity to participate in an expressive writing project that could possibly help them cope with their difficult experience. The chief social worker at VHUP also referred distressed pet owners to the study. If interested, potential participants were given a packet containing the experimental materials or a flyer with experimenters' contact information if they needed more time to decide whether to participate in the project. Those who contacted the experimenters at a later time by phone were sent packets via postal mail. The experimenter thanked those who were not interested for their time.

Once participants agreed to participate in the experiment, they were randomly given an expressive writing packet containing mood questionnaires and instructions from one of the three experimental conditions. Experimenters remained blind to the type of instructions given to the participants. The participants either started the questionnaires in the waiting room or when they got home, and they were expected to complete the essays within 3 days of starting their first essay. They were instructed not to collaborate with others while completing the essays. One essay was completed each day for 3 days and then the materials were mailed back to the experimenters in self-addressed and pre-stamped envelopes. One month after receiving the essays, follow-up mood questionnaires (the same as those originally completed) were mailed to the participants.

To better understand the nature of the sample who agreed to participate in this lengthy protocol, experimenters also distributed packets containing only mood questionnaires to an additional 15 individuals who were in the waiting areas of the VHUP. This cross-sectional "comparison group" allowed us to compare the level of distress in the general waiting room population with individuals who agreed to participate in the lengthy experimental protocol.

Upon completion of the writing period, participants received debriefing statements via postal mail to explain the outline, purpose, and goals of the experiment. Participants with high scores on the Beck Depression Inventory-II (BDI-II), or individuals who endorsed any suicidal ideation were contacted by phone by the first author, who is a

licensed clinical psychologist, to assess the degree of risk and ensure that the individual was in a stable, non-life threatening condition.

Participants

Experimenters distributed 183 packets to pet owners with terminally ill, injured, or dying pets at VHUP. Eighty-five people began the project, and 41 subjects (34 women and 7 men) completed the study. Participants were predominantly Caucasian (39), with only one African-American and one Native-American. The mean age of the sample was 45. Most participants (32) were middle-aged (30–54 years); two were young adults (18–29 years); and seven were seniors (55+). The majority of participants were employed. All conditions were comprised mostly of Caucasian, middle-aged females.

Materials

The BDI-II (Beck et al. 1961, 1996) is a 21-item, forced-choice questionnaire that measures depressive symptoms. Items are scored on a 0–3 scale and summed to produce a total score, with higher scores indicating more depressive symptoms. This measure has moderate to good internal consistency and good test–retest reliability (Beck et al. 1996). For the BDI-II, Beck et al. (1996) suggest that symptom scores of 0–13 be interpreted as minimal, 14–19 as mild, 20–28 as moderate, and 29–63 as severe. Thus, 14 is a relatively sensitive cut point for symptomatic levels of depressive symptoms.

The Satisfaction with Life Scale (SWLS; Diener et al. 1985) is a 5-item scale that is designed to assess global life satisfaction. Items are rated from 1 to 7, and total scores range from 5 to 35, with higher scores indicating higher life satisfaction. Diener et al. (1985) report good internal consistency ($\alpha = .87$) and good temporal stability (2 months test–retest correlation of .82).

Specific Pet-Related Distress (EMO) was a single item that asked, “How do you feel in response to the events regarding your pet?” The item was scaled from 1 to 5, with the following anchors: 1-*unaffected*, 2-*slightly distressed*, 3-*upset*, 4-*very upset/sad*, 5-*deeply distressed*.

Design and Procedure

Participants were randomly assigned to one of three treatment conditions: CR, EP, and EP Combined with CR. Participants in each condition had 3 days of material to complete. In addition to the first essay prompt, day 1 materials for all conditions included an instruction sheet and consent form, a brief demographic profile and mood assessment question, and measures to assess general well being and emotional health: the BDI-II, the SWLS, and the 7-point scale to assess participants’ distress specific to their pets’ situations (EMO). To determine if habituation occurred in the EP condition, those participants were also instructed to rate their emotional arousal on a 7-point scale at the conclusion of each writing session.

The condition of the pet at 1-month follow-up (pet event) was categorized as either sick, injured, or deceased. Several of the pets who were sick or injured at the beginning of the study had subsequently died. None had recovered. The type of pet event was evenly distributed throughout the study sample.

In all conditions, the essay prompts for each day were prefaced by the following statement:

Expressive writing about certain topics has been shown to help people feel better. When people feel better, it is easier for them to get through difficult situations such as losing one's pet.

This instructional set was designed to increase the credibility of interventions. While it might be considered to introduce demand characteristics, all participants received the same instructions. Moreover, we deemed it unlikely that such a suggestion would have a significant impact on outcome measures 1 month later.

