Chapter 3: Intrusions of autobiographical memories in individuals reporting childhood emotional maltreatment

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ABSTRACT

During childhood emotional maltreatment (CEM) negative attitudes are provided to the child (e.g; ''*you are worthless*''). These negative attitudes may result in emotion inhibition strategies in order to avoid thinking of memories of CEM, such as thought suppression. However, thought suppression may paradoxically enhance occurrences (i.e. intrusions) of these memories, which may occur immediately or some time after active suppression of these memories. Until now, studies that examined suppressive coping styles in individuals reporting CEM have utilized self-report questionnaires. Therefore, it is unclear what the consequences will be of emotion inhibition styles on the intrusion of autobiographical memories in individuals reporting CEM. Using a thought suppression task, this study aimed to investigate the experience of intrusions during suppression of, and when no longer instructed to actively suppress, positive and negative autobiographical memories in individuals reporting Low, Moderate and Severe CEM compared to No Abuse (total N=83). We found no group differences during active suppression of negative and positive autobiographical memories. However, when individuals reporting Severe CEM were no longer instructed to suppress thinking about the memory, individuals reporting No Abuse, Low CEM, or Moderate CEM reported fewer intrusions of both positive and negative autobiographical memories than individuals reporting severe CEM. Finally, we found that intrusions of negative memories are strongly related to psychiatric distress. The present study results provide initial insights into the cognitive mechanisms that may underlie the consequences of childhood emotional maltreatment, suggesting avenues for successful interventions.

INTRODUCTION

Childhood Emotional Maltreatment (CEM) consists of behavior by a caregiver that conveys to a child that he or she is worthless, flawed, unloved, unwanted, endangered, or valued only in meeting another's needs (APSAC, 1995; Baker, 2009; Gilbert, Widom, Browne, Fergusson, Webb, Janson, 2009). Besides emotional abuse (e.g. yelling at, or cursing the child), CEM also comprises emotional neglect (e.g. ignoring the child, favoring other siblings, not giving support or attention to the child). As such, experiences of CEM strengthen the development of negative cognitive (self-) schemas in these children about the self and significant others (see Beck, 2008; Rohner, 2004; Rose & Abramson, 1992). This is corroborated by an accumulating number of studies indicating that CEM is strongly related to negative dysfunctional self-attitudes and negative (self-) inferential styles (Alloy, Abramson, Smith, Gibb, & Neeren, 2006; Gibb, 2002). These negative cognitive schemas can persist into adulthood, that is, more than 20 years after the maltreatment took place (van Harmelen, et al., 2010). As a result, emotionally maltreated individuals are more vulnerable to develop and/or maintain a mood and/or anxiety disorder in adulthood (Beck, 2008; Rohner, 2008; Spinhoven et al., 2010). This is supported by findings showing that negative self-inferential styles mediated depressive and anxious symptomatology in individuals reporting CEM (Gibb, Wheeler, Alloy, & Abramson, 2001; van Harmelen, et al., 2010; Wright, Crawford, & Del Castillo, 2009)

In response to memories and experiences of childhood maltreatment, emotionally abused individuals may try to avoid thinking about these distressing thoughts or memories. Subsequently, over the course of years, this habitual coping style may translate into the avoidance of negative memories in general, and may even apply to memories that are unrelated to the maltreatment. In line with this idea, emotionally maltreated adults have been characterized by avoidant coping styles in which emotional inhibition strategies such as thought suppression are utilized in order to avoid experiencing distressing thoughts or memories in general (Krause, Mendelson, & Lynch, 2003). Because of its reliance on mental control, successful suppression of distressing content has been associated with high intelligence, strong working memory capacity, and is inversely related to presence of psychopathology (Brewin & Beaton, 2002; Dalgleish, Yiend, Schweizer, & Dunn, 2009; Dunn, Billotti, Murphy, & Dalgleish, 2009; Geraerts & McNally, 2008). However, attempts to suppress a certain memory or thought may subsequently lead to a preoccupation and an increase in the occurrence of that memory or thought, which is most apt to occur when mental control is relinquished and the individual is no longer trying to suppress the memory or thought (i.e., post-suppression rebound effect) (Wegner, Schneider, Carter, & White, 1987; Wenzlaff & Wegner, 2000). Thus, despite this seemingly useful coping strategy, an enhancement of intrusions of distressing material may occur immediately, or some time after active suppression (i.e. post-suppressive rebound), and is especially prominent in

individuals with an avoidant coping style (Geraerts & McNally, 2008; Wenzlaff & Wegner, 2000).

