

The Role of Dissociation in the Development and Maintenance of Post-Traumatic Stress Disorder

James Murray
St John's College

D.Phil
Trinity Term 1997

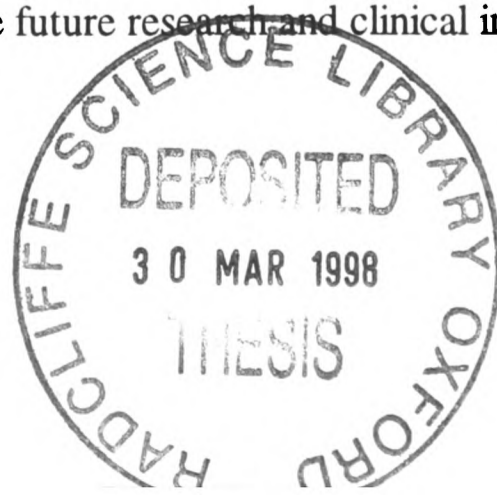
The aim of this thesis was to investigate psychological factors influencing the development and maintenance of post-traumatic symptoms, with particular attention to the role of dissociation. The concept of dissociation is at present not well understood, and a secondary aim of this thesis was to clarify its meaning and structure and enable its assessment.

Chapter 2 reports the development and testing of a questionnaire measuring trait dissociation, and the factor analysis of this questionnaire into seven sub-factors with low to medium intercorrelations, along with an analysis of the reliability and validity of this questionnaire, which was used in the subsequent studies.

Chapters 3 and 4 consist of experimental studies investigating the relationship between dissociation and later intrusive memories using a videotape of scenes from road traffic accidents as a stimulus. The first study attempted to manipulate dissociation, while the second used extreme scorers on the trait dissociation questionnaire. The manipulation of dissociation proved difficult, but both studies showed a relationship between dissociation and later intrusions.

Chapters 6 and 7 report on two prospective clinical studies following road traffic accident victims over the first six months following their accident, and investigates the role of dissociation and other psychological factors in the development of post-traumatic symptoms. Both state and trait dissociation, and the emotional numbing subfactor of dissociation in particular, predict the later development and maintenance of other post-traumatic symptoms. Persistent dissociation was more predictive of later symptoms than dissociation in the first few days after the accident.

These results are discussed in relation to current thinking about the concept of dissociation and the DSM diagnoses of post-traumatic stress disorder and acute stress disorder. In particular it seems useful to distinguish between components of dissociation in terms of their relationship to PTSD. Possible future research and clinical implications are also addressed.



Contents:

Acknowledgements

Chapter 1: General Introduction.....	1
Chapter 2: Trait Dissociation Questionnaire Development.....	40
Chapter 3: Investigating Dissociation Experimentally.....	68
Chapter 4: Investigating Dissociation Experimentally: High versus Low Trait Dissociation...103	
Chapter 5: Clinical Studies.....	132
Chapter 6: Admitted RTA Patients Prospective Study.....	147
Chapter 7: Non-admitted RTA Patients Prospective Study.....	179
Chapter 8: Conclusion.....	245
Bibliography.....	256
Appendices.....	274

Acknowledgements:

I am very grateful for the help of many people in researching and writing up this thesis, including Anke Ehlers and Richard Mayou, my supervisors; David Clark, the third member of my supervisory committee; Gail Stockford, without whom I could never have collected all my patient data; Prof. Michael Gelder; Warren Mansell, who looked over my drafts and gave me ideas, Dr Sam Cartwright-Hatton, Abigail Wroe, Candida Richards, Liz Forrester, Adrian Wells, Fiona Lobban, Jacqui Carter, Norma Morrison, and everyone else in the department for their help and advice; St John's College Boat Club, for giving me something to do in my spare time; and, most especially, Fran Watson, for looking after me and cooking my dinners while I wrote everything up.

CHAPTER 1:

General Introduction

The aim of this thesis is to describe aspects of psychological reactions to traumatic events, and in particular to investigate the relationship of the process of dissociation to common post-traumatic symptoms such as avoidance and intrusions.

In the first part of this chapter I:

- review the nature of trauma
- describe the historical background to accounts of post-traumatic psychological reactions
- examine the historical development of the diagnostic category of post-traumatic stress disorder
- review characteristics of chronic and acute reactions to trauma
- examine predisposing and precipitating factors which may be associated with individual differences in response to trauma

Following this general review I move on to discuss:

- models of post-traumatic reactions
- the definition and history of the term dissociation
- the role of dissociation in models of post-traumatic reactions
- attempts to measure and investigate dissociation

Finally I explain the aims of my research and the organization of the thesis.

What is “trauma”?

The word “trauma” in its medical sense has a very specific meaning, implying violent bodily injury. However, in the psychological literature it refers to both events that cause intense psychological distress (and may also cause physical damage to the individual), and also to the subjective interpretation of the event (i.e. the distress). In this thesis “trauma” refers to the actual event.

Examples of traumas include natural or man-made disasters, combat, serious accidents, witnessing the violent death of others, or being the victim of torture, terrorism, rape, kidnap, or other crimes. In ICD-10 trauma is described as an “event or situation (either short- or long-lasting) of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone” (World Health Organization, 1992, p. 147). DSM IV defines trauma as something which involves “direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one’s physical integrity; or witnessing an event that involves death, injury, or a threat to the personal integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate” (American Psychiatric Association, 1994, p. 424).

It is estimated that a large proportion of the world’s population has been exposed to a significant trauma during their lives. Traumatic events worldwide are estimated to have affected 3 billion people and killed 7 million between 1967 and 1991 (International Federation of Red Cross and Red Crescent Societies, 1993). Norris, in a study of 1000 randomly selected US adults, found that 69% of the sample had experienced a traumatic event at some time, and

21% had experienced an event in the past year (Norris, 1992). A more recent study of a representative sample of 8098 US adults found a lifetime prevalence of 60% amongst men and 51% amongst women (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), while a study of randomly selected US women found a lifetime prevalence of 69% (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993).

Experience of trauma is more common in particular groups, such as the young, men, ethnic minorities (in western countries), psychiatric patients, drug users, veterans, and refugees (Bang, 1993; Berton & Stabb, 1996; Browne, 1993; Cheung, 1994; Dansky et al., 1996; Darves Borno, Lemperiere, Degiovanni, & Gaillard, 1995; deLahunta, 1995; Dunn, Ryan, & Dunn, 1994; Ellason, Ross, & Fuchs, 1996; Fierman et al., 1993; Foa & Meadows, 1997; Giaconia et al., 1995; Herzog, Staley, Carmody, Robbins, & van der Kolk, 1993; Hien & Levin, 1994; Irwin et al., 1996; Krystal, 1968; Orsillo, Heimberg, Juster, & Garrett, 1996; O'Toole et al., 1996; Sack et al., 1993; Smith & Gittelman, 1994; Stretch et al., 1996; Triffleman, Marmar, Delucchi, & Ronfeldt, 1995; Vrana & Lauterbach, 1994).

In modern western society, road traffic accidents are one of the most common types of significant traumatic event (Norris, 1992), involving up to 25% of men and 13% of women (Kessler et al., 1995). Other commonly experienced traumas include witnessing someone being badly injured or killed (36% of men and 14% of women), and being involved in a fire or natural disaster (18% of men and 15% of women) (Kessler et al., 1995).

Historical Approaches

It is only recently that reactions to trauma have been examined systematically and quantitatively, although there is a long history of detailed accounts of many different types of trauma and reactions to them, which has shaped current concepts.

In the 19th century, doctors turned to explaining post-traumatic reactions after several famous case studies and a growing need for medical opinion in legal compensation cases following traumatic incidents, where finding a biological (and usually neurological) explanation became important to distinguish real suffering from malingering, sometimes labelled “compensation neurosis” (Bellamy, 1997).

The typical symptoms reported by writers at the time were somatic, and the explanations given often involved ideas such as neural or spinal damage. For example, Erichsen, who published papers in which he attempted to describe and explain symptoms in a group of patients who had been involved in railway accidents (Erichsen, 1882), believed that symptoms such as numbness, twitching, and muscular weakness, often reported in case studies of those who had been involved in railway accidents, were the result of “spinal concussion”. This resulted in the widespread use of the term “railway spine” to describe the symptoms of patients who had been involved in railway crashes and similar accidents.

The psychological symptoms most noted in modern times, such as intrusive recollections of the event, anxiety, and depression, are largely absent from these early accounts, and the emphasis was on physical signs such as paralysis, numbness, and weakness, and on possible organic causes. However, initial physical explanations began to be criticized, since often the physical evidence for spinal damage was weak or non-existent in many reported cases, and researchers began to look at possible psychological explanations. For

example, Page wrote:

“medical literature abounds with cases where the gravest disturbances of function, and even death or the annihilation of function, have been produced by fright and by fright alone. It is this same element of fear which in railway conditions has so large a share - in many cases the only share - in inducing immediate collapse, and in giving rise to those after-symptoms which may be almost as serious as, and are certainly far more troublesome than, those which we meet shortly after the accident has occurred.” (Page, 1885)

Freud, writing towards the turn of the century, was also interested in the role of fear in producing post-traumatic symptoms, and was one of the first researchers to talk about intrusive recollections of the traumatic event, a symptom now thought to be central to post-traumatic reactions. He wrote with Breuer in 1895:

“During the days following a railway accident, for instance, the subject will live through his frightful experiences again both in sleeping and waking, and always with the renewed affect of fright, till at last, after this period of ‘psychical working-out’, or of ‘incubation’, conversion into somatic phenomenon takes place.” (Freud & Breuer, 1895)

From the beginning of the twentieth century trauma research increasingly focussed on psychological rather than physical causes and symptoms. The two world wars in this century led to descriptions of post-traumatic reactions as “war neurosis”, “shell shock” (Mott, 1919), or “combat fatigue”. The descriptions of symptoms included many more cognitive and emotional phenomena, such as extreme distress, hypervigilance, mental and physical exhaustion, nightmares and the intrusive reexperiencing of the event. Psychological explanations of these symptoms were brought to prominence by the clinical observations that patients suffering from such symptoms often improved when removed from the combat area or when various treatments involving “suggestion” were employed (Trimble, 1981). Rivers, for instance, offered an explanation based on avoidance of distressing memories remarkably similar to that of modern information-processing models of post-traumatic reactions, and

reported that a treatment programme based upon gradual and repeated exposure to traumatic memories could produce marked improvement in patients (Rivers, 1918).

The symptoms that follow trauma vary widely from person to person, from depression, anxiety or anger, to drug or alcohol abuse, and flashback-type recollections as are evident in recent descriptions (Basoglu, Paker, Ozmen, Tasdemir, & Sahin, 1994; Blanchard et al., 1996; Blanchard, Hickling, Taylor, & Loos, 1995; Carlson & Rosser Hogan, 1991; Chemtob, Hamada, Roitblat, & Muraoka, 1994; Daly, Fleming, & Loughrey, 1996; Patterson et al., 1993; Weine et al., 1995). During the first half of the twentieth century it was recognized that common factors were involved in causing post-traumatic symptoms after a wide range of traumatic events, and a consensus grew that, while there was undoubtedly a wide variety of post-traumatic reactions, there was also a relatively common subset of symptoms, and that the various trauma-specific labels for post-traumatic reactions, such as “railway spine” and “war neurosis” should be dropped in favour of a single label.

It is very important that widely varying symptoms and styles of reacting to trauma should not be arbitrarily grouped together and assumed to represent a valid categorical disorder with a distinct underlying pathology. However, clinical observations (Lonigan, Shannon, Taylor, Finch, & Sallee, 1994; Mayou, 1992; Patterson et al., 1993; Roca, Spence, & Munster, 1992; Rothbaum, Foa, Murdock, Riggs, & Walsh, 1990; Shalev, 1992) have indicated common patterns of reaction as outlined in DSM and ICD following many widely different traumatic situations.

The emergence of the term “Post-traumatic stress disorder”

Early versions of diagnostic manuals contained categories for reactions to acute stress (for instance, as “Acute Situational Maladjustment” in ICD-6 (World Health Organization, 1948), and as “Transient Situational Personality Disturbance” in DSM-I (American Psychiatric Association, 1952)). There were always problems with these early categories, such as a lack of adequate description of symptoms, low inter-rater reliability, inadequate or vague description, poor validity, and poor fit into contemporary psychological or biological models of causation. The terms were also used to refer to a very broad range of stress-related conditions.

After a period of close psychiatric evaluation, research and treatment of Vietnam veterans and other groups a category of “post-traumatic stress disorder” (PTSD) was created and placed in the anxiety disorders section of DSM-III (American Psychiatric Association, 1980) and ICD-10 (World Health Organization, 1992), thereby indicating anxiety as a core phenomenon.

