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Cognitive factors involved in the onset and maintenance of posttraumatic stress disorder (PTSD) after physical or sexual assault

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Abstract

Cognitive factors hypothesised to influence the development and maintenance of PTSD were investigated. 92 assault victims completed questionnaires assessing a range of cognitive variables. Factors relating to *onset* of PTSD were investigated by comparing victims who did and who did not suffer PTSD. Factors relating to *maintenance* of PTSD were investigated by comparing victims who had recovered from PTSD with victims who had persistent PTSD.

Cognitive factors associated with both onset and maintenance of PTSD were: appraisal of aspects of the assault itself (mental defeat, mental confusion, appraisal of emotions); appraisal of the sequelae of the assault (appraisal of symptoms, perceived negative responses of others, permanent change); dysfunctional strategies (avoidance/safety seeking) and global beliefs impacted by assault. Cognitive factors that were associated only with the onset of PTSD were: detachment during assault; failure to perceive positive responses from others and mental undoing. Relationships between the cognitive variables and PTSD remained significant when variations in perceived and objective assault severity were statistically controlled. The cognitive factors identified in the study may contribute to PTSD directly, by generating a sense of ongoing threat, or indirectly, by motivating cognitive and behavioural strategies that prevent recovery, or by affecting the nature of the traumatic memory. © 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Posttraumatic stress disorder; Cognition; Onset; Maintenance; Assault

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1. Introduction

In recent years posttrauma adaptation research has begun to focus on the role of cognitive factors in the development and maintenance of PTSD and there is a growing body of evidence that suggests cognitive factors may be at least as important as trauma severity and variations in pretrauma experience (e.g. Janoff-Bulman, 1985; Horowitz, 1986; McCann, Sakheim & Abrahamson, 1988; Foa, Steketee & Rothbaum, 1989; Ehlers & Steil, 1995).

A range of cognitive variables have been suggested as possible contributors to PTSD and its persistence. The first to be highlighted were trauma induced changes in global beliefs (McCann et al., 1988), especially shattered assumptions (Janoff-Bulman, 1989) and preliminary evidence suggests that global negative beliefs are associated with PTSD (Resick, Schnicke & Makrway, 1991; Wenninger & Ehlers, 1998). More recently, theorists have focused on specific appraisals of aspects of the trauma itself and of its immediate sequelae.

With respect to appraisal of the trauma key variables that have been highlighted are: appraisal of one's thoughts, behaviour and emotional responses during the trauma and general encoding styles. Two constructs relevant to appraisal of thoughts during the trauma are 'mental defeat' and 'mental planning' (Ehlers et al., 1998). Preliminary findings show both mental defeat and lack of mental planning to be related to the persistence of PTSD after assault (Dunmore, Clark & Ehlers, 1997) and to poorer outcome following exposure therapy amongst rape victims (Ehlers et al., 1998). The role of negative appraisal of behaviour is suggested by evidence of a relationship between posttrauma psychopathology and self blame (Frazier & Schauben, 1994), guilt (Riggs, Foa, Rothbaum & Murdock, 1991) and internal attributions for negative outcomes (Joseph, Brewin, Yule & Williams, 1991, 1993). Anecdotally, appraisal of emotions as frightening, uncontrollable or unacceptable is associated with more persistent PTSD, but empirical evidence is required. Last, encoding style during a trauma is thought to influence trauma memory. Two variables of interest here are detachment (shutting off from thoughts and emotions during the trauma) and mental confusion (inability to focus on important aspects of what is happening during the trauma). Detachment overlaps with the concept of dissociation which has been linked to greater posttrauma psychopathology (Breslau & Davis, 1992; Koopman, Classen & Spiegel, 1994). It is postulated that mental confusion may be associated with poorer outcome as it signals a failure to engage in 'semantic processing' during the trauma. Ehlers and Clark (in preparation) argue that lack of semantic processing is linked to posttraumatic intrusions because it prevents the formation of a trauma memory that is integrated into its context in time, place and other autobiographical memories.

With respect to the sequelae of the trauma, interest has largely focused on appraisal of initial posttrauma symptomatology, perception of other people's responses and perception of the permanent impact of the trauma. A link between negative appraisal of initial symptoms and PTSD has been postulated by Foa and Riggs (1993) and by Ehlers and Steil (1995). Support for such a link has been found amongst road traffic accident victims (Ehlers & Steil, 1995) and assault victims (Dunmore et al., 1997). The perception that others have failed to react in a positive or supportive manner after a trauma has been associated with greater posttraumatic psychopathology (e.g. Keane, Scott, Chavoya, Lamparski & Fairbank, 1985; Riggs et al., 1991; Joseph, Andrews, Williams & Yule, 1992). Evidence also suggests that perceived negative

responses from others is associated with poor adjustment (Ullman, 1996; Dunmore et al., 1997) and that the impact of perceived negative responses may be greater than that of perceived absence of positive responses (Davis, Brickman & Baker, 1991). The impact of perceiving that the trauma has permanently and negatively changed one's life was first explored by Ehlers et al. (1998b), where it was found to correlate with poorer outcome following exposure therapy.

Some of the above appraisals may directly influence the persistence of PTSD, while others may act by motivating dysfunctional cognitive and behavioural strategies (Foa et al., 1989; Ehlers & Steil, 1995). For example, victims who believe they will go mad unless they control their intrusive thoughts about the trauma will make intentional efforts to suppress both trauma related thoughts with the paradoxical effect of elevating their intrusions (Wegner, 1989; Trinder & Salkovskis, 1994; Davis & Clark, 1998). Individuals may also try to 'undo' the trauma (Resick et al., 1991; Mechanic & Resick, 1993). This involves mental attempts, often ruminative in nature, to alter the event (i.e. by imagining how the assault could have been prevented). Preliminary evidence exists suggesting an association between posttraumatic psychopathology and both undoing (Mechanic & Resick, 1993) and rumination (Ehlers, Mayou & Bryant, 1998a).

Existing studies have tended to focus on a small number of cognitive variables and rarely distinguish between factors that may be involved in the development of PTSD and those that are involved in its persistence. This is unfortunate as the latter are arguably the most relevant to treatment. The present study attempts to redress these problems by simultaneously investigating all the cognitive factors described above and separately assessing their relevance to development versus maintenance.

