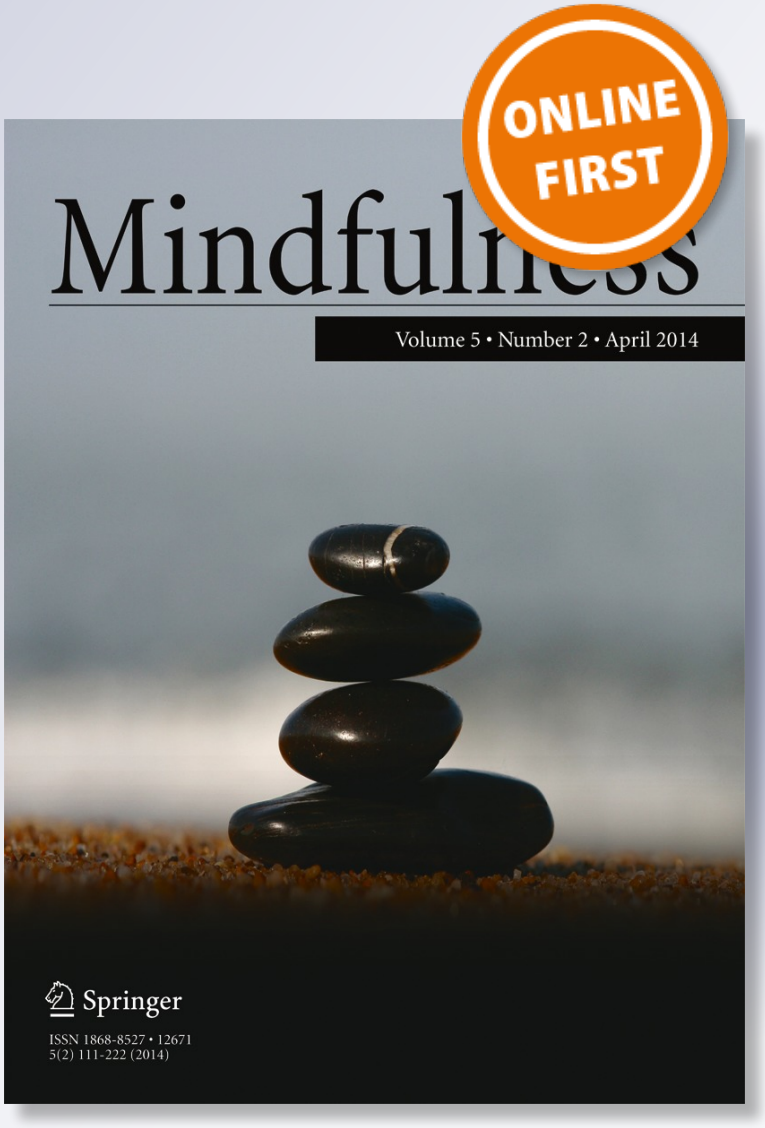
Promoting Attachment-Related Mindfulness and Compassion: a Wait-List-Controlled Study of Women Who Were Mistreated During Childhood

Jon G. Caldwell & Phillip R. Shaver

Mindfulness

ISSN 1868-8527

Mindfulness
DOI 10.1007/s12671-014-0298-y



Springer

Your article is protected by copyright and all rights are held exclusively by Springer Science +Business Media New York. This e-offprint is for personal use only and shall not be self-archived in electronic repositories. If you wish to self-archive your article, please use the accepted manuscript version for posting on your own website. You may further deposit the accepted manuscript version in any repository, provided it is only made publicly available 12 months after official publication or later and provided acknowledgement is given to the original source of publication and a link is inserted to the published article on Springer's website. The link must be accompanied by the following text: "The final publication is available at link.springer.com".

Author's personal copy

Mindfulness
DOI 10.1007/s12671-014-0298-y

ORIGINAL PAPER

Promoting Attachment-Related Mindfulness and Compassion: a Wait-List-Controlled Study of Women Who Were Mistreated During Childhood

Jon G. Caldwell · Phillip R. Shaver

© Springer Science+Business Media New York 2014

Abstract Numerous studies have shown that mindfulness-based interventions contribute to a variety of positive outcomes in physical, cognitive, and affective domains. Less is known about how mindfulness influences variables associated with close interpersonal relationships. The present study evaluated a novel mindfulness-based intervention for promoting cognitive-emotional processes that are underdeveloped in people who have experienced unhealthy attachment relationships. In a sample of women who were mistreated in childhood, baseline measures confirmed that attachment anxiety was related to rumination and negative emotion; attachment avoidance was related to emotion suppression and lack of emotional clarity; and both kinds of insecurity were related to emotion dysregulation and lower levels of mindfulness. Across three measurement periods, a treatment group (N=17), relative to a wait-list control group (N=22), evinced significant improvements in the domains of rumination, emotion suppression, clarity of emotions, emotion regulation, and mindfulness. A multiple mediation analysis showed that, of these variables, improvements in rumination and emotional clarity mediated the gains in mindfulness for the treatment group. Also, participants in the treatment group showed significant changes in their use of mindfulness-based language when writing about stressful or traumatic childhood attachment experiences. Taken together, the results suggest that the intervention led to increases in mindfulness, primarily due to decreased rumination and increased emotional clarity, and these treatment-related changes were specifically related to participants' thoughts and emotions regarding attachment.

Keywords Mindfulness · Compassion · Adult attachment · Rumination · Emotion suppression · Emotional clarity · Emotion regulation

Introduction

For thousands of years, various philosophical and spiritual traditions have suggested that heightened awareness of direct experience in the present moment enhances well-being. In modern times, the related concept of mindfulness has emerged from Buddhist contemplative traditions and become integrated into contemporary psychology. Mindfulness involves bringing one's full attention to experiences in the present moment, in a nonjudgmental or accepting way (Kabat-Zinn, 1990). Mindfulness is thought to cultivate understanding and insight regarding the true nature of reality as well as greater compassion and loving-kindness for oneself and other sentient beings (Brach, 2003). A growing body of research shows that enhancing mindfulness through training can lead to improvements in a variety of physical, mental, and emotional health symptoms, such as: immune function (Davidson et al., 2003), arthritic pain (Rosenzweig et al., 2010), anxiety (Hofmann, Sawyer, Witt, & Oh, 2010), depression (Paul, Stanton, Greeson, Smoski, & Wang, 2013), and general quality of life (Grossman et al., 2010; Keng, Smoski, & Robins, 2011). In recent years, researchers have suggested that mindfulness shares important correlates with secure attachment relationships and that mindfulness-based interventions can promote greater personal and interpersonal well-being for individuals who have experienced unhealthy attachment relationships (Shaver, Lavy, Saron, & Mikulincer, 2007; Siegel, 2007; Snyder, Shapiro, & Treleaven, 2012; Wallin, 2007).

J. G. Caldwell (✉)
Department of Psychiatry, The Meadows, 1655 N. Tegner St, Wickenburg, AZ 85390, USA
e-mail: drjoncaldwell@gmail.com

P. R. Shaver
Department of Psychology, University of California, Davis, Davis, CA 95616, USA

Published online: 28 March 2014

Author's personal copy

Throughout the lifespan, experiences in close relationships have profound effects on human development and adaptive functioning. Extensive research motivated by attachment theory (Bowlby, 1969) has shown that people who have experienced close relationships characterized by warmth, sensitivity, openness, and trust are more likely to have optimistic beliefs about themselves and others, and to express and regulate emotion in ways that facilitate coping and interpersonal connection (see Cassidy & Shaver, 2008, for a review). In contrast, people who have experienced abandonment, neglect, enmeshment, and maltreatment are more likely to harbor negative views of themselves and others, and often, they exhibit defensive, self-defeating ways of expressing and managing emotion. Thus, through repeated attachment experiences, people develop interpersonal patterns of relating, or attachment orientations, that are associated with implicit cognitive-emotional strategies for maintaining intra- and inter-personal safety and security.

