Faculty Publications

10-13-2017

Weak Evidence for Increased Motivated Forgetting of Trauma-Related Words in Dissociated or Traumatised Individuals in a Directed Forgetting Experiment

Lawrence Patihis
University of Southern Mississippi, l.patihis@usm.edu

Patricia J. Place
University of California, Irvine

Follow this and additional works at: https://aquila.usm.edu/fac_pubs

Part of the Psychology Commons

Weak Evidence for Increased Motivated Forgetting of Trauma-Related Words in Dissociated or Traumatized Individuals in a Directed Forgetting Experiment

Lawrence Patihis[1] and Patricia J. Place[2]

[1]Department of Psychology, University of Southern Mississippi

[2]Institute for Memory Impairments and Neurological Disorders, Alzheimer's Disease Research Center, University of California, Irvine

Uncorrected preprint of accepted article in the journal *Memory*

Address correspondence to: Lawrence Patihis, Department of Psychology, University of Southern Mississippi, 118 College Drive #5025, Hattiesburg, MS, 39406, USA. E-mail: L.Patihis@usm.edu

Abstract

Motivated forgetting is the idea that people can block out, or forget, upsetting or traumatic memories, because there is a motivation to do so. DePrince et al. (2012) cited directed forgetting studies using trauma-related words as evidence for the theory of motivated forgetting of trauma. In the current article subjects used the list method directed forgetting paradigm with both trauma-related words and positive words. After one list of words was presented subjects were directed to forget the words previously learned, and they then received another list of words. Each list was a mix of positive and trauma-related words, and the lists were counterbalanced. Later, subjects recalled as many of the words they could, including the ones they were told to forget. Based on the theory that motivated forgetting would lead to recall deficits of trauma-related material, we created six hypotheses. High dissociators, trauma-exposed, sexual trauma-exposed, and high dissociators with trauma-exposure participants were hypothesized to show enhanced forgetting of trauma words. Results indicated only one of seven hypotheses were supported: those higher on dissociation *and* trauma recalled fewer trauma-words in the to-be-forgotten condition, compared to those low on dissociation and trauma. These results provide weak support for differential motivated forgetting.

Keywords: motivated forgetting, directed forgetting, trauma, dissociation

Introduction

Motivated forgetting is a proposed phenomenon in which traumatic memories are forgotten due to a defense or motivation to avoid those memories. Sigmund Freud (1916/1949) was one of the first to describe motivated forgetting—reporting that he was unable to accurately recall a word that he later attributed to the painful associations he had to the word. Freud concluded that a *motive* to suppress or repress something painful may have caused the *forgetting*. Since then, some researchers have argued that evidence for motivated forgetting can be found using the directed forgetting paradigm utilizing words that are trauma-related, and that traumatized or dissociated individuals are differentially vulnerable to the phenomena (e.g., DePrince & Freyd, 2001, 2004; DePrince et al., 2012). However, some researchers (e.g., McNally, Metzger, Lasko, Clancy, and Pitman, 1998; Devilly et al., 2007) provided data that called this relationship into question. This topic relates the broader debate about the relationship between trauma, dissociation, and memory—with some researchers arguing that trauma is a likely cause of dissociation and dissociative amnesia (a type of motivated forgetting; e.g.,

Dalenberg et al., 2012), and other researchers arguing that the link between trauma, dissociation, and dissociative amnesia is weak and possibly non-causal (e.g., Lynn et al., 2014). In this study, we investigate the relationship between trauma, dissociation, and motivated forgetting within the directed forgetting paradigm using a list method directed forgetting task with both trauma-related words and positive words.

The definition of dissociation, in the context of this article, involves a number of experiences including feelings of depersonalization, unreality (derealization), and amnesic experiences. Indeed, the Dissociative Experiences Scale (Bernstein & Putnam, 1986) was developed to capture these elements, and factor analyses confirmed a three factor construct. Giesbrecht, Lynn, Lilienfeld, & Merckelbach (2008) noted that dissociation is typically defined as "the lack of normal integration of thoughts, feelings, and experiences into consciousness and memory" (p. 617).

The trauma theory of dissociation and dissociative amnesia posits that trauma is a causal factor in the development of dissociation, and such dissociation can lead to the motivated forgetting of the original trauma. The trauma-dissociation model goes back as far as Janet (1887) and Breuer & Freud (1895/1953) and is maintained to various degrees by some theorists more recently (e.g., Van der Kolk & Fisler, 1995; Freyd, 1996; DePrince et al., 2012; Dalenberg et al., 2012; Brewin and Andrews, 2014). Indeed, the belief in the link of trauma and dissociation is somewhat implied by the inclusion of dissociative disorders in the Diagnostic and Statistical Manual-5 (DSM-5; American Psychiatric Association, 2013).

In contrast, the sociocultural theory of trauma and dissociation posits that there may not be such a strong causal link between trauma and dissociative symptoms (e.g., Lynn et al., 2014), or between trauma and dissociative amnesia or repressed memories (e.g., Loftus, 1993; Patihis, Lilienfeld, Ho, & Loftus, 2014), and that the relationship between trauma and dissociative amnesia may be explained by social and cultural factors, as well as suggestion, memory distortions and fantasy proneness (Pope, Poliakoff, Parker, Boynes, & Hudson, 2007; Giesbrecht, et al., 2008). Likewise, some research has shown that trauma leads to *more* involuntary recall, rather than less, (e.g., Berntsen & Rubin, 2008), and involuntary memories—such as flashbacks—are listed in relation to posttraumatic stress disorder in the DSM-5 (American Psychiatric Association, 2013). In addition, avoiding trauma reminders can lead to the event becoming more persistent and intrusive (Wegner, 1989). Other research suggests that traumatic memory can be remembered all too well (see McNally, 2005), and that voluntarily trauma recall is consistent over time relative to positive memories (Porter & Peace, 2007). Although in this article we address these constructs within the narrow focus of the directed forgetting paradigm, it is important to understand how this fits into the broader scientific debate about the relationship between trauma, dissociation, and memory.

The use of word lists to analogize repression or dissociation has a few decades of history. Glucksberg and King (1967) found that when pairing electric shocks to the learning phase of a word pair, subjects recalled fewer words associated with an electrical shock. They argued that the forgetting was due to the unpleasant event, although a possible confound may have been the effect of electricity on the memory system. In other research, DePrince and Freyd (1999) found that those high on the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) recalled fewer emotionally charged words presented during a Stroop dual attention task (see also Freyd, Martorello, Alvarado, Hayes, & Christman, 1998). Subsequent research used the directed forgetting paradigm to further investigate motivated forgetting.

Directed Forgetting Paradigm

The directed forgetting paradigm has roots in the Woodward and Bjork (1971) experiment that presented words immediately after each word they saw instructions to remember (to-be-remembered) or forget (to-be-forgotten) that word. After repeated instructions to remember some words, and not others, they found that those instructions did indeed lead to much better recall of to-be-remembered words than to-be-forgotten words. Directed forgetting was theorized to serve the purpose of dismissing information in order to make room for new information (Epstein, 1972). The explanations given for why to-be-remembered words were recalled better were rehearsal and elaboration.

Out of the early studies of the directed forgetting paradigm (Bjork & Woodward, 1973; Geiselman & Bagheri, 1985; Woodward & Bjork, 1971) two directed forgetting procedures emerged: the list method and the item method (MacLeod, 1989). The *list method* involves instructing the participants to forget a list of words *once* at the end of the list, whereas the *item method* instructs participants to forget a word after each individual item. Research using directed forgetting has displayed that the item method directed forgetting paradigm tests memory at the time it is encoded. The list method is argued to focus on what goes on during the retrieval stage and the item method tells us more about the encoding stage (Basden, Basden, & Gargano, 1993; Basden & Basden, 1996). The inhibitory account of directed forgetting posits that participants actively inhibit the recall of material they are told to forget (Geraerts & McNally, 2008).

Directed Forgetting Paradigm with Trauma-Related Stimuli

Item Method. McNally (1997) argued that due to personal emotional attachment, the participants would recall *more* trauma-related material, not less. Indeed, McNally, et al. (1998) used the item method directed forgetting paradigm with trauma, positive, and neutral words. Their participants were sexually abused women with posttraumatic stress disorder (PTSD), self-reported survivors of child sexual assault (CSA), and women without a history of sexual abuse. Subjects with PTSD did not show a significant reduction in trauma word recognition. However, subjects with PTSD did show a significantly lower mean score for recognition of positive words than the trauma exposed and control subjects. These early results did not demonstrate enhanced motivated forgetting of trauma words in trauma-exposed PTSD participants. Similarly, McNally, Clancy, and Schacter (2001) found that groups reporting recovered CSA and repressed CSA showed neither worse nor better memory for trauma-related words relative to control subjects. Both these item method directed forgetting studies failed to demonstrate the hypothesized superior forgetting of trauma-related material in those exposed to trauma.

Similarly, Elzinga, de Beurs, Sergeant, van Dyck, and Phaf (2000) found that patients with elevated dissociative identity symptoms did not differentially forget sexual-related words. In line with this, Cloitre, Cancienne, Brodsky, Dulit, and Perry (1996) found that childhood abuse was associated with enhanced memory of to-be-remembered material, rather than associated with suppression of to-be-forgotten material. Likewise, Zoellner, Sacks, and Foa (2003) found that attempts to induce dissociation experimentally resulted in no directed forgetting effect, which again does not support the idea that trauma or dissociation leads to enhanced forgetting.

Baumann et al. (2013) found mixed support for elevated motivated forgetting in traumatized/dissociated individuals using the item method of directed forgetting utilizing pictures instead of words. Using a recognition memory test instead of free recall, the researchers found traumatized refugees in Germany with PTSD did not have larger directed forgetting effects, in line with McNally et al. (1998, 2001). Baumann et al. (2013) also found that PTSD patients had higher false-alarm rates (see also Zwissler et al., 2012). However they did find that

those with higher dissociation had lower discrimination between true and false items in the to-be-forgotten condition, although the sample size was low due to sampling difficulties in clinical populations ($N = 25$; 12 PTSD, 13 control).

However, some studies using the item-method do report differential motivated forgetting of trauma that they argue supports their theory of motivated forgetting. For example, DePrince and Freyd (2001) reported that when participants had their attention divided between two tasks, those higher on the Dissociative Experiences Scale recalled fewer trauma words and more neutral words. Those low on the DES showed an opposite pattern. However, Devilly et al. (2007) in a replication of DePrince and Freyd's (2001) study, was unable to reproduce the earlier results. Instead, Devilly et al. (2007), found that those in the elevated DES group remembered fewer words overall than those in the lower DES group. These were very similar studies in that both used college student samples, yet reached different conclusions. These mixed results are what propel continuing research.

