ORIGINAL PAPER

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Modes of Processing Trauma: Self-Compassion Buffers Affective Guilt

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Abstract

Self-compassion (SC) entails being kind toward oneself when in pain and holding painful experiences in mindful awareness, and has been associated with lower levels of posttraumatic stress severity. Recent research suggests SC may be more relevant to the current conceptualization of PTSD that is based on the *DSM-5* definition, which includes a new symptom cluster focused on alterations of cognitions and mood such as guilt. We examined effects of SC on affective guilt as a function of treatment-relevant processing modes. One week after completing the SC Scale, 63 victimized women were randomly assigned to one of three processing mode induction conditions: "analytic" (brooding), "experiential" (mindful experiencing), or control. Following induction, women completed a trauma-specific perseverative thinking interview to process their trauma. Before induction (T1) and after the interview (T2), women completed a measure of affective guilt. Guilt increased from T1 to T2, and SC was negatively related to increases in guilt. Processing mode conditions moderated the relation between SC and changes in guilt; simple slopes revealed a negative relation among the analytic condition. Components of SC, including greater self-kindness and mindfulness, were related to diminished increases in guilt. Results suggest SC can buffer feelings of guilt, especially in those who process their trauma analytically. Implications for research are discussed.

Keywords Self-compassion · Trauma processing · Trauma guilt · Analytic processing

A growing body of research on self-compassion (SC) has found higher SC is associated with less posttraumatic stress severity (Thompson and Waltz 2008) among combat veterans (Hiraoka et al. 2015), childhood abuse survivors (Barlow et al. 2017), and other interpersonal trauma survivors (Bistricky et al. 2017). Even more, a study by Hoffart et al. (2015) found components of SC predict within-person changes in posttraumatic stress severity over the course of Prolonged Exposure Therapy (PE; Foa et al. 2007). PE is a trauma-focused cognitive behavioral treatment considered a first line intervention for posttraumatic stress disorder (PTSD; Karlin et al. 2010). PE does not directly target SC, but can address it during postimagery dialogs in session. Greater self-kindness and less self-judgment, isolation, and over-identification over the course of

PE treatment predicted decreases in posttraumatic stress (Hoffart et al. 2015).

Moreover, research examining SC-based practices in treatment for trauma-related distress has revealed positive findings. In a pilot study of a 12-week course of Loving-Kindness Meditation, a practice designed to enhance feelings of kindness and compassion for self and others, PTSD symptoms decreased at 3-month follow-up (Kearney et al. 2013). The reduction in symptoms from baseline was mediated by enhanced SC (Kearney et al. 2013). Mindfulness-Based Stress Reduction (MBSR) has also been studied in trauma survivors. MBSR is a treatment program that focuses on the progressive acquisition of mindful awareness, a core component of SC, and loving-kindness is introduced during an all-day meditation (Kabat-Zinn 1990). Two studies examined the effectiveness of group MBSR in trauma survivors: one in a sample of adult community childhood sexual abuse survivors (Kimbrough et al. 2010) and another in veterans seeking treatment at a Veterans Affairs hospital (Kearney et al. 2012). PTSD symptoms decreased after the MBSR course and were maintained after 6 months in both studies (Kearney et al. 2012; Kimbrough et al. 2010). A longitudinal follow-up study in the community sample of childhood sexual abuse survivors

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found improvements in depression, PTSD, anxiety symptoms, and mindfulness scores were shown two-and-a-half years later, with magnitude of intervention effects ranging from medium to large (Earley et al. 2014).

Most research demonstrating the negative relation between SC and posttraumatic stress uses the conceptualization of PTSD based on the *Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision* (*DSM-IV-TR*; American Psychiatric Association [APA] 2000). In the *DSM-IV*, PTSD is defined by three symptom clusters: (1) reexperiencing, (2) avoidance/numbing, and (3) hyperarousal. Research has demonstrated in a sample who endorsed *DSM-IV* Criterion A traumas that greater SC was associated with less avoidance/numbing symptoms, but neither reexperiencing nor hyperarousal symptom clusters (Thompson and Waltz 2008). However, the opposite was found in another sample who endorsed *DSM-IV* Criterion A traumas; greater SC (defined by positively valanced items) was associated with less reexperiencing and hyperarousal symptom clusters, but not avoidance/numbing symptoms (Seligowski et al. 2015). In the *DSM-Fifth Edition* (*DSM-5*; APA 2013), slight alterations were made to the reexperiencing and hyperarousal symptom clusters. A new symptom cluster was added (i.e., alterations in cognitions and mood associated with trauma exposure), which had a significant impact on reconfiguring the avoidance/numbing symptom cluster. Specifically, the avoidance/numbing cluster was separated into two: one cluster to specify avoidant behaviors and the other cluster to specify dysphoric arousal that represented affective responses to trauma. In a study examining the relation between SC and PTSD symptoms using *DSM-IV* and *DSM-5* criteria in two trauma-exposed samples, SC was negatively associated with aggregated PTSD symptoms for *DSM-IV* and *DSM-5* (Maheux and Price 2015). However, SC was correlated only with *DSM-IV* avoidance/numbing symptoms, but was correlated with all *DSM-5* symptom clusters (Maheux and Price 2015). These findings suggest SC may be more relevant for the current PTSD diagnostic criteria, which has significant implications for current treatments.