2. Method

2.1. Design

Individuals who had experienced a physical or sexual assault as an adult were assessed using a semi-structured interview, covering assault severity and background factors and questionnaires assessing the cognitive factors hypothesised to be associated with the development and/or maintenance of PTSD. To investigate factors associated with the onset of PTSD, participants who suffered PTSD in the month after assault were compared with participants who did not suffer PTSD. To investigate factors associated with the maintenance of PTSD, participants who suffered PTSD initially and who continued to experience PTSD at assessment (persistent PTSD) were compared with participants who had recovered from PTSD by the time of assessment (recovered PTSD).

2.2. Participants

Ninety two participants who had been assaulted at least 3 months prior to assessment were included in the study. Participants were recruited via posters in public places; advertisements in local newspapers; presentations on local radio programmes and contacts with local 'Victim

Support Schemes', police services, hospitals and head injury services. Participants were excluded from the study if the assault occurred in the context of ongoing domestic violence. 67 participants had experienced physical assault and 25 had experienced sexual assault.

Participants were categorised according to their scores on two versions of the PTSD Symptom Scale (PSS-SR; Foa, Riggs, Dancu & Rothbaum, 1993). The first version provided ratings of current symptomatology and the second version provided retrospective ratings of symptoms in the month after the assault. At each time point, participants were considered to suffer from PTSD if they met DSM-IV criteria for PTSD (American Psychiatric Association, 1994) and scored at least 18 on the PSS-SR. DSM-IV criteria were satisfied if scores on the PSS-SR indicated that participants met symptomatic criteria (i.e. scored at least 'one' on the four point frequency scale for a minimum of one intrusion, three avoidance and two arousal symptoms) and scored at least 'two' on a 9 point scale of how disabling the symptoms were. The aim of the additional '18 or over' cut off was to ensure that those who met criteria for PTSD experienced at least moderate symptom severity.

The groups used in the study were defined as follows. The *no PTSD group* ($n = 28$, 10 women and 18 men) failed at least one of the requirements for PTSD in the month after assault. The *PTSD group* ($n = 64$, 34 women and 30 men) met both requirements for PTSD in the month after assault. The latter group was subdivided into persistent and recovered PTSD groups. The *persistent PTSD group* ($n = 44$, 25 women and 19 men) met the requirements for PTSD in the month after the assault and continued to meet these requirements at the time of the assessment. The *recovered PTSD group* ($n = 20$, 9 women and 11 men) met the requirements for PTSD in the month after the assault, but failed at least one of the requirements at the time of assessment.

2.3. Measures

2.3.1. PTSD symptom scale: self-report version (PSS-SR: Foa et al., 1993)

This 17 item scale corresponds to the PTSD symptoms listed in DSM-IV (American Psychiatric Association, 1994). The PSS-SR has been demonstrated to have acceptable levels of reliability and validity (Foa et al., 1993) and provides a measure of the severity of symptoms. The questionnaire also showed good agreement with the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, Gibbon & First, 1990). The PSS-SR is an earlier version of the Posttraumatic Diagnostic Scale that has satisfactory agreement with the SCID ($\kappa = 0.65$, agreement = 82%, sensitivity = 0.89, specificity = 0.75; Foa, Cashman, Jaycox & Perry, 1997).

2.3.2. Beck depression inventory (BDI, Beck, Rush, Shaw & Emery, 1979)

The BDI was used to assess levels of depression at each time point.

2.3.3. Semi-structured interview

An interview was developed to assess participants' background characteristics and the nature and severity of the assault. First, participants were asked to provide *demographic information*. Next, they were asked about any *other traumatic events* which they had experienced either as an adult or as a child. Participants were then asked if they had experienced any *psychological*

difficulties prior to and/or following the assault. Next participants described the assault in their own words. Participants were also asked a series of specific questions about the *nature and severity of the assault*. These included questions about the number of assailants; the participant's relationship to the assailant/s; the time, location and duration of the assault; the level of threat used by the assailant/s (presence and use of a weapon and use of physical and/or verbal force) and the extent of any injury. To assess subjective assault severity participants rated *perceived threat to life and perceived threat of serious injury* on 0–100 scales. In addition *perceived uncontrollability* over the event and one's thoughts/feelings was rated on 0–6 point Likert scales ranging from 'totally disagree' through 'disagree very much', 'disagree slightly', 'neutral', 'agree slightly', 'agree very much' to 'totally agree'. Previous investigations have found perceived threat (Kilpatrick et al., 1989) and perceived loss of control (Baum, Cohen & Hall, 1993) to be associated with posttrauma psychopathology. The remaining questions in the interview dealt with the *legal consequences* of the assault, including whether there had been any court action.

2.3.4. Cognition and behaviour questionnaires

Eight questionnaires were developed to assess the cognitive and behavioural factors postulated to be involved in the onset and maintenance of PTSD following assault. Of primary interest was whether early cognitions (occurring during or soon after the assault) were associated with PTSD at a later time point. Therefore, the questionnaires focused on cognitions during and/or in the month after the assault, rather than on cognitions at the time of assessment. The internal consistency of each questionnaire and any subscales was assessed.

2.3.4.1. Cognitive factors operating during/shortly after assault. A 29-item questionnaire assessed participants' *thoughts during the assault*. Each item was rated on a 5-point scale relating to the extent to which the participant had experienced each type of thought (ranging from 'did not occur at all' to 'all of the time'). The questionnaire consisted of four subscales; mental defeat (12 items; $\alpha = 0.93$), mental planning (9 items; $\alpha = 0.85$), mental confusion (5 items; $\alpha = 0.67$) and detachment (3 items; $\alpha = 0.69$). Mental defeat items assessed the extent to which victims had mentally given up efforts to retain their sense of being human with a will of their own, or perceived that they had relinquished their autonomy (i.e. "I didn't feel like I was a human being any more"; "I mentally gave up"). In contrast, mental planning items assessed the extent to which participants had been thinking of ways to escape or influence the assailant, or thinking of ways to protect themselves physically or psychologically (i.e. "I went through in my mind ways in which I may cope better with the assault"; "I tried to work out what kind of person the assailant was"). Items on the mental confusion subscale related to being unable to focus on what was happening, including having your mind go blank or fixing on irrelevant things (i.e. "I couldn't believe this was happening to me"; "My mind went blank"). Detachment items asked participants to rate the extent to which they shut off from what was happening both in terms of their thoughts and their emotions (i.e. "I automatically shut down and detached from what was happening").