Adult attachment orientations can be reliably measured along two dimensions: attachment anxiety and avoidance (Brennan, Clark, & Shaver, 1998; Fraley & Shaver, 2000). Individuals who score low on both dimensions are considered secure with respect to attachment, whereas individuals who score high on one or both dimensions are considered to be insecure. In circumstances where an attachment partner is inconsistently available, a person may implicitly adopt hyperactivating attachment strategies involving amplification of attachment needs, high levels of negative emotion, persistent attempts to maintain connection, and intense fear of abandonment (Cassidy & Kobak, 1988). Alternatively, in situations where an attachment partner is consistently dismissive, neglectful, or abusive, a person may develop deactivating attachment strategies that involve down-playing attachment needs, hiding vulnerabilities, remaining emotionally detached, and avoiding intimacy (Cassidy & Kobak, 1988). These strategies are associated, respectively, with anxious and avoidant attachment.

In a study of 388 young adults, Caldwell and Shaver (2012) found that both attachment anxiety and avoidance were associated with greater difficulties in managing negative emotional states and with lower levels of resilience (i.e., the ability to regulate oneself to respond adaptively to situational challenges and affordances). However, the two attachment dimensions were related to those outcome variables through different pathways: Attachment-related anxiety had effects via a hyperactivating pathway involving high levels of rumination and negative emotion. In contrast, attachment-related avoidance had its effects through a deactivating pathway involving high levels of emotional suppression and limited understanding of and clarity about emotional states.

Of particular interest here, lower levels of dispositional mindfulness have been linked to processes associated with hyperactivation of the attachment system, such as rumination (Raes & Williams, 2010) and negative emotion (Brown & Ryan, 2003), and with processes associated with deactivation of the attachment system, such as thought suppression (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007) and emotional unclarity (Baer, Smith, & Allen, 2004). Shaver et al. (2007) reported that, in a sample of experienced meditators, attachment-related anxiety and avoidance both made strong and unique contributions to lower levels of trait mindfulness. Moreover, Caldwell and Shaver (2013) found that attachment anxiety was related to lower levels of dispositional mindfulness, and this relation was mediated by rumination and attentional dyscontrol, whereas the relation between attachment avoidance and diminished mindfulness was mediated by thought suppression and attentional dyscontrol.

These findings raise the interesting possibility that mindfulness might counteract insecure attachment-related hyperactivating and deactivating patterns by promoting adaptive cognitive-emotional skills that are more consistent with attachment security. Although this empirical question has not been directly addressed before, Cordon, Brown, and Gibson (2009) found that adult attachment moderated the effects of a mindfulness-based stress reduction intervention on perceived levels of stress. Using participants' dimensional attachment scores to form two groups (secure vs. insecure), the authors found that the insecure group, relative to their counterparts, had higher levels of perceived stress at baseline, but they also showed greater reductions in perceived stress following the mindfulness-based intervention. Together with the aforementioned correlational and mediational findings, these results suggest that individuals who have experienced attachment insecurity may benefit from mindfulness-based interventions that focus on ameliorating maladaptive cognitive-emotional patterns.

In the present quasi-experimental study, female participants were assigned to a treatment group or a wait-list control group and were assessed at baseline, 1 week post-intervention and 5 weeks post-intervention. It was hypothesized that at baseline child maltreatment would be associated with adult attachment-related anxiety and avoidance, with the former relating to rumination and negative emotion and the latter relating to emotional suppression and emotional unclarity. In terms of intervention-related changes over time, it was anticipated that, compared to a wait-list control group, a mindfulness-based treatment group would show significant improvements in rumination, negative emotion, emotional suppression, emotional clarity, emotion dysregulation, and mindfulness. Moreover, it was expected that changes in rumination, negative emotion, emotional suppression, and emotional clarity would mediate the changes in mindfulness for the treatment group. Finally, a writing exercise was included as a way of objectively assessing changes in mindfulness and to investigate if the changes in mindfulness were specifically

Author's personal copy

related to participants' narratives regarding childhood attachment experiences. It was hypothesized that the treatment group, relative to the control group, would show significant language-based changes in mindfulness-related word categories on a writing exercise involving participants' emotional disclosures about stressful or traumatic attachment experiences in childhood.

Method

Participants

Study participants were recruited via email advertisements from a list of individuals who had received services from a health care facility specializing in the treatment of psychological trauma. Participants who were enrolled in the study met the following inclusion criteria: (1) female gender, (2) age between 18 and 80, and (3) self-reported history of childhood maltreatment. After providing written consent, participants were assigned to the treatment group or wait-list control group. In most cases, group assignment was performed randomly by the principal investigator, but in some cases, participants were nonrandomly assigned to a treatment group or a control group based on their individual scheduling needs. Participants received the mindfulness-based intervention in person, along with the other members of their group, over the course of 3 days at a retreat center. Participants in both groups completed research assessments electronically via a secure login at the same three assessment periods: (a) 1 week pre-intervention (T1), (b) 1 week post-intervention (T2), and (c) 5 weeks post-intervention (T3). The treatment group received the intervention after the T1 assessment period and the wait-list control group received the treatment program after the T3 assessment period. Thus, whereas participants in both groups were able to complete research assessments remotely by computer during the same time periods, they received the intervention in person with their assigned groups at different times. Research participants did not receive monetary compensation, but the treatment program was offered to them for free. All procedures were approved by the Argus Independent Review Board, Inc., and carried out with clear instructions to study participants. Upon completion of the study, all participants were fully debriefed.

Measures

Childhood Trauma Questionnaire (Bernstein et al., 1994) The Childhood Trauma Questionnaire (CTQ) is a 28-item self-report assessment of a range of traumatic childhood experiences. Items begin with the stem, "When I was growing up" and are rated on a five-point scale ranging from 1 (never true) to 5 (very often true). Confirmatory factor analysis of the 28-item CTQ identified five subscales: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect (Bernstein & Fink, 1998). Combining items from all five subscales yields a total childhood maltreatment score. In the present sample, Cronbach alpha coefficients for the CTQ subscales and total scale were: .85 for emotional neglect, .74 for physical neglect, .82 for emotional abuse, .76 for physical abuse, .93 for sexual abuse, and .88 for total childhood maltreatment.

Experiences in Close Relationships inventory (Brennan et al., 1998) The Experiences in Close Relationships inventory (ECR) is a 36-item self-report measure that asks about a respondent's typical behavior and emotional experiences in close relationships. Factor analysis has repeatedly shown that the ECR contains two distinct subscales: anxious attachment (with 18 items such as "I worry about being rejected or abandoned") and avoidant attachment (with 18 items such as "I don't feel comfortable opening up to others"). Items are rated on a seven-point Likert scale ranging from 1 (disagree strongly) to 7 (agree strongly). In the present sample, Cronbach alpha coefficients for attachment-related anxiety and avoidance were .90 and .89, respectively.

The Emotion Regulation Questionnaire The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) contains 10 items, 4 of which asses the tendency to suppress emotion (e.g., "I control my emotions by not expressing them"). To bolster internal reliability, six more similarly worded items (e.g., "I try hard to suppress my emotions, especially when I'm around other people") were added to the four items from ERQ suppression subscale. Participants rated each item on a seven-point Likert scale ranging from 1 (disagree strongly) to 7 (agree strongly) according to their experiences "during the past week." In the present sample, the supplemented 10-item suppression subscale had an alpha coefficient of .83, whereas the original 4-item suppression subscale had an alpha coefficient of .75. The former was used for statistical analyses in this study.