In fact, Hoffart et al. (2015) conjecture that increases in SC during treatment may reflect changes in negative cognitions and subsequent mood, such that greater SC reduces shame, guilt, and loneliness associated with a traumatic memory. This reduction in shame and guilt may relieve the potential for intrusive reexperiencing and avoidance of reminders. Similarly, increases in SC may counteract the negative emotions associated with the trauma memory and the corresponding symptoms. Research has demonstrated greater SC is associated in complex ways with guilt and shame (e.g., Woods and Proeve 2014). Yet, only recently has there been examination among *trauma survivors* of the effect of SC on affective responses, such as guilt. Guilt is an important area of investigation given the observation that guilt cognitions may remain unchanged for some clients over the course of PTSD treatment

(Owens et al. 2008) and may prevent trauma survivors from being able to fully recover (Kubany and Watson 2003). One study found that changes in guilt predicted subsequent changes in PTSD symptoms over the course of Prolonged Exposure Therapy, suggesting trauma-related guilt may be an important mechanism of change in PTSD treatment (Øktedalen et al. 2014b).

In a recent pilot study, examining the effects of a 4-week-long self-administered SC training on trauma-related guilt among a sample of highly traumatized homeless male veterans, SC increased over the treatment period and trauma-related guilt decreased (Held and Owens 2015). Interestingly, trauma-related guilt cognitions increased slightly from pre- to mid-intervention assessment and dropped dramatically after. This brief incline in guilt may be explained by the treatment procedure requiring participants to become more aware of their emotions and negative self-talk, leading to a potential increased awareness of their cognitions and affective guilt in the beginning stages of treatment. However, when compared to the stress-inoculation training control group, participants in both interventions reported increased levels of SC and equal reductions in trauma-related guilt (Held and Owens 2015). Thus, more research is needed to examine under what treatment conditions SC can exert effects on trauma-related affective guilt.

Valdez and Lilly (2016) examined the effects of SC on analogue traumatic stress symptoms after a trauma processing interview during an experimental paradigm among a sample of interpersonal trauma survivors. Results revealed those with higher levels of mindfulness and self-kindness who were in the control group or who were induced to process their index interpersonal trauma analytically (i.e., ruminate, brood) had less negative affect after their trauma processing interview. Those who were induced to process their trauma experientially (i.e., engage in present moment awareness) did not show a relation between SC at baseline and negative affectivity after their trauma processing interview. These results suggest that processing modes exert differential effects of SC components on trauma-related negative affectivity. Specifically, SC mindfulness and self-kindness may be most beneficial during analytic processing, potentially by working in conjunction to reduce the tendency to perseverate on negative internal experiences, including cognitions and emotions. Thus, treatments designed to enhance SC may be effective in targeting specific PTSD symptoms such as negative affectivity and affective guilt, especially among clients who engage in analytic modes of processing.

The purpose of this study is to examine the effects of SC, and its component variables, on the specific analogue PTSD symptom of affective guilt after trauma processing between those induced to process experientially and analytically. It is hypothesized that (1) affective guilt will significantly increase after a trauma processing interview, (2) SC will be negatively related to increases in affective guilt, (3) processing modes

will moderate the relation between SC and increases in affective guilt such that this relation will only exist for analytic processors, and (4) that the specific components of self-kindness and mindfulness will be negatively related to increases in affective guilt among analytic processors.

Method

Participants

Of 63 participants who were victims of interpersonal trauma (i.e., trauma in which a human being inflicts physical or psychological injury on another human being), 56 were community women and seven were female university students (three in the experiential processing condition, three in the analytic processing condition, and one in the control group. The average age of participants was 31.48 (SD = 12.76), ranging from 18 to 67. Thirteen participants were Hispanic or Latino (20.6%). Approximately half were Caucasian/White (50.8%, n = 32); 30.2% were African American/Black (n = 19), 1.6% were American Indian or Alaskan Native (n = 1), 1.6% were Asian (n = 1), 6.3% were Biracial (n = 4), 1.6% reported Unknown (n = 1), and 6.3% declined to answer (n = 4). Most participants in the subsample were heterosexual (85.7%, n = 54) and 39.7% were single (i.e., never married, n = 24). The majority of participants had some college or vocational school training (54%, n = 34), and the greatest proportion of participants reported a household income of $15,000 or less (33.3%, n = 21). Across experimental groups (analytic processing, experiential processing, control), participants did not differ with regard to age, ethnicity, race, sexual orientation, marital status, education level, or household income (all p's > .05).

Participants were recruited from the Psychology Department student subject pool at a large Midwestern university and from the community through advertisements in local commercial locations (grocery stores, laundromats), social service agencies, and college billboards, as well as through previous research databases in which participants consented to be re-contacted for future studies. Community and student participants were prescreened through telephone and undergraduate classroom mass testing, respectively, to determine their eligibility for the study. Only women over the age of 18 were included to avoid introducing gender influences on posttraumatic stress into the study (e.g., Tolin and Foa 2006). Additionally, previous research has shown interpersonal traumas to be among the most distressing events reported by college students (Frazier et al. 2009) and community trauma victims (Breslau et al. 2004), and to result in the highest probability of PTSD (Breslau et al. 1998). Women were excluded from participation if (a) the last incident of the identified trauma occurred before the age of 16, to reduce the potential of developmental trauma effects in the study; and (b) the trauma occurred within the last 3 months, as

this group of individuals could have been coping with a high degree of posttraumatic stress symptoms (Rothbaum et al. 1992) and participation in this study could have placed participants under additional distress or interfered with study results.