The *appraisal of emotions* questionnaire consisted of 7 items ($\alpha = 0.68$) designed to assess participants' appraisal of the emotions which they had experienced during the assault. Each item specified a possible interpretation of the emotions (e.g. "If I can react like that, I

must be very unstable”; “I cannot accept the emotions which I had”) and participants were asked to rate how much they would have agreed with each statement in the month after the assault. Unless otherwise stated these, and all remaining items, were rated according to the 0–6 disagree/agree scale described earlier.

The *appraisal of actions* questionnaire consisted of 6 items ($\alpha = 0.74$) dealing with the extent to which participants believed that they were to blame for the assault (e.g. “It is my fault that the assault happened because I could have prevented it and I didn’t”; “I blame myself because my actions made things worse”).

2.3.4.2. Appraisal of sequelae of assault. A 24-item questionnaire ($\alpha = 0.89$) assessed participants’ *appraisals of initial posttrauma symptoms*. The questionnaire covered appraisal of post-assault reactions in general (i.e. “My reactions since the assault mean that I must be losing my mind”) as well as appraisal of specific PTSD symptoms, including intrusions (i.e. “Something terrible will happen if I do not try to control my thoughts about the assault”), avoidance (i.e. “If you avoid things after an assault it means you are a coward”), emotional numbing (“If you feel very numb after an assault it means you will never be able to be in touch with the world again”) and memory blanks (i.e. “If you cannot remember something about the assault then it is because you would find it unbearable”). It also assessed appraisals of subsequent anger (i.e. “Anger will make you go off the rails”) and guilt (“If I feel guilty it must mean that I really was to blame for what happened”).

The *perception of other people’s reactions* questionnaire consisted of 13 items ($\alpha = 0.91$) assessing negative perceptions of other people’s reactions (i.e. “People who I thought would stand by me have let me down”; “I feel like other people are ashamed of me now”) and 7 items ($\alpha = 0.89$) assessing positive perceptions of others’ reactions (i.e. “Other people are genuinely concerned about me”; “There is someone who I can completely confide in”).

An 11-item *perceived permanent change* questionnaire ($\alpha = 0.82$) assessed the extent to which participants believed the assault to have had a permanent negative impact on their lives (i.e. “I will never recover”; “My life has been destroyed by the assault”; “I feel like I don’t know myself any more”).

2.3.4.3. Dysfunctional cognitive/behavioural strategies. This questionnaire assessed the extent to which participants engaged in cognitive/behavioural strategies in the month after the assault. Participants rated how frequently they had engaged in each strategy on a four point scale (‘never’, ‘sometimes’, ‘often’ and ‘always’). The questionnaire consisted of two subscales. The first dealt with various forms of avoidance and safety seeking (26 items, $\alpha = 0.92$) and covered avoidance of assault related situations and activities (i.e. “Avoid people who remind you of the situation”; “Avoid unfamiliar places or situations”), cognitive avoidance (i.e. “Try to distract yourself from distressing thoughts”; “Try to push thoughts of the assault to the back of your mind”) and active attempts to feel safe (i.e. “Sleep with lights or radio on”; “Sleep with or carry a weapon”). The second subscale, ‘undoing’ (5 items, 0.77), dealt with attempts to mentally erase or alter memories of the assault (i.e. “Imagine other ways in which you could have defended yourself”; “Try to erase memories of the assault”).

2.3.4.4. Beliefs impacted by assault. A 59-item *beliefs after assault* questionnaire (alpha = 0.98) assessed beliefs which may potentially be affected by the experience of assault. These included beliefs about being alienated or isolated from other people (i.e. “I feel isolated and set apart from others”); being unable to trust other people (i.e. “I cannot rely on other people”); being unable to trust yourself (i.e. “I cannot trust my own judgements”); beliefs about core aspects of the self (i.e. “There is something wrong with me as a person”; “I am disgusting”); the fairness and safety of the world (i.e. “The world is dark and evil”; “There is no justice in the world”) and beliefs about victims and emotional problems (i.e. “People who have emotional difficulties are inferior”; “People only get assaulted if they have done something foolish or careless”).

The *beliefs before assault* questionnaire (alpha = 0.96) was identical to that above except that it asked participants to rate how much they would have agreed with each belief before the assault. A *change in beliefs* score was calculated by subtracting the score after assault from the score before the assault.

2.4. Procedure

Initially participants were asked to complete the PSS-SR and the BDI with respect to their current symptoms (i.e. in the month preceding the interview). The semi-structured interview was then administered to gain background information about the participant and information about their experience of assault. After the final section of the interview, participants were given the questionnaire assessing perception of others’ reactions. Remaining questionnaires were administered in four batches, following a fixed, logical order. The first batch dealt with thoughts, emotions and actions during the assault. The second batch comprised of the PSS-SR and BDI dealing with symptoms in the month after the assault. The third batch asked about participants’ appraisal of symptoms and the use of post-assault control strategies. The final batch, dealt with global beliefs before and after the assault. The interview and completion of questionnaires took between 1.5 and 3 h. All interviews were conducted by a female investigator (ED) and were tape recorded to check the accuracy of coding where necessary. Eight participants (8.7%) were unable to attend the interview so they completed and returned a questionnaire version by post.

2.5. Statistical analysis

Group comparisons for categorical variables were conducted using the χ^2 test, and if invalid, the Fisher’s Exact test was employed (test statistic denoted by FI). Any significant group differences were subsequently explored using post-hoc χ^2 tests between pairs of groups. For continuous variables, group comparisons were conducted using *t*-tests. When indicated by Levene’s equality of variance test, *t*-tests based on unequal variances were conducted. Measures of perceived life and injury threat were bimodally distributed and so were converted into dichotomous variables (perceived life threat coded as present if scoring 10 or more; perceived injury threat coded as present if scoring 40 or more).