Using the item method, Moulds and Bryant's (2002) results seemed to support the idea that traumatized individuals might forget threat-related information (see also Moulds & Bryant, 2005, albeit using the list method). The researchers found that those with acute stress disorder (ASD) following a recent assault or an accident (both non-sexual traumas) recalled less threat-related words in the to-be-forgotten condition, compared to the non-ASD group. The groups did not differ in their recall of threat-related to-be-remembered words. This study is in contrast to others in the results, and in the fact that the trauma was recent and non-sexual. In a follow up, Moulds and Bryant (2008) conducted a longitudinal directed forgetting study using individuals with ASD and found the directed forgetting deficits of encoding trauma-related words were gone after one year. It remains a puzzle as to why a recently traumatized individual would forget more to-be-forgotten trauma words, but studies with traumatized participants over a longer term (e.g., CSA, PTSD) would not show the same effect. The theory predicting motivated forgetting of trauma-related material would posit that long term sufferers of CSA or PTSD would also show a differential effect on trauma words, and the extant evidence reviewed above does not supply clear evidence for this from the item method directed forgetting task.

List Method. List method directed forgetting studies ask participants to forget a list of words just once at the end of the list (not after every item; for a review see Sahakyan, Delaney, Foster, & Abushanab, 2013). Using this list method with undergraduate participants, Myers, Brewin, and Power (1998) found those with a repressive coping style remembered significantly fewer to-be-forgotten negative words than those with non-repressor coping styles. Myers et al. (1998) argue that that repressors have meager recall abilities for both negative experimental and negative autobiographical memories, and that this lends support to the phenomena of motivated forgetting. Myers and Derakshan (2004) followed on from Myers, et al. (1998) to investigate whether repressors would be more likely to forget negative words based on self-referenced ratings and to determine if being in a public or private setting impacted repressors' performances. Like Meyers et al. (1998) repressors recalled less to-be-forgotten words than to-be-remembered words than non-repressor groups, specifically unique to self-relevant material and only in the private condition. Myers and Derakshan (2004) suggest this finding as an avoidant strategy for retrieval inhibition of specific negative self-relevant information rather than a global encoding deficiency. In contrast, Wessel and Merckelbach (2006) found that in their list-study design that the directed forgetting effect was not modulated by the emotional valence of the words, and proposed that attention focus during the second list may explain the results just as well as the idea that people can intentionally forget negative stimuli (i.e., retrieval inhibition).

Using the same criteria as Meyers et al., (1998) in identifying participants with a repressor coping style, Geraerts, Smeets, Jelicic, Merckelbach, and van Heerden (2006), unlike Meyers et al., (1998), found an overall directed forgetting effect with fewer to-be-forgotten words recalled than to-be-remembered words. Other research also found no evidence that women with repressive coping styles are better forgetters of trauma-related information than women in the other groups, and that overall words related to CSA were recalled better than positive words (McNally, Ristuccia, & Perlman, 2005; Geraerts et al., 2006). Blix and Brennan's (2011) research also found no support for differential motivated forgetting—they found those who had experienced sexual assault mistakenly recalled *more* trauma-specific to-be-forgotten words when asked to recall to-be-remembered words.

In a different approach to the list-method, this time using autobiographical memory instead of words, Barnier et al. (2007) found that recently recalled autobiographical memories can be recalled less well when participants are instructed to forget them. This directed forgetting effect was found in positive, negative, and neutral autobiographical memories, with participants having recalled more negative and positive than neutral memories.

Using the list method, McNally, Clancy, Barrett, and Parker (2004) found women with repressed or recovered memories of childhood sexual abuse remembered did not show enhanced forgetting of trauma vs. positive words, relative to those with continuous memories of sexual abuse and controls. DePrince and Freyd (2004) used the list method with trauma and neutral words to investigate the cognitive impact of trauma exposure and found high dissociators recalled less to-be-remembered trauma words and more neutral words than low dissociators under divided-attention though not statistically significant. In a supplemental analysis, participants who reported at least one betrayal trauma (see Freyd, 1996) revealed a significant difference in to-be-remembered words in the divided-attention condition, between high ($n = 13$) and low ($n = 10$) dissociators. Attempts to replicate the study results of DePrince and Freyd (2004) were unsuccessful (McNally et al., 2005; Devilly et al., 2007). Results from the McNally et al., (2005) replication revealed that in the divided-attention condition, in contrast to DePrince and Freyd's high-dissociation group, women in recovered and continuous-memory groups did not forget more trauma-related words than the control group. Devilly et al. (2007) found no significant relationship between DES classification and trauma word recall. Both studies found that all groups demonstrated exceptional recall ability and recalled significantly more trauma words than neutral words (McNally et al., 2005; Devilly et al., 2007).

As reviewed above, we can see that research using the list-method has been used to claim both support and refutation for the phenomena of retrieval inhibition of aversive stimuli or motivated forgetting. Similar to the item-method, the findings are mixed and there is still uncertainty as to whether differential retrieval inhibition of negative stimuli occurs in individuals that the theory would expect suppress more (e.g., traumatized or dissociated individuals).

The Current Study

The review of the evidence for motivated forgetting by DePrince et al. (2012) stated that the directed forgetting paradigm, especially those using trauma words had provided evidence for motivated forgetting (see also Erdelyi, 2006 who similarly cites directed forgetting studies as evidence for repression). However, as discussed above, the literature is perhaps more mixed on this issue. This current study set out to investigate whether the list method directed forgetting paradigm using trauma words, with levels of exposure to trauma as an independent variable, would provide evidence for motivated forgetting. We set out to utilize a large sample size to ensure we have a significant subset of participants who have experienced some exposure to

trauma, to ensure a range of dissociative experiences, and to make our study an incremental addition to the literature (previous research has typically utilized smaller sample sizes).

Motivated Forgetting Hypotheses

If the directed forgetting paradigm provides evidence of the differential motivated forgetting of negative stimuli then we would expect highly dissociated or traumatized individuals to have a motivation to forget trauma-related words, compared to positive words. The theory also would state that those who are highly dissociated (or traumatized) become better at suppressing or repressing trauma words from memory after these individuals tell themselves to forget something. Those specifically exposed to potential sexual trauma should especially be motivated to forget words related to such trauma. Therefore, we would predict the following patterns of results:

Hypothesis 1a. Those who are highly dissociated should remember less trauma words than those less dissociated, especially when told to forget those words.

Hypothesis 1b. Those who are highly dissociated should remember less trauma words than positive words, especially when told to forget those words.

Hypothesis 2a. Those who have had the most exposure to potentially traumatic events should recall less trauma words than those less traumatized, especially when told to forget those words.

Hypothesis 2b. Those with more trauma exposure should remember less trauma words than positive words, especially when told to forget those words.

Hypothesis 3a. Those exposed to sexual trauma should remember less trauma words than those not exposed to sexual trauma, especially when told to forget those words.

Hypothesis 3b. Those exposed to sexual trauma should remember less trauma words than positive words, especially when told to forget those words.

Hypothesis 4a. Those who score high on both dissociation *and* trauma exposure should remember less trauma words than those reporting low dissociation and no trauma, especially when told to forget those words.

Hypothesis 4b. Those who are highly dissociated and traumatized should remember less trauma words than positive words, especially when told to forget those words.

Past studies have tended to dichotomize and investigate low and high levels of *either* dissociation *or* trauma exposure. In the current study, we look at both. Hypothesis 1 can be compared to past studies examining high-DES and low-DES participants (e.g. DePrince & Freyd, 2001; Devilly et al., 2007). Hypotheses 2 and 3 investigates motivated forgetting with respect to trauma exposure and sexual trauma exposure (cf. McNally et al., 2004; Geraerts et al. 2006). In Hypothesis 4, we make a new analysis by comparing those who report high dissociation and trauma to those who report low dissociation and no trauma. The number of the above hypotheses that are supported by evidence in this paper will give an indication of the strength of support for differential motivated forgetting in the directed forgetting paradigm. It may also clarify under what circumstances that the phenomena holds.

Method

Participants

Four hundred and eighty six adults participated for course credit. Of these, 51 subjects failed an attention check, one gave more than 20 identical consecutive answers, and 31 did not participate in part of the experiment. This yielded a data set for analysis of 403 participants (M_{age} = 20.6, SD = 3.00, range 18–59 years; 85.4% female). Ethnicity was distributed as follows: 59.6% Asian; 23.3% White, 22.8% Hispanic or Latino, 2.2% Native Hawaiian or Pacific

Islander, 1.5% Black or African American, and 0.5% American Indian or Alaska Native. The project and materials was approved for human subjects' participation (IRB protocol HS#20129195).

Design

The design is a mixed design with the number of words recalled as the dependent measure. The within subject measures are Word Type (Trauma or Positive) and Instruction Type (To Be Forgotten, To Be Remembered). The between subject measures are dissociation, trauma exposure, and sexual trauma exposure.

Procedures and Materials

Subjects participated online from the subject pool portal and first answered questions from the Dissociative Experiences Scale–Comparison (DES-C; Wright & Loftus, 1999), the Life Events Checklist (LEC; Gray, Litz, Hsu, & Lombardo, 2004), and a demographic questionnaire. They then took the directed forgetting test. Two attention check questions were randomly inserted to verify subjects were paying attention for the duration of the survey.

The directed forgetting test was comprised of two consecutive lists of 20 words, each consisting of 10 positive (P) and 10 trauma-related (T) words, such as *elation* (P), and *molested* (T). The order of the two word lists was randomized. Words within each list were also randomized.

Before the words were shown the instructions the participants received was:
"You will be asked to rate a series of words in terms of their emotional meaning. Each word will appear on this computer screen for 3 seconds. When the word appears, please rate its emotional meaning on this seven--point scale.
As you can see, the scale ranges from –3 (very negative) to +3 (very positive). If the word has no emotional meaning for you, you should rate it a 0. A 2 second delay will occur after each word appears."

After the first word list was completed, the participants read "What you have done so far is practice. You can forget about those words. We will now show you the actual set of test words that we want you to rate in the same way you did for the practice words."

The subjects were then shown the second list of 20 words, again rating each one on the same scale. The subjects were then given a timed filler activity of simple arithmetic.

Test. The subjects were given five minutes and instructed to type out as any words as they could remember from *both* lists, even the ones they were told to forget.

Measures

Life Events Checklist. The Life Events Checklist (LEC; Gray et al., 2004) is a questionnaire that measures stressful or traumatic events that occur over a lifetime, rated on a 5 point scale: *happened to you personally*, you witnessed it happen to someone else, you learned about it happening to someone close to you, you're not sure if it fits, or *it doesn't apply to you*. LEC is a psychopathology measure designed by the National Center for PTSD as a screening tool. It consists of 17 items: 16 items inquire about the experience of 16 different potentially traumatic events (PTE) known to result in PTSD or other posttraumatic difficulties, and one item inquiring about any other unusual stressful experiences not captured by the other 16 items. It is not intended to establish definitively that an individual has experienced an event of sufficient severity to meet DSM-V diagnostic criteria for PTSD.

Dissociation. The Dissociative Experiences Scale-Comparison (DES-C; Wright & Loftus, 1999) is a self-report 28-item questionnaire that measures a person's dissociative symptoms: his or her ability, or inability, to encode thoughts, experiences, and feelings in life.