The Trait Meta-Mood Scale The Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) is a 30-item measure of "emotional intelligence" that contains an 11-item subscale to assess clarity of emotions (e.g., "I am usually very clear about my feelings"). Participants were instructed to rate each item on a seven-point Likert scale ranging from 1 (disagree strongly) to 7 (agree strongly) based on their experiences "during the past week." The alpha coefficient for the emotional clarity subscale was .90.

The Rumination-Reflection Questionnaire The Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999) is a 24-item measure containing two 12-item subscales;

Author's personal copy

rumination and self-reflection (the latter was not used in the current analysis). The rumination subscale assessed a participant's tendency to engage in negative cycles of self-critical rumination (e.g., "I spend a great deal of time thinking back over my embarrassing or disappointing moments"). Participants were instructed to rate each item on a seven-point Likert scale ranging from 1 (disagree strongly) to 7 (agree strongly) according to their experience "during the past week." The rumination subscale had an alpha coefficient of .94 in this study.

The Positive Affect and Negative Affect Scale The Positive Affect and Negative Affect Scale (PANAS)-X (Watson & Clark, 1994) is a 60-item checklist of positive and negative emotions designed to represent the affective lexicon in English. Each emotion was rated on a scale ranging from 1 (slightly or not at all) to 5 (very much) based on the degree to which it had been experienced "in the last week." For purposes of this study, scores were computed for "basic negative emotions" (e.g., scared, angry, ashamed, sad, and lonely). The alpha coefficient for the negative affect subscale was .91 in the present study.

Difficulties in Emotion Regulation Scale The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item measure that assesses the degree to which respondents have difficulties regulating their emotions (e.g., "When I'm upset, I lose control over my behaviors"). Participants were instructed to rate each item according to their experiences "during the past week" using a five-point scale on which 1 meant "almost never (0–10 %)," 2 was "sometimes (11–35 %)," 3 was "about half the time (36–65 %)," 4 was "most of the time (66–90 %)," and 5 was "almost always (91–100 %)." The DERS has six subscales, but all 36 items can be combined for a total score of general difficulties in regulating emotion. In the present study, the total scale was used for all analyses and its alpha coefficient was .95.

Five Facet Mindfulness Questionnaire The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) was derived from factor analysis of multiple questionnaires measuring the tendency to be mindful in daily life (e.g., "I find it difficult to stay focused on what's happening in the present," reverse scored). It consisted of 39 items assessing five facets of mindfulness, and each item was rated on a scale ranging from 1 (never or very rarely true) to 5 (very often or always true) according to participants' experiences "during the past week." The alpha coefficients for the five FFMQ subscales and total scale were as follows: observe (.90), describe (.94), act with awareness (.89), nonjudgment (.91), nonreactivity (.92), and total scale (.95).

Home-Based Practice Scale This questionnaire was designed by the authors of the present study to assess the degree to which participants utilized the intervention material at home (e.g., "How often did you practice mindfulness in your everyday activities?"). Participants were instructed to rate the four mindfulness items according to their experiences "during the past week" using a five-point scale ranging from 1 (never) to 5 (very often). In this study, the alpha coefficient for this scale was .92.

Program Evaluation Questionnaire Participants' subjective perceptions of the intervention were assessed with a questionnaire (designed by the authors of the present study) that contained two qualitative items and 17 quantitative items (e.g., "The content of the program was relevant to my personal needs at this time"). At the end of each intervention, participants were instructed to rate the items on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). The alpha coefficient for this measure was .84 in the present sample.

Attachment Narrative Emotional Disclosure Task A modified version of the narrative emotional disclosure task (Pennebaker & Beall, 1986) was employed to assess changes in mindfulness specifically related to attachment experiences. Brody and Park (2004) have suggested that the purported benefits of the narrative emotional disclosure task are related to increases in mindfulness. Recent studies have shown that repeated writing of traumatic narratives was associated with improvement in mindfulness skills (Moore & Brody, 2009) and that increases in mindfulness and decreases in experiential avoidance, and not necessarily the content of the writing exercise, were associated with improved mental health (Moore, Brody, & Dierberger, 2009).

Although the narrative emotional disclosure task has typically been used as an independent variable in research studies, its apparent connection to mindfulness indicates that it might be a useful dependent variable for measuring changes in emotions and mindfulness related to adverse childhood attachment experiences. The Linguistic Inquiry and Word Count (LIWC; Pennebaker, Francis, & Booth, 2001) software can be used to analyze participants' narratives to determine percentages of the total number of words that fall into 74 word/word stem categories. Research involving independent judges has shown that the LIWC is able to correctly categorize words (Pennebaker & Francis, 1996) and provides a valid measure of emotional content (Kahn, Tobin, Massey, & Anderson, 2007).

In the present study, methods established by Moore and Brody (2009) were used to assess changes in attachment-related emotions and mindfulness by examining the following word categories: (a) past (e.g., "was," "been"), present (e.g., "is," "am"), and future (e.g., "will"); (b) cognitive processing

Author's personal copy

words (e.g., "cause," "realize," which include causation, insight, and discrepancy word subcategories); (c) insight (e.g., "think," "know,"—a subcategory of the cognitive processing category); and (d) positive emotion (e.g., "happy," "good") and negative emotion (e.g., "hate," "worthless"). Consistent with previous research (Moore & Brody, 2009; Pennebaker & Francis, 1996), changes in word usage were computed by subtracting word category percentages at pre-intervention from those at post-intervention.

In the current study, instructions for the task were provided at each writing session and were similar to those used by Pennebaker (1994): "Please write about an upsetting or traumatic experience from your childhood that involved you and your parent(s) or caregiver(s). Write about your very deepest thoughts and feelings related to this experience. Your writing will be kept confidential, so try to let yourself go and don't worry about grammar or spelling. There is no time limit, but there is a maximum limit of 1,200 words. Once you start writing, please write continuously, without taking a break, until you have completed the task. Again, the primary goal is to reflect on your most basic thoughts and emotions related to an upsetting or traumatic experience from childhood involving you and your parent(s) or caregiver(s)." Participants were asked to remember the experience they wrote about at the pre-intervention assessment so that they could write about the same experience at the post-intervention assessment.

Intervention: Restoring Embodied Awareness, Compassionate Connection, and Hope As the name implies, the Restoring Embodied Awareness, Compassionate Connection, and Hope (REAC^{2}H) program was designed to enhance mindful awareness of bodily sensations, emotions, and thoughts associated with attachment experiences and to increase compassionate connection with oneself and others. For the purposes of this study, the REAC^{2}H program was conducted over a 3-day period for approximately 8 h each day. The daily schedule was organized around three basic mindfulness themes: body (day 1), thoughts (day 2), and emotions (day 3). These themes are based on three of the four foundations of mindfulness described in classic Buddhist psychology and routinely practiced in various contemplative traditions. Each day included a combination of educational presentations and experiential exercises involving the application of traditional mindfulness and loving-kindness techniques to attachment-related patterns of thought and emotion.

On the first day of the REAC^{2}H program, participants were introduced to the intervention and given thorough guidelines for maintaining emotional stability and safety. Participants were instructed on nonmeditation or basic relaxation techniques to lay the foundation for meditation training. The morning session included information about the relation between child maltreatment and attachment insecurity. Then, consistent with the day's theme of body mindfulness, participants were guided in a meditation focusing on breath and a traditional body scan (i.e., bringing mindful awareness to areas of the body). The afternoon session contained an introduction to mindfulness concepts, including a practical step-by-step method for applying mindfulness techniques to everyday situations. The rest of the first day was devoted to understanding the nature of secure attachment and having an experience of sensing or feeling attachment security in the body (an exercise called Embodied Awareness of Attachment Security Experiences, EA^{2}SE). More specifically, participants were invited to take part in a guided meditation that evoked a mental image of a wiser and stronger attachment figure (e.g., a person from their life, a fictional being, or a version of themselves) who had the capacity to relate to them with trust, warmth, and love. With this secure attachment imagery in mind, participants were invited to become mindfully aware of bodily sensations and feelings to establish a "somatic marker" for attachment security that they could use as a resource in future situations. Participants were encouraged to savor the embodied experience of secure attachment and to practice the exercise on their own.