In DSM-III the criteria for PTSD required that the trauma be one “generally outside the range of usual human experience” that would “evoke significant symptoms of distress in almost everyone”. Thus DSM-III (and ICD-10, which contains a similar criterion) placed a great emphasis on the role of the traumatic event itself in causing PTSD, rather than individual factors such as personality, cognitive style, or psychiatric vulnerability. It has been suggested that this emphasis was due to pressure by Vietnam veterans’ groups for recognition of post-traumatic reactions as direct results of extreme and harrowing experiences rather than as evidence for moral weakness or a “disorder-vulnerable” personality - an issue which has cropped up in relationship to post-traumatic reactions again and again throughout the history

of their investigation, and which will be discussed later.

This definition of PTSD did create some problems, however, since many traumatic events are relatively common (Kessler et al., 1995), especially in particular cultures or environments (such as road traffic accidents), and could not realistically be described as “beyond the range of normal human experience”, thereby ruling out anyone who suffers typical PTSD symptoms following such an event from qualifying for a formal diagnosis of PTSD. A definition of a disorder through statistical deviation is never entirely adequate.

The main change in DSM-III-R (American Psychiatric Association, 1987) was a reorganization of the symptom criteria. In DSM-III the requirements were for at least one reexperiencing symptom, at least one numbing symptom, and at least two of a mixed group of symptoms, including hyperarousal, sleep disturbance, survivor guilt, memory impairment, and avoidant behaviour. In DSM-III-R the symptoms were reorganized into clusters, and the requirements were for at least one reexperiencing symptom, at least three avoidance and numbing symptoms, and at least two hyperarousal symptoms. DSM-III-R included a wider range of symptoms, although it dropped survivor guilt from its criterion list.

DSM-IV (American Psychiatric Association, 1994) was published 7 years after DSM-III-R. The main change in this version was in the description of trauma. Instead of the problematic version used in DSM-III and DSM-III-R, DSM-IV required instead that the traumatic event should be one in which the person experiences or witnesses “threatened or actual death or serious injury”, and where the response to this event involves “intense fear, helplessness, or horror”. This criterion is far more satisfactory, since it allows for a greater breadth of traumatic events to be included, and centres around the concepts of physical threat and psychological distress. The symptom clusters in DSM-IV are almost identical to those used in DSM-III-R, the only change being that one symptom (physiological reactivity on

exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event) was moved from the hyperarousal cluster to the reexperiencing cluster.

In the most recent editions of DSM and ICD (ICD-10 and DSM-IV) the criteria for post-traumatic stress disorder, which represents a pathological, chronic reaction to a traumatic situation, are summarized below: it can be seen that the two descriptions are largely similar and consistent with one another.

ICD-10: Post-traumatic stress disorder (F43.1) (summarized criteria)

A. The patient must have been exposed to a stressful event or situation (either short- or long-lasting) of exceptionally threatening or catastrophic nature, which would be likely to cause pervasive distress in almost anyone.

B. There must be persistent remembering or “reliving” of the stressor in intrusive “flashbacks”, vivid memories, or recurring dreams, or in experiencing distress when exposed to circumstances resembling or associated with the stressor.

C. The patient must exhibit an actual or preferred avoidance of circumstances resembling or associated with the stressor, which was not present before exposure to the stressor.

D. Either of the following must be present:

(1) inability to recall, either partially or completely, some important aspects of the period of exposure to the stressor;

(2) persistent symptoms of increased psychological sensitivity and arousal (not present before exposure to the stressor), shown by any two of the following:

(a) difficulty in falling or staying asleep;

(b) irritability or outbursts of anger;

(c) difficulty in concentrating

(d) hypervigilance

(e) exaggerated startle response.

E. Criteria B, C, and D must all be met within 6 months of the stressful event or of the end of a period of stress. (For some purposes, onset delayed more than 6 months may be included, but this should be clearly specified.)

DSM-IV: Posttraumatic stress disorder 309.81

A. Exposure to a traumatic event with

1. experiencing or witnessing threatened or actual death or serious injury
2. a response involving intense fear, helplessness, or horror.

B. The event is reexperienced as below:

1. recurrent and intrusive distressing recollections
2. recurrent distressing dreams
3. acting or feeling as if the event is recurring (illusions, hallucinations, dissociative flashbacks)
4. intense distress at exposure to internal or external cues to the event
5. physiological reactivity on exposure to cues

C. Persistent avoidance of stimuli associated with the trauma. Numbing of general responsiveness as below:

1. Efforts to avoid thoughts, feelings or conversations associated with the trauma
2. Efforts to avoid activities, places or people associated with the trauma
3. Inability to recall an important aspect of the trauma
4. Diminished interest or participation in significant activities
5. Feelings of detachment or estrangement from others
6. Restricted range of affect (emotional numbing)
7. Sense of foreshortened future

D. Persistent symptoms of increased arousal as below:

1. Difficulty falling or staying asleep
2. Irritability or outbursts of anger
3. Difficulty concentrating
4. Hypervigilance
5. Exaggerated startle response

E. Duration of the disturbance is more than 1 month

F. The disturbance causes clinically significant distress or impairment in functioning

The main distinctions between DSM-IV and ICD-10 are that the criteria given in ICD-10 are somewhat less restrictive than those in DSM-IV. Whereas DSM-IV requires at least one reexperiencing symptom, at least three avoidance and numbing symptoms, and at least two hyperarousal symptoms, ICD-10 requires the presence of reexperiencing symptoms and avoidance and either amnesia or hyperarousal. The differences between DSM and ICD criteria may lead to estimates of prevalence using ICD-10 criteria being somewhat higher than those using DSM-IV criteria. In the later chapters of this thesis DSM-IV criteria for PTSD are used.

Acute Syndromes

Following the introduction of category of PTSD for the description of persistent post-traumatic symptoms, there has been renewed interest in acute symptoms. Recent accounts suggest there are characteristic immediate patterns of response following trauma, which can be divided into a *very early phase* (the first few hours following trauma) and a *later phase* (the first few days or weeks following trauma) (Hyams, Wignall, & Roswell, 1996; Muller, Yahav, & Katz, 1993; Yitzhaki, Solomon, & Kotler, 1991).

The *early phase*, often referred to as “shock”, or “nervous shock”, is characterized by hypervigilance, anxiety, numbing of general responsiveness, disorientation or stupor, and general lability of psychological state, lasts typically a few minutes or hours. Such reactions are so common following traumatic events that they may be regarded as “normal” (Koopman, Classen, Cardena, & Spiegel, 1995) - studies of traumatized groups such as rape victims have estimated that in the period immediately after a trauma the prevalence of acute stress reactions may be as high as 90-95% (Rothbaum et al., 1990).

In the *later phase* symptoms are less common. They include feelings of numbness and detachment, intrusive recollections, hypervigilance, anxiety, and avoidance of reminders of the traumatic incident. Clinical reports indicate that in the majority of individuals symptoms fade over several days or weeks (Riggs, Foa, Rothbaum, & Murdock, 1991). In a minority of cases symptoms persist as post-traumatic stress disorder. In others there may be a delayed onset of symptoms until months or even years later.

The current editions of DSM and ICD (DSM-IV and ICD-10) both have new categories for acute reactions alongside post-traumatic stress disorder. ICD-10 contains a category of “Acute Stress Reaction” to describe the early phase, while DSM-IV contains a

category of “Acute Stress Disorder” (ASD) to describe the later phase - a confusing situation.

The criteria for these two categories are given below:

ICD-10: Acute Stress Reaction F43.0 (summarized criteria)

A. The patient must have been exposed to an exceptional mental or physical stressor

B. Exposure to the stressor is followed by immediate onset of symptoms (within 1 hour)

C. Two groups of symptoms are given; the acute stress reaction is graded as:

Mild - only criterion (1) below is fulfilled

Moderate - Criterion (1) is met and there are any two symptoms from criterion 2

Severe - *Either* criterion (1) is met and there are any four symptoms from criterion (2); *or* there is dissociative stupor

Criterion (1):

At least four of: palpitations, sweating, trembling, dry mouth, difficulty breathing, feeling of choking, chest pain, nausea, dizziness, derealization or depersonalization, fear of losing control, fear of dying, hot flushes, numbness or tingling, muscle tension, restlessness, feeling tense, exaggerated startle response, difficulty concentrating, irritability, difficulty sleeping

Criterion (2)

Withdrawal from expected social interaction, narrowing of attention, apparent disorientation, anger or verbal aggression, despair or hopelessness, inappropriate or purposeless inactivity, uncontrollable and excessive grief

D. If the stressor is transient or can be relieved, the symptoms must begin to diminish after not more than 8 hours. If exposure to the stressor continues, the symptoms must begin to diminish after not more than 48 hours

DSM-IV: Acute Stress Disorder 308.3

A. Exposure to traumatic event involving experiencing or witnessing death or injury (real or threatened) and a response involving intense fear, helplessness, or horror.

B. While experiencing or after experiencing the event the individual has three (or more) of the following dissociative symptoms:

1. Subjective sense of numbing, detachment, or absence of emotional responsiveness
2. Reduction in awareness of surroundings (eg "being in a daze")
3. Derealization
4. Depersonalization
5. Dissociative amnesia (i.e., inability to recall an important aspect of the trauma)

C. The trauma is reexperienced as: recurrent images, thoughts, dreams, illusions, flashbacks, or distress on exposure to reminders

D. Avoidance of stimuli that arouse recollections of the trauma

E. Symptoms of anxiety or arousal

F. Clinically significant distress or impairment in functioning

G. The disturbance lasts for at least 2 days and a maximum of 4 weeks and occurs within 4 weeks of the trauma

H. The disturbance is not due to any psychoactive substance or a medical condition

Since the introduction of categories for acute post-traumatic reactions is very recent, the link between acute symptoms and the chronic disorder of PTSD is unclear. Research with combat veterans indicates that Acute Stress Disorder (ASD) is unrelated to previous negative life events, while the development of PTSD is less common and is related to previous negative life events (Solomon & Flum, 1988), suggesting that while ASD is a relatively common and more normal reaction PTSD may be due to an interaction between a traumatic event and other psychological vulnerability factors.

Individual differences in response to trauma

There is great individual variation in response to trauma, and only a proportion of individuals develops chronic psychological problems (Feinstein & Dolan, 1991; Kilpatrick et al., 1989; Mayou, Bryant, & Duthie, 1993; Rothbaum et al., 1990; Wolfe, Sas, & Wekerle, 1994). Models of the causation and maintenance of post-traumatic reactions have sought to identify psychological explanations of individual differences. Many factors have been investigated:

- **Predisposing factors**, such as previous psychiatric history, previous experience of trauma, personality variables, gender, and age,
- **Characteristics of the trauma and the way it is processed**, such as trauma severity, physical and neurological injury, subjective assessments of trauma severity, information processing during the trauma, and dissociation,
- **Maintaining or aggravating factors**, such as avoidance, information processing of recollections of the trauma, dissociation, negative interpretation of post-traumatic symptoms, continuing social or physical disability, and changed beliefs about the self and the outside world.

Models of PTSD development and maintenance, which are discussed below, have sought to incorporate these factors. In particular, they have tended to concentrate on the second and third categories of factors: information processing during the traumatic event, and later information processing of memories and avoidance in response to intrusive, distressing reexperiencing of traumatic memories. Such models examine individual differences to predict

those who will go on to suffer chronic rather than transitory post-traumatic reactions.

The individual factors will be reviewed in more detail in chapter 5, which introduces my clinical research.

Models of post-traumatic reactions

A number of models have been put forward to explain post-traumatic reactions, including biological, psychodynamic, behavioural, and cognitive theories.

Biological models attempt to connect the psychological symptoms of PTSD with underlying neurological systems. Some researchers have suggested that neurological sensitization may underlie hyperarousal and exaggerated startle responses in animals (Ottenweller, Natelson, Pitman, & Drastal, 1989) and in human PTSD patients (Fesler, 1991). It has also been suggested that abnormalities in adrenocortical function may also be linked to chronic PTSD symptoms, a theory supported both by animal research (Friedman, 1994) and human studies, which have shown plasma cortisol levels to be lower in PTSD patients (Boscarino, 1996). Endogenous opioid abnormalities have also been observed in PTSD patients and linked to emotional numbing symptoms (Kosten & Krystal, 1988).