Questions inquiring about dissociative tendencies such as "Some people find that they sometimes sit staring off into space, thinking of nothing, and are not aware of the passage of time," are the same as in the original Dissociative Experiences Scale (DES) and the Dissociative Experiences Scale II (DES II; Carlson & Putnam, 1993). The difference in the scales falls within the origin of the answers. The DES-C examines the answers on an 11 point Likert scale, where subjects compare themselves relative to others, with 1 being "*much less than others*" and 11 being "*much more than others*". We chose the DES-C measure because it has less floor effects and skew than the DES-II (Wright & Loftus, 1999). Cronbach's alpha coefficient for internal reliability of the DES-C was $\alpha = .93$ in Wright & Loftus, (1999) and was found to be $\alpha = .934$ in the current study.

   List method directed forgetting paradigm. The list method directed forgetting test (McNally et al., 2004) was used to compare superior recall of trauma-related words in repressed or recovered survivors with continuous survivors of CSA. Extensive research has been completed testing directed forgetting in relationship to obsessive-compulsive disorder, posttraumatic stress disorder, and repression (Wilhelm, McNally, Baer, & Florin, 1996; McNally et al., 1998; McNally et al., 2004). The current research study used the materials and procedure from McNally et al. (2004).

<div align="center">

Results

</div>

   Trauma exposure (LEC) and dissociation (DES-C) were binned into high and low categories in order to create dichotomous variables to explore the hypotheses using ANOVA. To analyze Hypothesis 1 we used mixed design 2 x 2 x 2 ANOVAs and within subjects variables Word Type (Trauma, Positive) and Instruction Type (To Be Forgotten, To Be Remembered), and the between subjects variable was Dissociation Group (Low Dissociation, High Dissociation). To examine Hypotheses 2 and 3 we follow up with similar ANOVAs but with the between subjects variable being Trauma Exposure (No Trauma, High Trauma), Sexual Trauma Exposure (None, Sexual Trauma). In Hypothesis 4, the between subjects variable in an ANOVA was Dissociation and Trauma Group (Low Dissociation and No Trauma, High Dissociation and High Trauma). Finally, in an analysis secondary to our main hypotheses, we examine gender (Male, Female) for the purposes of full and thorough reporting.

Descriptive Statistics and Correlations between Dissociation, Trauma Exposure and Word Recall Scores

   The mean LEC score was 2.33 (*SD* = 1.88; range 0 to 10). The mean DES-C score was 30.2 (*SD* = 14.9; range 1.07 to 73.9). The mean number of total words recalled was 10.0 (out of 40 words presented; *SD* = 4.2; range 1 to 27). The correlation between trauma exposure (LEC) and dissociation (DES-C) was small but statistically significant, $r = .100$, $p = .045$, $N = 403$. The correlation between dissociation and the total number of words recalled was not statistically significant, $r = .097$, $p = .051$. Similarly, the correlations between the DES-C and the four subcategories of words recalled were either negligible (rs < .09, ps > .073) or small (Trauma To Be Forgotten, $r = .11$, $p = .027$, $N = 403$).

   Appendix A lists the positive and trauma-related words used in the study. Also included in Appendix A are the descriptive statistics of the participants' ratings of emotional valence of the words. As one can see from Appendix A, although there were minor differences in low and high-DES groups, in general positive words were generally rated as positive, and trauma-related words were generally rated as negative. Appendix B shows the valence ratings by trauma categories and Appendix C shows the ratings for low trauma/dissociation and high trauma and dissociation.

Dissociation Group: Low vs. High

     Binning. Dissociation scores (DES-C) were binned into lower (*n* = 135; "Low Dissociation") and upper thirds (*n* = 132; "High Dissociation"). This was done to dichotomize low and high dissociation in such a way that sample size and statistical power was maximized.

     Descriptive Statistics. In the Low Dissociation group, 8.9% were male, whereas in the High Dissociation group 18.9% were male (Chi square = 5.65, exact test, two-sided *p* = .021). The mean age in the Low Dissociation group was higher (*M* = 21.0 years, *SD* = 3.1) compared to the High Dissociation group (*M* = 20.3, *SD* = 1.66), *t*(261) = 2.27, *p* = .024. The LEC score (trauma exposure) in the Low Dissociation condition was lower (*M* = 2.01, *SD* = 1.73) than in the High Dissociation group (*M* = 2.55, *SD* = 2.07), *t*(265) = 2.28, *p* = .024. By design, the mean DES-C in the Low Dissociation group was 13.8 (*SD* = 6.19) and in the High Dissociation group was 47.3 (*SD* = 7.49), *t*(265) = 39.8, *p* < .001.

     ANOVA. We performed a mixed design ANOVA with the first variables being within subjects, and the final variable being between subjects: 2 (Word Type: Trauma, Positive) x 2 (Instruction Type: To Be Forgotten, To Be Remembered) x 2 (Dissociation Group: Low, High). The results are shown in Table 1 and illustrated in Figure 1. There was a main effect for Dissociation Group, such that those with high dissociation recalled more words. We found a main effect for Word Type, where overall trauma-related words were remembered better overall. As expected, we found a main effect for Instruction Type, where the To Be Forgotten word list was recalled less well than the To Be Remembered word list. We found a significant interaction between Instruction Type x Dissociation Group that can be seen Figure 1, such that high dissociators recalled relatively more words from the To Be Remembered list. This pattern was true of trauma and positive words (see Figure 1).

     Hypothesis 1a. Those scoring high on the Dissociative Experiences Scale did not recall less trauma words (*M* = 2.32, *SD* = 1.73) in the To Be Forgotten condition compared to those low on dissociation (*M* = 2.32, *SD* = 1.39), *t*(265) = 0.005, *p* = .996. This provides no evidence for hypothesis 1a. Individuals higher on dissociation did not show more motivated forgetting for trauma words than those low on dissociation.

     Hypothesis 1b. In the To Be Forgotten word lists, those who scored high on dissociation did not recall less trauma words (*M* = 2.32, *SD* = 1.73) than positive words (*M* = 1.67, *SD* = 1.59), *t*(262) = 3.18, *p* = .002 (effect in opposite direction to Hypothesis 1b). Similarly, in the To Be Remembered lists, high dissociators did not recall less trauma words (*M* = 3.69, *SD* = 1.73) than positive words (*M* = 2.74, *SD* = 1.74), *t*(262) = -4.45, *p* < .001 (effect also in opposite direction to Hypothesis 1b). Hypothesis 1b does not hold. Those highly dissociated do not show motivated forgetting of trauma words, compared to other less threatening words. On the contrary, they remember trauma words all too well.

     Non-Presented Words. There was no significant difference between those scoring low and high on dissociation on the number of incorrectly recalled words that were not presented in the experiment, *t*(265) = -1.13, *p* = .258.

Table 1.
2 x 2 x 2 Mixed Design ANOVA with Number of Words Recalled as the Dependent Measure and Dissociation Group (Low, High) as the Between Subjects Independent Variable

Source	F	p	η_p^2
Between Subjects Effects			
Dissociation Group (Low, High)	**5.0**	**.027**	**.018**
Within Subjects Effects & Interactions			
Word Type	**155.5**	**<.001**	**.370**
Word Type * Dissociation Group	.01	.904	<.001
Instruction Type	**66.6**	**<.001**	**.201**
Instruction Type * Dissociation Group	**4.0**	**.046**	**.015**
Word Type * Instruction Type	2.5	.111	.010
Word Type * Instruction Type * Dissociation Group	.2	.644	.001

*Note. df*s = 1, 265. Significant main effects or interactions are highlighted in **boldface.** Within subject variables are Word Type (Trauma, Positive) and Instruction Type (To Be Forgotten, To Be Remembered). Between subjects variable is Dissociation Group (Low, High).
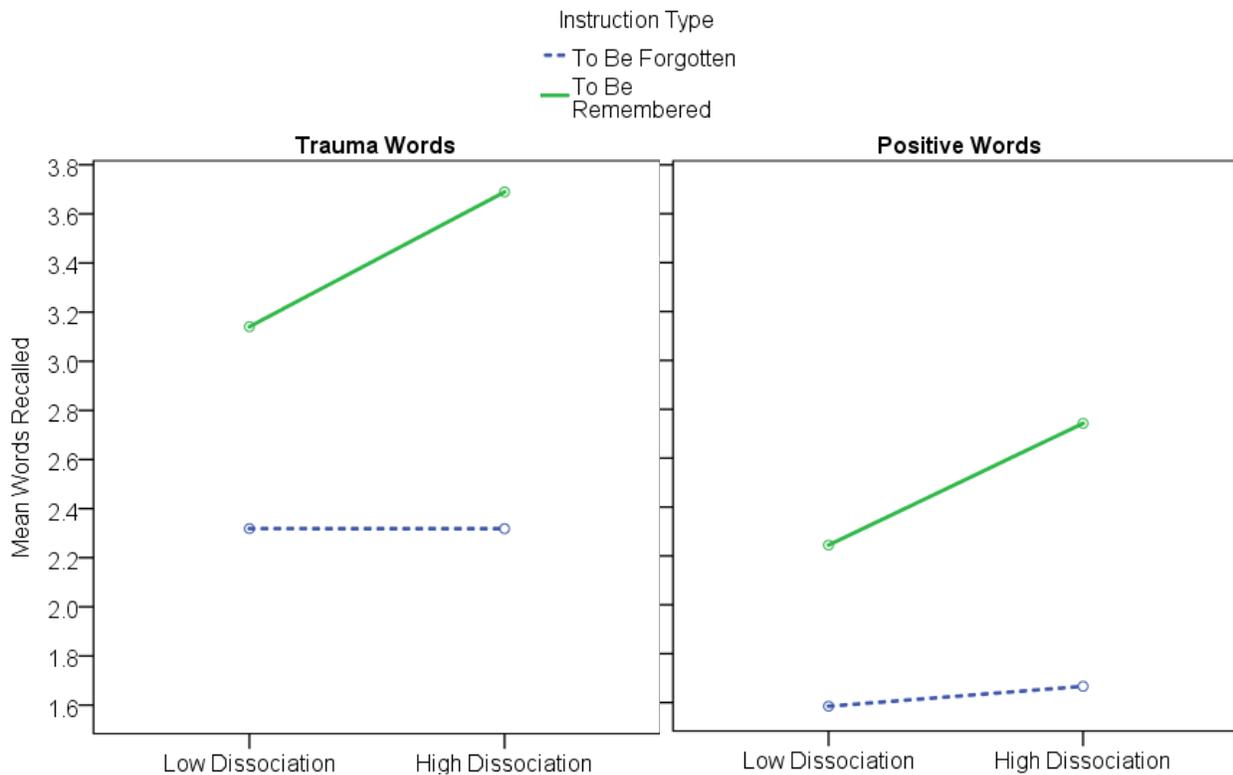

 Figure 1. Mean trauma (left graph) and positive words (right) recalled in low (*n* = 135) and high dissociators (*n* = 132), with separate lines showing the instruction type for a given list. There was a significant interaction between Dissociation Group and Instruction Type. Contrary to Hypothesis 1 high dissociators did not show higher rates of forgetting of trauma words than low

dissociators when told to forget a list, nor did they recall less trauma words compared to positive words.