The second day of the REAC^{2}H program began with a guided meditation based on the day's theme: mindfulness of thoughts. Next, participants were instructed on the connections between child maltreatment and attachment-related patterns of thinking (e.g., rumination and thought suppression). This was followed by a thorough discussion of attachment-related anxiety and avoidance and particularly how these insecure attachment dimensions are associated with maladaptive beliefs and unhealthy patterns of thinking (e.g., "I can't trust others" and "I'm unlovable"). The morning session finished with a writing exercise that encouraged participants to write down some of their unhealthy attachment-related beliefs or "scripts" and to share them with a fellow participant. Then, participants were encouraged to rewrite the scripts with self-compassion and loving-kindness in mind and to share the rewritten scripts with their partner.

The afternoon session of the second day started with a traditional walking meditation to practice using mindfulness in everyday activities and then moved to a presentation on several key facets of mindfulness: equanimity, nonjudgment, and acceptance. This was followed by a guided meditation that involved working with thoughts nonjudgmentally. Participants were then invited to take part in an exercise that involved bringing nonjudgmental awareness to one of the unhealthy attachment-related scripts they wrote about earlier in the day (an exercise called Non-judgmental Exploration and Awareness of Attachment Thoughts, NEA^{2}T). This experience was immediately followed by a repeat of the EA^{2}SE exercise, with instructions to pay special attention to the positive beliefs and thoughts associated with the embodied experience of secure attachment. The juxtaposition of these

Author's personal copy

two exercises was intended to help participants learn to transition from insecure attachment-related thoughts to a state of "felt security" via the previously established somatic marker of attachment security. Participants were encouraged to practice NEA^{2}T and EA^{2}SE at home.

The third day of the REAC^{2}H program began with a guided meditation that introduced participants to practices involving mindfulness of emotions—correlating with the day's theme. Participants were instructed on the linkages between child maltreatment and attachment-related patterns of emotional reactivity (e.g., dysregulated negative emotion and emotional avoidance/unclarity). Next, participants were invited to write about their unhealthy patterns of emotional reactivity that developed in the context of insecure attachment experiences and to share this information with a fellow participant. Then, participants were invited to consider ways that they might use mindfulness of emotions to "respond wisely" to perceived relationship threats instead of "reacting mindlessly." They were encouraged to record this information and share it with their partner.

The afternoon session of the third day began with a presentation on compassion and loving-kindness—additional key facets of traditional mindfulness practice. This was followed by a mindfulness exercise that invited participants to form pairs and silently offer and receive compassion. Then, similar to the exercise in day 2, participants were invited to take part in a guided meditation that involved bringing mindful awareness to one of the unhealthy attachment-related emotional patterns they wrote about earlier in the day (an exercise called Compassionate Awareness of Attachment-Related Emotions, CA^{2}RE). This was immediately followed by a repeat of the EA^{2}SE exercise to facilitate the process of learning to transition from insecure attachment-related emotions to more regulated affective states consistent with attachment security. Participants were encouraged to practice CA^{2}RE and EA^{2}SE at home. The REAC^{2}H program ended with the entire group practicing a traditional mettā meditation, which involved repeating a series of loving-kindness phrases to oneself, a benefactor, a loved one, fellow participants, a difficult person, and finally to all beings.

Results

Demographic Variables

A total of 48 people enrolled in the study and completed all of the pre-intervention measures. Due to scheduling conflicts, eight people (three assigned to the intervention group and five assigned to the wait-list control group) did not attend the intervention or complete the post-intervention measures. One person in the intervention group dropped out after the first day due to illness and did not complete the post-intervention measures. This resulted in a final sample of 39 people, 17 in the intervention group and 22 in the control group. The mean age of the participating women was 47 years (SD=13.5, range=21–80). Regarding ethnicity, the sample included 37 (96 %) White/Caucasians, 1 (2 %) Asian/Pacific Islander, and 1 (2 %) undeclared. In terms of highest level of education, 15 (38 %) held a bachelor's degree, 12 (31 %) a graduate degree, 7 (18 %) some college, 3 (8 %) a high school diploma, and 2 (5 %) an associate's degree. Employment status was reported as follows: 11 (28 %) full-time, 10 (26 %) unemployed, 7 (18 %) self-employed, 7 (18 %) homemaker, and 4 (10 %) part-time. With regard to relationship status, 15 were (38 %) married, 9 (23 %) single, 8 (21 %) divorced, 3 (8 %) significant other, 3 (8 %) separated, and 1 (2 %) widowed. Converting the two insecure attachment dimensions (anxiety and avoidance) to adult attachment categories using a procedure introduced by Brennan et al. (1998), 95 % of the present sample identified themselves as insecure with respect to attachment.

Total Sample Descriptive Statistics

Prior to investigating group differences, descriptive statistics were computed for all participants who completed T1 measures (N=48) to assess the degree of child maltreatment, its relation to adult attachment, and relations between adult attachment and the study's main variables. The degree of child abuse and neglect was assessed by comparing participants' mean scores on the CTQ subscales to established cutoff scores (COs) for moderate to severe child maltreatment (Bernstein & Fink, 1998). The present sample exceeded the COs on most of the CTQ subscales: emotional neglect (COs=15; M=15.88, SD=4.25), physical neglect (COs=10; M=9.75, SD=3.67), emotional abuse (COs=13; M=15.67, SD=5.36), physical abuse (COs=10; M=8.44, SD=3.90), and sexual abuse (COs=8; M=10.98, SD=6.34). Thus, participants in the present study identified moderate to severe levels of most forms of child maltreatment.

To examine the relation between child maltreatment and adult attachment, separate regression analyses were conducted with attachment-related anxiety and avoidance as dependent variables and all five CTQ subscales simultaneously entered as independent variables. Although the regression model for attachment-related anxiety did not reach statistical significance $F(5, 42)=1.81$, $p=.13$, the individual contribution of emotional neglect was significant $\beta=.50$, $t(42)=2.29$, $p<.05$. The regression model involving attachment-related avoidance was significant $F(5, 42)=3.91$, $p<.01$ and the unique effect of emotional neglect was again significant $\beta=.68$, $t(42)=3.41$, $p<.01$. Emotional neglect significantly correlated with both attachment-related anxiety and avoidance (see

Author's personal copy

Table 1 total sample correlations and group equivalence among study variables

Total Sample	1	2	3	4	5	6	7	8	9
1. Emotional neglect	–	.29*	.46**	.07	−.02	.23	−.26	.23	−.21
2. Attachment anxiety		–	.18	.63**	.41**	.10	−.14	.35*	−.33*
3. Attachment avoidance			–	−.02	−.18	.30*	−.34*	.37**	−.37*
4. Rumination				–	.53**	.37**	−.42**	.61**	−.57**
5. Negative emotion					–	.26	−.04	.39**	−.24
6. Emotion suppression						–	−.46**	.46**	−.46**
7. Emotional clarity							–	−.71**	.71**
8. Emotion dysregulation								–	−.81**
9. Mindfulness									–
Group equivalence									
Treatment group	14.35	4.60	4.15	5.04	13.54	3.44	46.24	2.49	3.13
	(3.46)	(1.16)	(1.16)	(1.54)	(3.75)	(1.16)	(15.59)	(.80)	(.59)
Control group	17.82	5.25	4.32	5.59	14.44	3.68	47.10	2.54	3.01
	(3.91)	(.94)	(1.04)	(1.33)	(3.92)	(1.18)	(14.00)	(.69)	(.68)
t test	−2.88**	-1.93^{ns}	$-.50^{ns}$	-1.18^{ns}	$-.72^{ns}$	$-.65^{ns}$	$-.18^{ns}$	$-.25^{ns}$	$.55^{ns}$

Table contains baseline data from the T1 assessment period. Correlations are listed for all participants who completed T1 measures (N=48). In the group equivalence section, means and standard deviations (in parentheses) are listed for the treatment group (N=17) and the control group (N=22). For all t-tests the df=37

NS not significant

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

Table 1 for these and other correlations among the study's main variables).