Drug treatments of PTSD, usually with antidepressants such as imipramine, phenelzine and fluvoxamine, have had some success (Braun, Greenberg, Dasberg, & Lerer, 1990; Davidson, 1992; De Boer et al., 1992; Katz, Fleisher, Kjernisted, & Milanese, 1996; Katz et al., 1994; Kinzie & Leung, 1989; Kosten, Frank, Dan, McDougle, & Giller, 1991; Penava, Otto, Pollack, & Rosenbaum, 1996; Rothbaum, Ninan, & Thomas, 1996; Sutherland & Davidson, 1994).

Psychodynamic models centre around the idea that in the post-traumatic state the self is “fractured” (Lansky & Bley, 1995) and that some of the most important aspects of post-traumatic stress reactions are feelings of aloneness, guilt, shame, and vulnerability (Koller, Marmar, & Kanas, 1992).

Behavioural models focus on the behavioural symptoms of PTSD, and derive from behavioural models of phobia (Rachman, 1977; Watson & Rayner, 1920). They argue that stimuli associated with the trauma become associated with fear and anxiety, and that subsequent presentations of these stimuli produce high levels of physiological arousal. Avoidance behaviour is used to avoid or escape from these stimuli, as in phobias. Evidence for the validity of this approach comes from animal studies (Adamec & Shallow, 1993; Foa, Zinbarg, & Rothbaum, 1992; Pynoos, Ritzmann, Steinberg, Goenjian, & Prisecaru, 1996; Servatius, Ottenweller, & Natelson, 1995) and from treatment studies with humans using exposure therapy (Boudewyns, 1996; Foa, Molnar, & Cashman, 1995b; Richards, Lovell, & Marks, 1994; Richards & Rose, 1991; Solomon, Gerrity, & Muff, 1992).

Cognitive models build on a basic behavioural framework but focus on the role of cognitions in producing anxiety and avoidance, and view intrusions and avoidance as part of a vicious circle of symptoms, with distressing intrusions leading to avoidance, and avoidance preventing habituation to intrusions (Ehlers & Steil, 1995; Foa, Steketee, & Rothbaum, 1989; McFarlane, 1992).

They also introduce the concept of cognitive schemas, following cognitive models of affective and anxiety disorders (Beck, 1967; Beck, 1976; Beck, Emery, & Greenberg, 1985; Brewin, 1996; Chambless & Goldstein, 1982; Clark, 1986). According to cognitive models, many preexisting beliefs are shattered by the trauma, such as a belief in personal invulnerability, a perception of the world as meaningful and controllable, and a view of the self

as positive (Creamer, Burgess, & Pattison, 1992; Janoff Bulman & Frieze, 1983; Kushner, Riggs, Foa, & Miller, 1992; Muran & Motta, 1993). Victims of trauma may develop exaggerated negative schematic beliefs in the areas of safety, trust, power, esteem, intimacy and psychological adaptation (McCann, Sakheim, & Abrahamson, 1988). These models have led to effective treatments (Chemtob, Novaco, Hamada, & Gross, 1997; Foa, Hearst Ikeda, & Perry, 1995a; Foa, Rothbaum, Riggs, & Murdock, 1991; Shalev, Bonne, & Eth, 1996a) although success rates are generally lower than in cognitive treatments of other anxiety disorders (Barlow et al., 1984; Barlow, Craske, Cerny, & Klosko, 1989; Barlow & Lehman, 1996; Beck, 1988; Clark, 1985; Clark et al., 1994; Salkovskis, Jones, & Clark, 1986).

At a more basic cognitive level, patients with chronic PTSD symptoms are characterized by selective attention to threat (Litz & Keane, 1989; McNally, Kaspi, Riemann, & Zeitlin, 1990; Thrasher, Dalgleish, & Yule, 1994), which may increase arousal and make avoidance behaviour more likely, and by the formation of implicit memories only accessible through appropriate situational cues (Brewin, Dalgleish, & Joseph, 1996) They also show a degree of emotional numbing in response to both the original trauma and reminders of it.

Emotional numbing is part of a cluster of symptoms identified in DSM IV and ICD-10 as part of the diagnostic criteria for Acute Stress Disorder and Post-traumatic Stress Disorder (Foa & Hearst-Ikeda, 1996; Joseph, Yule, & Williams, 1995; Litz & Keane, 1989): this cluster is labelled “dissociation”, and is discussed below.

Dissociation

There has been an increasing clinical interest in dissociation in both acute and chronic psychological reactions to trauma, linked to a renewed interest in dissociative disorders such as multiple personality disorder (or dissociative identity disorder, as it is called in DSM-IV). Dissociation is seen both as a part of the symptom constellation of PTSD and as an important psychological process in its own right which affects the ways in which information is processed during and after a traumatic event and influences the development of PTSD. Dissociation was made part of the criteria for a diagnosis of Acute Stress Disorder and PTSD in DSM-IV.

Dissociation seems particularly important in the development of Acute Stress Disorder (Bryant & Harvey, in press; Harvey & Bryant, in press). However, research into the role of dissociation in PTSD has been very limited until recently, which is why the primary aim of this thesis is to investigate the relationship between dissociation and the development of post-traumatic symptoms.

The definition of dissociation

There are many current definitions of dissociation. For example, DSM-IV describes it as “A disruption in the usually integrated functions of consciousness, memory, identity, or perception of the environment” (American Psychiatric Association, 1994, p.766).

Spiegel describes it as “the compartmentalization of experience, identity, memory, perception, and motor function” (Spiegel, 1994) p ix; while Erdelyi offers the definition

“Dissociationism designates a theoretical commitment to the notion that integrated systems such as the self are made up of subsystems that may become - or may even normally be - relatively disconnected in terms of information exchange or mutual control” - (Erdelyi, 1994, in Spiegel, 1994 p.3).

The content of these and other definitions reflects the complex history of the concept since the nineteenth century, which is reviewed in the next section.

The history of dissociation

The term “dissociation” was coined by early psychodynamic theorists to refer to the splitting off of a whole set of mental processes from normal consciousness and, indeed, a fragmentation of the self in varying degrees. There were two major theories.

Janet argued that dissociation represented a *deficit phenomenon* (Janet, 1907). That is to say, insufficiency of “binding energy”, caused by hereditary factors, life stresses, or traumas, or an interaction among them, results in a splitting off of parts of the self from the main body, or *ego*, the core personality.

In contrast, Freud argued that dissociation represented an *active defence process* (Freud, 1894). He proposed that subsystems of thoughts or memories that threatened the integrity of the overall self (i.e. the *ego*) are forcibly suppressed, or dissociated:

“I repeatedly succeeded in demonstrating that the splitting of the contents of consciousness is the consequence of a voluntary act on the part of the patient; that is to say, it is instituted by an effort of will, the motive of which is discernible.” - (Freud, 1894), in Spiegel (1994), p.69

The ideas of both Freud and Janet have remained influential, and the early distinction between an actively controlled process and a passive phenomenon has remained central to recent research.

Dissociation in models of PTSD

Patients with PTSD report more frequent dissociative symptoms than do depressed or anxious patients, though not as commonly as do patients with multiple personality disorder (Bernstein & Putnam, 1986).

The role of dissociative experiences and strategies in the development and maintenance of PTSD has been discussed extensively, and several researchers have incorporated them in aetiological and process models of the disorder (Foa et al., 1989; Spiegel, 1991; Spiegel, Koopman, & Classen, 1994). There have been two main psychological approaches.

Spiegel and others (Ross, Anderson, Heber, & Norton, 1990; Spiegel & Cardena, 1990) propose that dissociation is a *control strategy*, that seeks to limit the emotional impact of stimuli associated with trauma, both while the trauma is actually occurring and later, when memories of it come to mind. Immediate distress is reduced because there is less emotional processing, and the individual is distanced from what is being experienced. However, the control that this strategy gives over emotion at the time of the trauma may result, according to Spiegel, in a failure to work through the experience and to habituate to the emotional impact, resulting in a longer term loss of control over mental state, with distressing intrusive reliving of the trauma, numbing of response, and hyper-responsiveness to reminders of the trauma. Thus distress at the helplessness felt during the trauma is reduced by dissociation, even though in the longer term the individual loses psychological control with repeated further experiences of dissociation. Dissociated memories of the trauma are inconsistent with the “normal and fully controlling self”, and so they are not integrated into the self-concept and thus remain extremely distressing.

Foa et al. (Foa et al., 1989) offer an alternative learning theory based explanation similar

to the cognitive-behavioural model of phobia maintenance, which derived from work by Lang. He proposed that emotional memories are stored as “associative networks” that are activated when a person is confronted with a situation that contains components which trigger the individual elements of the associative network (Lang, 1979).

Foa et al argue that during a traumatic event similar processes occur, and that the various stimuli associated with the incident combine with the resulting emotion to produce a fear structure or network, which consists of the feared stimuli, physiological and motor responses, and interpretive information about their meaning. For example, in the case of a Vietnam veteran, the feared stimuli might include the sounds of gunfire or helicopters, or the smells of the jungle or of burning; physiological and motor responses might include feelings of intense anxiety, and a desire to run away or fall to the ground; interpretive information will relate the ways in which the feared stimuli are dangerous and should be avoided.

When a single stimulus associated with the fear structure is experienced, the whole structure is activated: this explains why reexperiencing phenomena and flashbacks are common in PTSD. Foa et al argue that processes such as depersonalization, emotional numbness and avoidance prevent the full activation of the whole fear structure, and also prevent habituation to its elements, protecting the stimulus-fear relationship. Since the fear structure is not fully activated, the interpretive information associated with it cannot be properly tested and altered and so the Vietnam veteran will continue to view helicopters or loud noises as being dangerous.

According to Foa, dissociation is a strategy which is aimed at reducing distressing emotions through the “shutting-down” of the affective system (Foa & Hearst-Ikeda, 1996; Foa & Riggs, 1993). Engaging in dissociation during a traumatic experience prevents full processing of semantic and emotional information along with the processing of environmental

sensory information, and this leads to the formation of fragmented, disorganised memories which may be activated as intrusions, flashbacks, or nightmares by a large variety of apparently unrelated stimuli: fragmented memories have been found to accompany PTSD (Foa & Riggs, 1993; Kilpatrick, Resnick, & Freedy, 1992), supporting this theory. The unpredictable triggering is held to account for the hyperresponsiveness in PTSD, since sufferers are always anxious about having intrusive memories triggered by unexpected environmental stimuli.

In the long term, engagement in dissociation, and the consequent failure to process information for emotional content, are said to lead to an inability to integrate and organize such information: traumatic memories therefore remain traumatic. Recovery from an acute stress reaction therefore depends upon the management of painful affect through emotional exposure rather than dissociation, and though the restructuring and organization of memories of the traumatic experience. A failure to do this, according to information processing models, results in the development of a long-term post-traumatic stress syndrome in which the activation of traumatic memories is both spontaneous and distressing. Successful recovery from PTSD following treatment is associated with more organized narrative memories (Foa et al., 1995b), a finding which supports this theory.

Foa suggests that dissociation may be mediated by biological mechanisms resembling those underlying the “freezing” behaviour in frightened animals. This idea is supported by experimental work on pain tolerance in PTSD carried out by Pitman et al., who hypothesized that emotional numbing symptoms in PTSD are mediated by endogenous opiates (Pitman, van der Kolk, Orr, & Greenberg, 1990). They showed combat movies to Vietnam veterans with and without PTSD, and then tested their pain sensitivity in response to an ice cold water test. They found that veterans with PTSD showed a decreased sensitivity to pain compared to the

non-PTSD veterans, and that this decrease was removed if naloxone, an opiate-antagonist, was administered to both groups before exposure to the combat movies. Similar results were reported by Demitrack et al., who found dissociation to be linked to dopamine, serotonin, and endogenous opioid levels in individuals with eating disorders (Demitrack et al., 1993).

These studies link in to biological models of dissociation, such as that of Glover, who proposed a theory of dissociation based on neurochemical theories of emotional experience (Glover, 1992), arguing that dissociation is explained by the effects of a psychological response to overwhelming stress mediated by an overactivation of the endogenous opiate system, following research demonstrating that endogenous opioid levels and immune responses mirror the time course of acute stress reactions (Gorbunov & Gannushkina, 1990). Biopsychological theories such as Glover's may be of importance in explaining both dissociation and PTSD since they offer an opportunity to integrate biological and psychological findings in trauma research.

Neither Foa's nor Spiegel's theories specify whether dissociation is to be seen as an actively controlled strategy or not. This is a central question when investigating the role of dissociation in post-traumatic stress reactions. Dissociation may be either a **defence mechanism** - an active strategy driven by the recognition of conflict; or a problem in **information processing** - a disruption in integration caused by intense arousal or lack of a selective focus (Atchison & McFarlane, 1994). Dissociation may also be an active strategy in some situations (e.g. when remembering traumatic information) while being an automatic response in others (e.g. when under extreme stress during the trauma itself). The investigation of this distinction is one of the aims of this thesis.