Table 1
 Characteristics of no PTSD and PTSD groups

	No PTSD	PTSD
<i>Sex (N (%))</i>		
Male	18 (64)	30 (47)
Female	10 (36)	34 (53)
Age (yr, mean (S.D.))	37.0 (16.8)	40.2 (15.5)
<i>Marital status at interview (N (%))</i>		
Single	17 (61)	29 (45)
Married/cohabiting	6 (21)	20 (31)
Divorced/widowed	5 (18)	15 (23)
<i>Marital status at assault (N (%))</i>		
Single	17 (61)	31 (48)
Married/cohabiting	6 (21)	22 (34)
Divorced/widowed	5 (18)	11 (15)
<i>Education (N (%))</i>		
Degree or above	7 (25)	13 (20)
School examinations	17 (61)	36 (56)
No qualifications	14 (14)	15 (23)
<i>Employment status at interview (N (%))</i>		
Full/part time work	17 (61)	29 (45)
Not working/studying	11 (39)	35 (55)
<i>Employment status at assault (N (%))</i>		
Full/part time work	17 (61)	33 (52)
Not working/studying	11 (39)	31 (48)
<i>Socio-economic class (N (%))^a</i>		
Upper/middle	5 (18)	9 (14)
Lower middle/lower	15 (54)	29 (46)
Lower	8 (29)	25 (40)
<i>Income (N (%))^b</i>		
Less than £5,000	9 (32)	25 (40)
£5,000–15,000	8 (29)	22 (36)
Over £15,000	11 (39)	15 (24)
Prior trauma (N (%)) (other than child abuse)	16 (57)	51 (80)
Abused as child (N (%))	4 (14)	31 (48)
Psychological difficulties pre-assault ^a (N (%))	9 (32)	36 (57)
Psychological difficulties post-assault ^a (N (%))	4 (14)	53 (84)
PSS-SR in month after assault ^a (mean (S.D.))	11.3 (7.2)	36.2 (8.0)
PSS-SR at interview (mean (S.D.))	6.6 (4.1)	25.0 (11.4)
BDI in month after assault ^c (mean (S.D.))	4.9 (5.9)	23.1 (11.8)
BDI at interview ^d (mean (S.D.))	4.7 (4.8)	17.0 (19.2)

No PTSD: $n = 28$; PTSD: $n = 64$ (unless otherwise specified).^aNo PTSD: $n = 28$; PTSD $n = 63$.^bNo PTSD: $n = 28$; PTSD $n = 62$.^cNo PTSD: $n = 27$; PTSD: $n = 62$.^dNo PTSD: $n = 27$; PTSD: $n = 63$.

Table 2
 Characteristics of assault for no PTSD and PTSD groups

	No PTSD	PTSD
<i>Type of assault (N (%))</i>		
Physical assault	21 (75)	46 (72)
Sexual assault	7 (25)	18 (28)
Time since assault (months, mean (S.D.))	20.4 (26.4)	18.9 (20.5)
<i>Relationship to assailant (N (%))</i>		
Stranger	21 (75)	50 (78)
Knew to some extent	7 (25)	14 (22)
<i>Degree assailant was trusted (N (%))^a</i>		
Did not trust at all	8 (31)	19 (31)
Neither trusted nor distrusted	14 (54)	35 (57)
Trusted to some extent	4 (15)	8 (13)
<i>Location of assault (N (%))</i>		
Own home	2 (7)	17 (27)
Public place	10 (36)	20 (31)
Empty street/secluded alley	13 (46)	16 (25)
Any other location	3 (11)	11 (17)
<i>Time when assault occurred (N (%))^a</i>		
Day (7.01 a.m.–5.00 p.m.)	8 (29)	17 (27)
Night (5.01 p.m.–7.00 a.m.)	20 (71)	46 (73)
<i>Severity of assault (N (%))</i>		
Punched/kicked/choked	18 (64)	55 (86)
Threatened with weapon ^a	10 (36)	32 (51)
Weapon used ^a	8 (29)	22 (35)
Verbally threatened/abused ^a	10 (36)	35 (56)
<i>Number of assailants (N (%))^b</i>		
One assailant	14 (50)	31 (49)
Two assailants	8 (29)	18 (29)
Three or more assailants	6 (21)	14 (22)
<i>Assault duration (N (%))^a</i>		
Less than 5 min	18 (64)	39 (62)
6–30 min	8 (29)	17 (27)
Over 30 min	2 (7)	7 (11)
<i>Extent of injury (N (%))^a</i>		
No injury	7 (25)	5 (8)
Minor to moderate injury	12 (43)	30 (48)
Major injury	9 (32)	28 (44)
Perceived a threat to life ^c (N (%))	5 (19)	39 (61)
Perceived a threat of injury ^c (N (%))	7 (8)	41 (64)
Perceived lack of control ^d (mean (S.D.))	3.0 (1.7)	4.0 (1.7)
Court action (N (%))	3 (11)	21 (33)

No PTSD: $n = 28$; PTSD: $n = 64$ (unless otherwise specified).^aNo PTSD: $n = 26$; PTSD: $n = 62$.^bNo PTSD: $n = 28$; PTSD: $n = 63$.^cNo PTSD: $n = 27$; PTSD: $n = 64$.^dNo PTSD: $n = 25$; PTSD: $n = 63$.

3. Results

3.1. Onset of PTSD: comparisons between PTSD and no PTSD groups

3.1.1. Group characteristics

Table 1 shows the characteristics of the no PTSD and PTSD groups. The two groups were comparable in all demographic characteristics. There were no significant differences between the groups in sex; age; marital status (at interview and assault); education; employment (at interview and assault); socio-economic status or income. The PTSD group was more likely than the no PTSD group to report having experienced abuse as a child, $\chi^2=9.64$, $p = 0.002$, and/or other previous traumatic events, $\chi^2=5.00$, $p = 0.025$. The PTSD group was also more likely to report having had psychological difficulties prior to the assault, $\chi^2=4.85$, $p = 0.028$. The selection criteria ensured that the PTSD group scored higher than the no PTSD group on the PSS-SR in the month after the assault, $t(89) = 14.11$, $p < 0.001$. In addition, as one might expect, the PTSD group was more depressed than the no PTSD group, $t(87) = 7.56$, $p < 0.001$ and was more likely to report psychological difficulties after the assault, $\chi^2=40.40$, $p < 0.001$.

3.1.2. Characteristics of assault

The characteristics of the assault are summarised in Table 2. In most instances, the nature and objective severity of the assault was similar in the two groups. There were no significant differences between the no PTSD and PTSD groups in the type of assault (sexual versus physical); the amount of time elapsed since the assault; the relationship to assailant; the degree to which the assailant was trusted; the location of the assault or the time when the assault occurred. There were also no significant differences between the groups on any of the seven measure of assault severity, apart from whether they had been hit by the assailant, $\chi^2=5.57$, $p = 0.018$. In contrast to the general absence of differences on objective measures of assault severity, the groups did differ on measures of perceived life and injury threat. The PTSD group were significantly more likely to have perceived life threat $\chi^2=13.7$, $p < 0.001$, and to have perceived threat of injury $\chi^2=11.1$, $p = 0.001$. The PTSD group was also significantly more likely to have felt out of control during the assault than the no PTSD group, $t(86) = 2.40$, $p = 0.018$. In terms of the legal consequences of the assault, the PTSD group was significantly more likely than the no PTSD group to have been involved in court action after the assault, $\chi^2=4.93$, $p = 0.026$.