Group Equivalence

As mentioned, of the 48 participants who were initially enrolled in the study, 9 dropped out (4 from the treatment group and 5 from the wait-list control group). Analyses of differences between study completers and those who dropped out produced only one significant difference: Study completers had higher levels of physical abuse (M=9.00, SD=4.03) compared to those who dropped out [M=6.00, SD=2.00; $t(46)=2.16$, $p<.05$]. Otherwise, there were no significant differences in demographic variables or the main baseline measures, so the remaining statistical analyses include only data from study completers.

A series of independent t tests and chi square analyses determined that there were no significant differences between the treatment group and wait-list control group at baseline in terms of: (a) age [$t(37)=.05$, $p=.96$], (b) race [$\chi^2(2, N=39)=2.73$, $p=.26$], (c) education [$\chi^2(4, N=39)=2.27$, $p=.69$], (d) employment [$\chi^2(4, N=39)=.88$, $p=.93$], and relationship status [$\chi^2(5, N=39)=5.89$, $p=.32$]. Except for a baseline difference in childhood emotional neglect, with higher levels reported by the wait-list control group compared to the treatment group, there were no significant group differences in the study's main variables (see Table 1). However, because there were group differences in childhood emotional neglect at baseline, subsequent analyses of treatment effects controlled for this variable.

Treatment Effects on Primary Outcomes

Treatment effects on the main outcome variables were evaluated using a series of repeated measures analyses of covariance (ANCOVAs) with a between-subjects factor (group, treatment vs. control), a within-subjects factor (time, T1, T2, and T3), and a covariate (childhood emotional neglect). Table 2 contains means, standard deviations, and group-by-time interaction effects for each of the primary outcome variables (the main effect of time was not significant for any of the ANCOVAs). Using the same parameters, a repeated measures multivariate analysis of covariance (MANCOVA) of the five-facets of mindfulness was significant overall [$F(2,36)=2.43$, $p<.05$] and was characterized by the following univariate results: observe [$F(2,36)=9.82$, $p<.01$], describe [$F(2,36)=3.62$, $p<.05$], act with awareness [$F(2,36)=5.69$, $p<.01$], nonjudgment [$F(2,36)=9.50$, $p<.01$], and nonreactivity [$F(2,36)=2.93$, $p=.06$]. These results suggest that, relative to the control group, the treatment group showed significant improvements in most of the study's outcome variables, including nearly all facets of mindfulness.

Author's personal copy

Table 2 Means, standard deviations, and group-by-time interaction effects for primary outcome variables

	Treatment group						Control group						
	T1		T2		T3		T1		T2		T3		G×T
Measure	*M*	SD	*M*	SD	*M*	SD	*M*	SD	*M*	SD	*M*	SD	*F*
Rumination	5.04	1.54	4.00	1.33	3.63	1.19	5.59	1.33	5.29	1.07	5.34	1.18	3.81*
Negative emotion	13.54	3.75	11.35	4.42	10.84	3.89	14.44	3.92	14.08	4.48	13.78	4.43	1.34^{ns}
Emotion suppression	3.44	1.16	3.22	.78	2.79	.79	3.68	1.18	3.83	1.15	3.66	1.17	2.70†
Emotional clarity	46.24	15.59	54.00	12.57	57.12	11.58	47.09	14.00	48.32	17.12	47.82	19.04	3.95*
Emotion dysregulation	2.49	.80	1.97	.52	1.91	.63	2.57	.69	2.55	.70	2.45	.74	4.71*
Mindfulness	3.13	.59	3.73	.42	3.81	.44	3.01	.68	3.02	.77	3.01	.78	12.30**

Table contains means and standard deviations of primary outcome variables by group across three assessment times. The group-by-time (G×T) interaction effects are based on ANCOVAs with childhood emotional neglect as a covariate. For all *F* statistics the *df*=36

NS not significant

† p=.07; *p<.05; **p<.01

Multiple Mediation Analyses

A multiple mediation analysis procedure was used to determine whether improvements in mindfulness were mediated by changes in: (a) rumination, (b) negative emotion, (c) suppression of emotion, and (d) emotional clarity. Residual change scores were computed for each of the proposed mediating variables and for the dependent variable (mindfulness) by regressing the T3 scores onto the T1 scores. The independent variable was condition, with treatment group coded as 1 and control group as −1. Childhood emotional neglect was entered as a covariate. The multiple mediation analysis used here was based on a bootstrapping method recommended for smaller samples (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004) and was computed with an SPSS macro that estimates direct and indirect effects with multiple mediators simultaneously (Preacher & Hayes, 2008). The bootstrap estimates presented here are based on 5,000 bootstrap samples. Statistical significance with alpha set at .05 is indicated by the 95 % bias-corrected (BC) confidence intervals (CI) not crossing zero.

The multiple mediation model was significant [F(6,32)= 15.03, p<.01] and accounted for 74 % of the variance in mindfulness improvement from T1 to T3 (see Fig 1). The total effect of treatment condition on mindfulness (c path), β =.32, p<.001, became nonsignificant (c' path), β =.13, p=.08, when the four mediators were included in the model. The total *indirect* effect through the four mediators was significant, with a point estimate (PE) of −.1972 and a 95 % BC/CI of .0733 to .3890. The specific indirect effects of change in rumination (PE=.1088, BC/CI=.0143 to .2844) and change in emotional clarity (PE=.1121, BC/CI=.0199 to .2309) were both significant, whereas the indirect effects of change in negative emotion (PE=−.0087, BC/CI=−.0892 to .0182) and change in emotion suppression (PE=−.0151, BC/CI= −.0815 to .0408) were not significant. Thus, for participants in the treatment group, increases in mindfulness over time were mediated by improvements in rumination and emotional clarity.