Investigating and measuring dissociation

In order to make the concept of dissociation accessible to research, investigators have categorised dissociation into several groups of experiences or symptoms (Freinkel, Koopman, & Spiegel, 1994; Marmar & Weiss, 1990; Sanders, 1986) derived from clinical observations and theoretical explanations. This has resulted in a number of different definitions which include several symptom clusters, including:

- **emotional numbing** (an inability to feel strong emotions),
- **depersonalization** (the experience of feeling detached from one's body or mental processes),
- **derealization** (an alteration or distortion of perception or experience of the external world so that it seems strange or unreal),
- **alienation from others** (feeling that one is isolated or alone, and different from others)
- **lability of mood and impulsivity**,
- **a sense of split self** (feeling that one's identity or personality is split into two or more distinct parts),
- **stupor** (feeling confused or dazed),
- **altered sense of time** (feeling that time is going by too slowly or too quickly),
- **automatism and day-dreaming**,
- **forgetfulness** (of everyday things), and
- **psychogenic amnesia** (an inability to recall some or all of the aspects of an event, particularly a stressful one, for which there is no basic physiological reason).

Different researchers have placed different emphases on these symptoms: emotional numbing is regarded as important by some (Foa & Hearst-Ikeda, 1996; Freinkel et al., 1994; Glover, 1992), while others have concentrated more on depersonalization and derealization (Cardena & Spiegel, 1993; Fonagy & Target, 1995; Marmar, Weiss, Metzler, & Delucchi, 1996; Noyes & Kletti, 1977; Putnam, 1991; Steinberg, 1991). There is no one complete, agreed list of dissociative symptoms, and the assumption is often made that all these symptoms reflect parts of a unitary process, even though theories of dissociation are at present at too early a stage for this to be concluded.

Measures of dissociation

There has been an increasing interest in the role of dissociative symptoms in a variety of psychiatric disorders, including multiple personality disorder and post-traumatic stress disorder, and also in non-clinical populations. This has resulted in the development of a number of questionnaire and interview methods to assess dissociative symptomatology, both as a state phenomenon following a trauma, and as a trait measure (i.e. a tendency to dissociate in response to stressful life events).

Current measures are diverse in both style and content, a state of affairs which reflects the complex history, the lack of a simple, agreed definition, and the many aetiological theories. There is no agreement about what constitutes a dissociative symptom, and no agreement about whether dissociation is a consciously activated strategy or an automatic response. Existing questionnaires and interviews concentrate on those areas of experience that their authors believe to be the most important:

Questionnaires which were developed to measure dissociation	Subscales
DES (Dissociative Experiences Scale) (Bernstein & Putnam, 1986) DES-T (Brief version of the DES) (Waller, Putnam, & Carlson, 1996) A-DES (adolescent version of DES) (Armstrong, Putnam, Carlson, Libero, & Smith, In press)	amnestic dissociation absorption and imaginative involvement depersonalization and derealization
PAS (Perceptual Alteration Scale) (Sanders, 1986)	Modification of affect Modification of control Modification of cognition
PDEQ-RV (Peritraumatic Dissociative Experiences Questionnaire) (Marmar & Weiss, 1990)	Psychogenic amnesia Depersonalization Derealization
CDC (Child Dissociative Checklist) (Putnam, Helmers, & Trickett, 1993)	No delineation of subscales / clusters
NCDI (North Carolina Dissociation Index) using MMPI-2 items (Mann, 1995)	No delineation of subscales / clusters

Table 1: questionnaires measuring dissociation

Many questionnaire measures are relatively new and have not been adequately standardized on large or varied populations.

The most commonly used and widely standardized measure is the **Dissociative Experiences Scale** or DES (Bernstein & Putnam, 1986; Carlson & Putnam, 1993), a 28-item measure using visual analogue scales. It was developed and validated on a US sample, consisting of 8 groups of between 10 and 39 participants: adult non-patients, late adolescent college students, alcoholics, agoraphobics, phobic anxious patients, patients with PTSD, schizophrenics, and patients with multiple personality disorder (now termed dissociative identity disorder in DSM-IV). The DES reliably distinguishes between patients with dissociative disorders and other patients (Bernstein & Putnam, 1986; Carlson, Putnam, Ross,

& et al., 1993; Ensink & van Otterloo, 1989; Frischholz, Braun, Sachs, & al., 1990; Ross, Norton, & Anderson, 1988), as well as between patients and non-patients. Patients with dissociative disorders score higher on the DES than do any other group. Within the two non-patient groups (the adults and the college students) there was a large spread of scores (although the distribution of scores was skewed towards the low end).

Test-retest reliability for the DES has ranged from .84 to .96 in studies with test-retest intervals of 4-6 weeks (Bernstein & Putnam, 1986; Frischholz et al., 1990; Pitblado & Sanders, 1991). The internal consistency was measured by Frischholz et al., (1990), who obtained a Cronbach's Alpha coefficient of .95.

Three other questionnaires which have been standardized and validated on groups which include non-patients and PTSD patients and which include questions about dissociative phenomena are listed below, together with the relevant items they contain:

Questionnaires which include dissociation items	Relevant items
IES (Impact of Events Scale) (Horowitz, Wilner, & Alvarez, 1979)	Contains items on: Derealization Numbness
PSS (PTSD Symptom Scale) (Foa, Riggs, Dancu, & Rothbaum, 1993)	Contains items on: psychogenic amnesia detachment from others difficulty concentrating numbing
SASRQ (Stanford Acute Stress Reaction Questionnaire) (Koopman, Classen, & Spiegel, 1993)	Contains items on: Numbing & detachment Awareness of surroundings Derealization Depersonalization Dissociative amnesia

Table 2: questionnaires containing dissociation items

None of these questionnaires is ideal in terms of assessing dissociative experiences amongst normal participants, patients with PTSD and other psychiatric patients. Foa et al. (Foa & Hearst-Ikeda, 1996), for instance, criticized the DES for not including any items that measure emotional numbing, a symptom that is believed to be important in PTSD. The DES also has a preponderance of items concerned with dissociative amnesia, and has been criticized for containing items of high reading difficulty appropriate only for participants with at least 12 years of schooling (Paolo, Ryan, Dunn, & van Fleet, 1993). Many of the items in the NCDI do not relate to items in the other questionnaires, since they are taken from the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) and often refer to particular psychiatric problems or symptoms (e.g. the item “Bad words, often terrible words, come into my mind and I cannot get rid of them”). Some questionnaires are only intended for use with particular populations: for instance many questions in the PAS are aimed at patients with eating disorders and are liable to measure something other than dissociation when used with a different clinical or non-clinical group, while the CDC and the A-DES are intended to be used with children only. The PSS includes only a very few items that measure dissociation, while the rest of the items are concerned with other PTSD symptoms, as is the case with the SASRQ and IES.

There is therefore a need for the development of a comprehensive, simple measure of dissociation appropriate for use in a wide range of subject and patient groups.

Aim 1: Questionnaire Study (Chapter 2)

To develop a single, simple, reliable and valid measure of trait dissociation, by combining into a large item pool all the non-redundant items from the above mentioned questionnaires, along with new items developed from the DSM-IV criteria for dissociative disorders and dissociative symptoms in PTSD.

A secondary aim is to explore the factor structure of dissociation as measured by the available items, and thereby to assess the usefulness of dissociation as a single, unitary concept as opposed to a combination of various sub-factors.

Investigating dissociation experimentally

The validation of models of PTSD that link dissociation to later symptoms depends upon the empirical testing of the aetiological role of dissociation following stressful events. The evidence is at present limited: some of the major studies which have attempted to link dissociation to PTSD are listed below.

Studies linking dissociation and PTSD:

The simplest method of linking dissociation to PTSD is to demonstrate that levels of state dissociation are higher amongst traumatized individuals than amongst non-traumatized individuals. Putnam et al. demonstrated this in a comparison of 54 sexually abused girls and 51 matched controls (Putnam, Helmers, Horowitz, & Trickett, 1995); level of state dissociation is also predicted by previous degree of experience of violence amongst a group of 39 physically abused girls (Berger et al., 1994); by experience of trauma in a group of 50

Cambodian refugees (Carlson & Rosser Hogan, 1994); and by level of experience of sexual abuse in a group of 188 adults sexually abused in childhood (Roesler & McKenzie, 1994). However, this type of study does not directly address the link between PTSD and dissociation, since it only demonstrates that traumatized individuals (who are known to be at higher risk of developing PTSD) show higher levels of dissociation.

Studies which have directly addressed the link between dissociation and PTSD fall into four main categories:

a). The first category links current state dissociation with current PTSD: for instance, Bremner and Brett found higher levels of state dissociation amongst a group of 34 Vietnam veterans with PTSD than amongst a group of 28 veterans without PTSD (Bremner & Brett, 1997); a similar finding was reported by Carlier et al. in a group of 42 police officers with PTSD compared to a group of 50 police officers who had experienced a traumatic event without developing PTSD (Carlier, Lamberts, Fouwels, & Gersons, 1996). The same relationship was reported by van der Kolk et al., who compared a group of 395 individuals exposed to trauma and seeking treatment to a control group of 125 individuals exposed to trauma but not seeking treatment (van der Kolk et al., 1996), and by Mann, who found that level of state dissociation was higher amongst gang combat veterans with PTSD than in those without PTSD in a sample of 19 participants (Mann, 1995). These studies are all correlational, however: they demonstrate a link between dissociation and PTSD, but give no indication as to whether the dissociation is a result of the PTSD or is involved in the development of PTSD.

b). The second category of study attempts to address this problem: retrospective studies allow a comparison to be made between a current measure (i.e. PTSD symptom severity or PTSD caseness) and a self-report of dissociation at the time of the trauma, the aim being to establish that peritraumatic dissociation is involved in the development of PTSD. Several

studies have indicated a link between PTSD symptoms and retrospectively reported peritraumatic dissociation in Vietnam veterans (Bremner & Brett, 1997; Bremner et al., 1992; Marmar et al., 1994; Tichenor, Marmar, Weiss, Metzler, & Ronfeldt, 1996), although all these studies took place approximately 25 years after the traumatic event and so the accuracy of the self-report measure of peritraumatic dissociation must be questioned. A study by Albach and Everaerd reported a correlation between reports of peritraumatic dissociation and PTSD development amongst a population of 97 adult female victims of incest (Albach & Everaerd, 1992), although again the time-lag between the trauma and the self-report measure is long and is additionally complicated by the fact that the trauma may have occurred in early childhood and thus suffer from a proportionally greater distortion of memory. One of the biggest problems with retrospective studies is the potential bias in self-report, which may result from the passage of time and the alteration of the memory of the trauma over that period. For this reason a correlation between a retrospective self-report of peritraumatic dissociation and the presence of PTSD symptoms does not necessarily mean that the dissociation has caused the PTSD (or indeed that dissociation is a result of PTSD).

c). The third category of study correlates trait dissociation with PTSD: if trait dissociation is stable over time and is not affected by the occurrence of trauma or the presence of PTSD then a correlation indicates that it is involved in the development of PTSD. Many studies have shown trait dissociation to be correlated with PTSD symptoms or to be higher in groups of patients with PTSD than in similar groups without PTSD, including Vietnam veterans (Hyer, Albrecht, Boudewyns, Woods, & Brandsma, 1993; Marmar et al., 1994; Tichenor et al., 1996); and in a group of 35 Holocaust survivors with PTSD compared to a group of 25 without PTSD 50 years after the trauma (Yehuda et al., 1996). The major problem with concluding about the relationship between dissociation and PTSD from this type

of study is that trait dissociation may alter following a trauma and the degree of alteration may be related to PTSD symptom severity: if this is the case then a correlation between trait dissociation and PTSD may merely reflect the fact that trait dissociation is increased by the presence of PTSD, rather than that trait dissociation is involved in causing PTSD.

d). The fourth category of study, the prospective study, is rare, for obvious practical reasons. Measuring trait or state dissociation either before a traumatic event or in the first few hours or days after a trauma and then following participants up over a lengthy period afterwards is more difficult in practical terms than studying patients who are already suffering from chronic PTSD. One such prospective study was carried out by Shalev et al., who interviewed a series of 51 individuals involved in a variety of traumatic events who attended a general hospital one week after the trauma and then again six months after the trauma (Shalev, Peri, Canetti, & Schreiber, 1996b). They found that peritraumatic dissociation was predictive of later development of PTSD. A similar study was carried out by Dancu et al. with 84 female non-sexual assault victims, and found that trait dissociation measured within one month of the trauma predicted PTSD symptoms three months later (Dancu, Riggs, Hearst Ikeda, Shoyer, & Foa, 1996; Riggs et al., 1991). However, in both of these studies sufficient time had elapsed following the trauma that dissociative activity might well have changed following the presence or absence of dissociative and other PTSD symptoms.