Trauma Exposure: None vs. High

Binning. LEC scores ranged from 0 to 12 and were distributed discontinuously in such a way that binning into equal groups was challenging. The best solution was to bin LEC scores into two groups: "No trauma" ($n = 56$ with LEC scores of zero) and "High Trauma" ($n = 43$; LEC scores ≥ 5). Due to the distribution of LEC scores no other way to bin approximately equally into low and high was available.

Descriptive Statistics. In the No Trauma group, 16.1% of participants were male, whereas in the High Trauma group 18.6% were male (Chi square = 0.74, Fisher exact test, two-sided $p = .792$). The mean age in the No Trauma group was lower ($M = 20.4$, $SD = 1.8$) than the High Dissociation group ($M = 21.4$, $SD = 2.0$), $t(95) = 2.52$, $p = .013$. The mean DES-C in the No Trauma group was not statistically different ($M = 27.8$, $SD = 15.6$) than in the High Trauma group was ($M = 32.8$, $SD = 15.8$), $t(97) = 1.56$, $p = .122$. By design, the LEC score (trauma exposure) in the No Trauma condition was lower ($M = 0.00$, $SD = 0.00$) than in the High Trauma group ($M = 6.33$, $SD = 2.07$), $t(97) = 29.9$, $p < .001$.

ANOVA. Table 2 summarizes the results of the 2 x 2 x 2 mixed design ANOVA. The dependent measure was number of words recalled, within subjects variables were Word Type and Instruction Type, and the between subjects variables was Trauma Exposure Group (None, High). See Figure 2 below.

Hypothesis 2a. Those higher scores on trauma exposure did not recall significantly less trauma words ($M = 2.37$, $SD = 1.62$) in the To Be Forgotten condition compared to those with no reported trauma exposure ($M = 2.61$, $SD = 1.67$; $t(97) = 0.72$, $p = .474$). This provides no evidence for Hypothesis 2a.

Hypothesis 2b. Those with high trauma exposure did not recall less trauma words (To Be Forgotten: $M = 2.37$, $SD = 1.62$; To Be Remembered: $M = 3.88$ $SD = 1.76$) than positive words (To Be Forgotten: $M = 1.63$, $SD = 1.40$; To Be Remembered: $M = 2.58$, $SD = 1.74$), regardless of whether they were instructed to forget the words ($t(84) = -2.27$, $p = .026$; effect in direction opposite to Hypothesis 2b) or not ($t(84) = -3.45$, $p = .0009$; effect again in direction opposite to Hypothesis 2b). This is contrary to Hypothesis 2b.

Table 2.

2 x 2 x 2 Mixed Measures ANOVA with Dependent Measure = Number of Words Recalled, with Between Subjects Independent Variable Trauma Exposure

Source	F	*p*	η_p^2
Between Subjects Main Effect			
Trauma Exposure Group	0.1	.788	.001
Within Subjects & Interactions			
Word Type	**37.0**	**<.001**	**.276**
Word Type * Trauma Exposure Group	**4.2**	**.044**	**.041**
Instruction Type	**17.7**	**<.001**	**.154**
*Instruction Type * Trauma Exposure Group*	*3.2*	*.074*	*.033*
Word Type * Instruction Type	0.7	.402	.007
Word Type * Instruction Type * Trauma Exposure Group	2.3	.131	.023

*Note. df*s = 1, 97. Significant main effects or interactions are highlighted in **boldface.** Marginal main effects or interactions are highlighted in *italics.* Within subject variables are Word Type (Trauma, Positive) and Instruction Type (To Be Forgotten, To Be Remembered). Between subjects variable is Trauma Group (None, High).
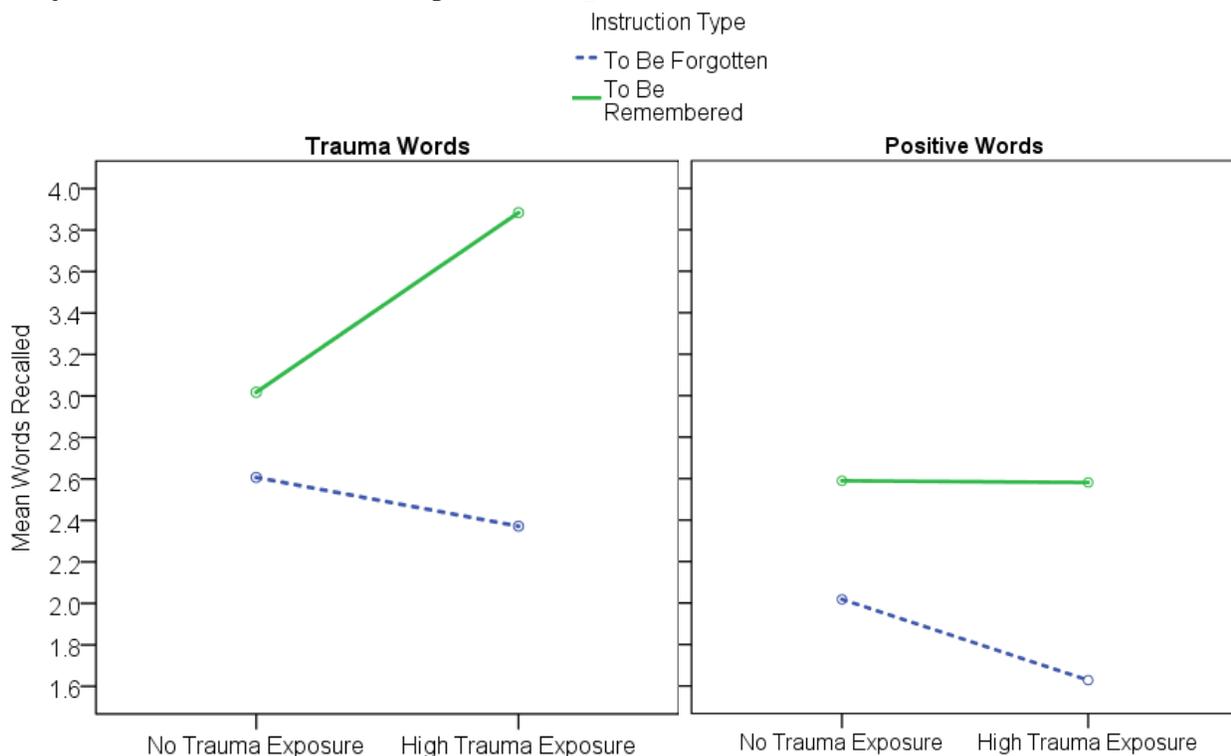
Figure 2. Mean trauma and positive words recalled in those with no reported trauma exposure (*n* = 56), and those with high trauma exposure (LEC; *n* = 43), with separate lines showing the instruction type for a given list. There was a significant interaction between Trauma Group and Word Type. Contrary to Hypothesis 2, those with high trauma did not show differentially lower recall of trauma words than those with no trauma when told to forget a list (compared to positive

words). Those exposed to relatively more trauma did not recall less trauma words compared to positive words.

Sexual Trauma Exposure

Binning. Answers on the LEC that indicated exposure to sexual assault or unwanted sexual contact were binned into a dichotomous variable, which for brevity we will name "sexual assault" (unwanted sexual or assault $n = 97$; none indicated $= 306$).

Descriptive Statistics. In the No Sexual Trauma group, 16.7% of participants were male, whereas in the Sexual Trauma group 8.2% were male (Chi square $= 4.18$, Fisher exact test, two-sided $p = .047$). The mean age in the No Sexual Trauma group was not statistically significantly different ($M = 20.5$, $SD = 3.1$) than in the Sexual Trauma group ($M = 20.9$, $SD = 4.4$), $t(396) = 1.00$, $p = .317$. The mean DES-C in the No Sexual Trauma group was lower ($M = 38.9$, $SD = 14.8$) than in the Sexual Trauma group ($M = 34.1$, $SD = 14.5$), $t(401) = 3.03$, $p = .003$. The LEC score (total trauma exposure) in the No Sexual Trauma condition was lower ($M = 1.86$, $SD = 1.53$) than in the Sexual Trauma group ($M = 3.80$, $SD = 2.12$), $t(401) = 9.89$, $p < .001$.

ANOVA. Table 3 summarizes the results of the 2 x 2 x 2 mixed design ANOVA. The dependent measure was number of words recalled, within subjects variables were Word Type and Instruction Type, and the between subjects variables was Sexual Trauma Exposure Group (None, Some). See Figure 3 below.

Hypothesis 3a. In the To Be Forgotten condition, those with some sexual trauma exposure did not recall significantly less trauma words ($M = 2.61$, $SD = 1.50$) compared to those with no reported trauma exposure ($M = 2.35$, $SD = 1.63$); $t(401) = -3.99$, $p = .0001$—effect in opposite direction of Hypothesis 3a. This provides no evidence for Hypothesis 3a. Rather than forgetting trauma words in a differentially motivated way, those with exposure to sexual trauma remembered more trauma words than those reporting no trauma.

Hypothesis 3b. Those with sexual trauma exposure did not recall less trauma words (To Be Forgotten: $M = 2.61$, $SD = 1.504$; To Be Remembered: $M = 3.84$, $SD = 1.74$) than positive words (To Be Forgotten: $M = 1.80$, $SD = 1.48$; To Be Remembered: $M = 2.52$, $SD = 1.80$), regardless of whether they were instructed to forget the words ($t(192) = -3.76$, $p = .0002$; effect in direction opposite to Hypothesis 3b) or not ($t(192) = -5.19$, $p = .0001$; again the effect is in direction opposite to Hypothesis 3b). This is contrary to Hypothesis 3b.

Table 3.