Procedure

Women who met inclusion criteria during the telephone prescreening were asked to complete a set of self-report questionnaires online to obtain demographic and trauma history information, as well as their level of SC and posttraumatic stress severity 1 week prior to a research session in the lab (baseline). Participants were given the weblink to access the online questionnaire. Those who did not have access to a computer or the Internet completed the online questionnaire in the research lab, where they were given access to a computer. Participants provided informed consent online by clicking the appropriate button that directed them to the online study questionnaires. The online questionnaire took approximately 30 min to complete. Community participants were paid $10 for their time, and student participants were given course credit. Following the completion of the online questionnaires, participants were assigned randomly to either an experimental condition (experiential processing or analytic processing) or the control group. They were then contacted via phone or e-mail to schedule a lab session. Childcare was provided by undergraduate research assistants during the lab session when needed.

The mean number of days between the online questionnaire and research session was 15.14 (SD = 10.59) and ranged from 7 days to 61 days, which did not differ by condition, $F(2, 62) = 0.66$, $p = .522$. The lab session took approximately one and a half hours to complete. Community participants received an additional $30 for their time, and student participants received additional course credit. The lab session began by having participants complete self-report questionnaires, including the Positive and Negative Affect Schedule-Expanded Form (PANAS-X; Watson and Clark 1999) to obtain a baseline of state affective guilt (T1). After the first author administered PANAS-X questionnaires to participants, a female undergraduate research assistant who was blind to study hypotheses came into the room to administer the experimental manipulation (i.e., Modes of Processing induction; Watkins, Moberly, and Moulds 2008). Processing modes were induced using the procedures outlined in Watkins et al. (2008). In this procedure, participants read through 30 scenarios. Instructions for reading each scenario vary depending on experimental group assignment to induce either analytic or experiential processing, or control effects. There are 15 positive and 15 negative written scenarios across a range of settings (social, interpersonal, academic, employment), each approximately three sentences in length. All participants read through the same 30 scenarios, with instructions to spend a minute concentrating

on each event. The order of the written scenarios was randomized so that there would be no more than three scenarios of the same valence presented consecutively.

In the analytic processing condition, participants were instructed as follows for each scenario: "I would like you to think about why it happened, and to analyze the causes, meanings, and implications of this event." In the experiential processing condition, participants were instructed as follows for each scenario: "I would like you to focus on how it happened, and to imagine in your mind as vividly and concretely as possible a 'movie' of how this event unfolded, including how you felt moment-by-moment." In the control condition, participants were instructed as follows for each scenario: "I would now like you to spend a minute concentrating on this text. Specifically, I would like you to count the number of verbs that occur in the description of this event." Control group instructions were chosen to ensure that participants read the text without inducing either experimental processing mode. Prior to induction, all participants practiced adopting the assigned processing mode on the same (negative) practice scenario. For practice and target scenarios, participants were instructed to say aloud their reaction to the scenario based on the directions given for 1 min and to stop when instructed.

After the experimental induction, the undergraduate research assistant left the room, and the first author administered a trauma-specific perseverative thinking interview (adapted version of the Catastrophizing Interview; Davey and Levy 1998; Vasey and Borkovec 1992) on their index interpersonal trauma (i.e., the trauma that distressed them the most). The Catastrophizing Interview assesses perseverative thinking about a worrisome topic, in this case, the index trauma, in an iterative fashion by asking interviewees to elaborate their concerns repeatedly until they adequately addressed their concern. After, participants completed the PANAS-X (T2) to obtain a post-manipulation assessment of state affective guilt. The study concluded with inducing a positive mood state with a short story to remove potential negative residual effects from revisiting trauma memories. To induce a positive mood, participants were asked to read a short positive story about a 76-year-old grandmother who received her college degree after delaying her education for 42 years to raise a family. Participants were explicitly instructed to enter the mood state before reading the story, as demand characteristics intensify mood induction (Westermann et al. 1996). Following the completion of the study, participants were thanked for their participation and given a debriefing form.

Measures

Demographic Questionnaire (DQ) Participants completed a demographic questionnaire created by the researchers to record age, ethnicity, race, marital status, sexual orientation, household income, and education level.

Self-Compassion Scale (SCS) The SCS (Neff 2003) is a 26-item scale that measures beliefs and attitudes about SC. It assesses three components of SC, including the ability to treat oneself with kindness (self-kindness) versus critical self-judgment (self-judgment), seeing one's experiences as a part of a common shared humanity (common humanity) versus isolating one's experiences (isolation), and being able to hold one's thoughts in balanced awareness (mindfulness) versus over identifying with them (over-identification). SC is an overarching factor emerging out of the combination of subscale components (Neff 2003). A total sum score for SC was computed by reverse scoring items from the negative subscales (i.e., self-judgment, isolation, and over-identification) and then summing all items. The three positive subscales (i.e., self-kindness, mindfulness, and common humanity) were used to assess components of SC relevant to this study. Self-kindness is measured by five items (e.g., "I try to be loving toward myself when I'm feeling emotional pain"). Mindfulness is measured by four items (e.g., "When I'm feeling down I try to approach my feelings with curiosity and openness"). Common humanity is measured by four items ("When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am"). Items are rated from 1 (*almost never*) to 5 (*almost always*) and averaged to create subscale mean scores, with higher scores indicating greater self-kindness and mindfulness. SCS subscales have demonstrated adequate internal consistency (self-kindness $\alpha = .78$; mindfulness $\alpha = .75$; common humanity $\alpha = .80$, Neff 2003). Internal consistency for the sum score of SC in this study was .71, and subscale internal consistencies for self-kindness, mindfulness, and common humanity in this study were .88, .77, and .79, respectively.