3.1.3. Cognitive and behavioural factors

The results of the comparisons between the no PTSD and PTSD groups on the cognitive and behavioural measures are presented in Table 3.

3.1.3.1. Cognitive factors relating to assault itself. In terms of their thoughts during the assault, the PTSD group reported significantly higher levels of mental defeat, confusion and detachment during the assault than the no PTSD group. Contrary to our hypothesis, the PTSD group also reported significantly more mental planning during the assault than the no PTSD group. The PTSD group reported significantly more negative appraisals of their emotions

Table 3

Differences between no PTSD and PTSD groups on cognitive and behavioural measures: means and standard deviations (in parentheses)

Variable	No PTSD	PTSD	<i>t</i> -Statistic	df	<i>p</i> -Value
<i>Factors relating to assault itself</i>					
<i>Thoughts during assault</i>					
Mental defeat ^a	0.5 (0.58)	1.6 (1.16)	5.91	81.3	0.000
Mental planning ^a	0.8 (0.60)	1.4 (1.02)	3.78	73.1	0.000
Mental confusion ^a	1.2 (0.67)	2.0 (1.01)	4.13	66.0	0.000
Detachment ^a	0.7 (0.92)	1.4 (1.16)	2.80	85	0.006
<i>Appraisal of emotions and actions during assault</i>					
Negative appraisal of emotions ^b	1.1 (0.86)	1.8 (1.00)	3.19	86	0.002
Negative appraisal of actions ^c	1.3 (1.01)	1.7 (1.28)	1.18	86	0.243
<i>Appraisal of sequelae of assault</i>					
Negative appraisals of initial posttrauma symptoms ^d	1.6 (0.85)	2.1 (0.97)	2.37	88	0.020
Negative perception of other's responses ^e	1.0 (0.85)	2.3 (1.39)	5.20	68.2	0.000
Positive perception of other's responses ^e	5.0 (1.05)	4.1 (1.44)	2.86	59.2	0.006
Perceived permanent change ^a	0.9 (0.99)	2.5 (1.25)	5.81	85	0.000
<i>Dysfunctional cognitive/behavioural strategies</i>					
Avoidance/safety seeking ^f	0.5 (0.41)	1.3 (0.46)	8.24	86	0.000
Undoing ^f	0.9 (0.53)	1.6 (0.64)	4.80	86	0.000
<i>Beliefs impacted by assault</i>					
Negative global beliefs after assault ^a	1.5 (0.89)	2.6 (1.17)	4.73	57.8	0.000
Negative global beliefs before assault ^a	1.2 (0.67)	1.7 (0.80)	2.83	85	0.006
Change in negative global beliefs ^a	0.3 (0.52)	0.9 (0.87)	3.84	72.4	0.000

^a No PTSD: *n* = 62; PTSD: *n* = 25. ^bNo PTSD: *n* = 62; PTSD: *n* = 26. ^cNo PTSD: *n* = 63; PTSD: *n* = 25. ^dNo PTSD: *n* = 63; PTSD: *n* = 27. ^eNo PTSD: *n* = 56; PTSD: *n* = 24. ^fNo PTSD: *n* = 61; PTSD: *n* = 27.

during the assault than the no PTSD group, but the two groups did not differ in their appraisal of their actions during the assault.

3.1.3.2. Appraisal of sequelae of assault. The PTSD group reported significantly more negative appraisals of their symptoms in the month after the assault than the no PTSD group. The PTSD group was also more likely than the no PTSD group to have perceived other people's reactions as negative and less likely to have perceived their reactions as positive. Last, the PTSD group was significantly more likely to believe that the assault had had a permanent negative impact on their lives in comparison with the no PTSD group.

3.1.3.3. Dysfunctional cognitive and behavioural strategies. In the month after the assault, the PTSD group were significantly more likely to have engaged in avoidance/safety seeking and to try to undo memories of the assault than the no PTSD group.

Table 4
 Characteristics of recovered and persistent PTSD groups

	Recovered	Persistent
<i>Sex (N (%))</i>		
Male	11 (55)	19 (43)
Female	9 (45)	25 (57)
Age (yr, mean (S.D.))	34.9 (13.1)	42.7 (16.0)
<i>Marital status at interview (N (%))</i>		
Single	11 (55)	18 (41)
Married/cohabiting	4 (20)	16 (36)
Divorced/widowed	5 (25)	10 (23)
<i>Marital status at assault (N (%))</i>		
Single	13 (65)	18 (41)
Married/cohabiting	2 (10)	20 (46)
Divorced/widowed	5 (25)	6 (14)
<i>Education (N (%))</i>		
Degree or above	7 (35)	6 (14)
School examinations	12 (60)	24 (54)
No qualifications	1 (5)	14 (32)
<i>Employment status at interview (N (%))</i>		
Full/part time work	9 (45)	20 (46)
Not working/studying	11 (55)	24 (55)
<i>Employment status at assault (N (%))</i>		
Full/part time work	7 (35)	26 (59)
Not working/studying	13 (65)	18 (41)
<i>Socio-economic class (N (%))^a</i>		
Upper/middle	3 (16)	6 (14)
Lower middle/lower	10 (53)	19 (43)
Lower	6 (32)	19 (43)
<i>Income (N (%))^b</i>		
Less than £5,000	7 (39)	18 (41)
£5,000–15,000	7 (39)	15 (34)
Over £15,000	4 (22)	11 (25)
Prior trauma (N (%)) (other than child abuse)	17 (85)	34 (77)
Abused as child (N (%))	8 (40)	23 (52)
Psychological difficulties pre-assault ^c (N (%))	16 (80)	20 (47)
Psychological difficulties post-assault ^c (N (%))	16 (80)	37 (86)
PSS-SR in month after assault ^c (mean (S.D.))	29.2 (6.3)	39.5 (6.5)
PSS-SR at interview (mean (S.D.))	11.9 (4.9)	30.9 (7.9)
BDI in month after assault ^d (mean (S.D.))	15.7 (7.8)	26.6 (11.8)
BDI at interview ^c (mean (S.D.))	8.5 (5.2)	20.9 (9.5)

Persistent: $n = 44$; recovered: $n = 20$; (unless otherwise specified).^aPersistent: $n = 44$; recovered: $n = 19$.^bPersistent: $n = 44$; recovered: $n = 18$.^cPersistent: $n = 43$; recovered: $n = 20$.^dPersistent: $n = 42$; recovered: $n = 20$.