Intrusions of distressing memories have been found to induce the same mood state and physiological responses that are associated with that memory (Wenzlaff & Wegner, 2000). Furthermore, intrusions of negative material induce heightened accessibility to other negative autobiographical memories that may be more general (Dalgleish & Yiend, 2006), or less specific (Geraerts, Hauer & Wessel, 2010). In this way, intrusions of negative autobiographical memories may activate and strengthen individuals' negative cognitive self-schemas (Beck, 2008), thereby increasing individuals' vulnerability to the development of depressive disorders. In line with these findings, emotional inhibition styles, such as thought suppression, are associated with more depressive and anxious symptoms (Reddy, Picket, & Orcutt, 2006; Rosenthal, Polusny, & Follette, 2006; Spinhoven & van der Does, 1999). Also, emotion inhibition tendencies mediate acute psychological distress in emotionally maltreated individuals (Krause, et al., 2003).

So far, studies that examined suppressive coping styles in individuals reporting CEM have utilized self-report questionnaires (Krause, et al., 2003; Reddy, et al., 2006; Rosenthal, et al., 2006). However, self-report questionnaires are prone to inflation and distortion related to individual's psychiatric distress (McNally, 2003). Therefore, it is unclear what the consequences will be of emotion inhibition on the intrusion of autobiographical memories in individuals reporting CEM. It is possible that individuals reporting CEM might report fewer intrusions during active suppression, as they are more adept at suppressing these memories (e.g. Geraerts, Merckelbach, Jelicic, & Habets, 2007). In addition, thought suppression may also result in the experience of more intrusions when individuals reporting CEM no longer actively suppress thinking about these autobiographical memories. Finally, it is unknown whether (possibly) enhanced intrusions in individuals reporting CEM are specific to negative autobiographical memories (e.g. McNally & Ricciardi, 1996), or whether they generalize to positive autobiographical memories.

This study aimed to investigate the impact of varying degrees of CEM on intrusions during suppression and when no longer instructed to actively suppress positive and negative autobiographical memories. To investigate suppression and post-suppressive rebound of autobiographical memories in individuals reporting varying degrees of CEM or No abuse, we utilized a thought suppression task. We hypothesized that level of CEM is associated with 1) reduced intrusions during the suppression phase, and 2) increased intrusions of negative autobiographical memories when suppression is relinquished when compared to individuals that report no history of childhood abuse. Furthermore, given the function of the avoidance strategy, we merely expect this to occur in the context of negative memories; we do not expect differences between individuals reporting CEM or no abuse in

childhood with respect to positive emotional memories. Finally, we will explore whether intrusions (during, or post-, suppression) during the thought suppression task are related to explicit measurements (self-report questionnaires) of avoidance strategies, and/or general distress.

METHOD

PARTICIPANTS

The sample consisted of 83 first year psychology students, 27 males and 56 females, with a mean age of 19.7 $\pm$ 1.93 years (see Table 1 for additional demographics). Participants received course credits for participating in this study. All participants provided written informed consent.

CHILDHOOD TRAUMA

History of childhood maltreatment was assessed with the Dutch version of the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998; Bernstein, et al., 1994); the Jeugd Trauma Vragenlijst (JTV; Arntz & Wessel, 1996). In the CTQ, a total of 28 items are scored on a 5-point scale, ranging from 1=never true to 5=very often true. The CTQ retrospectively measures five subtypes of childhood abuse: emotional abuse, sexual abuse, physical abuse, emotional neglect and physical neglect. The CTQ is a sensitive and reliable screening questionnaire with Cronbach's alpha for the CTQ subscales varying between .63-.91 (Thombs, Bernstein, Lobbestael, & Arntz, 2009).

Emotional maltreatment in childhood was defined as a history of emotional neglect and/or emotional abuse before the age of 16 years according to the CTQ, see the American Professional Society on the Abuse of Children (APSAC) for a similar definition (APSAC, 1995; Baker, 2009; Glaser, 2002). In our study, Cronbachs alpha for the emotional abuse subscale was .85, for the emotional neglect subscale .86, and for the combined emotional abuse and neglect scales was .89. Overall CEM score was defined as the highest score on the emotional abuse or emotional neglect subscale of the CTQ (e.g. if emotional abuse score was 14, and emotional neglect score was 12, overall CEM score is 14). In the current sample, CEM scores ranged from 5 to 23; Median = 10.

Because we were specifically interested in the impact of emotional maltreatment, we excluded individuals reporting moderate to severe physical or sexual abuse (i.e. a CTQ score of >7 for sexual abuse, and >9 for physical abuse, based on Bernstein & Fink, 1998). This resulted in the exclusion of one participant who reported severe sexual abuse (i.e. sexual abuse subscale score = 16).