2 x 2 x 2 Mixed Measures ANOVA with Dependent Measure = Number of Words Recalled, with Between Subjects Independent Variable Sexual Trauma Exposure

Source	F	p	η_p^2
Between Subjects Main Effect			
Sexual Trauma Exposure Group	*3.781*	*.053*	*.009*
Between Subjects Variables & Interactions			
Word Type	**193.5**	**<.001**	**.326**
Word Type * Sexual Trauma Group	**5.1**	**.024**	**.013**
Instruction Type	**68.0**	**<.001**	**.145**
Instruction Type * Sexual Trauma Group	0.1	.711	<.001
Word Type * Instruction Type	**6.1**	**.014**	**.015**
Word Type * Instruction Type * Sexual Trauma Group	1.6	.214	.004

*Note. Note. df*s = 1, 401. Marginal main effects or interactions are highlighted in *italics*. Significant main effects or interactions are highlighted in **boldface.** Within subject variables are Word Type (Trauma, Positive) and Instruction Type (To Be Forgotten, To Be Remembered). Between subjects variable was Sexual Trauma Group (None, Exposed).
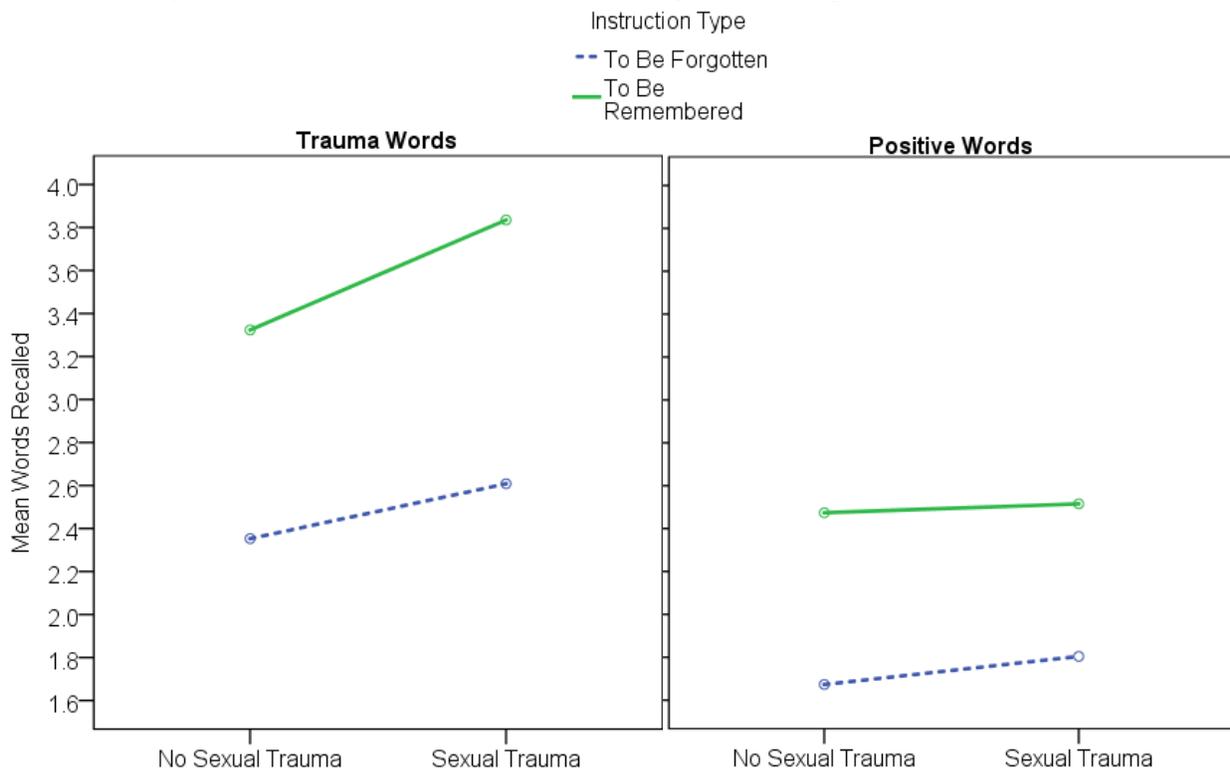
Figure 3. Mean words recalled of both trauma (left graph) and positive words (right) in those with no reported sexual trauma (*n* = 306) and those with sexual assault or unwanted sexual contact (*n* = 97), with separate lines showing the Instruction Type for a given list. There was a significant interaction between Sexual Trauma Group and Word Type. Contrary to Hypothesis 3, those with high sexual trauma did not show differentially lower recall of trauma words than those

with no sexual trauma when told to forget a list (compared to positive words); and those exposed to relatively more sexual trauma did not recall less trauma words compared to positive words.

Dissociation and Trauma Group: Low Dissociation *and* No Trauma vs. High Dissociation *and* Trauma

  Binning. Using the same binning described above for dissociation and trauma, we categorized those with low dissociation and no trauma together (n = 24; "Low Dissociation No Trauma") and those with high dissociation and high trauma together (n = 18; "High Dissociation and Trauma").

  Descriptive Statistics. In the Low Dissociation and No Trauma group, 12.5% of participants were male, whereas in the High Dissociation and Trauma group 16.7% were male (Chi square = 0.70, Fisher exact test, two-sided p = 1.000). The mean age in the Low Dissociation and No Trauma group was no different (M = 21.1, SD = 2.1) in the High Dissociation and Trauma group (M = 21.2, SD = 1.9), t(39) = 0.23, p = .820. As we would expect, the mean DES-C in the Low Dissociation and No Trauma group was lower (M = 13.7, SD = 5.9) than in the High Dissociation and Trauma group (M = 48.0, SD = 9.5), t(40) = 14.5, p < .001. Likewise, the LEC score (total trauma exposure) in the Low Dissociation and No Trauma condition was lower (M = 0.00, SD = 0.00) than in the High Dissociation and Trauma group (M = 6.56, SD = 1.89), t(40) = 17.1, p < .001.

  ANOVA. We performed a mixed design ANOVA with the first variables being within subjects, and the final variable being between subjects: 2 (Word Type: Trauma, Positive) x 2 (Instruction Type: To Be Forgotten, To Be Remembered) x 2 (Dissociation and Trauma Group: Low, High). The results are shown in Table 4 and illustrated in Figure 4. There was a main effect for Dissociation and Trauma Group, such that those with high dissociation and trauma recalled more words. We found a main effect for Word Type, where overall trauma-related words were remembered better overall. As expected, we found a main effect for Instruction Type, where the To Be Forgotten word list was recalled less well than the To Be Remembered word list. We found a significant interaction between Instruction Type x Trauma and Dissociation Group that can be seen Figure 4, such that high dissociators recalled relatively more words from the To Be Remembered list. This pattern was true of trauma and positive words (see Figure 4 below).

  Hypothesis 4a. Those scoring high on Dissociation and Trauma recalled fewer trauma words (M = 1.67, SD = 1.33; n = 18) in the To Be Forgotten condition compared to those low on Dissociation and Trauma (M = 2.63, SD = 1.64; n = 24), t(40) = 2.03, p = .049. This provided some evidence for hypothesis 4a. In the To Be Remembered condition, by contrast, those with high Dissociation and Trauma remembered *more* trauma words (M = 4.00, SD = 1.33) than those with lower Dissociation and Trauma (M = 2.71, SD = 2.14), t(40) = 2.26, p = .030.

  Hypothesis 4b. In the To Be Forgotten word lists, those who scored high on Dissociation and Trauma did not recall fewer trauma words (M = 1.67, SD = 1.33) than positive words (M = 1.33, SD = 1.28), t(18) = 0.88, p = .392 (non-significant effect in opposite direction to Hypothesis 4b). Similarly, in the To Be Remembered lists, those in the high Dissociation and Trauma condition did not recall fewer trauma words (M = 4.00, SD = 1.33) than positive words (M = 2.56, SD = 1.79), t(18) = 3.10, p = .007 (effect also in opposite direction to Hypothesis 4b). Hypothesis 4b was not supported.

Table 4.

2 x 2 x 2 Mixed Design ANOVA with Number of Words Recalled as the Dependent Measure and Dissociation and Trauma Group (Low, High) as the Between Subjects Independent Variable

Source	F	p	η_p^2
Between Subjects Effects			
Dissociation and Trauma Group (Low, High)	.006	.938	<.001
Within Subjects Effects & Interactions			
Word Type	**13.4**	**.001**	**.251**
Word Type * Dissociation and Trauma Group	1.1	.312	.026
Instruction Type	**8.8**	**.005**	**.181**
Instruction Type * Dissociation and Trauma Group	**7.3**	**.010**	**.155**
Word Type * Instruction Type	2.3	.136	.055
Word Type * Instruction Type * Dissociation and Trauma	2.3	.136	.055

*Note. df*s = 1, 40. Significant main effects or interactions are highlighted in **boldface.** Within subject variables are Word Type (Trauma, Positive) and Instruction Type (To Be Forgotten, To Be Remembered). Between subjects variable is Dissociation and Trauma Group (Low, High).
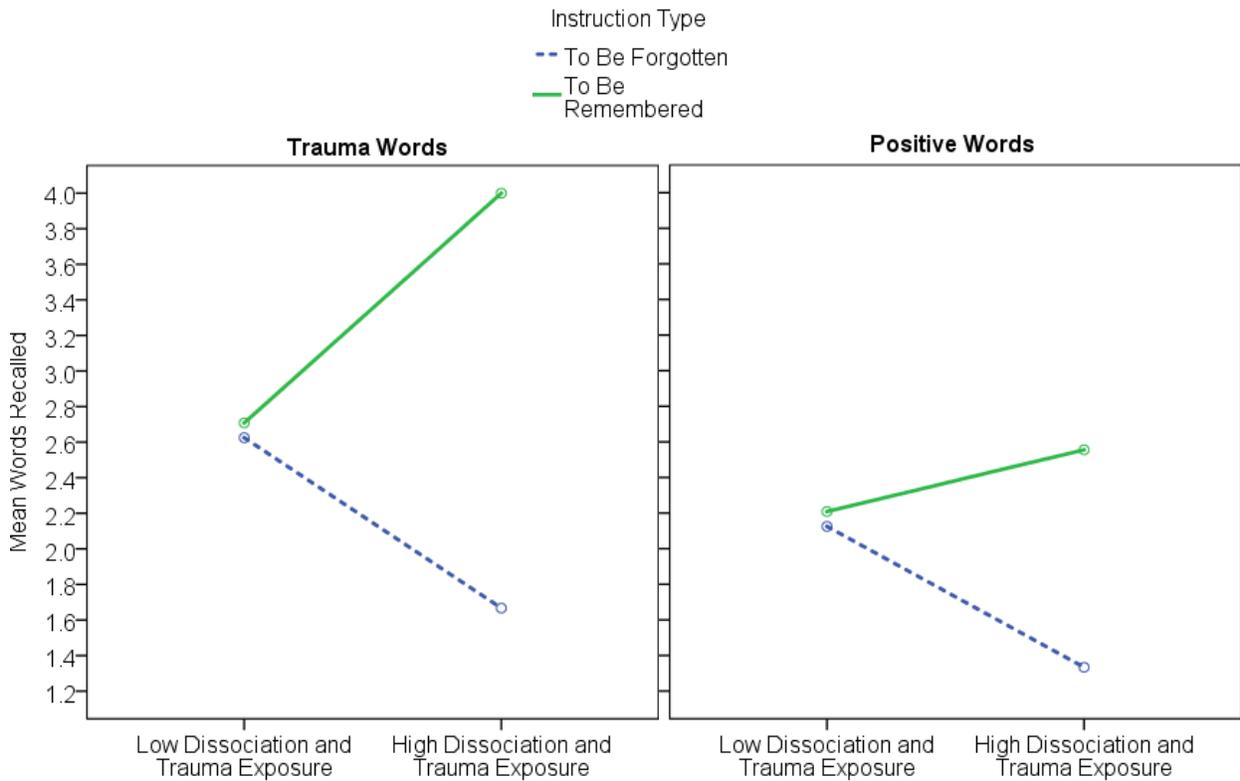

Figure 4. Mean words recalled of both trauma (left graph) and positive words (right) in those with low dissociation and no trauma exposure (*n* = 24) versus those with high dissociation and trauma exposure scores (*n* = 18), with separate lines showing the Instruction Type for a given

list. There was a significant interaction between Instruction Type and level of Dissociation and Trauma, but no other interactions were statistically significant. Those categorized high on Dissociation and Trauma recalled fewer trauma words in the To Be Forgotten condition compared to those low on Dissociation and Trauma, providing some evidence for Hypothesis 4a. In the To Be Forgotten word lists, those who scored highest on Dissociation and Trauma did not recall fewer trauma words than positive words, providing no support for Hypothesis 4b.