Because all these four categories of study are correlational rather than experimental in nature, it is very difficult for them to demonstrate that dissociation in some way causes or exacerbates other post-traumatic symptoms rather than simply accompanying them.

If dissociation is a strategy that can be consciously activated, then the relationship between dissociation and PTSD could be investigated through an experimental manipulation of the use of dissociative strategies. This would require the comparison of a group of

participants who intentionally engage in dissociation either during a traumatic event or afterwards when experiencing distressing intrusions with a group who do not consciously dissociate. The group instructed to dissociate would be expected to experience more of these symptoms. In the short term they would be predicted to experience less distress than a control group, while in the long term it would be predicted that they would experience more distress and more intrusions about the original distressing stimulus.

Aim 2: Experimental Studies (Chapters 3 and 4)

To investigate experimentally the role of dissociation in post-traumatic symptomatology using a distressing set of stimuli

The role of dissociation in traumatized individuals

Experimental and questionnaire studies in non-clinical populations suffer from one obvious problem in that they can only investigate mildly distressing trauma. It is therefore necessary to look beyond experimental analogues and study people who have suffered traumatic life events. This point has been emphasized by van der Kolk et al. (van der Kolk & Fisler, 1995), who argue that experimental studies which use mildly stressful stimuli may provide qualitatively different results to studies which examine extremely traumatic, life-threatening stimuli, and that many post-traumatic stress reactions will only occur when the stressor is severe.

However, most existing clinical studies of post-traumatic stress reactions are limited by another type of problem. They tend to be either retrospective, using patient groups who have suffered from PTSD for many years, or to follow a prospective design that only begins a week or more after the traumatic event, and are therefore liable to many biases and inaccuracies, particularly in assessing the psychological state in the crucial period before and immediately after the traumatic event. Chapters 6 and 7 present data from prospective studies of trauma victims, which minimize this difficulty by following patients from immediately after the trauma to the time at which post-traumatic stress symptoms can be regarded as chronic.

It is predicted that evidence of dissociation during the trauma itself, or during the period following the trauma, will predict a greater number of other post-traumatic symptoms, such as distress, intrusions, hyperarousal, and avoidance. It is also predicted that dissociation will be linked to more fragmented and disorganized memories of the traumatic event (Foa &

Hearst-Ikeda, 1996; Foa et al., 1989).

Aim 3: Clinical Studies

To examine prospectively the effects of dissociation upon post-traumatic reactions in a clinical population, using individuals recently involved in a road traffic accident

Conclusion

The current operational and theoretical concept of post-traumatic stress disorder has arisen out of a long and complex history of investigation. Although the syndrome has been studied for many decades, the factors which cause and maintain post-traumatic psychological reactions are still unclear. One proposed factor (or group of factors) is dissociation, which, despite its chequered history and the lack of an agreed definition, seems predictive of chronic pathological reactions to trauma. This thesis seeks to examine the relationship between dissociation and post-traumatic reactions by:

- defining and measuring dissociation through the development of a questionnaire (chapter 2)
- investigating the relationship between dissociation and post-traumatic symptoms in a controlled experimental setting (chapters 3 and 4)
- observing the relationship between dissociation and other PTSD symptoms in prospective clinical studies and examining its role as a predictive factor of medium term outcome alongside other factors (chapters 5, 6, and 7).

CHAPTER 2:

Trait Dissociation Questionnaire

Development

Introduction

The aim of the work described in this chapter was to formulate a single, reliable and valid measure of trait dissociation based on current concepts of the nature and components of dissociation, using a large item pool made up of items taken from the questionnaires described in Chapter 1, along with new items based on the DSM-IV criteria for dissociative disorders and dissociative symptoms in PTSD. The addition of new items ensured that there were several items representing each of the postulated types of dissociative symptom.

A secondary aim was to explore the factor structure of dissociation, and thereby to explore the value of dissociation as a unitary concept and of its constituent subfactors. This is important since it may be the case that some factors are linked to PTSD development while other factors may be unrelated to the development of PTSD but instead related to the development of other disorders, such as dissociative identity disorder.

The *reliability* of a trait measure can be established through test-retest reliability and measures of internal consistency. The *validity* of a trait measure is more difficult to determine. However, it has been reported that certain dissociative experiences (such as emotional numbing, alienation from others and depersonalisation) are more common following traumatic life events (Riggs, Dancu, Gershuny, Greenberg, & Foa, 1992; Spiegel & Cardena, 1991), especially violent events such as rape (Coons, Bowman, Pellow, & Schneider, 1989; Dancu, Riggs, Hearst Ikeda, Shoyer, & Foa, 1996; Jeffrey & Jeffrey, 1991), and so it is expected that individuals reporting past incidences of trauma would score more highly on these aspects of a trait dissociation questionnaire than individuals with no reported history of trauma. It is also predicted that questionnaire scores will be higher in those who have taken psychoactive drugs such as marijuana, general anaesthetics and barbiturates (Good, 1989), since drug taking has been linked to transitory dissociative states.

This chapter is in two parts: the first describes the development of the trait dissociation questionnaire from the item pool, while the second describes the cross-validation of the questionnaire, as well as tests of validity. The tests of validity include estimates of predictive validity based on data gathered for the study reported in Chapter 6 from patients admitted to hospital following a road traffic accident.

In addition to the development of the questionnaire in this chapter, the testing and use of a shortened version is reported in Chapter 7.

The aims of this chapter are as follows:

- Compile a large item pool from existing questionnaires together with additional items from descriptions of dissociation to ensure adequate representation of all possible aspects of dissociation
- Test the reliability and validity of this item pool
- Factor analyze the item pool to investigate the factor structure
- Create from the item pool a shorter questionnaire suitable for use in PTSD research
- Perform a cross-validation with a new participant sample to confirm the reliability of the questionnaire, and to confirm the original factor structure
- Test the validity of the questionnaire
- Determine whether dissociation is best considered as a unitary concept or as a number of distinct phenomena.

Part 1: Development of the Trait Dissociation Questionnaire

Method

Participants:

Participants were mainly university students in Oxford, who were recruited by way of posters and flyers. Approximately 1000 questionnaires were sent out, resulting in 211 returned questionnaires (121 men, 87 women, and 3 participants who did not indicate their gender). The mean age of participants was 21.5 years (range 18 to 32 years, s.d. 3.8 years). Following Baggaley (Baggaley, 1983), the sample size needed for factor analysis was determined to be 208 (assuming a mean inter-item correlation of 0.3).

Procedure:

Participants were sent a questionnaire containing the 101 items from the pool (appendix 1), and a personal details questionnaire (appendix 2). In order to establish the test-retest reliability of the items, those participants who provided their names and addresses were approached again after approximately two months and asked to fill out the 101 item questionnaire again.

Measures:

The **item pool** (appendix 1) consisted of 101 statements, and participants were asked to indicate on a 6-point scale how often or how much the statement applied to themselves. Most of these items were taken from existing questionnaires measuring dissociation (and the questionnaire format was taken from the PSS and DES). Other items were added so that each of the components of dissociation was represented adequately with several items, as listed below (some items were considered to represent more than one component):

Phenomenon	Items corresponding to phenomenon
emotional numbing	1,4,14,15,30,32,33,35,54,55
depersonalization	4,22,26,39,42,44,45,74,86,89,95
derealization	2,24,36,37,47,49,70,92,93
alienation from others	8,9,19,25,31,34,38,72,77
lability of mood and impulsivity	3,13,17,20,21,27,43,56,64,67,76,84,90
sense of split self	5,6,12,18,22,40,41,46,48,50,53,63,71,81,82,84,85,97,100,101
stupor / confusion	11,28,29,37,52,65,66,88
altered sense of time	23,73,78,80,94,99
automatism / day-dreaming	57,58,59,60,62,91,98,99
forgetfulness	7,10,12,16,61,63,79,91
amnesia for important life events	68,69,75,83,87,96,101

Table 1: Types of dissociative phenomena

The **personal details questionnaire** (appendix 2) asked for age, sex, previous experience of trauma, and past or present recreational drug use. The types of trauma and drug use asked about are given in the table below:

Traumatic events	Psychoactive drugs
Road traffic accident	Alcohol
Adult physical assault	Marijuana / Cannabis
Adult sexual assault other than rape	Cocaine
Rape	Heroin
Other crime	Amphetamines (Speed)
Childhood physical abuse	PCP (Angel Dust, Tranq)
Childhood sexual abuse	Ecstasy (MDMA, E)
Natural disaster	LSD (Acid)
Other	Tranquillizers (e.g. Valium)
	General anaesthetics (e.g. nitrous oxide)
	Other drugs

Calculating scores from questionnaires:

Item pool:

Responses to each item are on a six-point scale from 0 (“Never”) to 5 (“Always”) and are scored 0 to 5. To produce a total score item scores are added together.

Personal details questionnaire

Participants were asked to say if they had experienced each type of event, how serious or distressing they rated it on a scale from 0 (not distressing or serious) to 5 (extremely distressing/serious), how many times the event had occurred, and the age when the event occurred.

A trauma score for each type of trauma was calculated by multiplying rated seriousness by the number of times that event occurred. A **total trauma score** was calculated by summing the scores for each type of trauma.

For psychoactive drug use, participants were asked to rate whether they had ever

taken a drug, how much they had taken, and how often they took it. A drug use score for each drug was calculated by working out the weekly intake in units of the drug. Units were defined as one unit of alcohol (half a pint of beer or one glass of wine), one joint / cigarette, one pill, or one administration (e.g. one shot of heroin or one glue-sniffing session). Medical administrations of anaesthetics were not included in drug use scores. A **total drug use score** was calculated by summing all of the individual drug use scores except for alcohol: the reason for the exclusion of alcohol was that it was used almost universally and quite often in large weekly quantities, which tended to obscure the effect on the total score of any other drug use.

Results

Because many variables were not normally distributed, the correlations reported are all non-parametric Spearman rank correlations. Where appropriate, non-parametric versions of tests are used (e.g. the Mann-Whitney U-test in place of the independent samples t-test).

211 completed 101-item questionnaires were analysed. The mean total score on the item pool (out of a possible range of 0 to 505) was 106.4 (s.d. 52.6). The distribution of scores was skewed to the low end and significantly different from a normal distribution (Kolgorov-Smirnov Goodness of Fit test, $Z=1.49$, $p<.023$; skewness 1.13, s.e. skewness .17, kurtosis 2.03, s.e. kurtosis .33). This distribution can be seen in the figure below:

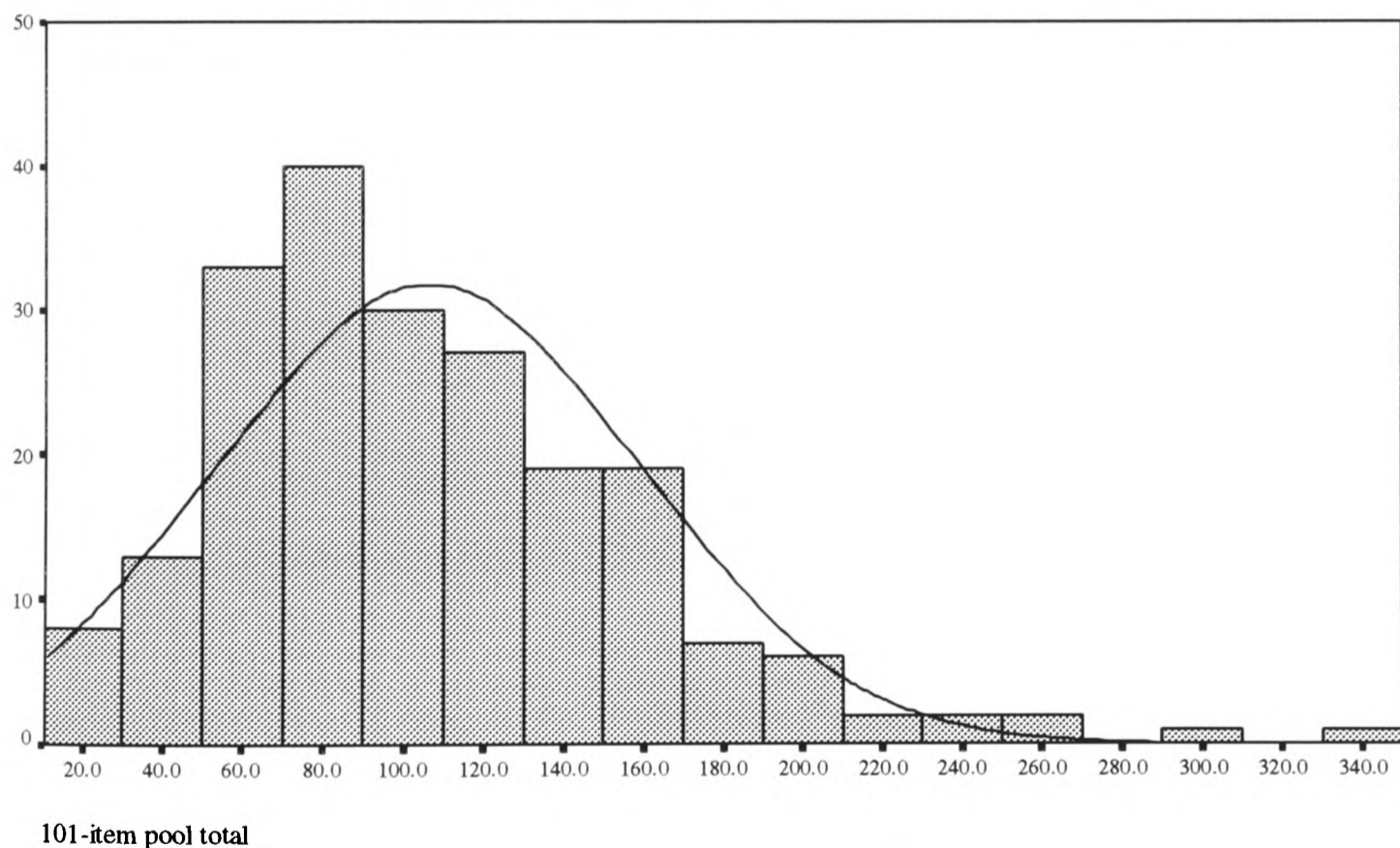


Figure 1: Distribution of total scores on the 101-item pool with normal curve superimposed

The mean inter-item correlation, predicted to be approximately 0.3, was 0.27 (range -.13 to 0.80).

Gender and Age

There were no significant sex differences (mean total score for men 107.3 (s.d. 55.0), mean total score for women 105.3 (s.d. 49.6). Mann-Whitney U-test, $Z=0.133$, $p<.894$).

There was no significant correlation between age and total score ($r=-.11$, $n=207$, $p<.108$), although the age range of the sample is very restricted.

- Questionnaire scores are not significantly affected by gender or age

Factor analysis

Analysis of the factor structure of the 101-item pool (with $n=210$) was carried out using a variety of methods (varimax, oblimin) and a varying numbers of factors, from 3 to 11.

A 7-factor varimax solution was chosen on the basis of simplicity of structure, meaningfulness of factors, and adequate number of items loading on each factor.

From this solution, 38 items were chosen to construct a 38-item questionnaire. These 38 items were chosen on the basis of several criteria:

- significant item-total correlation
- high variance of scores on item across participants
- significant loading of item on one factor, and few significant loadings on all other factors
- short, simple items with high face validity (as evidenced in piloting work with normal individuals and RTA patients)

A scree test of eigenvalues was not used, since it produced no definitive indication of useable factors.

The 7 factors that emerged, and the selected items that loaded onto these factors, are as follows:

Factor	Name	Items loading on factor
1	Detachment from others and world	25. I feel as if other people live in a different world 31. I feel distant and cut off from others around 38. I feel like I don't belong 49. I feel that other people, objects, and the world around me are not real 72. I live in a world of my own where no one can reach me 92. The world seems unreal or strange
2	Sense of split self	26. I feel as though I am standing next to myself or watching myself do something and I actually see myself as if I were looking at another person 42. I feel that I am floating beside my body, and watching it from "outside" 44. I feel that I am more than one person 46. I feel that my mind is divided 48. I feel that my personality is split into two distinct parts 50. I feel that there are two of me
3	Lability of mood and impulsivity	3. I have conflicting desires 13. I can't understand why I get so cross and grouchy 17. I do many things which I regret afterwards 21. I don't know how to stop myself from doing something 56. I find myself doing things without knowing why 76. I say things without meaning to 90. My moods can really change
4	Inattention and memory lapses	57. I find myself dressed in clothes that I don't remember putting on 58. I find myself in a place and have no idea how I got there 59. I find new things among my belongings that I do not remember buying 62. I find writings, drawings, or notes among my belongings that I must have done but cannot remember doing
5	Emotional numbing	4. I am able to ignore pain 15. I cannot get angry about the things which should annoy me 32. I feel distant from my own emotions 33. I feel emotionally numb (e.g. feel sad but can't cry, unable to have loving feelings) 54. I find it difficult to feel real emotions, such as pain, happiness, sadness, or anger 55. I find it difficult to respond to others in a sympathetic way
6	Confusion and altered time sense	52. I feel unable to think straight 65. I have difficulty concentrating 73. I look at my watch and am surprised at the time it shows 80. I underestimate or overestimate the amount of time that has passed 94. Things seem to go by faster or slower than they really do
7	Amnesia for important life events	68. I have no memory for some important events in my life (for example, a wedding or graduation) 69. I have problems remembering details of stressful events 83. If something upsetting happens, I find it difficult to remember afterwards 87. My memory of upsetting events is patchy

Table 1: Items loading on the 7 emergent factors from the item pool

The loadings of items on each factor are given fully in Appendix 3.

Reliability analysis

Internal Consistency:

Alpha coefficients for the 7 factors that make up the 38-item questionnaire and for questionnaire totals are as follows: corrected item-total correlation ranges are given as well.

Factor	1	2	3	4	5	6	7	38-item total	101-item total
Alpha	.87	.82	.79	.63	.78	.79	.82	.93	.97
item-total correlation range	.64-.71	.51-.69	.47-.61	.42-.45	.33-.64	.46-.63	.37-.82	.16-.71	.13-.74

Table 2: Reliability of the trait dissociation questionnaire: internal consistency

Inter-item correlations ranged from -0.13 to 0.80 (mean 0.27).

Test-Retest Reliability:

Test-retest reliability analysis was carried out using participants who had provided names and addresses. A retest after a 2-month period produced a Spearman correlation coefficient of 0.87 ($n=83$, $p<0.0005$) for the total score of all 101 items in the item pool. The test-retest reliability for the 38-item questionnaire is $r=.86$ ($n=83$, $p<.0005$) as shown in the figure below.

There was a significant difference in means between the test and the re-test: the original mean for the 38 items on the questionnaire ($n=72$) was 39.4 (s.d. 18.4), while the re-test mean was 37.1 (s.d. 18.0): Wilcoxon matched-pairs signed-ranks test $Z=1.98$, $p<.048$.

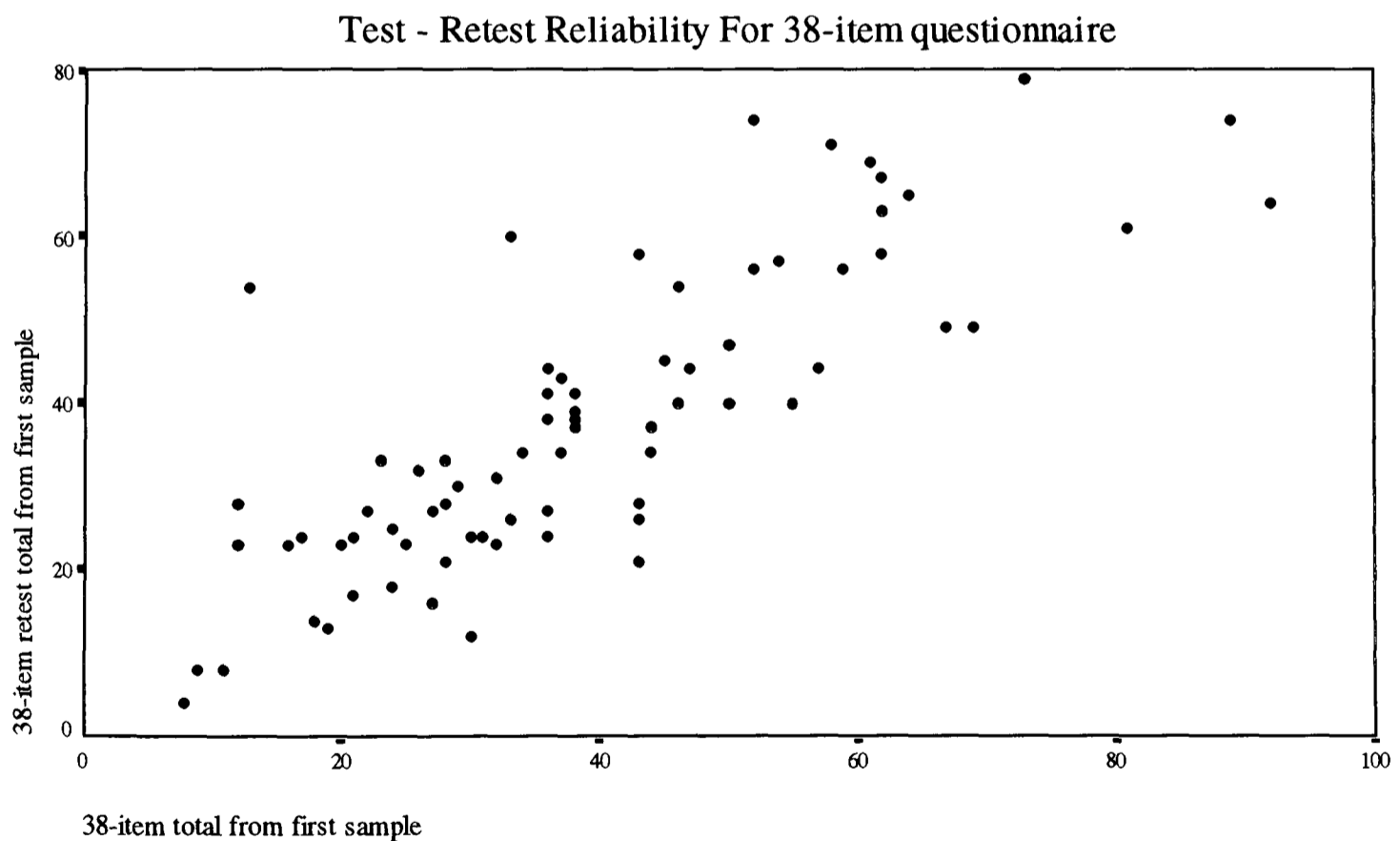


Figure 2: test-retest reliability scatter graph for scores on the 38-item questionnaire

The test-retest reliability coefficients for the individual factors are detailed below (all are significant at $p < .0005$):

Factor	Detachment	Sense of split self	Lability of mood and impulsivity	Memory lapses	Emotional numbing	Confusion and altered time sense	Amnesia for important life events
r=	.79	.86	.75	.48	.79	.66	.62
n=	78	78	80	82	80	83	82

Table 3: test-retest reliability coefficients for individual factors from the questionnaire

Of the seven factors, all have relatively high test-retest reliability, except the memory lapse factor.

- The Trait Dissociation Questionnaire has good internal consistency and test-retest reliability
- Of the seven factors identified, all but the memory lapse factor have good internal consistency and test-retest reliability

Part 2: Cross-validation of the questionnaire

Method:

Participants:

Participants were recruited as in part 1, with no overlap in the participant populations. 260 individuals filled in the questionnaire, and of these 104 were female and 102 male (54 participants did not indicate their gender). The mean age of participants was 20.7 years (s.d. 2.44 years, range 17 to 32).

Procedure:

Participants were given the Trait Dissociation Questionnaire (TDQ, appendix 4) and the personal details questionnaire, both of which are described in part 1.