The specific essay instructions for each condition for each day read as follows:

Cognitive Restructuring

Day 1

Some research suggests that focusing on positive ways of looking at a situation helps people feel better. Please take the next 20 min to write an essay focusing on reasonable ways of thinking about this difficult situation with your pet. Try to question any negative thoughts you might be having. For example, you might remind yourself that no one can watch their pet 24 h a day, or that your pet lived a long, full life. You might focus on the efforts the doctors made to help your pet, or on the love and attention you have given your pet over the years.

Day 2

Please take the next 20 min to write an essay focusing on some reasonable ways of thinking that might help you feel better. For example, you could consider that your distressing beliefs might be seen in a more positive perspective. Ask whether you are giving yourself enough credit for the care and love you gave your pet. Remember that your pet was well loved, or that memories of your pet will enrich your life, or make you a better pet lover in the future. In other words, try to identify and target whatever beliefs help you feel better.

Day 3

Today, please take the next 20 min to write an essay focusing on some reasonable ways of thinking that might help you feel better. Try to think about what you have written over the past 2 days about the difficult situation with your pet. Try to see your current situation in a more positive perspective.

Emotional Processing

Day 1

Please take the next 20 min to write about your deepest thoughts and feelings regarding what you have experienced throughout this difficult event with your pet.

Do not worry about punctuation or grammar. Just let your feelings spill right onto the page.

Day 2

Using the paper provided, please copy over the essay you wrote yesterday. When you're done, please rate how strongly you felt the emotions, compared to how strongly you felt them when you first wrote the words.

Day 3

Using the paper provided, please copy over the essay you wrote on day one again. This is an opportunity for you to see if your feelings have diminished or changed at all in this time. When you're done, please rate how strongly you felt the emotions, compared to how strongly you felt when you first wrote the words.

Emotional Processing Combined with Cognitive Restructuring

Day 1

Please take the next 20 min to write about your deepest thoughts and feelings regarding the situation with your pet. As you write, consider your reactions on several levels. Many people feel embarrassed by the strength of their emotions. Some people feel guilty. Others feel angry. Some people even feel hopeless about ever feeling better. If you have these feelings, try to identify the beliefs behind them. For example, you might be thinking "he/she was only an animal - it's crazy to feel this way." That thought might make you feel embarrassed about your grief. Or you might be thinking "I didn't do enough to care for/protect my pet." That thought might make you feel guilty.

Day 2

Today, Please take the next 20 min to write about your deepest thoughts and feelings regarding the situation with your pet. Allow yourself to experience your feelings, but at the same time, try to include in your essay some reasonable ways of thinking that might help you feel better. For example, you could consider that your reaction might be normal. Perhaps the depth of your feelings might be an indication of your ability to care for another creature. Ask whether you are giving yourself enough credit for the care and love you gave your pet. Remember that your pet was well loved, or that memories of your pet will enrich your life, or make you a better pet lover in the future. In other words, try to identify and target whatever beliefs seem to cause you the most distress.

Day 3

Once again, please take the next 20 min to write about your deepest thoughts and feelings regarding the situation with your pet. If you still find yourself experiencing a great deal of anger, guilt, embarrassment, hopelessness, or depression perhaps now is the time to ask yourself if the beliefs that make you feel that way are the most

reasonable, balanced way of viewing the situation. Grief is a natural response to the loss or illness/injury of pet. Try to let yourself mourn without letting those negative beliefs get in your way.”

Content Analysis

The content analysis of all essays was carried out by two out of three raters who remained blind to essay condition and mood outcome of each participant. Essays were transcribed by one experimenter and rated by two other experimenters.

Cognitive Restructuring

Cognitive restructuring in each essay was assessed using the Ways of Responding (WOR) Rater's Guide (Barber and DeRubeis 1992). Barber and DeRubeis reported excellent interrater reliability using the intraclass correlation coefficient of .97 for the WOR-Positive subscale, .94 for the WOR-Negative subscale, and .89 for the WOR-Quality rating. The WOR questionnaire was utilized by Hunt (1998) to analyze the amount of CR present in participants' essays written after a negative mood induction. The rater's guide for WOR consists of 25 positive or negative strategies for coping with upsetting events. Positive strategies include: planning or problem solving, CR, and changing one's desire concerning one's character, the world, or one's own goals. In contrast, negative strategies include: focusing blame on oneself, ignoring the situation, and thinking negatively.