Secondary Analysis

Appendix A shows that the words "penis" and "semen" were not rated on average with negative emotional valence. For that reason, we ran the analyses for all the Hypotheses (1a through 4b), and found that when excluding those two words, none of the hypotheses were met—there were no statistically significant differences in the analyses (see Supplemental Material).

Gender

We conducted a 2 x 2 x 2 mixed design ANOVA. The dependent measure was number of words recalled, within subjects variables were Word Type and Instruction Type, and the between subjects variables was gender (male, female). We found no main effect for gender, $F(1, 401) = 1.57$, $p = .211$, and no interaction between Word Type (Trauma, Positive) and gender.

Discussion

We found weak and only partial evidence in support of DePrince et al. (2012) for the phenomena of differential motivated forgetting of trauma words in traumatized and/or dissociated individuals. Together with other directed forgetting studies that measured trauma-related word recall and dissociation (Devilly et al., 2007; McNally et al., 2004) no evidence of motivated forgetting was found for high-dissociation participants. Consistent with other directed forgetting studies measuring forms of trauma (McNally et al., 2004, 2005) our high trauma exposure group did not experience a directed forgetting deficit as predicted by the motivated forgetting theory. Congruent with prior directed forgetting studies measuring sexual trauma (McNally et al., 2004, 2005) no evidence for the differential motivated forgetting theory was found in those who have experienced sexual trauma. However, we did find that those reporting high dissociation *and* trauma exposure remembered fewer trauma words in the To Be Forgotten list, compared to those with low dissociation and no trauma exposure which supported one of our eight hypotheses (Hypothesis 4a). A supplementary analysis removing two 'trauma' words not rated as negative (penis, semen) found that none of the eight hypotheses held. This relatively weak evidence can be contrasted with the position reiterated by DePrince et al. (2012) that differential motivated forgetting effects for trauma words are reliably demonstrated by the directed forgetting studies.

Past research has failed to replicate the motivated forgetting phenomena in similar paradigms (e.g., McNally et al., 1998; McNally et al., 2004; Cloitre et al., 1996). Additionally, attempts to replicate DePrince and Freyd (2001, 2004) have been unsuccessful (McNally et al., 2005; Devilly 2007). However, Brewin (2007) questioned the validity of these attempts to replicate by noting that betrayal trauma, specifically, was not measured. In addition, some past studies have investigated the link between betrayal trauma and dissociation, and found results contrary to betrayal trauma theory. For example Kiser et al. (2014) found that sexual trauma inflicted by caregivers was associated with *lower* posttraumatic stress and dissociation than was sexual trauma from non-caregivers.

The predicted phenomena of differential motivated forgetting of trauma words would result in less recall of trauma words in those people that are highly dissociated, traumatized,

and/or sexually traumatized. Hypothesis 1a, 2a, and 3a (that predicted those reporting dissociation, trauma, or sexual trauma, respectively, will have lower recall of to-be-forgotten trauma words) found no support for that phenomena in trauma word recall. However, Hypothesis 4a was supported—in the To Be Forgotten word lists those who reported high levels of dissociation and trauma exposure remembered fewer trauma words than those reporting low dissociation and no trauma exposure. Motivated forgetting of trauma words would also predict that highly dissociated, traumatized, and/or sexually traumatized people would block out trauma words compared to non-threatening words. Hypotheses 1b, 2b, 3b, and 4b—that stated those reporting dissociation and/or trauma should remember less trauma words than positive words, especially when told to forget those words—showed no support for that phenomena. Out of the eight hypotheses, only one hypothesis showed evidence for the differential forgetting of trauma words. Our categorizing of those high and low on both dissociation *and* trauma exposure is something that we recommend future research to emulate. Future research should specifically use large enough sample sizes to be able to compare those with high and low dissociation/trauma, in order to see whether our finding in Hypothesis 4a holds. If it does replicate, they may be legitimate support for a well-defined and specific differential motivated forgetting of trauma words. At this stage, however, caution is warranted because the finding of support in just one of eight hypotheses does not yet constitute overwhelming evidence.

There are some limitations to our study. The sample size in Hypothesis 4a, for example, which was the only hypothesis to support differential motivated forgetting, was low ($n = 18$ vs. $n = 24$). In light of the other seven hypotheses that were not supportive, we urge cautious interpretation and urge further research. In addition, we used positive and trauma words, but did not use neutral words that might have provided interesting comparisons. Nevertheless, previous work using neutral words have been done, and some studies found no strong support for differential motivated forgetting (McNally, et al., 1998). Another limitation is that the LEC instrument is that it provides only an approximation of true traumatic experiences and their impact. In addition, although we found weak evidence for motivated forgetting for trauma-related material in the directed forgetting paradigm does not mean that the differential motivated forgetting of trauma in dissociated individuals does not occur in more naturalistic settings. Indeed, autobiographical memories of real-world trauma would be more vivid, emotional and distinct—features that promote strong memory encoding and consolidation—and therefore may make motivated forgetting less likely. However, our findings—in combination with others—do call into question the bidirectional and selective citing of directed forgetting studies as evidence for motivated forgetting of trauma. One other potential limitation is that our use of the list method of the directed forgetting technique measures suppression at retrieval, and not suppression during encoding as the item method is proposed to do. Putting aside the fact that the item method has also failed to show a consistent motivated-forgetting effect in a number of studies, we argue that in real situations one might make an attempt to forget things after a series of actions or events (similar to the list method) rather than telling oneself to forget individual items.

One possible explanation for the mixed results in past research may be a combination of the large number of comparisons that are available to researchers in typical directed forgetting datasets using various word types (see Simmons, Nelson, & Simonsohn, 2011), and the motives of researchers to find evidence in one direction or another. As we can see in the present study, we had 8 hypotheses to attempt to find a differential motivated forgetting effect. In a typical directed forgetting dataset there are multiple comparisons available, and if one comparison fails

to show differential forgetting, the researchers are able to perform multiple comparisons until they find some effect. For example, within a given dataset, researchers can attempt to demonstrate differential forgetting between the To Be Remembered lists and the To Be Remembered lists. If that fails they can compare trauma to positive or neutral words. If that fails they can look for statistical significance in several interactions—and they can make all these comparisons with a number of categorizations: on dissociation, trauma, diagnosis, acute stress, which all provide additional degrees of freedom. Given the number of possible combinations, a motivated researcher will likely be able to find one comparison that might be interpreted as motivated forgetting. In the context of these large degrees of freedom, we urge that failures to find differential motivated forgetting are not ignored. In our case, we emphasize that only one of our seven comparisons supported the phenomena of differential motivated forgetting. Replication of this finding is needed before this caution can be lifted.

The mixed results found in past research into differential motivated forgetting in traumatized and/or dissociated individuals, as well as our present study, raise doubts about whether directed forgetting studies consistently support the phenomena. Nevertheless, our study, however did find some support when we dichotomized extreme groups by dissociation *and* trauma. This could be an incremental step forward that could potentially explain why the literature has been mixed in the past. If future studies compare individuals who are categorized on both trauma *and* dissociation, there is potential for more consistent findings in the future. At the moment, it is unclear whether one significant result out of eight hypotheses is sufficient to conclude that the directed forgetting paradigm offers consistent support for the phenomena of differential motivated forgetting of trauma-related material in dissociated and/or traumatized individuals. This research also has important implications for the wider debate on how trauma effects memory—with some researchers emphasizing how trauma can lead to suppression (Brewin and Andrews, 2014) and/or dissociative amnesia (DePrince et al., 2012; Dalenberg et al., 2012), while others emphasize how trauma is more likely to be remembered all too well (McNally, 2005) and warn about the possibility of memory distortions that might result from a belief in dissociative amnesia, motivated forgetting, or repressed memories (Patihis, Ho, Tingen, Lilienfeld, & Loftus, 2014). Our finding raise the question whether those who are *both* traumatized *and* dissociated will forget more traumatic material than others.

References

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

Barnier, A. J., Conway, M. A., Mayoh, L., Speyer, J., Avizmil, O., & Harris, C. B. (2007). Directed forgetting of recently recalled autobiographical memories. *Journal of Experimental Psychology*, *136*, 301-322. doi:10.1037/0096-3445.136.1.301

Basden, B. H., & Basden, D. R. (1996). Directed forgetting: Further comparisons of the item and list methods. *Memory, 4*, 633–653. doi:10.1080/741941000

Basden, B. H., Basden, D. R., & Gargano, G. J. (1993). Directed forgetting in implicit and explicit memory tests: A comparison of methods. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 19*, 603–616. doi:10.1037/0278-7393.19.3.603.

Baumann, M., Zwissler, B., Schalinski, I., Ruf-Leuschner, M., Schauer, M., & Kissler, J. (2013). Directed forgetting in post-traumatic-stress-disorder: a study of refugee immigrants in Germany. *Frontiers in behavioral neuroscience*, *7*, Article 94, 1–8.

Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of a dissociation scale. *The Journal of Nervous and Mental Disease*, *172*, 727-735. doi:10.1097/00005053-198612000-00004

Berntsen, D., & Rubin, D. C. (2008). The reappearance hypothesis revisited: Recurrent involuntary memories after traumatic events and in everyday life. *Memory & Cognition*, *36*, 449–460.

Bjork, R. A., & Woodward, A. E. (1973). Directed forgetting of individual words in free recall. *Journal of Experimental Psychology, 99*, 22-27. doi: /10.1037/h0034757

Blix, I., & Brennen, T. (2011). Intentional Forgetting of Emotional Words after Trauma: A Study with Victims of Sexual Assault. *Frontiers in Psychology, 2*, 235.

Breuer, J., & Freud, S. (1895/1953). Case histories. In *J. Strachey (ed. and trans.), The Standard Edition of the Complete Works of Sigmund Freud*, *2*. London, UK: Hogarth Press.

Brewin, C. R., & Andrews, B. (2014). Why it is scientifically respectable to believe in repression: A response to Patihis, Ho, Tingen, Lilienfeld, and Loftus (2014). *Psychological Science*, *25*, 1964–1966.