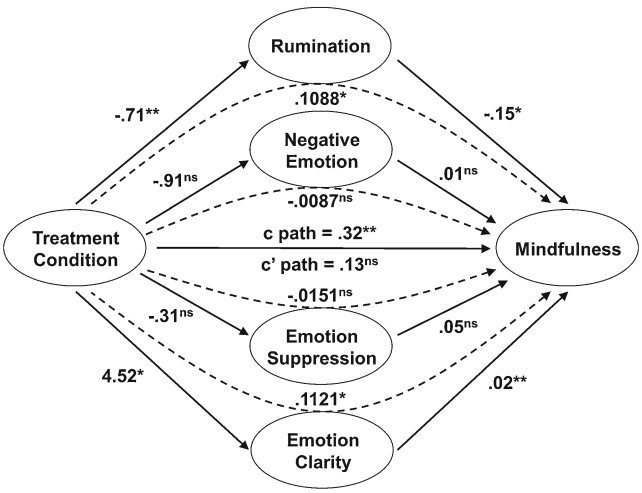


Fig. 1 Multiple mediation bootstrap analysis of the relation between treatment condition and mindfulness as mediated by rumination, negative emotion, emotion suppression, and emotional clarity. Treatment group was coded as 1 and control group as −1. Unstandardized regression coefficients (β) are associated with *solid pathways* (*p<.05, **p<.01), and point estimates of indirect effects are associated with *dashed pathways* (*95 % bias-corrected confidence intervals not crossing zero). The c path represents the effect of treatment condition on mindfulness without the mediators (total effect), and the c' path is the effect of treatment condition on mindfulness after accounting for the mediators (direct effect)

Author's personal copy

Treatment Effects and the Attachment Narrative Emotional Disclosure Task

To compare group differences regarding changes in the capacity for mindfulness of attachment experiences in childhood, participants' narratives about stressful or traumatic experiences with caregivers were analyzed with the LIWC software. Change scores were computed for participants who completed pre- and post-narratives (N=37) by subtracting mindfulness-related word category percentages at T1 from those at T3. The change scores were used in a series of one-way ANCOVAs with childhood emotional neglect as a covariate. Table 3 contains means and standard deviations for the percentages of the total word counts for each word category at T1 and T3 and for change scores across time (T1 to T3). The results of the ANCOVAs and their statistical significance are also listed. In general, the results indicated that, following the intervention, participants in the treatment group, relative to controls, used fewer past tense words and more present tense, cognitive processing, and insight-oriented words when writing about stressful or traumatic attachment experiences.

Home-Based Practice Effects on Changes in Mindfulness

A brief scale was used to assess the degree to which participants in the treatment group practiced the mindfulness techniques at home and whether or not home-based practice was related to changes in mindfulness. The mean score for the four mindfulness items was 3.56 (SD=.68; on a 1–5 scale), indicating that, on average, participants rated their practice frequency between "sometimes" and "often" for the week prior to the T3 assessment period. The residual change score in mindfulness (T1 to T3) significantly correlated with the total mean score for the four home-based practice items (r=.51, p<.05).

Program Evaluation

Evaluation of participants' subjective experience of the treatment program, using a questionnaire with 17 items rated on a 1 (strongly disagree) to 5 (strongly agree) scale, showed that participants from both groups (N=39) offered high ratings of the program's (a) organization (M=4.83, SD=.11), (b) content (M=4.81, SD=.10), (c) instructor (M=4.97, SD=.04), and (d) overall satisfaction (M=4.88, SD=.10).

Discussion

This study was undertaken to evaluate the effectiveness of a novel intervention that is firmly rooted in attachment theory and was specifically designed to utilize mindfulness and loving-kindness practices to ameliorate the unhealthy cognitive-emotional patterns associated with adult attachment insecurity. In general, the results indicated that, for the present sample of women who reported moderate-to-high levels of child maltreatment and adult attachment insecurity, the mindfulness-based intervention was well tolerated, was transferable to home-based practice, and had significant positive effects on most of the study's primary outcome variables. These findings will be explored in more detail in the subsequent paragraphs.

It is noteworthy that, after controlling for the various forms of childhood maltreatment, emotional neglect was the strongest predictor of both attachment-related anxiety and avoidance. Similarly, in a sample of resource-limited mothers, Caldwell, Shaver, Li, and Minzenberg (2011) found that childhood emotional abuse was the most significant predictor of adult attachment insecurity, symptoms of depression, and low parental satisfaction and self-efficacy. In recent years, researchers have increasingly recognized the deleterious effects of emotional abuse and neglect on various developmental outcomes, with some arguing that these may in fact be the most pervasive and damaging forms of childhood maltreatment (Hart, Binggeli, & Brassard, 1997; Riggs, 2010). Like other forms of maltreatment, emotional abuse and neglect frequently occur within the context of attachment relationships, which can profoundly effect socioemotional development.

Consistent with previous research (Caldwell & Shaver, 2012, 2013), in this study, adult attachment anxiety correlated with the hyperactivating processes of rumination and negative emotion (but not emotional suppression or lack of clarity) and attachment avoidance correlated with the deactivating processes of emotional suppression and unclarity (but not rumination or negative emotion). It is interesting to note that attachment-related hyperactivation and deactivation strategies are closely linked to traditional Buddhist notions of the two major causes of human suffering: craving/clinging and avoidance/ignorance, respectively. Along these lines, in the present study, attachment-related anxiety and avoidance were both related to more emotional suffering and lower levels of mindfulness. Thus, the cognitive-emotional patterns that are formed and reinforced in the context of insecure attachment relationships contribute to a diminished capacity for open, flexible, and nonjudgmental awareness of oneself and others.

In the present study, participants who received the mindfulness-based intervention, compared to wait-list controls, showed significant improvements in rumination, emotional suppression (marginally significant), emotional clarity, emotion regulation, the composite mindfulness score, and all five facets of mindfulness. Moreover, for the treatment group, improvements in the composite mindfulness score were most significantly mediated by positive changes in rumination and emotional clarity. Analyses of participants' written narratives about stressful or traumatic childhood attachment experiences

Author's personal copy

Table 3 Means, standard deviations, and change scores for mindfulness-related word categories on an attachment emotional disclosure task

	Treatment group						Control group						
	T1		T3		T3-T1		T1		T3		T3-T1		ANCOVAs
Word categories	*M*	SD	*M*	SD	*M*	SD	*M*	SD	*M*	SD	*M*	SD	*F*
Past tense	11.13	3.61	6.76	3.94	−4.36	3.59	9.41	1.89	8.66	3.14	−.75	3.19	9.55**
Present tense	2.67	1.19	6.08	2.67	3.41	2.25	5.39	2.33	5.17	2.51	−.21	2.96	13.25**
Future tense	.83	.73	.54	.41	−.29	.82	1.04	1.05	1.02	1.15	−.02	.99	2.63^{ns}
Positive emotion	1.56	.88	2.70	1.84	1.14	1.78	1.75	1.00	2.02	1.19	.27	.93	1.82^{ns}
Negative emotion	3.96	1.60	3.20	1.43	−.76	1.48	3.48	1.82	3.15	1.46	−.33	1.29	.61^{ns}
Cognitive processing	16.57	3.49	19.22	2.27	2.65	3.41	18.81	2.71	18.42	3.51	−.39	2.87	6.47*
Insight-oriented	2.47	1.53	4.23	1.74	1.76	2.44	3.78	1.41	3.33	1.60	.45	2.22	6.31*

Participants' written narratives about stressful or traumatic childhood experiences with caregivers were analyzed to determine the percentages of words falling into mindfulness-related categories. Change scores were computed for the treatment group and control group by subtracting T1 percentages from T3 percentages for each word category. Group change scores were used in a series of one-way ANCOVAs with childhood emotional neglect as a covariate. For all *F* statistics the *df*=34

NS not significant

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

revealed that the treatment group, and not the control group, used fewer past tense words and more present tense, cognitive processing, and insight-oriented words after the mindfulness-based intervention. Thus, for participants in the treatment group, self-reported improvements in mindfulness coincided with objectively measured increases in language-based mindfulness. Moreover, these findings suggest that the treatment-related enhancements in mindfulness were not merely global, but were specific to language structures associated with attachment experiences. Taken together, these results suggest that the intervention resulted in significant improvements in all areas of mindfulness, particularly due to changes in rumination and emotional clarity, and that the treatment-related changes included participants' thoughts and emotions regarding attachment.