Finally, groups were formed based on the 25th, 50th, and 75th percentiles of overall CEM score (i.e. 7, 10 and 14). The final sample consisted of the following four groups; No Abuse (i.e. CEM score 5-7; n=24), Low CEM (i.e. CEM score 8-10; n=22), Moderate CEM (i.e. CEM score 11-14; n=20) and Severe CEM (i.e. CEM score> 14; n=16)(see Table 1).

PSYCHOPATHOLOGY

In order to assess general distress, we utilized the Dutch version of the Symptom Check-List 90 Revised (SCL-90R; Arrindell & Ettema, 2003; Derogatis, 1983). The SCL-90 is a self-report questionnaire designed to assess major symptoms of psychic distress and the experience of psychopathology, represented in nine primary symptom dimensions (Arrindell & Ettema, 2003). The Dutch version of the SCL-90-R consists of 90 items concerning a patient's symptom distress, each item rated on a five-point Likert scale (1–5) varying from 'not at all' to 'extremely'. These items combined form a total score that is indicative of psychiatric functioning in general. In terms of psychometric properties, the internal consistency reliabilities for the nine dimensions of the SCL-90-R range from .77 to .90. Test-retest reliability for the SCL-90-R ranges between .80 and .90 (Derogatis & Savitz, 2000).

Table 1. Mean (M) and Standard Deviations (SD) of demographics and clinical characteristics per CEM group.

Groups		**No Abuse (*n* =24)**		**Low CEM (*n* =22)**		**Moderate CEM (*n* =21)**		**Severe CEM (*n* =16)**		X^2	P
Gender	*n* Female/Male	18/6		12/10		14/7		12/4		2.71	0.43
		M	SD	M	SD	M	SD	M	SD	F	P
Age		19.79	2.09	19.59	1.47	19.57	1.66	20.06	2.62	0.24	.86
Impact of Event Scale	Total score	9.83	12.89	18.57	17.19	14.76	12.17	22.50	17.93	2.56	.06 #
	Intrusion	5.29	6.66	9.18	8.66	7.38	6.30	8.25	6.98	1.20	.32
	Avoidance	4.54	6.98	8.95	9.12	7.38	7.37	14.25	12.40	3.92	.01 *
SCL-90	Total score	124.00	29.47	125.55	25.13	128.67	28.76	129.31	21.28	0.18	.99
Negative Experience	Frequency	1.58	1.10	2.00	1.72	1.65	1.18	1.63	1.02	0.48	.70
	Negativeness	7.29	1.97	7.52	1.87	7.25	1.77	7.63	1.50	0.18	.91
	Vividness	8.58	1.02	7.59	2.17	7.15	2.16	7.94	1.95	2.35	.08 #
	Stressfulness	5.75	1.94	4.91	2.86	6.05	2.91	6.88	1.36	2.17	.10
	Frightfulness	3.71	2.37	4.91	2.89	5.05	2.96	4.81	2.32	1.22	.31
Positive Experience	Frequency	2.00	1.18	2.50	0.74	2.10	1.07	1.88	1.15	1.37	.26
	Negativeness	1.83	1.17	1.73	0.88	1.85	0.99	2.31	1.85	0.78	.51
	Vividness	7.38	1.64	7.64	2.11	7.45	2.21	8.00	1.71	0.38	.77
	Stressfulness	2.00	2.15	2.32	1.55	2.35	2.21	2.88	2.16	0.60	.62
	Frightfulness	1.79	1.79	1.73	1.42	1.80	1.88	1.94	1.83	0.94	.43

Note . # = P<.10, * = P< .05

IMPACT OF EVENT SCALE (IES).

To assess individuals stress reactions related to a traumatic event, we administered the Impact of Event Scale (IES; Horowitz, Wilner, & Alverez, 1997). The IES assesses individual's most negative life experience. Participants are required to provide a short description of this life event, and to complete a short questionnaire regarding the impact of that event. This questionnaire consists of two subscales, Intrusions, and Avoidance that together measure stress reactions after a traumatic event (Sundin & Horowitz (2002). The reliability of the IES is good, with Cronbach's alpha's ranging from .85 to .95 for the Intrusion subscale, from .77 to .91 for the Avoidance subscale, and from .87 to .96 for the total score (van der Ploeg, Mooren, Kleber, van der Velden, & Brom, 2004). Furthermore, the sub-scales are relatively independent suggesting adequate content validity (van der Ploeg, et al., 2004).

THOUGHT SUPPRESSION TASK

The thought suppression task consisted of two stages, during which participants were instructed to retrieve either a positive or a negative autobiographical memory respectively. The order of the positive and negative autobiographical memory was counterbalanced, so half of the participants started with retrieving a positive autobiographical memory and the other half started with a negative autobiographical memory. Each stage consisted of an imagining period, a suppression period and an expression period, each lasting three minutes.