3.1.3.4. Beliefs impacted by assault. The PTSD group reported significantly more negative beliefs, both before and after the assault, than the no PTSD group. The PTSD group also showed a significantly greater shift towards holding more negative beliefs following the assault.

3.1.4. Additional analyses

Logistic regression analyses were used to investigate whether the significant group differences in cognitive/behavioural factors remained when any between group differences in previous history and perceived and objective assault severity were statistically controlled. The eight significant previous history/severity variables (trauma as a child; previous trauma (other than abuse); psychological difficulties prior to assault; being hit during assault; court action; perceived life threat; perceived injury threat; perceived lack of control) were forced into the equation before the cognitive/behavioural factors. Because of missing data for some variables, these analyses were run separately for each cognitive variable to maximise the number of participants. With the exception of confusion and appraisal of actions during assault, all cognitive and behavioural factors accounted for significant variance over and above previous history, and perceived and objective assault severity (p 's ranged between <0.036 for appraisal of symptoms and <0.001 for avoidance behaviours).

3.2. Maintenance of PTSD: comparisons between persistent PTSD and recovered PTSD groups

3.2.1. Group characteristics

Table 4 shows the characteristics of the persistent PTSD and recovered PTSD groups. The two groups were similar in most demographic characteristics. There were no significant differences between the groups in sex; age; employment (at interview and assault); socio-economic status or income. The groups were similar in their marital status at interview, but the persistent group was less likely to have been married at the time of the assault, $\chi^2=7.71$, $p = 0.021$. The persistent group was also less likely than the recovered group to have attained educational qualifications, FI; $p = 0.016$. Surprisingly, the recovered group was more likely than the persistent group to report having had psychological difficulties prior to the assault, $\chi^2=6.25$, $p = 0.012$. The two groups were equivalent in their reports of psychological difficulties after the assault. There were no significant differences between the groups in their experience of previous trauma including child abuse. On the PSS-SR the persistent group scored higher than the recovered group both in the month after the assault, $t(61) = 5.96$, $p < 0.001$, and in the month prior to assessment, $t(62) = 9.92$, $p < 0.001$. The persistent group also had higher BDI scores in the month after assault, $t(53.6) = 4.34$, $p < 0.001$, and prior to assessment, $t(59.2) = 6.66$, $p < 0.001$.

3.2.2. Characteristics of assault

The characteristics of the assault for the persistent and recovered groups are summarised in Table 5. The nature and objective severity of the assaults were comparable in all instances. There were no significant differences between the groups in the type of assault (sexual versus physical); amount of time elapsed since the assault; relationship to assailant; degree to which assailant was trusted; location of assault or the time when the assault occurred. In addition, there were no significant differences on any objective measure of assault severity. On the

Table 5
 Characteristics of assault for recovered and persistent PTSD groups

	Recovered	Persistent
<i>Type of assault (N (%))</i>		
Physical assault	14 (70)	32 (73)
Sexual assault	6 (30)	12 (27)
Time since assault (months, mean (S.D.))	20.3 (21.3)	18.2 (20.4)
<i>Relationship to assailant (N (%))</i>		
Stranger	17 (85)	33 (75)
Knew to some extent	3 (15)	11 (25)
<i>Degree assailant was trusted (N (%))^a</i>		
Did not trust at all	6 (32)	13 (30)
Neither trusted nor distrusted	11 (58)	24 (56)
Trusted to some extent	2 (11)	6 (14)
<i>Location of assault (N (%))</i>		
Own home	5 (25)	12 (27)
Public place	8 (40)	12 (27)
Empty street/secluded alley	6 (30)	10 (23)
Any other location	1 (5)	10 (23)
<i>Time when assault occurred (N (%))^b</i>		
Day (7.01 a.m.–5.00 p.m.)	4 (20)	13 (30)
Night (5.01 p.m.–7.00 a.m.)	16 (80)	30 (69)
<i>Severity of assault (N (%))</i>		
Punched/kicked/choked	17 (85)	38 (86)
Threatened with weapon ^b	11 (55)	21 (49)
Weapon used ^b	6 (30)	16 (37)
Verbally threatened/abused ^b	14 (70)	21 (49)
<i>Number of assailants (N (%))^c</i>		
One assailant	10 (53)	21 (48)
Two assailants	4 (21)	14 (32)
Three or more assailants	5 (26)	9 (21)
<i>Assault duration (N (%))^b</i>		
Less than 5 min	13 (65)	26 (61)
6–30 min	5 (25)	12 (28)
Over 30 min	2 (10)	5 (12)
<i>Extent of injury (N (%))^b</i>		
No injury	2 (10)	3 (7)
Minor to moderate injury	10 (50)	20 (47)
Major injury	8 (40)	20 (47)
Perceived a threat to life (N (%))	8 (40)	31 (71)
Perceived a threat of injury (N (%))	8 (40)	33 (75)
Perceived lack of control ^b (mean (S.D.))	3.6 (1.8)	4.2 (1.7)
Court action (N (%))	3 (15)	18 (41)

Persistent: $n = 44$; recovered: $n = 20$ (unless otherwise specified).^aPersistent: $n = 43$; recovered: $n = 19$.^bPersistent: $n = 43$; recovered: $n = 20$.^cPersistent: $n = 44$; recovered: $n = 19$.

subjective measures, the persistent group was more likely to have perceived both life threat, $\chi^2=5.4$, $p=0.021$, and injury threat, $\chi^2=7.3$, $p=0.007$. The groups did not differ significantly in their ratings of perceived lack of control, $t(61)=1.42$, $p=0.162$. The persistent group was more likely than the recovered group to have been involved in court action after the assault, $\chi^2=4.19$, $p=0.041$.

3.2.3. Cognitive and behavioural factors

The results of comparisons between persistent and recovered groups on the cognitive and behavioural measures are presented in Table 6.

3.2.3.1. Cognitive factors relating to assault itself. The persistent group reported significantly higher levels of mental defeat and mental confusion during the assault than the recovered group. The persistent group also reported significantly more negative appraisals of their emotions during the assault than the recovered group. There was a trend for the persistent group to also have more negative appraisals of their actions than the recovered group, $p=0.052$. The groups did not differ significantly in mental planning or detachment during the assault.