Raters extracted phrases from participants' essays containing thoughts that could be categorized as one of the 25 WOR to an upsetting event. The frequency of positive and negative thoughts were recorded for each participant for each day. A single summary score of positive CR across all 3 days was obtained by adding the separate totals of positive thoughts for each day. As used by Hunt (1998), the six examples of CR categories in the WOR guide were: bringing evidence for a benign proposition or counterevidence to an upsetting belief; seeking or bringing in evidence for an alternative explanation; generating one or more explanations for a bad event; diminishing the importance of a negative situation; looking for or finding a positive feature in a seemingly negative situation; and expressing a hopeful attitude toward the situation.

In addition to determining the frequency of positive CR, the overall quality of cognitions (WOR quality) found in each of the participants' essays was also rated. As described by Barber and DeRubeis (1992), the quality of cognitions reflects the likelihood that a participant's thoughts will improve his or her mood. Ratings of quality were based on a 7-point Likert scale where a rating of “1” corresponded to highly effective thoughts and a “7” corresponded to ineffective thoughts. Although the overall quality rating is somewhat subjective and tends to have lower levels of interrater reliability, it was used as a simple means to capture the general quality of cognitions in an entire essay.

Emotional Arousal

The degree to which participants experienced negative emotional arousal was assessed by determining the frequency and intensity of negative affect words in each essay. The intensity of affect words was rated on a 3-point scale ranging from 1 to 3. Raters were

trained using several exemplars (e.g., *unhappy* = 1, *sad* = 2, *very sad* = 3). Summary scores for intensity of affect words in each essay were obtained by adding the ratings for each word and averaging the total values given by each rater for each day. Total summary scores for each participant for frequency and intensity were obtained by adding the score totals from each day.

Results

Subpopulation at Increased Risk for Depressive Symptoms

In order to determine if there was a significant difference in baseline emotional well-being between the average population at VHUP (the comparison group who completed only mood measures at Time 1) and those who chose to participate in the full study (experimental group), we conducted independent samples *t*-tests comparing the means on all outcome measures. There was a marginally significant difference between the experimental group and the comparison group in mean BDI score at Time 1 [$t(52) = 1.87, p = .067$]. The experimental group was more distressed (mean BDI at Time 1 = 13.73, SD = 9.52) than the comparison group (mean BDI at Time 1 = 8.23, SD = 8.21). Moreover, a significantly higher percentage of subjects in the experimental group scored 14 or above on the BDI. Of the 41 subjects in the experimental group, 19 (or 46%) scored 14 or higher on the BDI. Of the comparison group, 2 out of 15 (or 13%) scored in that range [$\chi^2(1) = 3.98, p < .05$]. Participants in the comparison group were also significantly more satisfied with life than participants who elected to participate [$t(52) = 2.22, p < .05$]. For the comparison group, mean SWLS at Time 1 was 25.38 (SD = 6.36). For the experimental group, mean SWLS at Time 1 was 20.15 (SD = 7.72). There were no significant group differences in EMO at Time 1 (see Table 1)

Effect of Condition on Mood over Time

An ANCOVA was conducted to test for significant mood outcome differences between the three experimental conditions. Condition was a significant predictor of BDI at Time 2 when controlling for BDI at Time 1 [$F(2,39) = 4.67, p = .01$]. Pairwise comparisons were conducted between the conditions, and as predicted, participants in the combined condition (EPCR) improved significantly more than those in the CR alone condition [$t(24) = -2.92, p < .01$]. Participants in the EP alone condition improved marginally significantly more than the CR group [$t(24) = 1.96, p = .06$]. As seen in Fig. 1, the EP and EPCR conditions were not significantly different from each other [$t(28) = -1.16, ns$].

Table 1 Experimental versus comparison group at Time 1

Measure	Comparison	Experimental	<i>t</i> -Test (<i>p</i> -value)
BDI	8.23 (8.21)	13.73 (9.52)	$t(52) = 1.87 (p = .067)$
SWLS	25.38 (6.36)	20.15 (7.72)	$t(52) = 2.22 (p < .05)$
EMO	3.62 (1.26)	3.75 (1.06)	<i>ns</i>

Standard deviations are in parentheses

BDI beck depression inventory, SWLS satisfaction with life scale, EMO pet specific distress

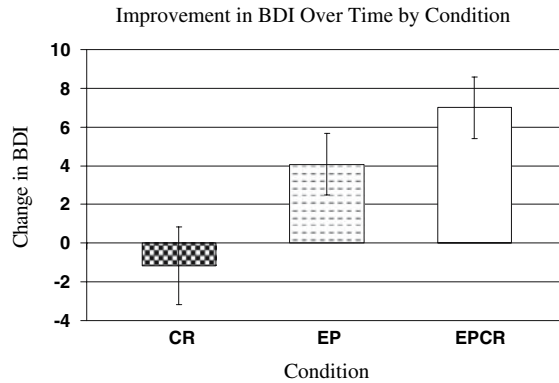


Fig. 1 Improvement in BDI over time by condition. *BDI* beck depression inventory, *CR* cognitive restructuring, *EP* emotional processing, *EPCR* emotional processing and cognitive restructuring