In the first phase, the imagining period, participants had to select and describe the most positive (or negative) event they had experienced in the past two years. This was called the target experience, and could be either a negative experience (e.g. a fight, a break-up or a bad critique) or a positive experience (e.g. receiving a compliment, engaging in a relationship or celebrating with friends). Participants rated their own target experience on the following four scales: negativeness, vividness, stressfulness, and frightfulness, on a 10 point scale ranging from, for instance, 'very much negative' to 'very much positive'.

In the second phase, the suppression phase, participants were asked to look at the screen of the computer, which was black with a yellow fixation cross in the middle. Participants were instructed to try to suppress any thoughts about the target experience. If they did think about the target experience, they were asked to press a button on the response box.

The third phase, the expression period, was similar to the suppression phase, only now participants were allowed to think about anything they wanted, including the target experience. Participants were again asked to press a button on the response box if they were thinking about the target experience. After this expression phase, participants completed an easy mathematical filler task for three minutes to provide a distraction before moving on to the next phase. After the filler task the first three phases were

repeated with a different autobiographical memory; if the first memory was positive, then the second memory was negative and vice versa.

PROCEDURE

Upon arrival in the lab, participants were informed about the procedure, and completed a written informed consent form. Thereafter, participants conducted the computerized thought suppression task sitting behind a desk on which a PC was situated at a distance of 50 centimeter from the participants. After completing the computerized task, participants completed the SCL-90, the IES and the CTQ respectively. Afterwards, all participants were fully debriefed.

STATISTICAL ANALYSES

All analyses were performed using SPSS version 17. The positive and negative autobiographical events were classified by three independent raters, who were blind to the participant's history of childhood maltreatment. The first independent rater constructed general classifications for the type of memories, which were based on the relationship with a significant other (or self) (self, partner, friends, parents, strangers, external factors), and the type of emotion or experience (pride, compliment, rejection etc) (see Table 2 for the exact classifications used). Thereafter, two other raters independently classified the memories (the classification was exclusive, i.e. all memories were classified as one type of event). Correlations for these two independent raters were r=.86 for the positive and r=.72 for the negative autobiographical memory. Thereafter the raters discussed and categorized all remaining memories that were rated differently in the first phase, resulting in full agreement on all memories.

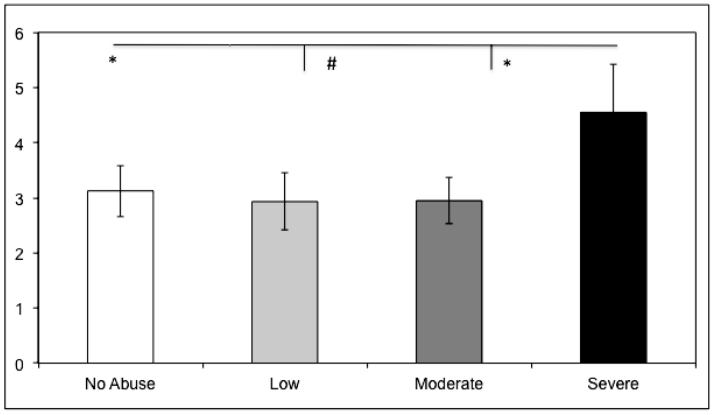
Ratings of the positive and negative autobiographical memory on the scales of negativeness, vividness, stressfulness, and frightfulness were compared using one-way analysis of variance (ANOVA). To determine the impact of CEM on the amount of intrusions of negative or positive autobiographical memories, we performed a Valence (positive, negative)×Phase (suppression- expression) repeated measures (RM) Analysis of Variance (ANOVA), with Group (No Abuse, Low-, Moderate-, Severe CEM) as fixed factor. Per phase and valence type (i.e. negative suppression, negative expression, positive suppression and positive expression), intrusion scores were standardized in order to control for outliers: scores that exceeded Z=3.29 were transformed to 2 times standard deviation above or below the mean (for each individual). For the final analysis, two outlier scores were detected and transformed. Least square difference correction was applied to control for multiple testing. All analyses were conducted with a two-tailed α of $<.05$

Results

Groups

There was no significant difference between the groups in gender (χ^2=2.74 (3) P=.43), age (F(3,79)=.24, P=.86), nor SCL-90 total score (F(3,79)=.18, P=.99) see Table 1. Groups did differ marginally on the Impact of events (IES) total scale score (F(3,79)=2.56, P=.06) with the Low CEM, Moderate CEM and Severe CEM groups having higher IES scores than the No Abuse group (Table 1). Furthermore, groups differed significantly on the IES Avoidance subscale (F(1,79)3.92, P<.05). In the Severe CEM group, individuals reported more Avoidance compared to the No Abuse group, P<.001, the Moderate CEM group, Mean Difference= 6.87, P<.05, and marginally more than the Low CEM group, Mean Difference = 5.29, P=.07, see Figure 1. No other group differences were found on IES avoidance (all Mean Difference's<4.41, P's>.10) nor on the IES Intrusions scale (F(1,79)=1.20, P=.32).