Positive and Negative Affect Schedule-Expanded Form (PANAS-X) The PANAS-X (Watson and Clark 1999) was used to assess affective guilt with six items that describe emotions and feelings of guilt (e.g., "blameworthy," "angry at self"). Each item is rated on a 5-point scale from 1 (*very slightly or not at all*) to 5 (*extremely*). A total mean score is created by summing all items corresponding to that scale and then dividing by the number of items on that scale, with higher scores indicating higher degrees of affective guilt. Affective states assessed by the PANAS-X are reliable; median internal consistency for the guilt subscale across 11 samples has shown to be .88 (Watson and Clark 1999). Test-retest reliability has been shown to range from .23 (Surprise) to .49 (Shyness) for other affective states assessed by the PANAS-X, indicating a moderate level of stability, but more importantly, that subjects have a characteristic range of affect within which short-term fluctuations occur (Watson and Clark 1999). Thus, the PANAS-X scales are sensitive to changing internal and external circumstances, and can be used validly to assess short-term state affect. Participants in this study were asked to rate their affect at T1 and T2: "Indicate to what extent you feel this way

right now, that is, at the present moment." Internal consistencies for T1 and T2 affective guilt in this sample were .85 and .92, respectively.

Data Analyses

IBM SPSS Version 24 was used for all statistical analyses. Before hypothesis testing, one-way ANOVAs were used to assess for potential differences in baseline SC variables (i.e., overall SC, self-kindness, mindfulness, and common humanity) and both T1 and T2 affective guilt among the experimental conditions (Table 1). To test hypothesis 1, paired samples t tests were used to examine differences in affective guilt between T1 and T2. A change score was then calculated to create a variable defined by the increase in affective guilt between T1 and T2 (i.e., T2 affective guilt minus T1 affective guilt).

To test hypothesis 2, a linear regression analysis was conducted to examine the relation between SC and increases in affective guilt after trauma processing. A series of linear regression post hoc analyses was run to assess the relation

Table 1 Descriptive Statistics of Continuous Variables ($N = 63$)

Variable	Minimum	Maximum	Mean	Standard deviation
Total sample ($n = 63$)				
Mindfulness	1	5	3.37	0.96
Self-kindness	0.60	5	2.96	1.12
Common humanity	0.25	5	3.21	1.07
T1 affective guilt	1	3.17	1.33	0.55
T2 affective guilt	1	4.83	1.55	0.79
Analytic condition ($n = 21$)				
Mindfulness	1.25	4.75	3.42	0.81
Self-kindness	1	4.80	3.15	1.11
Common humanity	1.5	4.5	3.30	0.90
T1 affective guilt	1	2.83	1.44	0.62
T2 affective guilt	1	4.83	1.70	1.08
Control condition ($n = 21$)				
Mindfulness	1.5	5	3.18	0.84
Self-kindness	1	5	2.81	1.03
Common humanity	0.25	5	2.86	1.22
T1 affective guilt	1	2.83	1.28	0.47
T2 affective guilt	1	2.67	1.49	0.55
Experiential condition ($n = 21$)				
Mindfulness	1	5	3.5	1.19
Self-kindness	0.60	5	2.92	1.22
Common humanity	1.5	5	3.46	1.03
T1 affective guilt	1	3.17	1.27	0.57
T2 affective guilt	1	3.50	1.47	0.66

between SC components (i.e., self-kindness, common humanity, mindfulness) and increases in affective guilt. To correct for family-wise error, a Bonferonni Correction was implemented, and statistical significance was set at $p < .017$ (.05/3 subscale comparisons) for post hoc analyses.

A moderation analysis was conducted to test hypothesis 3, that trauma processing modes (i.e., experimental conditions) moderate the relation between SC and affective guilt after trauma processing. To test this moderation model, the steps outlined in Frazier et al. (2004) were followed. First, the processing modes variable was dummy coded, and SC was standardized (i.e., z scored) to reduce multicollinearity between the moderator variables and product term. Next, a product term representing the interaction between processing modes and standardized SC was created. Finally, a hierarchical multiple linear regression analysis was conducted with the dummy coded processing modes variable and the standardized SC variable entered on step one, and the interaction between these two variables entered on step two. Simple slopes were inspected to examine whether the relation between SC and increases in affective guilt exists only for the analytic processors compared to the experiential processors. A moderated multiple regression (MMR) is the method of choice for testing hypotheses about moderating effects of categorical variables in a variety of applied research domains (Aguinis et al. 2005). To achieve .95 power with three predictors and an estimated medium effect size of .25, a sample size of 55 was estimated using G*Power (Faul et al. 2009). The only known study examining the relation between SC and guilt (i.e., guilt-proneness while controlling for shame-proneness) found a small to medium effect of .16 (Woods and Proeve 2014). However, a more relevant study examining these constructs found a large effect when examining trauma-related guilt before and after a SC intervention for trauma survivors (i.e., $d = 1.56$; Held and Owens 2015). Therefore, utilizing these effect size estimates, and leaning toward a conservative approach, a medium effect size estimate was selected in calculating the required sample size to achieve .95 power.

Finally, to examine what specific components of SC may be related to changes in guilt among analytic processors (hypothesis 4), a series of linear regression analyses was conducted in which increases in affective guilt were regressed on either self-kindness, mindfulness, or common humanity. To correct for family-wise error, a Bonferonni Correction was implemented, and statistical significance was set at $p < .017$ (.05/3 subscale comparisons) for the three linear regression analyses.

Results

Intimate partner violence was the modal index trauma identified on the Catastrophizing Interview, reported by 44.44% of participants ($n = 28$). For a complete description of trauma

history and posttraumatic stress severity reported in this sample, refer to Valdez and Lilly (2016).