Compared to participants in the control group, individuals who received the mindfulness-based intervention showed greater emotion regulation over time. Using the same measures as the present study, investigators in Australia recently showed that in a sample of 572 individuals, emotion regulation significantly mediated the relations between attachment anxiety and mindfulness and attachment avoidance and mindfulness (Pepping, Davis, & O'Donovan, 2013). Similarly, using exploratory factor analysis and the same measures in a sample of 192 individuals, Goodall, Trejnowska, and Darling (2012) found that attachment anxiety, and to a larger degree, attachment avoidance, loaded onto a factor with emotion regulation subscales (lack of emotional awareness and clarity) and mindfulness subscales (difficulties describing experiences and acting with awareness). These findings corroborate the fundamental tenet of attachment theory that, throughout the lifespan, the quality of attachment relationships is closely linked to the capacity for adaptive regulation of emotion (Coan, 2010; Mikulincer, Shaver, & Pereg, 2003). Moreover, the present findings suggest that mindfulness and loving-kindness techniques may help ameliorate maladaptive emotion regulation patterns commonly found in individuals who have experienced maltreatment and insecure attachment relationships.

There are a number of theoretical reasons why mindfulness and loving-kindness practices may be particularly well suited for people with attachment difficulties. First, mindfulness and secure attachment share many of the same positive correlates and outcomes (Shaver et al., 2007, Snyder et al., 2012; Wallin, 2007), and their key functions are located in similar areas of the brain (Siegel, 2007). Second, individuals who have experienced secure attachment relationships report higher levels of attentional control (Caldwell & Shaver, 2013; Walsh, Balint, Smolira, Fredericksen, & Madsen, 2009) and perform better on behavioral tasks requiring flexible management of attentional resources (Caldwell, Krug, Carter, & Minzenberg, in press; Edelstein & Gillath, 2008). Third, mindfulness appears closely related to the construct of "reflective function" or "mentalization," which refers to the capacity to understand one's own and others' behavior in terms of underlying mental states, thoughts, beliefs, and intentions (Fonagy, Steele, Steele, Moran, & Higgitt, 1991). Secure individuals have been shown to have higher levels of reflective function, which enables them to adopt an "observing stance" regarding their own attachment experiences, even when these experiences have been difficult or traumatic. Fourth, as previously mentioned, mindfulness is inversely related to the hyperactivating and deactivating strategies associated with attachment insecurity—raising the important possibility that mindfulness might

Author's personal copy

be an "antidote" to these maladaptive cognitive-emotional patterns.

From a clinical standpoint, the intervention presented here addresses an important niche within the overlapping fields of trauma recovery and attachment-informed treatment. Within the USA alone, there are nearly one million substantiated reports of child maltreatment each year, and women are disproportionally exposed to relational trauma (DHHS, 2010). A large corpus of research has shown that child maltreatment has far-reaching effects on many areas of adult functioning (Gilbert et al., 2009). Moreover, without appropriate clinical interventions, individuals exposed to relational trauma in childhood are at greater risk for difficulties in adult relationships and parenting (Caldwell et al., 2011; Reyome, 2010), which contribute to intergenerational cycles of dysfunction and disadvantage (Repetti, Taylor, & Seeman, 2002). Although attachment-related treatments are available for parents and children (Marvin, Cooper, Hoffman, & Powell, 2002), troubled adolescents (Blaustein & Kinniburgh, 2010), adult couples (Johnson, 2002), and families (Diamond, Diamond, & Hogue, 2007), there are relatively few treatments for individual adults and even fewer that incorporate mindfulness techniques to directly address issues related to childhood maltreatment and attachment insecurity.

Despite its promising results, the present study is not without limitations. First, the sample size was relatively small, and all participants had received mental health treatment at some point in the past, which may have increased their receptivity to the intervention. Additionally, because participants were recruited from various parts of the country, scheduling challenges did not allow for random assignment to the treatment condition in all cases. This may have contributed to group differences at baseline. Also, group equivalency may have been further biased by not accounting for study noncompleters via an intention-to-treat analysis. Despite these shortcomings, equivalency tests of study completers showed that, at baseline, the treatment and control groups differed only in their level of childhood emotional neglect and this variable was controlled for in all of the statistical analyses. Additionally, most of the measures were self-report questionnaires, which could have introduced common method variance. For this reason, the failure of all measures to perform in exactly the same way, and our use of the more behavioral word-category analyses, are notable. Also, conducting a number of statistical tests without controlling for alpha inflation may have increased the likelihood of type 1 error. To facilitate recruitment efforts, current involvement in a committed relationship was not used as an inclusion criterion for the study, but may have had some bearing on the results. Also, the relatively short duration of the study precluded evaluations about changes in attachment orientation and the long-term sustainability of treatment-related effects. Thus, it is important that future research incorporate larger samples and study designs of longer duration to investigate the effects of mindfulness-based interventions on actual attachment orientations and adult relationship quality.

Limitations aside, the present study introduces a unique mindfulness-based intervention that was specifically tailored to enhance cognitive-emotional processes that are often underdeveloped in people who have experienced child maltreatment and attachment insecurity. The mindfulness and loving-kindness techniques investigated here were well received, were applicable to participants' daily lives, and resulted in less suppression and better regulation of emotion, as well as less rumination and greater emotional clarity, and changes in the latter two variables mediated gains in mindfulness for the treatment group. The mindfulness-based intervention also resulted in the treatment group using relatively more present tense, cognitive processing, and insight-oriented words when writing about stressful or traumatic childhood attachment experiences. This study makes a valuable contribution to the fields of attachment and contemplative science and offers additional hope to people who are longing to heal attachment-related wounds.

Acknowledgments This research was funded by a research grant from the International Society for Traumatic Stress Studies and with generous support from The Meadows of Wickenburg Inc. We kindly thank Elijah J. Bedrosian and Jennifer Noto for co-facilitating the REAC^{2}H program, Morgan Day for administrative support, Cheryl Caldwell for her contributions to program development, and the courageous women who participated in this research.

References

Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: the Kentucky inventory of mindfulness skills. *Assessment, 11*(3), 191–206.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27–45.

Bernstein, D. P., & Fink, L. (1998). *Childhood trauma questionnaire: a retrospective self-report*. San Antonio: The Psychological Corporation.

Bernstein, D. P., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., et al. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *American Journal of Psychiatry, 151*, 1132–1136.

Blaustein, M., & Kinniburgh, K. (2010). *Treating traumatic stress in children and adolescents: how to foster resilience through attachment, self-regulation, and competency*. New York: Guilford Press.

Bowlby, J. (1969). *Attachment and loss: vol. 1. Attachment*. New York: Basic Books.

Brach, T. (2003). *Radical acceptance: embracing your life with the heart of a Buddha*. New York: Bantam Dell.

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: an integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford Press.

Brody, L. R., & Park, S. H. (2004). Narratives, mindfulness, and the implicit audience. *Clinical Psychology: Science and Practice, 11*(2), 147–154.

Author's personal copy

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*, 822–848.

Caldwell, J. G., & Shaver, P. R. (2012). Exploring the cognitive-emotional pathways between adult attachment and ego-resiliency. *Individual Differences Research, 10*(3), 141–152.

Caldwell, J. G., & Shaver, P. R. (2013). Mediators of the link between adult attachment and mindfulness. *Interpersona, 7*(2), 299–310.

Caldwell, J. G., Shaver, P. R., Li, C. S., & Minzenberg, M. J. (2011). Childhood maltreatment, adult attachment, and depression as predictors of parental self-efficacy in at-risk mothers. *Journal of Aggression, Maltreatment & Trauma, 20*, 595–616.

Caldwell, J. G., Krug, M. K., Carter, C. S., & Minzenberg, M. J. (In Press). Cognitive control in the face of fear: reduced cognitive-emotional flexibility in women with a history of child abuse. *Journal of Aggression, Maltreatment, & Trauma*.

Cassidy, J., & Kobak, R. R. (1988). Avoidance and its relation to other defensive processes. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 300–323). Hillsdale, NJ: Erlbaum.

