



Brief Report

Self-defining memories in post-traumatic stress disorder

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Objective. This study investigated the relationship between trauma survivors' goals and retrieval of self-defining memories in post-traumatic stress disorder (PTSD).

Methods. Civilian trauma survivors with PTSD, trauma survivors with no PTSD and non-trauma-exposed control participants ($N = 49$) provided autobiographical memories of events that they believe shaped who they are. Participants also provided details about their major personal goals.

Results. Participants with PTSD reported more self-defining memories that were trauma-related, negative valence and from adult years than non-PTSD and control participants. Further, retrieval of trauma-related self-defining memories was strongly associated with reporting personal goals that were related to traumatic experiences.

Conclusions. These findings are discussed in terms of the proposition that trauma survivors' current concerns may direct retrieval of trauma-related memories.

Researchers are increasingly turning attention to the role of autobiographical memory in post-traumatic stress disorder (PTSD). The most common index of autobiographical memory is the autobiographical memory cueing task that provides participants with cue words and requires recall of a specific personal memory in response to the cue. Most studies measure the specificity of recalled memories, which is defined as the memory being of an event restricted to 'a date, day of the week or time of the day when the episode occurred' (Williams & Scott, 1988, p. 691). There is convergent evidence that people with PTSD display over-general retrieval of memories, particularly in relation to positive memories (Harvey, Bryant, & Dang, 1998; McNally, Litz, Prassas, Shin, & Weathers, 1994; McNally, Lasko, Macklin, & Pitman, 1995). Interestingly, McNally *et al.* (1995) found that Vietnam veterans who still wore their military insignia were particularly likely to have difficulty retrieving specific positive memories, and were more likely to retrieve memories of Vietnam. This finding was interpreted in terms of veterans' self-representation being focused on being a military veteran (McNally *et al.*, 1995).

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Consistent with the interpretation, there is evidence that cancer patients with PTSD recall more negative memories as they become more hopeless about their condition (Kangas, Henry, & Bryant, 2005).

Extending the relationship between the self construct and autobiographical memory, Conway and Pleydell-Pearce (2000) have proposed that autobiographical memory for specific events is reconstructed from mental representations in the autobiographical knowledge base. According to this model, retrieval of specific information about one's personal past is influenced by constructions of the self, including one's self-image and goals. The reconstruction of autobiographical memories is shaped by memories that accord with one's goals and self-image. According to Conway and Pleydell-Pearce's (2000) model, trauma survivors with PTSD should selectively retrieve memories related to their trauma because the disorder is characterized by concerns about the effects of trauma. For example, individuals with PTSD who perceive themselves as vulnerable to future harm may selectively recall memories involving harmful experiences.

Commentaries have noted that one limitation of the autobiographical memory cueing task may be that it indexes access to valenced memories without directly indexing memories that are personally important to the individual (Jansari & Parkin, 1996; Rybash & Monaghan, 1999). Employing a different approach, Singer and Moffitt (1991, 1992) developed an approach that indexed 'self-defining memories'. Self-defining memories are defined as memories that are affectively intense, repetitive, vivid and comprise enduring concerns about oneself (Singer & Salovey, 1993). These recollections represent exemplar memories of experiences that reflect one's identity because, by definition, self-defining memories comprise narratives that individuals draw on to inform their sense of identity (Biagov & Singer, 2004). In early work on self-defining memories, Singer and Salovey (1993) found that eliciting self-defining memories resulted in a higher proportion of memories deemed important to the participant than a standard autobiographical memory task. This may be a constructive approach to understanding autobiographical memories in PTSD because traumatic experiences often alter one's self construct, especially if the individual suffers persistent psychological effects of the experience. Previous research has focused on the narratives that people construct after potentially difficult experiences, such as divorce (King & Raspin, 2004) and having children with Down syndrome (King, Scollon, Ramsey, & Williams, 2000), partly because of the premise that life-altering experiences may alter the memories that contribute to maintaining a particular construct of self. Bernsten (2001) has argued that traumatic memories may become reference points to other events in the autobiographical memory base, because these memories are landmarks that represent the major threat that people with PTSD perceive.