Figure 1. Mean and standard error of IES avoidance level per CEM group.



Note. * = P < .05, # = P < .10.

Selection of Autobiographical events

The types of memories that participants reported in the thought suppression task are depicted in Table 2. For the positive autobiographical memory, all groups most often reported an event in which they felt proud, or relieved due to their own achievement. For the negative memory, the most frequently reported memory in the No Abuse, Low CEM, and Moderate CEM groups concerned the ending of the participant's relationship, or major troubles in their relationship (i.e. 29.2 %, 27.3 %, and 38.1 % respectively). Interestingly, the most often reported negative memory in the Severe CEM group (30%) concerned their parents not showing support or appreciation. This is in contrast with the other groups: In the No Abuse group only 12.5 % of cases reported a memory that involved lack of parental support or appreciation, and in the low and Moderate CEM groups this was reported in

Table 2. Classifications of the pcsitive and negative autobiographical memories.

Groups	No Abuse (*n*=24)	%	Low CEM (*n*=22)	%	Moderate CEM (*n*=21)	%	Severe CEM (*n*=16)	%
Positive memory								
Self, pride and relief in own achievement	13	54.2	14	63.6	9	42.9	7	43.8
Partner, beginning of relationship, or happy moment with p	4	16.7	0		2	9.5	4	25
Friends give compliments, appreciation	1	4.2	0		2	9.5	1	6.3
Friends show support	3	12.5	2	9.1	2	9.5	1	6.3
Parents show support/ appreciat on	1	4.2	0		0		0	
Compliment, appreciation from stranger	2	8.3	1	4.5	2	9.5	0	
Special occasion, party, get together	0		4	18.2	3	14.3	3	18.8
Something else	0		1	4.5	1	4.8	0	
Negative memory								
Self, guild, shame	4	16.7	2	9.1	3	14.3	1	6.3
Partner, ending of relation, or relationship troubles	7	29.2	6	27.3	8	38.1	4	25
Friends that are not being supportive, or do not show respe	4	16.7	6	27.3	3	14.3	4	25
Friends, having words with, or being critisized by	1	4.2	0		2	9.5	1	6.3
Parents do not show support/ apsreciation	3	12.5	1	4.5	1	4.8	5	31.3
Having words/being critisized with /by strangers	0		1	4.5	0		0	
Loss, or illness	3	12.5	6	27.3	3	14.3	1	6.3
Something else	2	8.3	0		1	4.8	0	

less than 5% of cases. However, the number of cases in each group is too small to perform non-parametric tests for these differences.

RATINGS OF AUTOBIOGRAPHICAL EVENTS

Overall, all subjects rated their negative autobiographical memories as being more stressful, more frightful, and less positive, compared to their positive autobiographical memories (all t's>2.19, P's< .001). In addition, all participants indicated that they thought less frequently about the negative memory (t(81)=-2.19, P<.05), compared to the positive autobiographical memory. Finally, there was no difference in reported vividness of the negative vs. positive memories (t(81)=.86, P=.39).

On a group level, it appeared that the four groups differed marginally on vividness of the negative autobiographical memory (F(3,78)=2.53, P=.08) with the Low CEM, Moderate CEM, and Severe CEM groups reporting to remember the negative autobiographical memory less vividly than the No Abuse group (Table 1).

The groups did not differ on all other ratings of the positive and negative autobiographical memory (all F's <2.17, P's> .10), Table 1.