SC did not differ by condition, $F(2, 62) = 1.17$, $p = .32$. Self-kindness, mindfulness, and common humanity did not differ by condition (p's > .05). T1 guilt did not differ by condition ($F(2, 62) = 0.60$, $p = .554$). Consistent with hypothesis 1, guilt significantly increased from T1 to T2, $t(62) = 2.70$, $p = .009$, regardless of condition (see Fig. 1).

Consistent with hypothesis 2, greater baseline SC predicted a diminished increase in guilt after trauma processing ($\beta = -.37$, $p = .004$). Post hoc analyses found that this remained true for two components of SC after controlling for the family-wise error rate using a Bonferonni Correction and setting statistical significance at $p < .017$ (.05/3 subscale comparisons). That is, greater self-kindness ($\beta = -.34$, $p = .007$) and greater mindfulness ($\beta = -.34$, $p = .006$) were associated with a diminished increase in guilt after trauma processing, but greater common humanity was not associated with changes in guilt ($\beta = -.24$, $p = .062$).

Although there were no differences in increases in guilt after trauma processing among the analytic ($t[62] = 1.31$, $p = .207$), experiential ($t[62] = 1.70$, $p = .106$), and control ($t[62] = 2.08$, $p = .050$) conditions, processing conditions moderated the relation between SC and changes in guilt after trauma processing; a model regressing increases in affective guilt on SC, trauma processing modes, and the interaction term was significant, $F(3,61) = 6.56$, $p = .001$ (see Table 2 and Fig. 2).

Simple slopes analyses revealed there was no relation between SC and changes in guilt among the experiential ($\beta = -.23$, $p = .322$) and control ($\beta = -.41$, $p = .064$) conditions. Consistent with hypothesis 3, greater SC predicted a diminished increase in guilt after trauma processing among the analytic condition ($\beta = -.46$, $p = .006$).

Among the analytic condition, greater self-kindness ($\beta = -.52$, $p = .016$) and mindfulness ($\beta = -.57$, $p = .007$) were associated with a diminished increase in guilt after trauma

processing, even after correcting for the family-wise error rate using a Bonferonni Correction and setting statistical significance at $p < .017$ (.05/3 subscale comparisons). The relation between common humanity and increased guilt was not significant ($\beta = -.39$, $p = .077$), supporting hypothesis 4.

Discussion

The role of guilt in the development and maintenance of PTSD is well-documented (for review see Pugh et al. 2015). Factors that buffer against the development of posttraumatic guilt, or mitigate guilt post-trauma, may be important targets for effective prevention and intervention efforts. An influx of affective guilt was observed following a ruminative thinking task for all participants, regardless of their experimental condition.

However, participants who reported more SC prior to an experimental manipulation (i.e., modes of processing induction) experienced a diminished increase in guilt following the trauma-focused interview. Across all conditions, individuals with lower SC experienced a greater influx of affective guilt after thinking about their index trauma.

Results of this study further suggest that SC may be particularly important in the context of interventions characterized by an analytic processing approach. Specifically, SC exerted the greatest influence on affective guilt when participants were induced to focus on the causes, meanings, and implications of life events. It is when individuals focus most intently on the causes and consequences of traumatic events that they may be most prone to guilt feelings. It is possible that the reason the effect of SC on affective guilt was seen most strongly (and only significantly) in this condition was because other conditions did not cue guilt as strongly, weakening the ability to detect whether variation in SC affected guilt in these conditions. In other conditions, in which there was not a significant

Fig. 1 Increases in affective guilt between T1 and T2 as a function of experimental condition
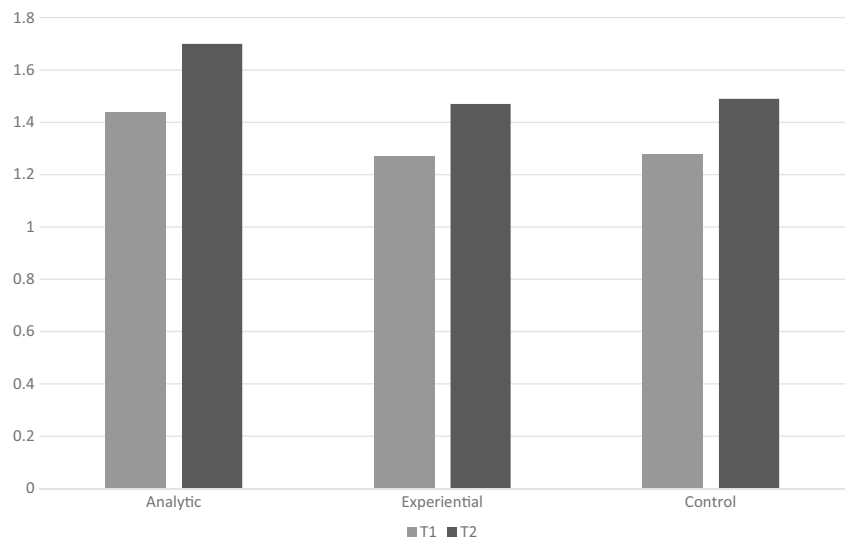
Table 2 Hierarchical linear regression analysis testing self-compassion as a moderator of the relation between trauma processing modes and affective guilt ($N = 63$)

Predictor	Adj.R^2	B	SE B	β
Step 1:	.11			
Predictor: self-compassion		−1.54	0.49	−.39**
Predictor: processing mode		−.50	0.59	−.11
Step 2:	.22			
Predictor: self-compassion		−.81	0.53	−.20
Predictor: processing mode		−.20	0.56	−.04
Predictor: interaction		−.29	0.10	−.38**
Total Adj. R^2	.22**			

*$p < .05$; **$p < .01$

relation between SC and guilt, it is possible that guilt was felt less poignantly when focusing on data-driven elements of the narrative, such as in the experiential condition.