The present study indexed self-defining memories in participants with PTSD, no PTSD or non-trauma-exposed controls. According to Conway and Pleydell-Pearce (2000), retrieval of negative or trauma-related memories should be greater in PTSD participants, and should be more strongly associated with goals that are linked to trauma-related events, because people with PTSD have stronger concerns and goals involving trauma-focused themes (Smith & Bryant, 2000). This study tested this proposition by requesting participants to provide five self-defining memories, and also by asking participants to rate their major goals. On the premise that concern about future harm would lead people to preferentially retrieve negative self-defining memories, we hypothesized that PTSD participants would report more negative self-defining memories than the two comparison groups, and that these memories would be

associated with goals that are related to a traumatic experience. Additionally, on the basis that people with PTSD would selectively retrieve self-defining memories related to their trauma and all trauma experienced by our participants suffered trauma as an adult, we predicted that more PTSD participants than comparison participants would report self-defining memories from adult years.

Method

Participants

Participants in the study were 17 people (11 female, 6 male) with PTSD of mean age 26.90 years ($SD = 8.20$), 16 trauma-exposed non-PTSD people (11 female, 5 male) of mean age 27.44 years ($SD = 11.19$) and 16 non-trauma-exposed controls (12 female, 4 male) of mean age 22.81 years ($SD = 5.50$). PTSD (10 motor vehicle accident survivors, 7 assault survivors) and non-PTSD (11 motor vehicle accident survivors, 5 assault survivors) participants were recruited from consecutive volunteer patients who were admitted to a major trauma hospital following exposure to a traumatic event as an adult. Presence of PTSD was assessed using the Clinician administered PTSD scale (CAPS; Blake *et al.*, 1995). The CAPS possesses good sensitivity (.84) and specificity (.95) relative to the SCID PTSD diagnosis, and also possesses sound test-retest reliability (.90; Blake *et al.*, 1995). Non-trauma-exposed control participants were recruited from a university sample and administered a structured interview to determine the absence of trauma history. Exclusion criteria included inability to speak English without the aid of an interpreter. After a complete description of the study, written informed consent was obtained from all participants.

Procedure

Following written informed consent procedures, participants were informed that the study was intended to learn about peoples' goals. All data were obtained in one experimental session. Participants were administered the Beck Depression Inventory (BDI-II; Beck & Steer, 1987), the Impact of event scale (IES; Horowitz, Wilner, & Alvarez, 1979), and the Beck Anxiety Inventory (Beck & Steer, 1990). Whereas trauma-exposed participants responded to the IES in relation to their trauma, control participants responded to the IES in relation to a 'very distressing event they had experienced'.

Following Emmons (1986), participants were then asked to provide five self-defining memories. Specifically, participants were told that a self-defining memory is a memory from your life that you remember very clearly and still feels very important to you even as you think about it. It is a memory that helps you to understand who you are as a person and might be that memory that you would tell someone if you wanted that person to understand you on a more fundamental level. It may be a memory that is positive or negative, or both, in how it makes you feel. The only important aspect is that it leads to strong feelings. It is a memory that you have thought about many times. It should be familiar to you like a picture you have looked at a lot or song you have learned by heart. What I want you to do is try to think of five of these memories and then describe them out loud. Take however much time you need, the main thing is that the memories that you describe to me are those ones that are important and have some strong relation to who you are as a person today. And remember they can contain positive or negative feelings.

Each time participants completed narrating a memory, the experimenter provided them to provide another memory until five memories had been reported. Following Emmon's (1986, 1989) measure of personal strivings, participants were asked to list 15 goals that represent 'the things that are most important for to you to achieve at this time'. All responses were audiotaped. Goals were subsequently coded by an independent rater as being either trauma-related (e.g. 'I want to get over the pain') or non-trauma-related (e.g. 'I want to get my degree').

Scoring

A rater coded audiotaped responses for the valence of the memory in terms of positive (e.g. 'when my parents reunited when I was 8 years old'), neutral (e.g. 'I moved from England to Australia') and negative (e.g. 'my grandmother died when she was babysitting me'). The rater also coded the time period from which the memory was retrieved (childhood, adulthood). Childhood was defined as less than 15 years of age, and adulthood defined as over 15 years of age. In addition, trauma-exposed participants' memories were coded in terms of whether they related to the trauma. A second independent rater coded 20% of responses of the current data for valence, time period and trauma-relatedness. The mean kappa coefficient of reliability for each condition was .87 for valence, .92 for time period and .90 for trauma-relatedness.