INTRUSIONS OF NEGATIVE AND POSITIVE AUTOBIOGRAPHICAL MEMORIES DURING SUPPRESSION AND EXPRESSION PERIOD

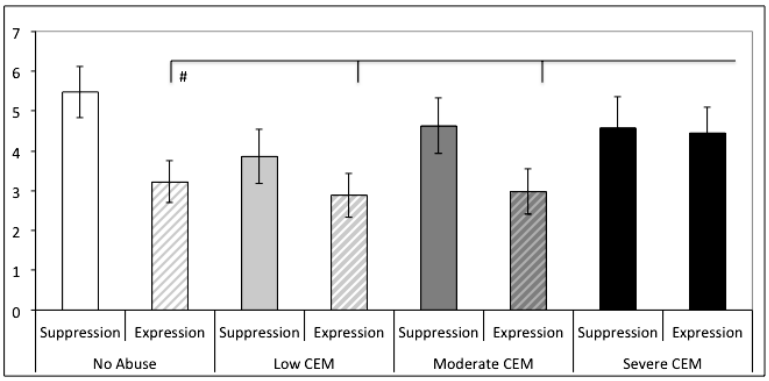
To investigate the impact of CEM on the number of intrusions of autobiographical memories, we conducted a Valence (positive-negative)×Phase (suppression-expression) RM ANCOVA with Group (No Abuse, Low-, Moderate-, Severe CEM) as fixed factor. To control for the group differences in total IES score, we added total IES score as covariate to the analysis.

The analysis showed that there was a significant Group×Phase interaction ($F(3,76)=3.23$, $P<.05$, $\eta p^2 = .11$)[II] indicating that the amount of intrusions in the groups differed for the suppression vs. expression phase (depicted in Figure 1). To further investigate this interaction, we performed exploratory contrast analyses. The CEM groups did not differ in the amount of self-reported intrusions during the suppression phase (all Contrast Estimates (CE)'s< 1.06, all P's> .39) However, during the expression phase, when participants were no longer instructed to suppress thinking about the memory, it appeared that individuals reporting Severe CEM reported (marginally) more intrusions compared to the No Abuse group (CE= -1.43, P=.08) to the Low CEM group (CE=-1.62, P=.06) and to the Moderate CEM group (CE=-1.60, P=.06) Finally, the amount of intrusions significantly decreased over time (from suppression to expression) for the No Abuse, Low CEM, or Moderate CEM groups (all t's>-2.64, P's<.05) However, the Severe CEM group did not show this decline of intrusions over time (t=-.50, P=.62) indicating that they reported a similar amount of intrusions during the suppression and expression phase.

In addition, Group did not have a main effect on self-reported intrusions ($F(3,76)=.78$, $P=.50$) and IES score was not a significant covariate in the analysis ($F(1,76)=2.64$, $P=.11$). Group did not interact with Valence ($F(3,76)=.77$, $P=.51$) indicating that the groups did not differ in the amount of intrusions for positive vs. negative autobiographical memories. There was no Group×Valence×Suppression interaction ($F(3,76)=1.07$, $P=.36$). All participants reported more intrusions in the suppression compared to the expression phase (i.e. a main effect of Phase ($F(1,76)=4.09$, $P<.05$, $\eta p^2 = .05$, see Figure 2).

[II] *Adding IES avoidance as covariate to the model (instead of IES total), or adding frequency of thinking about the negative event, or adding vividness of the negative events as covariate to the model did not affect the results, including the significant Group×Phase interaction.*

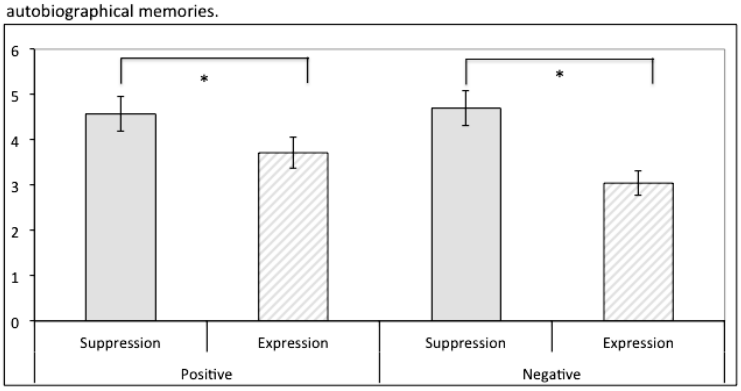
Figure 2. Mean and standard errors of self-reported intrusions of the autobiographical memories in the Suppression and Expression phase within the CEM groups.



Note, # = P<.10.

Hence, we found no post-suppressive rebound effect (Geraerts & McNally, 2008; Wenzlaff & Wegner, 2000). In addition, there was no main effect of Valence ($F(1,76)=.72$, $P=.40$), but there was a significant Valence×Phase interaction ($F(1,76)=6.86$, $P<.05$, $\eta p^2 = .08$). Taken together, all participants reported fewer intrusions in the expression phase, and that effect was stronger for the negative autobiographical memories (Figure 3).

Figure 3. Mean and standard error of self reported intrusions for the positive and negative autobiographical memories.



Note. * = P < .05.