Cassidy, J., & Shaver, P. R. (2008). *Handbook of attachment, second edition: theory, research, and clinical applications*. New York: The Guilford Press.

Coan, J. A. (2010). Adult attachment and the brain. *Journal of Social and Personal Relationships, 27*(2), 210–217.

Cordon, S. L., Brown, K. W., & Gibson, P. R. (2009). The role of mindfulness-based stress reduction on perceived stress: preliminary evidence for the moderating role of attachment style. *Journal of Cognitive Psychotherapy, 23*(3), 258–269.

Davidson, R. J., KabatZinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65*(4), 564–570.

Diamond, G. M., Diamond, G. S., & Hogue, A. (2007). Attachment-based family therapy: adherence and differentiation. *Journal of Marital and Family Therapy, 33*(2), 177–191.

Edelstein, R. S., & Gillath, O. (2008). Avoiding interference: adult attachment and emotional processing biases. *Personality and Social Psychology Bulletin, 34*(2), 171–181.

Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: the development and initial validation of the cognitive and affective mindfulness scale-revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment, 29*(3), 177–190.

Fonagy, P., Steele, M., Steele, H., Moran, G. S., & Higgitt, A. C. (1991). The capacity for understanding mental states: the reflective self in parent and child and its significance for security of attachment. *Infant Mental Health Journal, 12*(3), 201–218.

Fraley, R. C., & Shaver, P. R. (2000). Adult romantic attachment: theoretical developments, emerging controversies, and unanswered questions. *Review of General Psychology, 4*(2), 132–154.

Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *The Lancet, 373*, 68–81.

Goodall, K., Trejnowska, A., & Darling, S. (2012). The relationship between dispositional mindfulness, attachment security and emotion regulation. *Personality and Individual Differences, 52*(5), 622–626.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26*(1), 41–54.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348–362.

Grossman, P., Kappos, L., Gensicke, H., D'Souza, M., Mohr, D. C., Penner, I. K., et al. (2010). MS quality of life, depression, and fatigue improve after mindfulness training: a randomized trial. *Neurology, 75*(13), 1141–1149.

Hart, S., Binggeli, N., & Brassard, M. (1997). Evidence for the effects of psychological maltreatment. *Journal of Emotional Abuse, 1*(1), 27–58.

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. *Journal of Consulting and Clinical Psychology, 78*(2), 169–183.

Johnson, S. M. (2002). *Emotionally focused couple therapy with trauma survivors: strengthening attachment bonds*. New York: Guilford Press.

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

Kahn, J. H., Tobin, R. M., Massey, A. E., & Anderson, J. A. (2007). Measuring emotional expression with the linguistic inquiry and word count. *The American Journal of Psychology, 120*(2), 263–286.

Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: a review of empirical studies. *Clinical Psychology Review, 31*, 1041–1056.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*(1), 83–104.

Marvin, R., Cooper, G., Hoffman, K., & Powell, B. (2002). The circle of security project: attachment-based intervention with caregiver-pre-school child dyads. *Attachment & Human Development, 4*(1), 107–124.

Mikulincer, M., Shaver, P. R., & Pereg, D. (2003). Attachment theory and affect regulation: the dynamics, development, and cognitive consequences of attachment-related strategies. *Motivation and Emotion, 27*(2), 77–102.

Moore, S. D., & Brody, L. R. (2009). Linguistic predictors of mindfulness in written self-disclosure narratives. *Journal of Language and Social Psychology, 28*(3), 281–296.

Moore, S. D., Brody, L. R., & Dierberger, A. E. (2009). Mindfulness and experiential avoidance as predictors and outcomes of the narrative emotional disclosure task. *Journal of Clinical Psychology, 65*, 971–988.

Paul, N. A., Stanton, S. J., Greeson, J. M., Smoski, M. J., & Wang, L. (2013). Psychological and neural mechanisms of trait mindfulness in reducing depression vulnerability. *Social Cognitive and Affective Neuroscience, 8*(1), 56–64.

Pennebaker, J. W. (1994). *Hints on running a writing experiment*. Unpublished manual. Retrieved from http://homepage.psy.utexas.edu/homepage/faculty/Pennebaker/Reprints/Hints.doc. Accessed 7 July 2013.

Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: toward an understanding of inhibition and disease. *Journal of Abnormal Psychology, 95*(3), 274–281.

Pennebaker, J. W., & Francis, M. E. (1996). Cognitive, emotional, and language processes in disclosure. *Cognition & Emotion, 10*, 601–626.

Pennebaker, J. W., Francis, M. E., & Booth, R. J. (2001). *Linguistic Inquiry and Word Count (LIWC): a computerized text analysis program*. Mahway: Lawrence Erlbaum Associates.

Pepping, C. A., Davis, P. J., & O'Donovan, A. (2013). Individual differences in attachment and dispositional mindfulness: the mediating role of emotion regulation. *Personality and Individual Differences, 54*(3), 453–456.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*, 717–731.

Author's personal copy

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891.

Raes, F., & Williams, J. M. G. (2010). The relationship between mindfulness and uncontrollability of ruminative thinking. *Mindfulness, 1*(4), 199–203.

Repetti, R. L., Taylor, S. E., & Seeman, T. E. (2002). Risky families: family social environments and the mental and physical health of offspring. *Psychological Bulletin, 128*(2), 330–366.

Reyome, N. D. (2010). Childhood emotional maltreatment and later intimate relationships: themes from the empirical literature. *Journal of Aggression, Maltreatment & Trauma, 19*(2), 224–242.

Riggs, S. A. (2010). Childhood emotional abuse and the attachment system across the life cycle: what theory and research tell us. *Journal of Aggression, Maltreatment & Trauma, 19*(1), 5–51.

Rosenzweig, S., Greeson, J. M., Reibel, D. K., Green, J. S., Jasser, S. A., & Beasley, D. (2010). Mindfulness-based stress reduction for chronic pain conditions: variation in treatment outcomes and role of home meditation practice. *Journal of Psychosomatic Research, 68*(1), 29–36.

Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C., & Palfai, T. P. (1995). Emotional attention, clarity, and repair: exploring emotional intelligence using the trait meta-mood scale. In J. W. Pennebaker (Ed.), *Emotion, disclosure, and health* (pp. 125–154). Washington, DC: American Psychological Association.

Shaver, P. R., Lavy, S., Saron, C. D., & Mikulincer, M. (2007). Social foundations of the capacity for mindfulness: an attachment perspective. *Psychological Inquiry, 18*(4), 264–271.

Siegel, D. J. (2007). *The mindful brain: reflection and attunement in the cultivation of well-being*. New York: WW Norton & Company, Inc.

Snyder, R., Shapiro, S., & Treleaven, D. (2012). Attachment theory and mindfulness. *Journal of Child and Family Studies, 21*(5), 709–717.

Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the five-factor model of personality: distinguishing rumination from reflection. *Journal of Personality and Social Psychology, 76*, 284–304.

U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. (2011). *Child Maltreatment 2010*. Retrieved from http://www.acf.hhs.gov/programs/cb/stats_research/index.htm#can. Accessed 22 Aug 2012.

Wallin, D. (2007). *Attachment in psychotherapy*. New York: Guilford Press.

Walsh, J. J., Balint, M. G., Smolira SJ, D. R., Fredericksen, L. K., & Madsen, S. (2009). Predicting individual differences in mindfulness: the role of trait anxiety, attachment anxiety and attentional control. *Personality and Individual Differences, 46*(2), 94–99.

Watson, D., & Clark, L. A. (1994). *The PANAS-X: manual for the positive and negative affect schedule—expanded form*. University of Iowa, Iowa City: Unpublished manuscript.