Results

Participant characteristics

Participant characteristics are presented in Table 1. Participants did not differ in terms of age. As expected, PTSD participants scored higher than non-PTSD and control participants on IES-intrusions, IES-avoidance, BDI and BAI scores.

Table 1. Participant characteristics

	PTSD	Non-PTSD	Controls	<i>F</i> (2, 46)	<i>p</i>
Age	26.94 (8.23)	27.44 (11.19)	22.81 (5.50)	2.24	ns
Trauma-assessment interval	9.77 (6.85)	10.44 (6.74)	–	0.28	ns
IES-Intrusions	26.94 (9.64) ^a	9.75 (7.67) ^b	17.31 (8.60) ^c	16.23	.001
IES-Avoidance	22.34 (9.31) ^a	9.50 (11.10) ^b	16.81 (8.87) ^b	7.00	.005
BAI	26.53 (13.85) ^a	6.50 (5.51) ^b	13.13 (10.92) ^c	14.94	.001
BDI	23.71 (8.67) ^a	5.94 (6.18) ^b	9.00 (7.03) ^b	27.44	.001

Note. Trauma-assessment interval measured in months. IES = Impact of event scale. BAI = Beck Anxiety Inventory. BDI = Beck Depression Inventory. Standard deviations appear in parentheses. Values with different superscripts indicate differences between groups.

Self-defining memories

Table 2 presents the mean number of defining memories. A 3 (participant group: PTSD versus non-PTSD versus control) × 3 (valence: positive, negative, neutral) mixed-model ANCOVA of self-defining memories that controlled for age indicated a significant group × valence interaction effect, $F(4, 90) = 5.00$, $p < .001$. *Post hoc* Tukey comparisons indicated that PTSD participants reported more negative self defining memories than non-PTSD ($p < .001$) and control ($p < .05$) participants, and PTSD participants reported fewer positive memories than non-PTSD participants ($p < .01$).

Table 2. Mean number of defining memories

Valence	PTSD	Non-PTSD	Controls
Positive	1.70 (0.91) ^a	2.81 (1.37) ^b	2.00 (1.21)
Neutral	0.47 (0.62)	1.00 (1.31)	0.81 (0.98)
Negative	2.94 (1.97) ^a	1.18 (1.17) ^b	1.94 (1.18) ^b
Time period			
Childhood	0.88 (0.96) ^a	1.62 (0.95) ^b	3.50 (0.96) ^c
Adulthood	4.12 (0.95)	3.37 (0.95)	1.50 (0.97)
Trauma-related	0.94 (1.12) ^a	0.25 (0.44) ^b	–

Note. Standard deviations appear in parentheses. Values with different superscripts indicate differences between groups.

A 3 (participant group: PTSD versus non-PTSD versus control) \times 2 (time period) mixed-model ANCOVA of memories retrieved from different time periods that controlled for participants' age indicated a significant group \times time period interaction effect, $F(2, 45) = 20.81$, $p < .001$. *Post hoc* comparisons indicated that PTSD participants reported fewer defining memories from childhood than non-PTSD ($p < .05$) and control ($p < .001$) participants, and non-PTSD participants reported fewer childhood memories than control participants ($p < .001$). A planned comparison between trauma-related memories indicated that PTSD participants reported more trauma-related defining memories than non-PTSD participants, $t(31) = 2.27$, $p < .05$.

Prediction of negative self-defining memories

A forward stepwise multiple regression was conducted to examine the variables that predict retrieval of trauma-related defining memories in trauma-exposed participants (i.e. PTSD and non-PTSD participants; $N = 33$). On the premise that depression, PTSD symptoms and trauma-related goals may influence retrieval of trauma-related memories, we entered BDI, BAI, IES-intrusions, IES-avoidance and the proportion of trauma-related goals reported by trauma-exposed participants as independent variables. The only significant predictor of retrieval of trauma-related defining memories was the proportion of trauma-related goals (adjusted $R^2 = .37$, $\beta = 0.63$, $SE = 0.57$, $t = 4.41$, $p < .001$).

Discussion

Participants with PTSD reported more self-defining memories that were trauma-related, negative valenced and from adult years than non-PTSD and control participants. It appears that trauma survivors who develop PTSD see themselves as being strongly influenced by their trauma than those who do not develop PTSD. This pattern accords with reports that people with PTSD report that their traumatic experience is part of their current identity (Bernsten, Willert, & Rubin, 2003). Considering the impact of the traumatic experience on people with PTSD, it would be unexpected if they did not consider their trauma amongst their most self-defining memories. Nonetheless, this finding supports Conway and Pleydell-Pearce's (2000) proposition that trauma survivors with PTSD, who presumably are more concerned with the consequences of the traumatic experience, will selectively retrieve memories that are related to their trauma.