Guilt is a powerful emotion that occurs when individuals experience an awareness of, and regret related to, previous behaviors and decisions. In the context of trauma, guilt is often reflected in "should" cognitions (e.g., "I should have known that would happen") that are targeted in the course of treatment, particularly in cognitive behavioral approaches such as Cognitive Processing Therapy (CPT; Resick et al. 2017) and Prolonged Exposure (Foa et al. 2007). The results of the current study suggest a focus on SC alone may have salutary

effects in the domain of affective guilt when individuals are exposed to reminders or memories of previous traumatic events. This argument supports a growing literature that shows a connection between greater SC and lower posttraumatic stress severity (Barlow et al. 2017; Bistricky et al. 2017; Hiraoka et al. 2015; Thompson and Waltz 2008), as well as research demonstrating the efficacy of Loving-Kindness Meditation and MBSR (which include a focus on SC) for the treatment of PTSD (Earley et al. 2014; Kearney et al. 2012; Kearney et al. 2013; Kimbrough et al. 2010).

Though the literature supporting standalone mindfulness-based approaches for the treatment of trauma has grown, it may be equally or more effective to incorporate a focus on SC into current "gold standard" trauma-focused interventions such as CPT and PE early in the treatment process, which may enhance treatment outcomes by reducing affective guilt associated with trauma memories revisited within these treatments. This contention is supported by the work of Hoffart et al. (2015), in which SC at baseline predicted treatment-related change in the context of Prolonged Exposure (PE). Yet, a recent meta-analysis on the use of meditation-based approaches (including MBSR) for the treatment of PTSD yielded less robust results. Specifically, Hilton et al. (2017) found that across 10 trials on adjunctive meditation interventions for PTSD, the additional intervention resulted in greater improvement in PTSD and depression when compared to control groups, but the effect size was small and the overall quality of evidence for the effect was considered low. Future use of

Fig. 2 Interaction plot depicting the relation between self-compassion and changes in affective guilt from T1 to T2 as a function of experimental condition
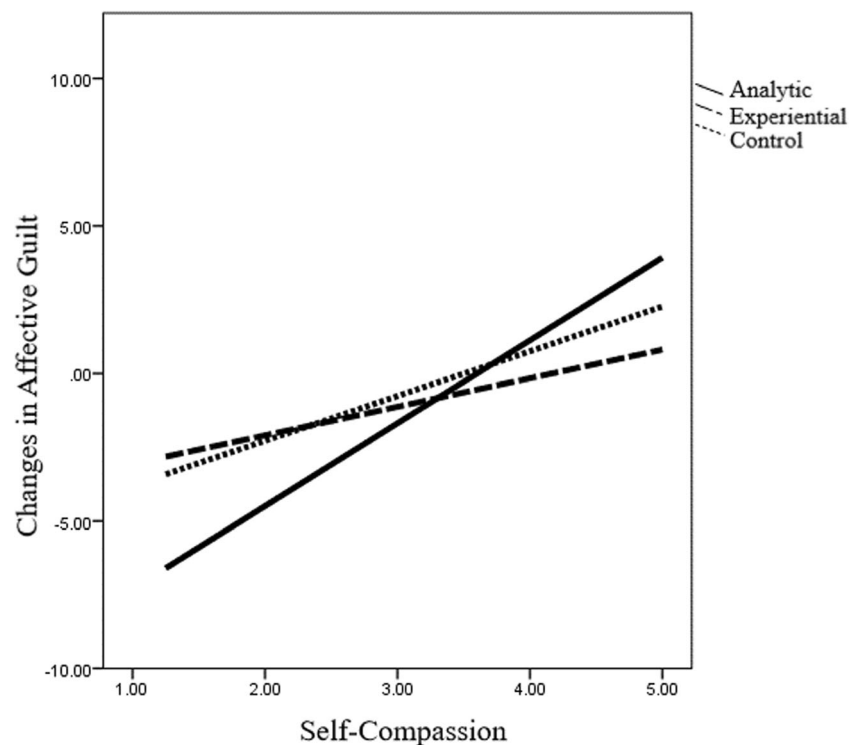
randomized control trials that examine mindfulness-based interventions that focus on SC as a standalone treatment for trauma, or as an adjunctive treatment for trauma, can provide more robust evidence in support of this study's conclusions. Additionally, it may be important to look at components of SC to elucidate the key ingredients that influence change. Prior research suggests that greater self-kindness (Valdez and Lilly 2016) and mindfulness (Woods and Proeve 2014) are variables associated significantly with negative affectivity and guilt, and this study found these components of SC to be associated negatively with guilt. It may be that common humanity alleviates feelings of inadequacy related to shame as one recognizes that the human experience is imperfect. However, guilt involves negative evaluations of specific actions or behaviors that motivate individuals to attempt reparative action (Øktedalen et al. 2014a), which may be more relevant to the phenomenon of PTSD, and more readily targeted through processes of mindfulness and self-kindness.