Brewin, C. R. (2007). Autobiographical memories for trauma: Update on four controversies. *Memory*, *15*, 227-248. doi:10.1080/09658210701256423

Carlson, E. B., & Putnam, F. W. (1993). An update on the dissociative experiences scale. *Dissociation: Progress in the Dissociative Disorders, 6*, 16-27. Retrieved from https://search.proquest.com/docview/618478129?accountid=14509

Cloitre, M., Cancienne, J., Brodsky, B., Dulit, R., & Perry, S. W. (1996). Memory performance among women with parental abuse histories: Enhanced directed forgetting or directed remembering? *Journal of Abnormal Psychology*, *105*, 204–211.

Dalenberg, C. J., Brand, B. L., Gleaves, D. H., Dorahy, M. J., Loewenstein, R. J., Cardeña, E., ... & Spiegel, D. (2012). Evaluation of the evidence for the trauma and fantasy models of dissociation. *Psychological Bulletin*, *138*, 550–588.

DePrince, A. P., & Freyd, J. J. (1999). Dissociative tendencies, attention, and memory. *Psychological Science*, *10*, 449–452.

DePrince, A. P., & Freyd, J. J. (2004). Forgetting trauma stimuli. *Psychological Science, 15*, 488-492. doi:10.1111/j.0956-7976.2004.00706.x

DePrince, A. P., Brown, L. S., Cheit, R. E., Freyd, J. J., Gold, S. N., Pezdek, K., & Quina, K. (2012). Motivated forgetting and misremembering: Perspectives from betrayal trauma theory. (pp. 193-242). New York, NY, US: Springer Science + Business Media, New York, NY. doi: 10.1007/978-1-4614-1195-6_7

DePrince, A.P., & Freyd, J.J. (2001). Memory and dissociative tendencies: The roles of attentional context and word meaning in a directed forgetting task. *Journal of Trauma & Dissociation, 2*, 67–52.

Devilly, G. J., Ciorciari, J., Piesse, A., Sherwell, S., Zammit, S., Cook, F., & Turton, C. (2007). Dissociative tendencies and memory performance on directed-forgetting tasks. *Psychological Science, 18*, 212-217. doi: 10.1111/j.1467-9280.2007.01875.x

Elzinga, B. M., de Beurs, E., Sergeant, J. A., Van Dyck, R., & Phaf, R. (2000). Dissociative style and directed forgetting. *Cognitive Therapy and Research*, *24*, 279-295. doi:10.1023/A:1005559203356

Epstein, W. (1972). Mechanisms of directed forgetting. *Journal of Experimental Psychology, 6*, 147-191.

Erdelyi, M. H. (2006). The unified theory of repression. *Behavioral & Brain Sciences, 29*, 499–511.

Freud, S. (1916/1949). Motivated forgetting. (pp. 199-205). Reprinted from *The Psychopathology of Everyday Life*, 1916. New York, NY, US: Prentice-Hall, Inc., New York, NY. doi: 10.1037/11352-030

Freyd, J. J., Martorello, S. R., Alvarado, J. S., Hayes, A. E., & Christman, J. C. (1998). Cognitive environments and dissociative tendencies: Performance on the standard Stroop task for high versus low dissociators. *Applied Cognitive Psychology*, *12*, S91-S103.

Freyd, J.J. (1996). *Betrayal trauma: The logic of forgetting childhood abuse*. Cambridge, MA: Harvard University Press.

Geiselman, R. E., & Bagheri, B. (1985). Repetition effects in directed forgetting: Evidence for retrieval inhibition. *Memory & Cognition, 13*, 57-62. doi: 10.3758/BF03198444

Geraerts, E., & McNally, R. J. (2008). Forgetting unwanted memories: Directed forgetting and thought suppression methods. *Acta Psychologica, 127*, 614–622.

Geraerts, E., Smeets, E., Jelicic, M., Merckelbach, H. & van Heerden, J. (2006) Retrieval inhibition of trauma-related words in women reporting repressed and recovered memories of childhood sexual abuse. *Behaviour Research & Therapy 44*, 1129–1136. doi: 10.1016/j.brat.2005.09.001

Giesbrecht, T., Lynn, S. J., Lilienfeld, S. O., & Merckelbach, H. (2008). Cognitive processes in dissociation: An analysis of core theoretical assumptions. *Psychological Bulletin*, *134*, 617–647.

Glucksberg, S., & King, L. J. (1967). Motivated forgetting mediated by implicit verbal chaining: A laboratory analog of repression. *Science, 158*, 517–519. doi:10.1126/science.158.3800.517

Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment, 11*, 330-341. doi: 10.1177/1073191104269954

Janet, P. (1887). L'anesthésie systématisée et la dissociation des phénomènes psychologiques. *Revue Philosophique de la France et de l'Étranger*, *23*, 449–472.

Kiser, L. J., Stover, C. S., Navalta, C. P., Dorado, J., Vogel, J. M., Abdul-Adil, J. K., . . . Briggs, E. C. (2014). Effects of the child-perpetrator relationship on mental health outcomes of child abuse; It's (not) all relative. *Child Abuse & Neglect*, *38*, 1083-1093. doi:10.1016/j.chiabu.2014.02.017

Loftus, E. (1993). The Reality of Repressed Memories. *American Psychologist*, *48*, 518–537.

Lynn, S. J., Lilienfeld, S. O., Merckelbach, H., Giesbrecht, T., McNally, R. J., Loftus, E. F., ... & Malaktaris, A. (2014). The trauma model of dissociation: inconvenient truths and stubborn fictions. Comment on Dalenberg et al. (2012). *Psychological Bulletin*, *140*, 896–910.

MacLeod, C. (1989). Directed forgetting affects both direct and indirect tests of memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 15*, 13-21. 10.1037/0278-7393.15.1.13

McNally, R. J. (1997). Implicit and explicit memory for trauma-related information in PTSD. (pp. 219-224). New York, NY, US: New York Academy of Sciences, New York, NY. doi: 10.1111/j.1749-6632.1997.tb48281.x

McNally, R. J. (2005). Debunking myths about trauma and memory. *The Canadian Journal of Psychiatry, 50*, 817–822.

McNally, R. J., Clancy, S. A., & Schacter, D. L. (2001). Directed forgetting of trauma cues in adults reporting repressed or recovered memories of childhood sexual abuse. *Journal of Abnormal Psychology*, *110*, 151-156. doi:10.1037/0021-843X.110.1.151

McNally, R. J., Clancy, S. A., Barrett, H. M., & Parker, H. A. (2004). Inhibiting retrieval of trauma cues in adults reporting histories of childhood sexual abuse. *Cognition & Emotion, 18*, 479-493. doi: 10.1080/02699930341000400

McNally, R. J., Metzger, L. J., Lasko, N. B., Clancy, S. A., & Pitman, R. K. (1998). Directed forgetting of trauma cues in adult survivors of childhood sexual abuse with and without posttraumatic stress disorder. *Journal of Abnormal Psychology, 107*, 596-601. doi: 10.1037/0021-843X.107.4.596

McNally, R. J., Ristuccia, C. S., & Perlman, C. A. (2005). Forgetting of trauma cues in adults reporting continuous or recovered memories of childhood sexual abuse. *Psychological Science*, *16*, 336-340. doi: 10.1111/j.0956-7976.2005.01536.x

Moulds, M. L., & Bryant, R. A. (2002). Directed forgetting in acute stress disorder. *Journal of Abnormal Psychology, 111*, 175-179. doi: 10.1037/0021-843X.111.1.175

Moulds, M. L., & Bryant, R. A. (2005). An investigation of retrieval inhibition in acute stress disorder. *Journal of Traumatic Stress*, *18*, 233–236.

Moulds, M. L., & Bryant, R. A. (2008). Avoidant encoding in acute stress disorder: a prospective study. *Depression & Anxiety*, *25*, E195–E198.

Myers, L. B., Brewin, C. R., & Power, M. J. (1998). Repressive coping and the directed forgetting of emotional material. *Journal of Abnormal Psychology*, *107*, 141-148. doi:10.1037/0021-843X.107.1.141

Myers, L., & Derakshan, N. (2004). To forget or not to forget: What do repressors forget and when do they forget? *Cognition and Emotion*, *18*, 495-511. doi:10.1080/02699930341000419

Patihis, L., Ho, L. Y., Tingen, I. W., Lilienfeld, S. O., & Loftus, E. F. (2014). Are the "memory wars" over? A scientist-practitioner gap in beliefs about repressed memory. *Psychological Science*, *25*, 519–530.

Patihis, L., Lilienfeld, S. O., Ho, L. Y., & Loftus, E. F. (2014). Unconscious repressed memory is scientifically questionable. *Psychological Science*, *25*, 1967–1968.

Pope, H. G., Poliakoff, M. B., Parker, M. P., Boynes, M., & Hudson, J. I. (2007). Is dissociative amnesia a culture-bound syndrome? Findings from a survey of historical literature. *Psychological Medicine*, *37*, 225–233.

Porter, S., & Peace, K. A. (2007). The scars of memory. *Psychological Science, 18*, 435–441.

Sahakyan, L., Delaney, P. F., Foster, N. L., & Abushanab, B. (2013). List-method directed forgetting in cognitive and clinical research: A theoretical and methodological review. *Psychology of Learning and Motivation*, *59*, 131–189.

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, *22*, 1359–1366.

Van der Kolk, B. A., & Fisler, R. (1995). Dissociation and the fragmentary nature of traumatic memories: Overview and exploratory study. *Journal of Traumatic Stress*, *8*, 505–525.

Wegner, D. M. (1989). *White bears and other unwanted thoughts: Suppression, obsession, and the psychology of mental control.* London, UK: Penguin Press.

Wessel, I., & Merckelbach, H. (2006). Forgetting "murder" is not harder than forgetting "circle": Listwise-directed forgetting of emotional words. *Cognition and Emotion*, *20*, 129-137. doi:10.1080/02699930500260195

Wilhelm, S., McNally, R. J., Baer, L., & Florin, I. (1996). Directed forgetting in obsessive-compulsive disorder. *Behaviour Research and Therapy, 34*, 633-641. doi: 10.1016/0005-7967(96)00040-X

Woodward, A. E., & Bjork, R. A. (1971). Forgetting and remembering in free recall: Intentional and unintentional. *Journal of Experimental Psychology, 89*, 109-116. doi: 10.1037/h0031188

Wright, D. B., & Loftus, E. F. (1999). Measuring dissociation: Comparison of alternative forms of the dissociative experiences scale. *The American Journal of Psychology*, *112*, 497-519. doi:10.2307/1423648

Zoellner, L. A., Sacks, M. B., & Foa, E. B. (2003). Directed forgetting following mood induction in chronic posttraumatic stress disorder patients. *Journal of Abnormal Psychology*, *112*, 508–514.

Zwissler, B., Hauswald, A., Koessler, S., Ertl, V., Pfeiffer, A., Wöhrmann, C., ... & Kissler, J. (2012). Memory control in post-traumatic stress disorder: evidence from item method directed forgetting in civil war victims in Northern Uganda. *Psychological Medicine*, *42*, 1283–1291.