3.2.3.2. Appraisal of sequelae of assault. Participants in the persistent group reported significantly more negative appraisals of their symptoms in the month after the assault than the recovered group. The persistent group also endorsed to a greater extent that they were permanently changed by the assault than the recovered group. The groups did not differ significantly in either positive or negative perceptions of other people's reactions.

3.2.3.3. Dysfunctional cognitive/behavioural strategies. The persistent group was significantly more likely to have engaged in avoidance/safety seeking in the month after the assault than the recovered group. However, the groups did not differ in the extent to which they tried to undo memories of the assault.

3.2.3.4. Beliefs impacted by assault. The persistent group reported significantly more negative beliefs after the assault than the recovered group, although their beliefs did not differ before the assault. The persistent group showed a significantly greater shift towards holding more negative beliefs following the assault than the recovered group.

3.2.4. Additional analyses

Logistic regression analyses tested whether the significant differences between persistent and recovered groups in cognitive/behavioural factors remained when any between group differences in previous history and perceived assault severity were statistically controlled. The six significant previous history/severity variables (education, marital status at time of assault, psychological difficulties prior to assault, court action and perceived life and injury threat) were forced into the equation before the cognitive/behavioural factors. Once again these analyses were run separately for each cognitive variable. The following variables accounted for significant variance in PTSD over and above previous history and perceived assault severity; appraisal of emotions and actions during assault, negative perception of others' reactions,

Table 6

Differences between recovered and persistent PTSD groups on cognitive and behavioural measures: means and standard deviations (in parentheses)

Variable	Recovered	Persistent	<i>t</i> -Statistic	df	<i>p</i> -Value
<i>Factors relating to assault itself</i>					
<i>Thoughts during assault</i>					
Mental defeat ^a	1.1 (1.01)	1.9 (1.15)	2.62	60	0.011
Mental planning ^a	1.2 (0.91)	1.5 (1.06)	1.29	60	0.201
Mental confusion ^a	1.5 (0.83)	2.2 (1.00)	2.94	60	0.005
Detachment ^a	1.2 (1.07)	1.6 (1.18)	1.31	60	0.194
<i>Appraisal of emotions and actions during assault</i>					
Negative appraisal of emotions ^b	1.2 (0.63)	2.1 (1.02)	4.34	55.6	0.000
Negative appraisal of actions ^c	1.2 (1.03)	1.9 (1.35)	1.98	61	0.052
<i>Appraisal of sequelae of assault</i>					
Negative appraisals of initial posttrauma symptoms ^c	1.5 (0.58)	2.4 (0.98)	4.75	57.3	0.000
Negative perception of other's responses ^d	1.8 (1.37)	2.5 (1.36)	1.80	54	0.077
Positive perception of other's responses ^d	4.1 (1.75)	4.2 (1.26)	0.24	30.3	0.810
Perceived permanent change ^b	1.8 (1.02)	2.8 (1.23)	3.14	60	0.003
<i>Dysfunctional control strategies</i>					
Avoidance/safety seeking ^e	1.1 (0.41)	1.5 (0.43)	3.29	59	0.002
Undoing ^e	1.5 (0.58)	1.7 (0.66)	1.23	59	0.224
<i>Beliefs impacted by assault</i>					
Negative global beliefs after assault ^b	2.0 (0.73)	2.8 (1.27)	2.97	57.7	0.004
Negative global beliefs before assault ^b	1.5 (0.69)	1.7 (0.85)	0.93	60	0.357
Change in negative global beliefs ^b	0.5 (0.45)	1.1 (0.97)	3.07	60.0	0.003

^a Persistent: *n* = 43; recovered: *n* = 19. ^bPersistent: *n* = 42; recovered: *n* = 20. ^cPersistent: *n* = 43; recovered: *n* = 20. ^dPersistent: *n* = 36; recovered: *n* = 20. ^ePersistent: *n* = 41; recovered: *n* = 20.

negative appraisal of symptoms, perceived permanent change, avoidance/safety seeking, beliefs before and after assault and change in beliefs (all *p*'s < 0.03).

4. Discussion

The primary aim of the current study was to identify the cognitive factors associated with the onset and persistence of PTSD over and above variables relating to the severity of the traumatic event. Ten cognitive factors were found to be related to both onset and persistence. In addition, four cognitive factors were found to be associated only with the onset of PTSD.

4.1. Cognitive factors associated with both onset and persistence

Factors associated with onset and persistence of PTSD were mental defeat, mental confusion, negative appraisal of emotions, negative appraisal of symptoms, perceived negative

responses from others, permanent change, avoidance/safety behaviours, global beliefs before and after assault and change in beliefs. When controlling for perceived and objective severity of the assault the relationships between the cognitive variables and the onset and persistence of PTSD held up with very few exceptions. These exceptions were mental defeat which failed to explain a significant proportion of variance in PTSD persistence and mental confusion which failed to explain a significant proportion of variance in PTSD onset and persistence over and above the other variables.

How may the cognitive factors contribute to the onset and persistence of PTSD? It is argued that the central theme running through the negative beliefs and appraisals is one of ongoing threat (Ehlers & Steil, 1995). Victims holding these types of negative beliefs experience the traumatic event as continuing to have damaging implications, despite the event being in the past. This *continued* threat then precipitates the anxious symptomatology at the heart of PTSD. Themes of threat run through the global negative beliefs found to be associated with the onset and persistence of PTSD in the current study. Individuals who hold these beliefs question their own personality (“I am disgusting”; “I am a loser”; “I cannot be relied upon”), their safety (“There is no place which is safe”; “You never know who may harm you”; “People have bad intentions”) and the meaning of their world (“There is no justice in the world”; “The world is dark and evil”). Consequently, the lives of these individuals are dominated by apprehension and uncertainty.

The threatening beliefs just described may be fed by specific appraisals of aspects of the trauma itself. For instance, the experience of mental defeat may rock an individual’s sense of integrity, autonomy and worthiness, resulting in highly threatening appraisals (e.g. “I am weak”; “I don’t matter”). Furthermore, mental defeat may cause victims to doubt their ability to trust themselves (e.g. “If something like that happened again I’d go to pieces”; “Assailants will always pick me because they know I will give in”). The inability to trust oneself may result in particularly pervasive anxiety, avoidance and impairment of decision making as for these victims the threat resides *within*. Similarly, for victims who interpret their emotional responses as signs of being ‘unstable’, ‘out of control’ or a ‘sick person’ these emotions are likely to represent a threat to their view of themselves and they may fear that they will break down if any frightening or stressful situations arise again.