Given our relatively small sample size, we also calculated the effect sizes for these comparisons using Cohen's *d* (Cohen, 1988). Based on the above independent *t*-tests, the effect size for the EPCR versus CR groups was 1.19. The effect size for the CR versus EP groups was .80. Finally, the effect size for the EPCR versus EP groups was .44, although the conventional *p*-value was not significant. According to Cohen's suggestions, these effect sizes are medium to large.

We also compared the percentage of participants in each condition who went from a score of 14 or higher on the BDI (suggesting at least mild depressive symptoms; Beck et al. 1996) to below that cutoff. The average BDI score at Time 1 for those above 14 was 21 (SD = 8.68), suggesting moderate levels of depressive symptoms. An omnibus Chi-square comparing rates of change across all three experimental groups was statistically significant [$\chi^2(2) = 6.14, p < .05$], suggesting that a greater percentage of participants in both the EP and EPCR groups recovered than in the CR alone group. Of the four cases who started out at or above 14 in the CR alone group, no one (0%) decreased below that score. In comparison, the EP group started out with eight cases above 14, and five of those (63%) ended up below a score of 14 [compared to the CR group, $\chi^2(1) = 5.72, p < .05$]. The EPCR group started out with seven cases of whom four (57%) fell below a score of 14 at follow up [compared to the CR group, $\chi^2(1) = 4.86, p < .05$]. The uncertainty coefficient is a directional measure of the strength of the relationship between two nominal variables (in this case, condition and recovery status). It ranges from 0 to 1 and provides an estimate of the effect size of the relationship. The preceding Chi-square analyses yielded uncertainty coefficients ranging from .23 to .35, all $p < .05$, suggesting a moderate effect size.

Condition was also a marginally significant predictor of pet specific distress (EMO) at Time 2, controlling for EMO at Time 1 ($F = 2.92, p = .07$). *t*-Tests indicated that there was no significant difference between EP and EPCR participants' change in emotional response ($t(27) = .46, ns$), and the effect size ($d = .18$) was quite small. However, both EP and EPCR participants' emotional distress decreased significantly more than CR participants' emotional response [$t(24) = 2.13, p < .05$ and $t(23) = 2.81, p = .01$, respectively], and the effect sizes for both large ($d = .87$ and $d = 1.17$, respectively). Overall, these results indicate that the EPCR condition was the most effective in

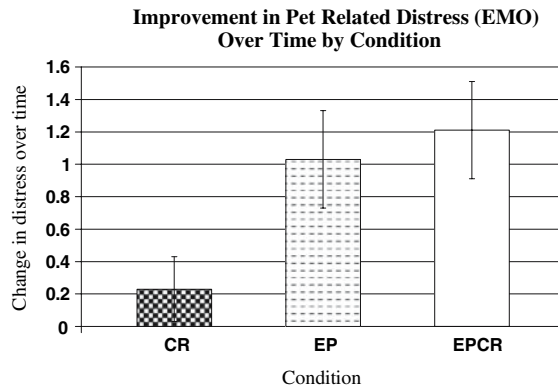


Fig. 2 Improvement in pet related distress (EMO) over time by condition. *CR* cognitive restructuring, *EP* emotional processing, *EPCR* emotional processing and cognitive restructuring, *EMO* specific pet-related distress scale

reducing participants' emotional distress regarding their pet's situation, followed closely by the EP condition (see Fig. 2)

Life satisfaction (SWLS) at Time 2 was not significantly predicted by condition when controlling for SWLS at Time 1 ($F = 1.76$, ns). It should be noted that SWLS at Time 1 was highly correlated with SWLS at Time 2 ($r = .87$, $p < .01$), which suggests that life satisfaction was relatively stable across time. Table 2 presents all outcome means and standard deviations by condition.