Limitations and Future Research Directions

The current study implicates SC as a person-level variable that impacts emotional reactions to trauma-related memories and reminders. Yet, findings must be considered in light of the limitations. To begin, the sample size was relatively small, which may have increased risk for type two error. However, a power analysis revealed that our sample size should be sufficient to achieve. 95 power. Further, the association between SC and affective guilt in this study was demonstrated to be strong, reducing concerns of type two error. In addition, the current study was an analogue intervention study. The inductions were selected to examine how different treatment-relevant processing modes would impact analogue PTSD symptoms. This study did not use structured treatment protocols and the extent to which participants were successful in using their prescribed processing mode could not be assessed. Further, a clinical sample was not selected. Though approximately one third of the sample met cut-off for probable PTSD (Valdez and Lilly 2016), the extent to which the current findings would generalize to a treatment-seeking clinical sample cannot be determined. In addition, all participants identified as female and survivors of interpersonal trauma. Whether results would generalize to men and survivors of non-interpersonal forms of trauma can only be answered through future research. In addition, the study involved multiple tasks that can be cognitively taxing and recollection of previous adverse life events, which may have led to participant fatigue and subsequent lack of engagement. Relatedly, some participants may be better able to identify cognitions during the ruminative thinking task due to greater psychological insight or cognitive flexibility. We did not assess these factors as potential individual differences that may affect the content and/or number of steps completed during the task. Despite limitations, this study used relatively novel experimental tasks to investigate treatment-relevant constructs among a sample exposed to interpersonal trauma, a form of trauma that more frequently affects women and has been consistently linked to heightened risk for adverse psychological outcomes. Study methods allowed for examination of how trait-level characteristics that clients may bring to the treatment room may impact processing of previous traumatic experiences.

Compliance with Ethical Standards

References

Aguinis, H., Beaty, J. C., Boik, R. J., & Pierce, C. A. (2005). Effect size and power in assessing moderating effects of categorical variables using multiple regression: a 30-year review. *Journal of Applied Psychology, 90*, 94–107. https://doi.org/10.1037/0021-9010.90.1.94.

American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders (4th ed., text rev.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Barlow, M. R., Goldsmith Turow, R. E., & Gerhart, J. (2017). Trauma appraisals, emotion regulation difficulties, and self-compassion predict posttrauamtic stress symptoms following child abuse. *Child Abuse & Neglect, 65*, 37–47. https://doi.org/10.1016/j.chiabu.2017.01.006.

Bistricky, S. L., Gallagher, M. W., Roberts, C. M., Ferris, L., Gonzalez, A. J., & Wetterneck, C. T. (2017). Frequency of interpersonal trauma types, avoidant attachment, self-compassion, and interpersonal competence: a model of persisting posttrauamtic symptoms. *Journal of Aggression, Maltreatment & Trauma, 26*, 608–625. https://doi.org/10.1080/10926771.2017.1322657.

Breslau, N., Kessler, R. C., Chilcoat, H. D., Schultz, L. R., Davis, G. C., & Andreski, P. (1998). Trauma and posttraumatic stress disorder in the community: the 1996 Detroit Area Survey of Trauma. *Archives of General Psychiatry, 55*, 626–632 Retrieved from http://archpsyc.jamanetwork.com/journal.aspx.

Breslau, N., Peterson, E. L., Poisson, L. M., Schultz, L. R., & Lucia, V. C. (2004). Estimating post-traumatic stress disorder in the community: lifetime perspective and the impact of typical traumatic events. *Psychological Medicine, 34*, 889–898. https://doi.org/10.1017/S0033291703001612.

Davey, G. C. L., & Levy, S. (1998). Catastrophic worrying: personal inadequacy and a perseverative iterative style as features of the catastrophizing process. *Journal of Abnormal Psychology, 107*, 576–586. https://doi.org/10.1037/0021-843x.107.4.576.

Earley, M. D., Chesney, M. A., Frye, J., Greene, P. A., Berman, B., & Kimbrough, E. (2014). Mindfulness intervention for child abuse survivors: a 2.5-year follow-up. *Journal of Clinical Psychology, 70*, 933–941. https://doi.org/10.1002/jclp.22102.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149–1160.

Frazier, P., Anders, S., Perera, S., Tennen, H., Park, K., Tomich, P., & Toshiro, T. (2009). Traumatic events among undergraduate students: prevalence and associated symptoms. *Journal of Counseling Psychology, 56*, 450–460. https://doi.org/10.1037/a0016412.

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology, 51*, 115–134. https://doi.org/10.1037/0022-0167.51.1.115.

Foa, E. B., Rothbaum, B. O., & Hembree, E. A. (2007). *Prolonged exposure therapy for PTSD: emotional processing of traumatic experiences*. New York: Oxford University Press, Inc..

Held, P., & Owens, G. P. (2015). Effects of self-compassion workbook training on trauma-related guilt in a sample of homeless veterans: a pilot study. *Journal of Clinical Psychology, 71*, 513–526. https://doi.org/10.1002/jclp.22170.

Hilton, L., Maher, A. R., Colaiaco, B., Apaydin, E., Sorbero, M. E., Booth, M., Shanman, R. M., & Hempel, S. (2017). Meditation for posttraumatic stress: systematic review and meta-analysis. *Psychological Trauma: Theory, Research, Practice, and Policy, 9*, 453–460. https://doi.org/10.1037/tra0000180.

Hiraoka, R., Meyer, E. C., Kimbrel, N. A., DeBeer, B. B., Bird Gulliver, S., & Morissette, S. B. (2015). Self-compassion as a predictive predictor of PTSD symptom severity among trauma-exposed U.S. Iraq and Afghanistan war veterans. *Journal of Traumatic Stress, 28*, 127–133. https://doi.org/10.1002/jts.21995.

Hoffart, A., Øktedalen, T., & Langkaas, T. F. (2015). Self-compassion influences PTSD symptoms in the process of change in trauma-focused cognitive behavioral therapies: a study of within-person processes. *Frontiers in Psychology, 6*, 1273. https://doi.org/10.3389/fpsyg.2015.01273.

Kabat-Zinn, J. (1990). *Full catastrophe living: using the wisdom of your body and mind to face stress, pain, and illness*. New York: Dell.