Results

240 complete questionnaires were analysable. The mean score (out of a possible range of 0 to 190) was 46.5 (s.d. 19.8, range 4 to 111). The distribution was not significantly different from normal (Kolgorov-Smirnov goodness of fit test $Z=0.91$, $p<.382$), although it is significantly skewed to the lower end of the scale (skewness .58, s.e. skewness .16; kurtosis .58, s.e. kurtosis .31) as figure 1 shows:

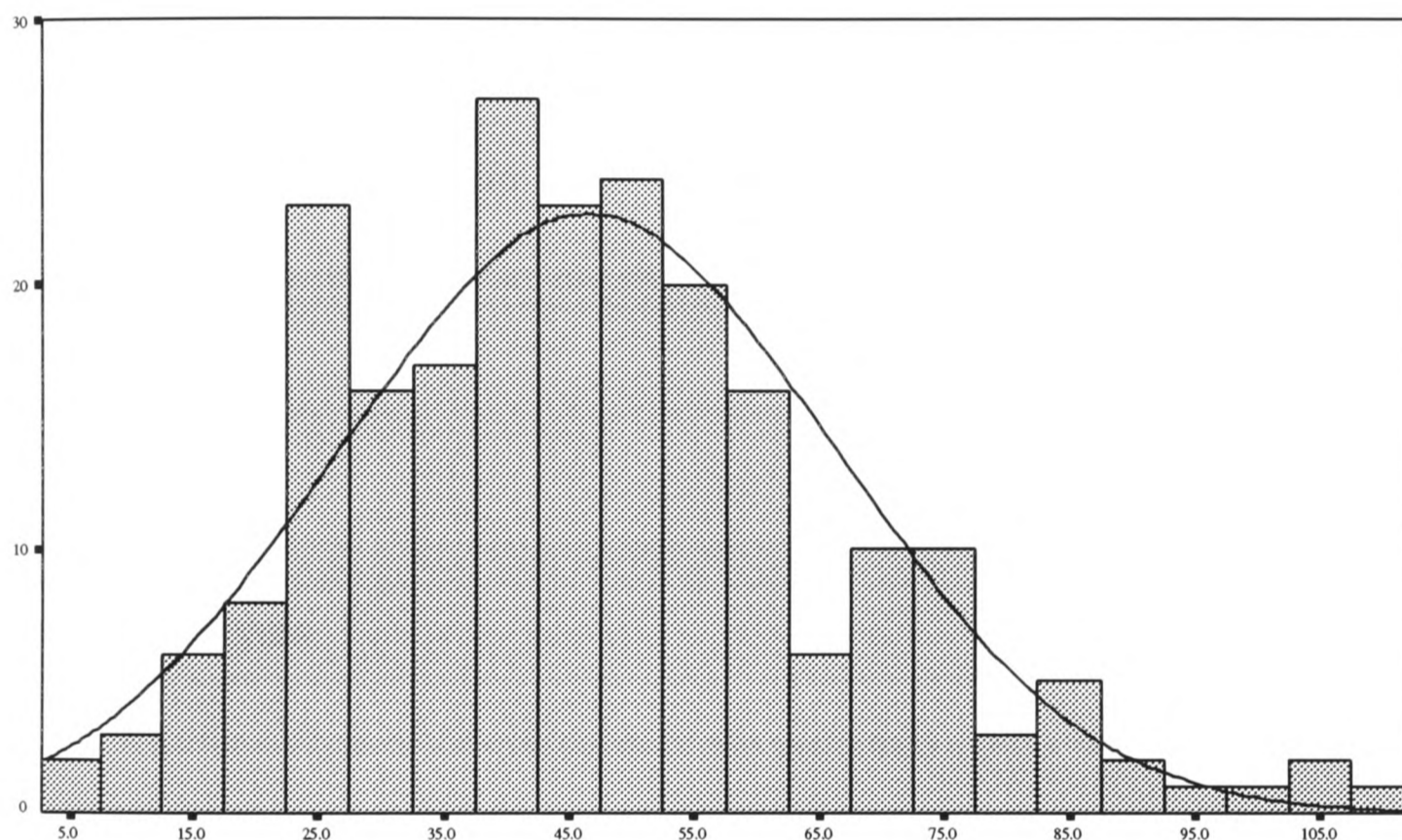


Figure 3: Distribution of total scores on the trait dissociation questionnaire with normal curve superimposed

The mean of 46.5 compares to one of 40.7 (s.d. 20.1, $n=199$) for the same 38 items from the 101-item pool sample in part 1. This difference is significant (Mann-Whitney U-test $Z=3.43$, $p<.0006$).

Gender and Age

There was no significant difference in score between male and female participants (male mean 43.9 (s.d. 17.5), female mean 46.9 (s.d. 21.2). independent samples t-test $t(176)=0.91$, $p<0.366$). There was no significant correlation between questionnaire score and age ($r=-.12$, $n=168$, $p<.112$), although the correlation was in the correct direction and the lack of significance may be due to the restricted age range of the sample.

- The 38-item questionnaire used in this sample has a similar distribution to the same items used in part 1
- Questionnaire scores are not significantly affected by gender or age

Factor analysis

A factor analysis of the questionnaire was performed using a 7-factor varimax rotation (the factor loadings of the 38 items can be seen in appendix 5). A cross-validation analysis was performed following Schneewind & Cattell's method of calculation (Schneewind & Cattell, 1970), comparing this solution to that obtained in part 1. This analysis demonstrates good fit for all 7 factors ($R_c>0.91$; see Appendix 6 for full details).

The table below lists the intercorrelations between the factors in this sample (n=238), and below them for comparison the intercorrelations for the clinical sample (n=27), using data gathered for Chapter 6. All correlations in the student sample are significant at $p < .0005$; those correlations in the patient sample significant at $p < .05$ are underlined:

Correlation	2	3	4	5	6	7
1. Detachment from others and world	.59 <u>.48</u>	.51 <u>.54</u>	.40 .25	.42 <u>.52</u>	.46 .37	.40 <u>.39</u>
2. Sense of split self		.51 <u>.65</u>	.40 .30	.29 .30	.39 <u>.63</u>	.30 .34
3. Lability of mood and impulsivity			.41 <u>.49</u>	.26 <u>.65</u>	.59 <u>.88</u>	.49 <u>.39</u>
4. Inattention and memory lapses				.32 .32	.49 <u>.46</u>	.38 <u>.55</u>
5. Emotional numbing					.30 <u>.48</u>	.23 .35
6. Confusion and altered time sense						.50 <u>.51</u>
7. Amnesia for important life events						

Table 4: Intercorrelations of questionnaire factors

- Seven factors can be reliably extracted from the Trait Dissociation Questionnaire

Reliability analysis

Internal Consistency:

Alpha coefficients for the 7 factors and the questionnaire totals are as follows:

corrected item-total correlation ranges are given as well.

Factor	1	2	3	4	5	6	7	38-item total
Alpha	.86	.78	.79	.71	.71	.76	.82	.92
item-total correlation range	.56-.71	.46-.69	.43-.58	.48-.57	.30-.58	.41-.65	.38-.77	.16-.70

Table 5: Reliability of the trait dissociation questionnaire: internal consistency

- The Trait Dissociation Questionnaire has good internal consistency

Validity

In order to assess *concurrent validity*, tests were carried out jointly on participants from the part 1 sample as well as the part 2 sample. Scores on the trait dissociation questionnaire were correlated with measures of drug use and trauma involvement, taken from the personal details questionnaire.

To assess *predictive validity*, tests were carried out using data gathered for the clinical study reported in Chapter 6. Scores on the trait dissociation questionnaire were compared for patients who developed PTSD and those who did not.

The three tests of validity reported are as follows:

- correlation with trauma involvement
- correlation with drug use
- differences in questionnaire score between patients with and without PTSD

1. Trauma Involvement

The mean total trauma score was 10.8 (s.d. 32.7, range 0 to 320). There was a significant sex difference in this score (mean male score 7.0 (s.d. 19.3); mean female score 15.7 (s.d. 43.8); Mann-Whitney U-test $Z=2.65$, $p<.008$). Therefore in the validity analysis sex was partialled out as a variable (the correlations for men and women separately are not presented, but show a pattern consistent with each other and the table below). Correlations significant at $p<.05$ are underlined.

Variable	correlation	n	p<
38-item total	.10	355	.051
1. Detachment from others and world	<u>.11</u>	<u>373</u>	<u>.037</u>
2. Sense of split self	.09	373	.089
3. Lability of mood and impulsivity	.07	372	.159
4. Memory lapses	<u>.14</u>	<u>374</u>	<u>.006</u>
5. Emotional numbing	<u>.14</u>	<u>373</u>	<u>.006</u>
6. Confusion and altered time sense	-.07	378	.201
7. Amnesia for important life events	<u>.14</u>	<u>373</u>	<u>.009</u>

Table 6: Correlations between trauma score and trait dissociation questionnaire factors.

It can be seen in the table that some, but not all, of the factors correlate significantly with the previous involvement in trauma.

2. Drug Use

The mean total drug score was 0.39 (s.d. 1.19, range 0 to 13.6 (in units of drug taken per week)), with no significant sex difference (male mean=0.40 (s.d. 0.9); female mean=0.38 (1.5); Mann-Whitney U-test $Z=0.88$, $p<.369$).

There was a significant correlation between drug taking and questionnaire score, as the table below shows. Correlations significant at $p<.05$ are underlined.

Variable	r=	n=	sig. p<
38-item total	.18	210	<u>.008</u>
1. Detachment from others and world	.21	217	<u>.002</u>
2. Sense of split self	.13	218	.056
3. Lability of mood and impulsivity	.17	217	<u>.014</u>
4. Memory lapses	.17	220	<u>.011</u>
5. Emotional numbing	.12	218	.072
6. Confusion and altered time sense	.09	222	.174
7. Amnesia for important life events	.12	220	.066

Table 7: Correlations between drug-use score and trait dissociation questionnaire factors

There were significant correlations between drug use and questionnaire total, detachment from others, lability and impulsivity, and memory lapses, as well as near significant correlations with other factors.

3. Questionnaire scores for patients with and without PTSD

Data collected for the study in Chapter 6 (patients admitted to hospital following a road traffic accident) is now presented. The trait dissociation questionnaire was administered within 24 hours of the accident, and patients were followed up over the next six months. The table below shows the mean score on the questionnaire for patients with and without PTSD, at the 4 week point (the first time-point at which a DSM diagnosis of PTSD can be given), and also at 6 months:

Group	Mean (and s.d.)	t(d.f.)=	p<
4 weeks: PTSD (n=6)	48.3 (17.1)	3.34 (14)	<u>.005</u>
no PTSD (n=10)	19.2 (16.8)		
6 months: PTSD (n=4)	41.5 (7.6)	2.39(13)	<u>.033</u>
no PTSD (n=18)	27.4 (19.2)		

Table 8: TDQ scores for PTSD and non-PTSD patients

The TDQ has predictive validity in a clinical population. Because of the small numbers, no meaningful breakdown by individual factors was possible.

The mean score for all patients is 28.8 (s.d. 19.1). This is significantly lower than the mean student population score (mean for both samples 43.2 (s.d. 20.1), n=458. Mann-Whitney U-test, $Z=3.65$, $p<.0003$).

- The Trait Dissociation Questionnaire has criterion validity on the criteria used and is a valid measure of trait dissociation

Discussion

The aims were to develop a reliable and valid measure of trait dissociation which could then be used in experimental and clinical studies, and which covered all important aspects of dissociation. These were largely achieved.

A 38-item questionnaire, and the all the factors within it except for the memory lapse factor were shown to be reliable both in terms of internal consistency and test-retest reliability. Items taken from other questionnaires which were overly complex or difficult to understand were simplified and made easier to read. It is unclear why the memory lapse factor was not shown to be reliable: it could be that the experience of memory lapses, or memory for memory lapses, varies over time. It is also possible that the questions within the memory lapse factor are not strongly related to one another.

The tests of validity were limited, but nevertheless supported the validity of the questionnaire. In the subsequent chapters more data on validity will be presented. Scores on the questionnaire were significantly correlated both with previous experience of trauma, a finding that is consistent with previous studies using clinical samples (Bernstein & Putnam, 1986; Marmar & Weiss, 1990), and also with previous recreational drug use, a finding predicted following Good (1989). The questionnaire also has predictive validity: it discriminates between patients with and without chronic PTSD. This preliminary finding will be investigated further in Chapters 6 and 7.

The mean score of patients was significantly lower than that for the student population, even though it might be expected that scores would be higher because of the recent traumatic event. There are two possible reasons for this. The first is that the method of administration may have affected the results. For the two student samples the questionnaire

was self-administered, completed in private, and was completed by only about 20% of those who initially received questionnaires. Patients, on the other hand, had the questions read out to them and responses were recorded by an interviewer (because many patients had arm or hand injuries and were unable to write). More work with the questionnaire on a larger sample with a higher response rate is needed to determine true means for self- and experimenter-administered versions. A second possible explanation is that there is a real difference between the two groups which might be due to age, sex ratios, or educational level. The patients were older than the students (mean age 33 years compared to 21 years) and it is known that trait dissociation score declines with age (Bernstein & Putnam, 1986). The sex ratio is also different (in the patient sample 79% were men, while in the student population the proportion of men was 54%). However, there are no gender differences in trait dissociation score within either the patient or the student sample, so this is unlikely to be the reason. It is possible that educational level may have been responsible. Although measurements of educational level were not taken in either group, it is probable that the student group had a higher mean level than the patient group. There has been little work on the relationship between dissociation and educational level, but one study suggests they are unrelated (Ross, Joshi, & Currie, 1990). Again, in order to test this explanation more research on a larger group of patients and non-patients would be needed.