Effect of Demographics on Mood over Time

The effect of race could not be examined because of the lack of racial diversity in the study sample. Age was not a significant predictor of mood outcome at Time 2 controlling for mood at Time 1 (all F s < 1.0 , all $p > .75$). For all mood outcomes there were no significant interactions between age and condition. Although we did find a tendency for women to be more depressed than men, sex was not a significant predictor of BDI at Time 2, controlling for BDI at Time 1 ($F < .5$, ns). There were no significant sex differences in SWLS or EMO at Time 2 when controlling for these measures at

Table 2 Depression, satisfaction with life, and pet specific distress by condition

Measure	CR	EP	EPCR
BDI			
Time 1	14.45 (12.96)	12.47 (5.71)	14.47 (10.19)
Time 2	15.64 (17.41)	8.4 (5.60)	7.47 (7.07)
SWLS			
Time 1	21.45 (7.23)	19.07 (6.54)	20.27 (9.35)
Time 2	23.36 (9.20)	21.00 (7.71)	19.53 (9.86)
EMO			
Time 1	3.45 (0.92)	4.00 (0.76)	3.75 (1.40)
Time 2	3.18 (1.25)	2.97 (0.86)	2.57 (0.94)

Standard deviations are in parentheses

BDI beck depression inventory, *SWLS* satisfaction with life scale, *EMO* pet specific distress

Time 1. For all mood outcomes, there were no significant interactions between sex and condition.

Effect of Pet Event on Mood over Time

An ANOVA indicated that there were no significant differences in pet event between conditions ($F = .28$, ns). There was also no main effect of pet event on BDI at Time 2 when controlling for BDI at Time 1 ($F = 1.45$, ns). However, we did find a significant interaction between pet event and condition [$F(4,37) = 5.63$, $p < .01$]. That is, pet event moderated the effect of condition on BDI at Time 2 controlling for Time 1 such that participants in the CR group did particularly poorly if their pet had died since the study began (see Fig. 3). Pet event was not a significant predictor of SWLS or EMO (all $F_s < 2.34$, all $p > .1$).

Content Analysis Variables

Reliability of Content Analysis

Interrater agreement was strong for all content analysis variables. Intraclass correlation coefficients ranged from .97 to .99 between raters for negative emotional arousal ratings for essays one to three. Coefficients ranged from .94 to .97 for frequency of CR in essays one through three and .94 to .97 for quality ratings of CR.

Manipulation Checks

Several ANOVAs were conducted to examine whether participants followed the condition instructions when they wrote their essays. First, a significant difference in frequency of CR was observed between conditions [$F(2,39) = 3.32$, $p < .05$]. As expected, t -tests indicated that participants in the CR group had the highest frequency of CR in their essays. The mean frequency of CR in the CR group, 3.73, was marginally significantly different from the mean of the EPCR group [$t(24) = -1.95$, $p = .06$] and was

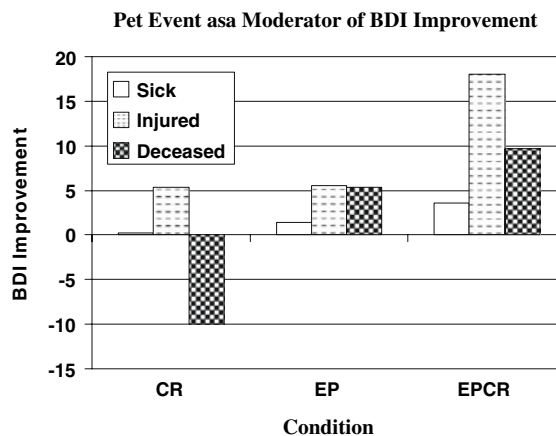


Fig. 3 Pet event as a moderator of BDI improvement. *BDI* beck depression inventory, *CR* cognitive restructuring, *EP* emotional processing, *EPCR* emotional processing and cognitive restructuring

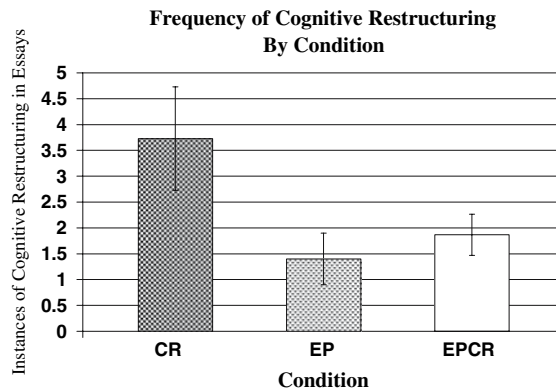


Fig. 4 Frequency of cognitive restructuring by condition *CR* cognitive restructuring, *EP* emotional processing, *EPCR* emotional processing and cognitive restructuring

significantly different from the mean of the EP group [$t(24) = -2.28, p < .05$]. Unexpectedly, there was no significant difference in frequency of CR between the EP and EPCR conditions (see Fig. 4)

Second, a significant difference in *frequency* of negative emotion words was observed between conditions [$F(2,39) = 3.59, p < .05$]. As expected, *t*-tests indicated that participants in the EP group had the highest frequency of negative emotion words in their essays. The mean frequency of negative emotions in the EP group was marginally different from the mean of the EPCR group [$t(28) = 1.98, p = .06$] and was significantly different from the mean of the CR group [$t(24) = 2.16, p < .05$]. There was no significant difference in the frequency of negative emotions between the CR and EPCR conditions, and the effect size for this comparison was relatively small ($d = .29$).