Karlin, B. E., Ruzek, J. I., Chard, K. M., Eftekhari, A., Monson, C. M., Hembree, E. A., et al. (2010). Dissemination of evidence-based psychological treatments for posttraumatic stress disorder in the Veterans Health Administration. *Journal of Traumatic Stress, 23*, 663–673. https://doi.org/10.1002/jts.20588.

Kearney, D. J., Malte, C. A., McManus, C., Martinez, M. E., Felleman, B., & Simpson, T. L. (2013). Loving-kindness mediation for post-traumatic stress disorder: a pilot study. *Journal of Traumatic Stress, 26*, 426–434. https://doi.org/10.1002/jts.21832.

Kearney, D. J., McDermott, K., Malte, C., Martinez, M., & Simpson, T. L. (2012). Association of participation in a mindfulness program with measures of PTSD, depression and quality of life in a veteran sample. *Journal of Clinical Psychology, 68*, 101–116. https://doi.org/10.1002/jclp.20853.

Kimbrough, E., Magyari, T., Langenberg, P., Chesney, M., & Berman, B. (2010). Mindfulness intervention for child abuse survivors. *Journal of Clinical Psychology, 66*, 17–33. https://doi.org/10.1002/jclp.20624.

Kubany, E. S., & Watson, S. B. (2003). Guilt: elaboration of a multidimensional model. *The Psychological Record, 53*, 51–90.

Neff, K. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity, 2*, 223–250. https://doi.org/10.1080/15298860309027.

Maheux, A., & Price, M. (2015). Investigation of the relation between PTSD symptoms and self-compassion: comparison across DSM IV and DSM 5 PTSD symptom clusters. *Self and Identity, 14*, 627–637. https://doi.org/10.1080/15298868.2015.1037791.

Owens, G. P., Chard, K. M., & Cox, T. A. (2008). The relationship between maladaptive cognitions, anger expression, and posttraumatic stress disorder among veterans in residential treatment. *Journal of Aggression, Maltreatment, and Trauma, 17*, 439–452. https://doi.org/10.1080/10926770802473908.

Øktedalen, T., Hagtvet, K. A., Hoffart, A., Langkaas, T. F., & Smucker, M. (2014a). The Trauma Related Shame Inventory: Measuring trauma-related shame among patients with PTSD. *Journal of Psychopathology and Behavioral Assessment, 36*, 600–615. https://doi.org/10.1007/s10862-014-9422-5.

Øktedalen, T., Hoffart, A., & Langkaas, T. F. (2014b). Trauma-related shame and guilt as time-varying predictors of posttraumatic stress disorder symptoms during imagery exposure and imagery rescripting: a randomized controlled trial. *Psychotherapy Research, 25*, 518–532. https://doi.org/10.1080/10503307.2014.917217.

Pugh, L. R., Taylor, P. J., & Berry, K. (2015). The role of guilt in the development of post-traumatic stress disorder: a systematic review. *Journal of Affective Disorders, 182*, 138–150. https://doi.org/10.1016/j.jad.2015.04.026.

Resick, P. A., Monson, C. M., & Chard, K. M. (2017). *Cognitive processing therapy for PTSD: a comprehensive manual*. New York: Guildford Press.

Rothbaum, B. O., Foa, E. B., Riggs, D. S., Murdock, T., & Walsh, W. (1992). A prospective examination of post-traumatic stress disorder in rape victims. *Journal of Traumatic Stress, 5*, 455–475. https://doi.org/10.1002/jts.2490050309.

Seligowski, A. V., Miron, L. R., & Orcutt, H. (2015). Relations among self-compassion, PTSD symptoms, and psychological health in a trauma-exposed sample. *Mindfulness, 6*, 1033–1041. https://doi.org/10.1007/s1267.

Thompson, B. L., & Waltz, J. (2008). Self-compassion and PTSD symptom severity. *Journal of Traumatic Stress, 21*, 556–558. https://doi.org/10.1002/jts.20374.

Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttramatic stress disorder: a quantiative review of 25 years of research. *Psychological Bulletin, 132*, 959–992. https://doi.org/10.1037/0033-2909.132.6.959.

Valdez, C. E., & Lilly, M. M. (2016). Self-compassion and trauma processing outcomes among victims of violence. *Mindfulness, 7*, 329–339. https://doi.org/10.1007/s12671-015-0442-3.

Vasey, M. W., & Borkovec, T. D. (1992). A catastrophizing assessment of worrisome thoughts. *Cognitive Therapy and Research, 16*, 505–520. https://doi.org/10.1007/bf01175138.

Watkins, E., Moberly, N. J., & Moulds, M. L. (2008). Processing mode causally influences emotional reactivity: distinct effects of abstract versus concrete construal on emotional response. *Emotion, 8*, 364–378. https://doi.org/10.1037/1528-3542.8.3.364.

Watson, D., & Clark, L. A. (1999). *Manual for the positive and negative affect schedule -expanded form*. Iowa City, IA: The University of Iowa.

Westermann, R., Spies, K., Stahl, G., & Hesse, F. W. (1996). Relative effectiveness and validity of mood induction procedures: a meta-analysis. *European Journal of Social Psychology, 26*, 557–580. https://doi.org/10.1002/(sici)1099-0992(199607)26:4<557::aid-ejsp769>3.0.co;2-4.

Woods, H., & Proeve, M. (2014). Relationships of mindfulness, SC, and mediation experience with shame-proneness. *Journal of Cognitive Psychotherapy, 28*, 20–33. https://doi.org/10.1891/0889-8391.28.1.20.