For all participants, correlation analyses showed that self-reported tendency to have intrusions about a negative life event (i.e. IES Intrusions), correlated marginally with the actual amount of self-reported negative autobiographical event intrusions during the thought suppression task (i.e. during suppression (r= .19, P=.10), and expression (r=.19, P=.09)). Moreover, tendencies to not think about that negative life event on the IES Avoidance did not correlate with the amount of self-reported intrusions of a

negative autobiographical event during the thought suppression task (i.e. suppression and expression, *r*'s<.12, P's>.44).

In contrast, the amount of intrusions of the negative autobiographical memory was strongly correlated with general distress (as measured with the SCL-90), both during the suppression (*r*=.41, P<.001) and expression phase (*r*=.40, P<.001). In addition, self-reported intrusions of the positive autobiographical memory also correlated somewhat to general distress, significantly during the suppression phase (*r*=.32, P<.01) and marginally significantly during the expression phase (*r*=.21, P=.06).

Discussion

This study aimed to investigate the impact of varying degrees of CEM on intrusions during suppression of and when no longer instructed to actively suppress, positive and negative autobiographical memories. We found no group differences when participants were instructed to suppress thinking about their memory. Thus, individuals with Severe CEM were not more adept in actually suppressing their negative autobiographical memory. However, during the expression phase, when participants were no longer instructed to actively suppress thinking about their autobiographical memory, individuals reporting No Abuse, Low, and Moderate CEM reported fewer intrusions of both positive and negative memories than participants reporting Severe CEM. These findings indicate that there is no dose-response relationship between CEM severity and number of intrusions, rather, only the most affected individuals, those reporting severe CEM, reported a differential amount of intrusions during the expression phase. Furthermore, and in line with Krause et al. (2003), we found that individuals reporting Severe CEM are characterized by higher scores on the avoidance scale (as measured with the IES) in response to negative experiences. Finally, we found that the number of actual intrusions during the thought suppression task had a strong relationship with general distress, which was especially prominent for the negative autobiographical memory (this is in line with; Dalgleish & Yiend, 2006; Kashdan, Barrios, Forsyth, & Steger, 2006; Krause et al., 2003).

Our findings show that individuals reporting No Abuse, Low CEM, or Moderate CEM report fewer post-suppressive intrusions than individuals reporting Severe CEM. The amount of intrusions significantly decreased over time (from suppression to expression) for the No Abuse, Low CEM, or Moderate CEM groups. However, the Severe CEM group did not show this decline of intrusions over time, they reported a similar amount of intrusions during the suppression and expression phase. One of the explanations for this finding may be that the severe CEM group shows sustained intrusions in response to emotional memories. Perhaps these emotional autobiographical memories require more processing time in individuals reporting CEM, and therefore continue to intrude. Another explanation may be that the severe CEM group was unsuccessful at diverting their thoughts, while the other groups were successful at not thinking about the memory. A third

explanation may be that individuals reporting Severe CEM involuntary persist in active suppression of these memories, even when they are not instructed not to do so. An important reason for the perpetuation of suppression may be that individuals reporting CEM have negative self-associations (van Harmelen et al., 2010). Individuals who are extremely self-critical may perceive the rebound effects of thought suppression as personal failures, which may lead them to perpetuate active suppression (Kelly & Kahn, 1994; Wenzlaff & Wegner, 2000).

These findings may have implications for clinical interventions. Increased occurrences of a distressing memory or thought have been found to augment psychological distress (Dalgleish & Yiend, 2006; Kashdan, et al., 2006; Krause, 2003). Therefore, therapists working with individuals who report emotional maltreatment in their youth could teach their patients more effective types of mental control in order to suppress thinking about, or reduce negative arousal related to, negative autobiographical events, using for instance memory diversion techniques, acceptance-based interventions or interventions aimed at expressing the negative thoughts (Wenzlaff & Wegner, 2000). An example of a memory diversion technique is the think/no-think task, which has been proven a successful memory diversion tool to suppress thinking about unwanted memories (Anderson & Green, 2001). Alternatively, therapists could aim at reducing the negative emotionality of the memory, for instance by acceptance and expressing the thoughts through cognitive therapy.