Third, a significant difference in the *intensity* of negative emotional arousal was observed between conditions [$F(2,39) = 4.40, p < .01$]. Again as expected, pairwise comparisons indicated that participants in the EP group had the most intense negative emotional arousal words in their essays. The mean intensity of negative emotions in the EP group was marginally significantly different from the mean of the EPCR group [$t(28) = 1.84, p = .08$] and was significantly different from the mean of the CR group [$t(24) = 2.55, p < .05$]. There was no significant difference in the intensity of negative emotions between the CR and EPCR conditions, however, the effect size for this comparison was moderate ($d = .57$), suggesting that the EPCR group did show more intense negative emotional arousal than the CR group (see Fig. 5)

Because the EP intervention was designed to facilitate habituation, we had asked those participants to rate the degree to which they experienced emotional arousal while writing the essay the first time and subsequently while recopying it. The other two groups were not asked to do this because we could gauge their emotional arousal from the content of the second and third essays. *t*-Tests indicated that habituation (defined as a decline in response strength) occurred across the three writing sessions in the EP alone condition. The mean emotional response score at the end of the second writing session was significantly lower than the mean after the first writing session [$t(11) = 3.22, p < .01$]. The difference between the day 3 session and day 2 session was marginally significant [$t(11) = 1.90, p = .08$].

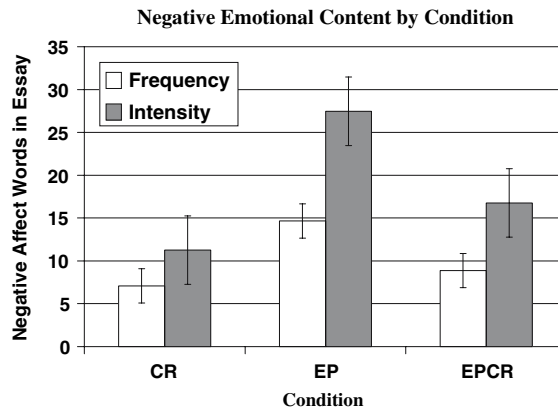


Fig. 5 Negative emotional content by condition *CR* cognitive restructuring, *EP* emotional processing, *EPCR* emotional processing and cognitive restructuring

Partial correlations revealed that this decline in emotional arousal in the EP group did not predict BDI at Time 2, controlling for BDI at Time 1 (partial $r = .03$, ns). However, the decline in arousal from essay 1 to essay 3 *did* predict change in EMO from Time 1 to Time 2 (partial $r = -.61$, $p < .05$).

We had predicted that moderate negative emotional arousal would be associated with decreases in depressive symptoms over time. We did find that participants with a higher BDI scores at Time 1 showed more intense negative emotional arousal ($r = .37$, $p < .05$) in their first essay. Negative emotional expression, both frequency and intensity, was also strongly negatively correlated with SWLS, both in essay 1 and averaged across essays (all r s $< -.43$, all p s $< .01$). Pet specific distress at Time 1 was associated with frequent and intense negative emotional expression across all essays ($r = .37$, $p < .05$ and $r = .40$, $p < .01$, respectively, see Table 3). However, ANCOVAs of BDI at Time 2 controlling for BDI at Time 1 did not reveal significant differences by frequency or intensity of negative emotions (All F s $< .80$, all ns).

Negative emotional expression did predict change in time of pet distress, however. Intensity of negative emotional expression in essays 2 and 3 were both significant

Table 3 Correlations of depression, satisfaction with life, and pet related distress at Time 1 with content analysis variables

	BDI Time 1	SWLS Time 1	EMO Time 1
Number of negative emotion words essay 1	.23	-.51**	.24
Average number of negative emotion words across essays	.17	-.43**	.37*
Intensity of negative emotions words essay 1	.37*	-.54**	.25
Average intensity of negative emotion words across essays	.30 [†]	-.51**	.40**
Frequency of cognitive restructuring essay 1	.21	-.09	.04
Average frequency of cognitive restructuring across essays	.17	-.02	.12
Quality of cognitive restructuring essay 1	.16	-.22	.24
Average quality of cognitive restructuring across essays	.25	-.22	.30 [†]

BDI beck depression inventory, *SWLS* satisfaction with life scale, *EMO* pet specific distress

* $p < .05$, ** $p < .01$

[†] $p < .10$

predictors of EMO at Time 2 controlling for EMO at Time 1 [both $F_s(1,39) > 4.3$, both $p_s < .05$]. This was not simply a function of condition, as both condition and negative emotional expression remained significant when both were included as independent variables in the ANOVA.