Another source of perceived threat is the victims’ appraisals of their PTSD symptoms. The experience of PTSD symptoms overall may be viewed as a sign of inadequacy or impending madness, whilst particular negative appraisals may relate to particular symptoms. For instance, victims may interpret the fact that they cannot remember parts of the assault as meaning that these parts must be ‘unbearable’. Such an interpretation would cause victims to be under the constant threat that the unbearable facts will resurface at any moment, heightening their general level of anxiety.

Victims who perceive other people to have reacted negatively following the assault perceive harm to have sprung not only from the assailant/s, but also from their everyday social world. Even positive responses from others may be interpreted as damaging (e.g. perceiving sympathetic responses as meaning you are weak). This suggests that the *interpretation* of people’s responses may be more important than the responses themselves. As well as adding to a sense of threat, perceived negative responses may be associated with emotions such as anger, guilt and shame. Preoccupation with these feelings and dwelling on the way others have

behaved seems to impede acceptance of the trauma and emotional processing (Ehlers & Steil, 1995), probably by preventing therapeutic reliving of the trauma (Riggs et al., 1991, 1992; Vaughan & Tarrier, 1992; Foa, Riggs, Massie & Yarczower, 1995b; Ehlers et al., 1998b). Acceptance of the trauma may also be hampered by beliefs about one's life having been permanently damaged. In addition, beliefs such as "My life has been destroyed" or "I'll never recover" may contribute directly to diminished interest and a sense of foreshortened future.

So far the discussion has focused on victims' beliefs and appraisals *after* an assault, but victims' beliefs *before* the assault, and the degree to which beliefs altered, were also related to the onset and persistence of PTSD. The role of 'shattering' in PTSD (Janoff-Bulman, 1985, 1989; Horowitz, 1986) was supported by the finding that PTSD onset and persistence were associated with the degree to which beliefs became more negative following the assault. However, authors such as Janoff-Bulman suggest that those who held more positive beliefs before a trauma may be most vulnerable to shattering and thus most vulnerable to PTSD. This proposition was not supported by the current research in which more *negative* preassault beliefs were associated with initial and persistent PTSD. This evidence is congruent with the Foa and Riggs (1993) argument that negative pretrauma beliefs may be confirmed by traumatic events leading to more severe and long lasting PTSD.

What must now be considered is why beliefs associated with ongoing threat persist? It is argued these negative beliefs motivate the individual to engage in avoidance and safety seeking. Dysfunctional cognitive/behavioural strategies may maintain negative beliefs by protecting them from disconfirmation. For instance, individuals who perceive themselves to be uniquely vulnerable to further assaults may try to ensure that they are not alone or may change their appearance to prevent unwelcome advances. Consequently, they continue to believe that they would have been assaulted if they had not engaged in these protective actions and fears regarding the permanent restrictions that the assault will impose on their lives are reinforced. Such strategies may also directly elevate specific PTSD symptoms. For instance, trying to avoid sleeping in case of intruders may result in fatigue and irritability and extreme avoidance such as leaving one's job, avoiding new relationships or avoiding taking decisions may add to a sense of a foreshortened future. In addition, trauma processing will be hindered whenever a victim avoids thinking or talking about the event. The beneficial effect of thinking about traumatic events is central to cognitive models of PTSD (i.e. Janoff-Bulman, 1985, 1989; Horowitz, 1986; Foa et al., 1989; Jaycox & Foa, 1996) in which the primary task of the victim is to 'emotionally process' the event.

A final factor which may contribute to the onset and persistence of PTSD is the way in which information is encoded during the trauma and the impact that this has on the nature of the trauma memory. There is evidence that PTSD patients have incoherent memories for the traumatic event (Foa, Molnar & Cashman, 1995a; van der Kolk & Fisler, 1995). It is likely that the level of processing during the trauma influences the way the event is laid down in memory and is subsequently recalled (Ehlers & Clark, in preparation). Victims who experience mental confusion during a trauma may be more likely to have encoded the memory at a lower level.

4.1.1. Factors associated with the onset of PTSD only

Detachment during assault, failure to perceive positive responses from others and attempting to mentally undo the assault were associated with onset but not persistence of PTSD. Unexpectedly, mental planning was found to be positively related to PTSD onset. Whilst detachment *during* a trauma has sometimes been considered to be an adaptive response to an uncontrollable situation, the findings of the current study indicate that the opposite may be the case. Detachment, emotional shutting down and numbing have been likened to freezing responses in animals (Foa et al., 1995b). It is possible that these responses hamper the initial mental absorption of the trauma contributing to initial PTSD. Individuals who detached may go on to recover if they subsequently allow themselves to process the traumatic event, but if they continue to try to detach themselves from trauma related thoughts and feelings they are likely to suffer persisting PTSD.

The perception that others are responding in a *positive*, sympathetic manner may help ameliorate the impact of a trauma and if this buffer is absent initial posttraumatic reactions may be more likely. However, the absence of perceived positive responses may be dismissed as being because other people do not know what to do for the best and may only lead to persistent PTSD if such an absence is interpreted as having negative implications.

Finally, evidence from the current research, that attempts to ‘mentally undo’ the trauma were associated with initial PTSD supports findings of an earlier study by Valentiner, Foa, Riggs, and Gershuny (1996) in which ‘wishful thinking’ or ‘denial by fantasy’ was associated with more severe PTSD symptoms 3 months after the assault. Rumination about why the assault happened and how it could have been prevented or alleviated ‘if only...’, or by wishing that the memories could just be wiped out, may increase the initial frequency of intrusive thoughts. Also, when imagining the trauma, victims may focus on minor ‘changes’ to events which may have prevented the trauma (i.e. if the bus had arrived two minutes earlier, if the victim had decided to visit their friend as usual). Thinking about these minor changes may elevate initial distress by causing intense frustration that the ‘clock cannot be turned back’.

4.1.2. Study limitations

The current study represented a significant advance on previous studies by considering a range of cognitive variables within one study and by investigating their role in both the onset and persistence of PTSD. However, the retrospective nature of the study raises interpretive problems and it is essential to replicate the results in a prospective design before being able to confidently assert that the cognitive variables are genuine predictors of the onset and persistence of PTSD. An additional problem complicating interpretation of persistence is the fact that the recovered group reported having experienced less severe initial PTSD symptoms than the persistent group. To establish whether the cognitive factors that are linked to persistence in the present study predict duration over and above initial severity, a future prospective study should compare persistent and recovered groups equated for initial severity.

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