The tendency for PTSD participants to recall self-defining memories that are negative is consistent with evidence that PTSD participants tend to be deficient in retrieving

positive autobiographical memories (Harvey *et al.*, 1998; Kangas *et al.*, 2005; McNally *et al.*, 1994, 1995). Moreover, the tendency for PTSD participants to retrieve defining memories from adulthood years to a greater extent than non-PTSD or control participants underscores the pattern in PTSD to focus on their traumatic experience as a self-defining experience. Autobiographical memory research has repeatedly demonstrated a 'reminiscence bump' that involves a disproportionate amount of memories retrieved from the period between 10 and 30 years of age (for a review, see Neisser & Libby, 2000). Conway (1997) proposes that more memories are retrieved from this period because experiences that occur in this period are particularly important in shaping the self, and accordingly, they are more accessible. It is possible that PTSD participants preferentially retrieve more adult memories than other participants do because they regard their traumatic experience (which occurred in adult years) as highly influential in terms of their current self-construct.

The possible relationship between current constructions of the self and retrieval of defining memories was further underscored by the reasonably strong relationship between trauma-related goals and self-defining memories. It appears that the more trauma survivors focus on goals or expectations that centre around their traumatic experience (e.g. 'I want to be safe again', 'I want to have no pain'), the more they retrieve defining memories that are negative and trauma-related. This finding accords with Moffitt and Singer's (1994) observation that people who report avoidant strivings (i.e. having goals of avoiding aversive outcomes) report more memories related to not reaching these goals. This pattern also points to possible mechanisms that may contribute to ongoing PTSD because there is much evidence indicating that avoidance goals are associated with an array of negative outcomes, including anxiety, poor psychological well-being and poor response to therapy (Elliot & Church, 2002; Elliot & McGregor, 1999; Elliot, Sheldon, & Church, 1997). It is possible that trauma-related goals that involve avoidance of unwanted outcomes contribute to further negative memories that perpetuate a maladaptive self construct.

We recognize that inferences from this study are limited by a possible order effect. The elicitation of self-defining memories prior to eliciting goals may have biased reporting of the goals. Similarly, PTSD participants' possible awareness of their recruitment to the study because of their status as PTSD sufferers may have biased them to selectively retrieve memories and goals that were related to their traumatic experience. Future studies of goals and self-defining memories should acquire these data sets in separate sessions, preferably separated by several weeks. Further, the small sample size limits the confidence in statistical outcomes. The marginally younger age of the non-trauma-exposed control may have contributed to more childhood memories being reported in that group. We also note that our control participants tended to be more symptomatic than the non-PTSD participants, and it is possible that our controls may not have been representative of healthy controls. The cross-sectional nature of this design precludes causal inferences, and prospective studies should acknowledge the possibility that trauma-related concerns after trauma exposure directly shape the subsequent retrieval of trauma memories during the course of post-traumatic adaptation. Finally, we did not focus on the specific or general nature of self-defining memories. Singer and Salovey (1993) propose that over-general retrieval may serve a defensive function that limits awareness of aversive memories. Future research on self-defining memories in trauma survivors should consider the specificity of these memories in relation to their content.

One consequence of the tendency to recall trauma-related and negative valenced memories may be that the tendency for PTSD participants to recall negative self-defining memories may limit their capacity to consider positive experiences in their lives that are contrary to the negative memories of the trauma. This tendency may contribute to the retrieval of memories that maintain negative mood states and a negative outlook. Alternately, it is possible that the tendency to focus on negative memories, and regard them as self-defining, is a vulnerability factor that predisposes some trauma-exposed people to develop PTSD. These pilot data suggest that self-defining memories play an important role in trauma response, and that future research should identify the specific relationship between retrieval of these memories and the course of PTSD. A key question for future research is to identify the causal direction of the relationship between goals, self-defining memories and PTSD. Understanding the influence of self-defining memories on PTSD, or the influence of PTSD on these memories, may have treatment implications, because concerns about the future may be influenced by the ongoing retrieval of particularly distressing memories that perpetuate negative psychological states.

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