The frequency of CR in the essays was not significantly correlated with initial distress level (all $r_s = .21$, all ns). There was a nonsignificant tendency suggesting that the average quality of CR was positively correlated with pet specific distress at Time 1 (see Table 3).

Cognitive restructuring (both frequency and quality) in essays 2 and 3 also did not predict change in BDI over time by CR (both frequency and quality) in essays 2 and 3 [all $F_s(1,40) < 1.0$, all ns]. There was a nonsignificant tendency for frequency of CR in essay 1 to predict change in BDI [$F(1,40) = 2.23$, $p = .14$]. However, this was accounted for entirely by condition. When condition was included as a covariate in the ANOVA, condition remained significant, and frequency of CR did not. Similarly, frequency and quality of CR generally did not predict change in pet specific distress. Only frequency of CR in essay 2 was a significant predictor of EMO at Time 2, controlling for EMO at Time 1 [$F(1,39) = 4.9$, $p < .05$], but again, this was no longer significant when condition was included as a covariate.

Discussion

This study was a follow-up to Hunt's (1998) mood induction study to explore the roles of EP and CR in reducing depressive symptoms and distress in a naturalistic sample. First, we were able to establish that the participants who elected to complete the study were indeed at risk for elevated depressive symptoms (and lower overall life satisfaction) than a sample of participants from the general waiting area at VHUP. Consideration of both mean scores on the BDI and SWLS and cut-point status on the BDI suggest that the individuals who elected to participate in the study were suffering from more depressive symptoms. This validates the choice of this naturally at-risk population for a study of coping after a potentially depressing life event.

As predicted, we found that the combination of EP and CR was the most effective intervention, followed closely by EP alone. The effect sizes for these findings were substantial, ranging from medium to large. CR in isolation unexpectedly increased participants' depressive symptoms if their pet died, suggesting that allowing oneself to experience negative emotional arousal is an important factor in decreasing levels of depression over the long term. Participants in the EPCR condition improved significantly more than those in the CR alone condition. Those in the EP alone condition also improved more than those in the CR alone condition, but this difference did not reach statistical significance. Individuals in the EP group showed a decline in self-reported emotional arousal over the course of writing the essays, and that decline predicted decreases in pet related distress (but not depressive symptoms) 1 month later. The EP and EPCR groups did not differ significantly in outcome on the BDI or pet related distress, and this pattern of results suggests that habituation was not the sole mechanism for improvement in depressive symptoms. As predicted, the main experimental results suggest that EP in conjunction with CR was, overall, the most effective coping technique for reducing depressive symptoms over time.

Condition had no effect on change in global satisfaction with life, probably because there was very little variance from Time 1 to Time 2 for any participant. Indeed, the

correlation from Time 1 to Time 2 was remarkably similar to the general test–retest correlations that Diener et al. (1985) reported. This suggests that global life satisfaction is relatively stable and that it was not sensitive either to the immediate events surrounding the pet's ill health or to the writing intervention.

Interestingly, the pet's health outcome moderated the effect of condition on depression. Participants with a recently deceased pet in the CR condition experienced significant increases in depressive symptoms, whereas participants with a recently deceased pet in conditions that integrated negative EP improved. It is unclear whether individuals in the CR group were at heightened risk, or whether the EP and EPCR groups experienced a protective effect from the intervention. The work of Segal, Boggards et al. (1999) and Segal, Gemar et al. (1999) on human bereavement, however, suggests that there may have been a protective effect from engaging in EP, even before the pet had died.

The content analysis variables were analyzed primarily as a manipulation check. As expected, the EP group engaged in significantly more EP (both in terms of frequency and intensity), the CR group engaged in more CR, and the EPCR group fell in the middle on both variables. Taken together, the results of the content analysis demonstrated that participants followed the specific instructions within their condition, and the essays they wrote were consistent with the way in which each intervention had been conceived.