Appendix A: Positive and Trauma Words with Emotional Valence Scores

	Word Type	Overall		Low DES		High DES		
		M	SD	M	SD	M	SD	p
affection	(positive)	2.20	0.94	2.27	0.85	2.19	0.98	.492
carefree	(positive)	1.29	1.29	1.30	1.29	1.20	1.32	.504
celebrate	(positive)	2.21	0.89	2.32	0.81	2.05	0.97	**.013**
charming	(positive)	1.98	0.93	2.10	0.83	1.86	0.94	**.028**
cheerful	(positive)	2.24	0.89	2.31	0.90	2.10	0.96	.063
confident	(positive)	2.13	0.95	2.23	0.85	1.99	1.01	**.038**
easygoing	(positive)	1.82	0.96	1.89	0.97	1.71	0.98	.139
ecstasy	(positive)	0.53	1.83	0.32	1.78	0.76	1.80	**.046**
elation	(positive)	0.97	1.27	0.84	1.34	1.13	1.27	.077
friendly	(positive)	2.30	0.81	2.44	0.75	2.09	0.87	**.001**
happiness	(positive)	2.61	0.75	2.69	0.64	2.46	0.92	**.020**
healthy	(positive)	2.42	0.84	2.53	0.79	2.27	0.88	**.009**
outgoing	(positive)	1.97	1.04	2.03	1.06	1.83	1.09	.136
pleasure	(positive)	2.16	0.90	2.16	0.92	2.10	0.93	.569
reassured	(positive)	1.61	1.00	1.75	0.98	1.39	1.06	**.004**
relieved	(positive)	1.72	0.95	1.76	0.81	1.64	1.04	.296
secure	(positive)	2.00	1.02	2.12	1.02	1.89	1.04	.076
sincere	(positive)	2.15	0.97	2.24	0.98	2.05	0.98	.111
sociable	(positive)	1.93	0.95	1.96	0.92	1.83	1.05	.282
steady	(positive)	0.96	0.93	0.93	0.92	0.90	0.96	.832
abused	(trauma)	-2.46	0.96	-2.49	1.09	-2.45	0.87	.728
assault	(trauma)	-2.39	0.98	-2.42	1.06	-2.36	0.98	.596
brutal	(trauma)	-2.09	1.07	-2.16	1.02	-1.96	1.17	.136
crime	(trauma)	-1.99	1.01	-2.05	1.07	-1.86	1.05	.147
humiliated	(trauma)	-1.84	1.09	-1.81	1.23	-1.90	1.02	.531
incest	(trauma)	-2.16	1.18	-2.18	1.17	-2.13	1.20	.736
molested	(trauma)	-2.56	0.93	-2.61	0.88	-2.52	0.98	.419
nightmare	(trauma)	-1.88	1.08	-1.95	1.02	-1.86	1.09	.513
painful	(trauma)	-2.10	1.01	-2.24	0.88	-1.92	1.14	**.011**
penis	(trauma)	0.09	1.20	0.02	1.20	0.14	1.27	.451
rape	(trauma)	-2.71	0.78	-2.77	0.75	-2.73	0.73	.636
scream	(trauma)	-1.32	1.08	-1.30	1.17	-1.26	1.05	.736
semen	(trauma)	-0.15	1.07	-0.18	0.98	-0.13	1.21	.716
shame	(trauma)	-1.84	0.91	-1.84	0.91	-1.80	0.91	.760
shock	(trauma)	-0.85	1.05	-0.77	1.16	-0.90	1.01	.326
terror	(trauma)	-2.23	0.97	-2.30	0.93	-2.10	1.03	.087
tortured	(trauma)	-2.56	0.90	-2.67	0.80	-2.48	0.96	.094
victim	(trauma)	-1.94	1.07	-2.09	1.00	-1.81	1.15	**.036**
violence	(trauma)	-2.32	0.93	-2.45	0.90	-2.25	0.93	.073
worthless	(trauma)	-2.20	0.99	-2.49	1.09	-2.45	0.87	.450

Note. Valence was determined on a scale from -3 (very negative) to +3 (very positive). Overall *N* = 403. *p* value from *t* tests of Low (*n* = 135) vs. High (*n* = 132) dissociation (DES-C) given.

Appendix B: *Emotional Word Valence for Positive and Trauma Words*

Word		No Trauma n = 56		High Trauma n = 43		
		M	SD	M	SD	*p*
affection	(positive)	2.30	.83	2.02	1.23	.178
carefree	(positive)	1.32	1.36	1.28	1.44	.881
celebrate	(positive)	2.21	.91	2.07	1.16	.489
charming	(positive)	2.13	.83	1.98	1.12	.452
cheerful	(positive)	2.34	.82	2.23	1.11	.582
confident	(positive)	2.20	.77	2.07	1.18	.522
easygoing	(positive)	1.88	.85	1.70	1.21	.394
ecstasy	(positive)	.23	1.67	1.00	1.99	**.040**
elation	(positive)	.79	1.49	.88	1.40	.740
friendly	(positive)	2.43	.76	2.16	.97	.130
happiness	(positive)	2.66	.61	2.58	1.03	.634
healthy	(positive)	2.50	.76	2.40	.93	.540
outgoing	(positive)	1.89	1.23	1.81	1.31	.760
pleasure	(positive)	2.18	.97	2.00	1.18	.411
reassured	(positive)	1.54	1.14	1.37	1.18	.487
relieved	(positive)	1.77	.91	1.56	1.24	.335
secure	(positive)	1.89	1.28	1.91	1.17	.955
sincere	(positive)	2.27	.80	2.07	1.20	.328
sociable	(positive)	1.93	.91	1.93	1.20	.994
steady	(positive)	1.23	.85	.93	1.20	.147
abused	(trauma)	-2.23	1.24	-2.47	.91	.301
assault	(trauma)	-2.21	1.37	-2.35	1.04	.594
brutal	(trauma)	-1.89	1.32	-2.14	1.04	.315
crime	(trauma)	-1.82	1.22	-1.95	1.13	.584
humiliated	(trauma)	-1.43	1.46	-2.00	1.13	**.037**
incest	(trauma)	-2.04	1.32	-2.14	1.25	.692
molested	(trauma)	-2.30	1.33	-2.60	.82	.196
nightmare	(trauma)	-1.77	1.11	-2.00	1.09	.302
penis	(trauma)	.09	1.18	.30	1.42	.418
painful	(trauma)	-2.04	.93	-2.07	1.33	.882
rape	(trauma)	-2.59	.85	-2.81	.70	.162

Appendix B: *Emotional Word Valence for Positive and Trauma Words (continued)*

Word		No Trauma n = 56		High Trauma n = 43		
		M	SD	M	SD	p
scream	(trauma)	-1.20	1.26	-1.26	1.12	.807
semen	(trauma)	-.18	1.16	-.05	1.19	.581
shame	(trauma)	-1.66	.94	-1.98	1.10	.127
shock	(trauma)	-.84	1.23	-.74	1.38	.719
terror	(trauma)	-2.13	1.05	-2.23	1.07	.616
tortured	(trauma)	-2.38	1.12	-2.65	**.84**	.181
victim	(trauma)	-1.80	1.14	-1.86	1.08	.801
violence	(trauma)	-2.45	.91	-2.19	1.16	.214
worthless	(trauma)	-2.09	1.00	-2.44	.96	.079

Note. Valence was determined on a scale of -3 (very negative to +3 (very positive).
p value from *t* tests of no vs. high trauma (LEC) given.

Appendix C: *Emotional Word Valence for Positive and Trauma Words*

Word		No Trauma and Low Dissociation n = 24		High Trauma and High Dissociation n = 18		
		M	SD	M	SD	p
affection	(positive)	2.29	.79	2.11	1.49	.610
carefree	(positive)	1.54	1.53	1.39	1.65	.759
celebrate	(positive)	2.33	.82	1.67	1.46	.066
charming	(positive)	2.17	.76	1.83	1.38	.324
cheerful	(positive)	2.38	.88	1.94	1.43	.235
confident	(positive)	2.08	.83	1.89	1.45	.586
easygoing	(positive)	1.83	.82	1.78	1.44	.875
ecstasy	(positive)	.17	1.79	1.28	2.02	.067
elation	(positive)	.38	1.69	.89	1.68	.334
friendly	(positive)	2.54	.59	2.00	1.19	.059
happiness	(positive)	2.75	.53	2.39	1.46	.269
healthy	(positive)	2.58	.65	2.00	1.09	**.036**
outgoing	(positive)	1.83	1.47	1.78	1.56	.906
pleasure	(positive)	2.17	.96	1.83	1.51	.387
reassured	(positive)	1.83	.96	1.00	1.37	**.026**
relieved	(positive)	1.79	.72	1.56	1.46	.495
secure	(positive)	1.71	1.57	1.83	1.47	.794
sincere	(positive)	2.46	.66	1.94	1.55	.152
sociable	(positive)	1.92	.93	1.83	1.51	.826
steady	(positive)	1.38	.92	.89	1.41	.185
abused	(trauma)	-2.29	1.37	-2.56	.78	.468
assault	(trauma)	-2.04	1.57	-2.50	.86	.271
brutal	(trauma)	-2.08	1.32	-2.28	.90	.593
crime	(trauma)	-1.71	1.37	-1.78	1.22	.865
humiliated	(trauma)	-1.42	1.67	-2.00	1.33	.229
incest	(trauma)	-2.17	1.34	-2.17	1.20	1.00
molested	(trauma)	-2.42	1.35	-2.50	.86	.820
nightmare	(trauma)	-2.00	.89	-2.11	1.13	.723
painful	(trauma)	-2.46	.78	-1.89	1.57	.130
penis	(trauma)	.02	1.20	.14	1.27	.451
rape	(trauma)	-2.88	.34	-2.89	.47	.912

(continued)

Appendix C: *Emotional Word Valence of Positive and Trauma Words (continued)*

Word		No Trauma and Low Dissociation n = 24		High Trauma and High Dissociation n = 18		p
		M	SD	M	SD	
scream	(trauma)	-1.17	1.31	-1.28	1.24	.784
semen	(trauma)	-.18	.98	-.13	1.21	.716
shame	(trauma)	-1.71	.91	-2.17	1.04	.137
shock	(trauma)	-.71	1.49	-0.89	1.13	.670
terror	(trauma)	-2.42	.72	-2.06	1.16	.221
tortured	(trauma)	-2.71	.55	-2.56	.78	.462
victim	(trauma)	-2.04	.86	-1.94	1.16	.757
violence	(trauma)	-2.67	.70	-2.00	1.37	**.047**
worthless	(trauma)	-2.21	.83	-2.44	1.04	.419

Note: Valence was determined on a scale of -3 (very negative to +3 (very positive).
p value from t tests of no trauma/low dissociation vs. high trauma/high dissociation
(LEC; DES-C) given.