For all participants, the number of intrusions during the thought suppression task was marginally related to the self-reported tendency to experience intrusions of a negative life event (IES Suppression), but not related to self-reported tendency to avoid thinking about a negative life event (IES Avoidance). In line, despite reporting more avoidant tendencies on the IES, individuals with Severe CEM were not more adept in actually suppressing their negative autobiographical memory. Moreover, while rating their autobiographical memories in the thought suppression task, individual reporting Severe CEM indicated to think as often about their negative autobiographical memory as individuals in the other groups. However, this was only the case during the suppression phase. When they were no longer instructed to avoid thinking about their memory, the other groups reported fewer intrusions than individuals with Severe CEM. Taken together, the thought suppression task may be a more sensitive instrument to measure tendencies to not think about distressing memories, and how successful these tendencies are, when compared to explicit (self-report) measures. This may be explained by the fact that explicit measurements are sensitive to inflation, or distortion, for instance because of acquiescence bias, or general distress (e.g. McNally, 2003). However, these findings may also be related to the fact that 69 individuals reported another negative experience for the IES as the thought suppression task, and only 13 individuals reported the same experience on both tasks (i.e. n=5 in the No

Abuse group, n=4 in the Low CEM, n=4 in the Moderate CEM, and n=1 in the Severe CEM group).

It is important to acknowledge that, contrary to an accumulating number of studies, we did not find evidence for an overall post-suppression rebound effect (Wenzlaff & Wegner, 2000). Our findings of higher frequency of intrusions during the suppression compared to the expression phase are more indicative of an immediate enhancement of the intrusions, especially for the negative autobiographical memory (Geraerts, Hauer, & Wessel, 2010; Salkovskis & Campbell, 1994). Studies investigating thought suppression under cognitive load also indicate immediate enhancement of intrusions during the suppression period (Dalgleish & Yiend, 2006), and no post-suppressive rebound of these memories (Wenzlaff & Wegner, 2000). In addition, emotional material is harder to suppress than neutral information (McNally & Ricciardi, 1996; Wenzlaff & Wegner, 2000). This is in line with findings that initial suppression of personally intrusive thoughts is followed by diminished expression of these thoughts (i.e. no rebound effect) (Kelly & Kahn, 1994; although this is not often been replicated; see Abramowitz, Tolin & Street, 2001 for a meta-analysis). A possible explanation for this finding is that individuals have more experience in distracting themselves from a personal thought. They may even have developed a network of distracter thoughts, and may have used this network in order to distract themselves during the suppression of a personal thought, and subsequently have diminished intrusions of that thought during the expression phase (Kelly & Kahn, 1994). In line, Salkovskis and Campbell (1994) found higher rates of intrusions of personal thoughts for participants who tried to suppress the thoughts compared to those who only monitored (expressed) them. Therefore, more intrusions during the suppression vs. expression phase may be indicative that individuals found it hard to actively suppress these positive and negative emotional autobiographical events, or that they had more experience with distracting themselves.

This study is not without its limitations. Although the overall sample is large, our sub samples were relatively small, limiting the types, and power of, statistical analyses that can be run. Furthermore, we did not include a baseline period prior to the suppression phase, which limits our interpretations regarding the effects of our instructions to suppress on the amount of reported intrusions. In addition, in the expression phase, the individuals were instructed to think about anything they wanted, including the autobiographical memory. Therefore, the expression phase more closely resembles day-to-day life when compared to the suppression phase. On the other hand, in our study, the expression phase always followed the suppression phase. In this way, we aimed to maximize our chances of measuring the post-suppression rebound effect. Although spontaneous suppression leads to the same paradoxical effects as instructed suppression (Wenzlaff & Wegner, 2000), in day to day life, individuals are not first explicitly instructed to suppress thinking about their memories. Therefore, our findings may only translate to explicit attempts to suppress thinking

about distressing memories (e.g. 'I must not think about this experience anymore').

It is important to acknowledge that the assessment of childhood trauma was based on retrospective self-report, and may therefore be susceptible to distortion and/or inflation (McNally, 2003). In addition, especially the inherent subjectivity of retrospective self-reported CEM is important to acknowledge. However, research has indicated that individuals are more likely to underreport than overreport their history of childhood abuse (Brewin, 2007). Furthermore, in a large sample of outpatients with depressive and anxiety disorders and healthy controls, current affective state did not moderate the association between retrospective self-reported CEM and lifetime affective disorders, indicating that recall of CEM is not critically affected by current mood state (Spinhoven et al., 2010).

CONCLUSION

We found that individuals reporting Severe CEM (vs. No Abuse, Low CEM, or Moderate CEM) report more avoidant tendencies for negative emotional experiences. Despite these tendencies, individuals reporting Severe CEM are not more adept in actually suppressing thinking of negative (and positive) autobiographical memories. Furthermore, we found that when individuals were no longer instructed to suppress thinking about the memory, individuals reporting No Abuse, Low CEM, or Moderate CEM reported fewer intrusions of both positive and negative autobiographical memories when compared to reporting Severe CEM. Finally, intrusions of negative memories are strongly related to psychiatric distress. Therefore, the present study results may provide an important avenue to better understand the consequences that emotional child maltreatment might have, as well as suggesting avenues for successful intervention.

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