Examining the content analysis variables as individual differences, interesting relationships were found between these variables and participants' emotional responses to their pets' situations. Negative emotional expression in the essays was positively correlated with both depressive symptoms and pet specific distress at Time 1. That is, the more distress participants were feeling initially, the more likely they were to express negative emotions in their essays. Contrary to predictions, emotional expression in the essays did not predict changes in depressive symptoms over time. However, more negative emotional arousal led to greater improvement in participants' distress levels regarding their pets' situation over time. This finding has broader implications for individuals faced with a distressing life event, whether or not they are at risk for depression. Although high levels of negative emotional arousal were not associated with reductions in overall depressive symptoms, they were associated with decreases in distress associated with a specific stressor.

There was no way to assess change in emotional expression in the essays for the EP group, because they simply recopied their day 1 essay on subsequent days. We did find, however, that the self-reported levels of emotional arousal after completing each essays declined significantly for participants in the EP group. Moreover, the decline in arousal, which suggests habituation, was associated with decline in pet related distress 1 month later. In retrospect, however, the instructional set that included the sentence "this is an opportunity for you to see if your feelings have diminished or changed at all in this time" may have set up an unfortunate demand characteristic to report decreased arousal. As a result, this particular finding must be interpreted with caution.

Cognitive restructuring in the essays was not strongly related to any of the Time 1 dependent measures, although there were some nonsignificant trends in the data suggesting that those individuals who were more distressed initially may have made higher quality efforts at CR. CR as coded from the essays, however, did not predict changes in depressive symptoms or pet specific distress over time.

The experimental design attempted to clearly separate the effects of CR and EP. The content analysis confirmed that the experimental manipulations were successful in

getting participants to expend their efforts on one, the other, or both. Although we attempted to constrain the amount of CR that the EP group engaged in, we obviously could not control the mental processes that took place while the participants recopied their essays. It may be that a great deal of CR took place during that exercise that was inaccessible to us. Thus, while we attempted to separate the effects of pure EP from simultaneous CR, we may not have been successful in doing so. On the other hand, we can be more confident that the CR group did not engage in much EP. Unlike Hunt (1998) we did not instruct the CR group to *avoid* expressing or experiencing emotion. Because there was relatively little expression of emotion in their essays, we conclude that they were not engaging in much EP.

The content analysis variables confirmed that our interventions accomplished what was intended, but they did not independently predict changes in depressive symptoms or pet specific distress over time. Thus, the most conservative interpretation of our results is that EP (probably in combination with CR) is more effective than CR in an emotional vacuum. However, we can say nothing definitive about *how* or *why* such an effect occurs.

Nevertheless, these findings have implications for the treatment of individuals at risk for depression and for therapeutic interventions for individuals who are currently depressed. In particular, the study suggests that negative emotional arousal may be, as Beck (1979) has suggested, an important component of cognitive therapy for depression. CR in an emotional vacuum, especially in the face of irretrievable loss (such as the death of a beloved pet) is not only unhelpful, but may actually be harmful. On the other hand, the combination of EP with effective CR seems to be a particularly powerful intervention.

There were some limitations of the study. In particular, the sample was highly self-selected and consisted mostly of Caucasian, middle-aged women. On the one hand, it is clear that we were successful in targeting a known high-risk sample. On the other hand, the nature of the sample clearly limits the generalizability of the results. Future research should focus on expanding the size and diversity of the sample population.

The second limitation is that our manipulations amounted to, at best, a weak analogue of CR or EP interventions as they are used clinically. Clearly the interpersonal support and skillful interventions of an experienced cognitive therapist would look quite different and would presumably have significantly more impact than our expressive writing instructions. Again, we want to stress that this study was an experimental dismantling of some of the processes that can and do occur during successful psychotherapy. The CR group did not simply engage in positive thinking or affirmations. The content analysis of CR was based on Barber and DeRubeis' (1992) WOR Measure. The WOR was designed quite explicitly to provide an exhaustive list of the types of CR patients are taught during cognitive therapy for depression. Examples include generating alternative explanations, citing evidence for benign beliefs, and citing counter-evidence for upsetting beliefs. The results of our content analysis suggest that participants in the CR group did an excellent job of this. Unfortunately, in the absence of emotional arousal, it simply was not very helpful.

We believe that our results shed some light on the importance of not bypassing emotional experience, particularly in the early stages of recovery from a negative event. That we were able to demonstrate significant change in severity of depressive symptoms using a relatively weak, short-term intervention, suggests that EP may play an important role in recovery. More research in the clinical domain, perhaps coding psychotherapy tapes for emotional arousal and CR, would be the next logical step in assessing the relative roles and interactions of these processes on recovery and relapse prevention.

Cognitive-behavioral therapy is an effective intervention for a number of disorders, especially depression. We simply suggest that process research should not ignore the role of emotional arousal in facilitating cognitive change.

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