An examination of individual factors reveals that previous experience is not linked to all dissociative phenomena. Previous trauma was related to detachment from others and the world, memory lapses, emotional numbing, and amnesia for important life events. With the relatively small number of traumatized participants in the sample it is difficult to draw firm conclusions as to the relationships between individual TDQ factors and specific traumas. Further research using larger groups of individuals who have experienced a wide variety of

traumatic events would be advisable.

This study aimed to examine whether the term “dissociation” was a meaningful one, whether the many current descriptions of dissociation are consistent with one another, and whether the term “dissociation” as it is in current usage has any reliability and validity. It also aimed to establish what the relationship is between the various phenomena that have been labelled “dissociative”.

It must first be noted that a factor analysis itself is not sufficient evidence for the existence of subcomponents of a trait: particularly with a relatively homogenous group as is the group of students used in this sample a large number of factors may emerge which might not have done so in a more heterogenous population. The fact that this study contains a relatively low subject:items ratio also indicates that factor analyses must be treated cautiously: indeed, the second, confirmatory factor analysis may represent a somewhat clearer picture than the first, exploratory analysis, due to its higher subject:items ratio.

Nonetheless, the finding that only some factors are predicted by trauma and themselves predict PTSD suggest that dissociation as not a unitary entity. Different dissociative phenomena may be linked (as the significant inter-factor correlations would indicate) and result from a common underlying mechanism, but they are clearly not merely different symptoms of a unitary phenomenon. However, there is still utility in using total dissociation score as a predictor: the high internal consistency of the questionnaire and the high inter-factor correlations support this view.

Since the participant population was mainly composed of students, the links between dissociation and trauma need to be investigated with clinical samples. In particular, the questionnaire needs to be used with a group of individuals who are at increased risk of developing PTSD (i.e. who have just experienced a traumatic life event). This is carried out

in chapters 6 and 7, where the development of a shortened 10-item version of the questionnaire is also described.

This study demonstrates that existing questionnaires which purport to measure dissociative experiences (such as the DES and PAS) overlap in the kinds of experience that they label as dissociative, although each one only measures a part of the whole spectrum of phenomena that have been described by various writers as part of dissociation. This situation reflects the general state of research into dissociation: dissociation is a term that has as yet no one clear definition, and no one clear theoretical model upon which it is based, and this inevitably means that its use in experimental and clinical research is imprecise.

Conclusion

This chapter describes the development and testing of a questionnaire measuring trait dissociation (the TDQ) for use within PTSD research. It addresses some of the shortcomings of existing measures of dissociation: it is simpler to read, and reliable both in terms of internal consistency and in terms of test-retest reliability. Its validity has been partially assessed but needs further backing up from tests in a clinical population, and will be used both in experimental studies (Chapters 3 and 4) and in clinical studies (Chapters 6 and 7). Examination of this questionnaire reveals a number of components of dissociation, which may separately be useful in predicting trauma.

CHAPTER 3:

Investigating Dissociation Experimentally

Introduction

Aims:

This first experimental study investigates the relationship between dissociative experiences and PTSD symptoms. Its aims are to:

- determine whether dissociation can be actively manipulated
- investigate whether trait and state dissociation are involved in the development of post-traumatic symptoms (particularly general distress and intrusions):
 - i) immediately following exposure to a distressing experience,
 - ii) during re-exposure to the same stimulus, and
 - iii) in the six-month period after the experiment.

In this experiment the distressing stimulus is a videotape of road traffic accidents, whose content is made up from scenes comparable to those a road traffic accident victim or witness might observe.

Information-processing models of PTSD predict that dissociation (and particularly emotional numbing) during a traumatic event reduces emotional arousal, prevents proper processing of that event, and thus leads to memories of the event being more fragmented and less meaningful (Foa & Hearst-Ikeda, 1996; Foa, Steketee, & Rothbaum, 1989). Subsequent memories may be triggered by a wide range of environmental stimuli related to the traumatic event, and experienced subjectively as intrusive thoughts or images, flashbacks, and unpleasant dreams. Further dissociation during remembering the traumatic event is thought to continue to prevent processing and activation of the entire memory structure, so that there is no opportunity for habituation, and the memories therefore remain distressing and intrusive. Emotional exposure, on the other hand, where participants do not dissociate but instead allow themselves full exposure to their emotions, allows full emotional arousal and processing, so that habituation occurs and memories become less distressing and intrusive. I chose to investigate this using separate groups of participants instructed to engage in these different processing styles. I predict that:

- trait dissociation, state dissociation, and allocation to an experimental group instructed to dissociate will all result in low levels of initial distress, but later unpleasant intrusive recollections, and continuing long term distress and intrusions.
- participants who engage in emotional exposure - either as state emotional exposure, or allocation to an experimental group instructed to engage in emotional exposure, will report more initial distress but fewer long term intrusions and anxieties.

Hypotheses:

1. Participants in the dissociation group will experience less distress during the first video showing than participants in the emotional exposure group, but will experience more intrusions during the diary phase and more distress during the second video showing. At six month follow-up the dissociation group will report more intrusions and anxiety related to road traffic accidents than the exposure group.
2. State dissociation during the first video showing will predict less distress during the first showing, but more intrusions in the diary phase and more distress during the second video showing. At six month follow-up it will predict more intrusions and anxiety.
3. Emotional exposure during the first video showing will predict more distress during the first showing, but fewer intrusions in the diary phase and less distress during the second video showing. At six month follow-up it will predict fewer intrusions and less anxiety.
4. Trait dissociation will predict less distress during the first showing of the videotape but more intrusions during the diary phase and more distress at the second showing of the videotape. At six-month follow-up it will predict more intrusions and anxiety.

Method

Participants

The 56 participants were from Oxford University. The age range was from 18 to 27 (mean age 20.1, s.d. 1.8). 29 were female and 27 were male.

Overview of Procedure

The study consisted of four main sections, over six months, as listed below:

1. Participants are given an information sheet (appendix 38) before agreeing to take part in the study. Participants complete several questionnaire measures before being allocated to one of three experimental groups. They are then given the experimental instructions and shown a 10-minute videotape.
2. Participants fill in short diaries for a seven day period, recording each intrusive thought about the videotape.
3. Participants return at one week and are asked to complete further questionnaires. They then watch the same videotape of road traffic accidents again.
4. Participants are contacted six months after the second video session with a final questionnaire measure.

Instructions

All participants were given an initial set of instructions, followed by a set particular to their allocated group. The three groups consisted of the **dissociation group**, the **exposure group**, and the **neutral group**: their instructions are described below. The second set of instructions was given in an interactive fashion, with participants able to query parts or ask for elaboration, and in the dissociation condition participants were also given the opportunity to practice the strategy, led by the experimenter.

Initial Instructions:

The video you are about to watch is composed of scenes of road traffic accidents. Please attend to the whole video carefully. You will be asked about its contents afterwards, so be sure that you watch every scene. You may find the video distressing to watch. However, I must ask that you do not look away, shut your eyes, or cover your face during the showing, since this will prevent you seeing properly what is going on.

Instructions given to dissociation group:

While watching, I would like you to avoid distracting yourself from the video, but instead attend carefully to what you are watching. At the same time I would like you to try to numb yourself emotionally. You can practice this by imagining and remembering a previous time when you may have felt the same - perhaps after a serious shock, while waiting for or after hearing some bad news, or (if you have ever experienced it) when under hypnosis. Can you think of such a situation in your life? ... For example, remember what you felt like in the few moments just before you found out your A-level results or (if you have done finals) your finals grade. You may have felt emotionally empty or numb, or “dead inside” - while you were

still paying attention to what was going on around you, you may have experienced things as being less connected to you, or as being very unemotional - neither upsetting nor exciting.

This kind of feeling may be difficult to imagine beforehand, but you should find it easier with practice and when you are actually watching the video.

Try staring at a spot on the wall (a plain spot). Concentrate on this and let every other sensation go away... Do you feel somewhat detached?

Try staring into a mirror at your own face / at your own hand. After a while, do you get an odd sensation that you are not really looking at yourself but at some other person?

Try to imagine that you are outside your own body, watching yourself as if you were someone else.

Shut your eyes and relax (from toes to head). Hold your arms out in front, and during this relax all other muscles. Your arms become heavy, you cannot stop them from dropping slowly downwards onto your lap. Now imagine that you are watching yourself sitting in the chair, from outside your own body.

When you begin watching the video, just watch it normally. At some point during the video, you will be given a signal by the experimenter. At this point you should begin to do what you have been practising, and distance yourself from your emotions.

Instructions given to exposure group:

While watching, I would like you to avoid distracting yourself from the video, but instead attend carefully to what you are watching. Try to engage yourself in what is happening as much as possible. I would like you to let any emotions that you may feel while watching flow, and take their natural course. If you feel upset, for instance, do not try to cheer yourself up, but simply allow yourself to continue feeling distress. Similarly, if you feel happy or

excited, do not try to alter or stop these feelings, but allow them instead to continue.

Instructions given to neutral group:

While watching, I would like you to avoid distracting yourself from the video, but instead attend carefully to what you are watching.

Videotape Contents

The videotape used in this study is one previously used in a similar study (Ehlers & Steil, 1995) in Germany. The content of the videotape is similar to that which a victim or witness of a road traffic accident might see shortly after an accident, and the footage was taken mainly by ambulance and fire crews in Germany. The videotape shows people with physical injuries and in pain, as well as wrecked vehicles and dead bodies. It consists of 6 short scenes, totalling approximately 10 minutes, with a short gap of approximately 15 seconds between scenes. A commentary accompanies the videotape, creating a context for each scene, explaining what is going on and emphasizing the relationship of the victims with the victims' families and with the participant. This commentary and a more detailed description of the contents of each of the scenes are given in appendix 37. The commentary does not accompany the shortened version of the videotape used in the second video showing.

Measures:

The questionnaires used were as follows:

1. Trait Dissociation Questionnaire (TDQ)
2. Beck Depression Inventory (BDI)
3. State-Trait Anxiety Inventory (STAI)
4. Video questionnaire
5. Seven-day diary
6. PTSD Symptom Scale (PSS)
7. Follow-up questionnaire
8. Second video questionnaire
9. 6-month follow-up questionnaire

1. The **Trait Dissociation Questionnaire** (TDQ, Appendix 4), developed by the author, is described in Chapter 2.
2. The **Beck Depression Inventory** (BDI, (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) Appendix 7) is a standardized list of 21 sets of 4 statements about depressive cognitions, behaviours, and symptoms.
3. The **State-Trait Anxiety Inventory** (STAI, (Spielberger & Sydeman, 1994) Appendix 8) is a standardized set of two questionnaires, one to measure state anxiety, and the other to measure trait anxiety. Each questionnaire consists of 20 items.
4. The **video questionnaire** (Appendix 9), administered by the experimenter during the video itself, asks participants to rate orally how distressing they had found each particular scene (on a scale from 0 to 100). These scores are totalled to give an overall distress score (with a minimum of 0 and a maximum of 600). In addition participants are asked if they have

missed any part of the video. At the end of the video participants are asked to rate which scene they found the most distressing, and to rate on a scale from 0 (not at all) to 100 (completely) the extent to which they engaged in a list of behaviours, as described below:

Avoidance items:

I put them out of my mind
I thought of something else
I visualised something else

Dissociation items:

I felt that they were not real
I numbed my emotions
I felt unreal
I felt distant from my emotions
I felt unable to think straight
I felt as if I was somehow remote from my body
I felt that time was passing faster or slower than it really did

Emotional exposure items:

I empathized with the people I saw
I let my emotions come and go

An avoidance score was calculated by summing the ratings for the avoidance items (giving a score from 0 to 300), a state dissociation score by summing the ratings for the dissociation items (giving a score from 0 to 700), and an emotional exposure score by summing the ratings for the emotional exposure items (giving a score from 0 to 200). In addition the questionnaire asks how successfully participants were able to follow the pre-video instructions on a five-point scale, from “not at all” (0) to “extremely well” (4).

5. The **seven-day diary** (Appendix 10) consists of seven identical daily pages. Participants are asked to record any intrusions concerning the videotape as soon as possible after the intrusion, along with the time the intrusion occurred, what its content was, how distressing the intrusion was (on a scale from 0 to 100), and what if anything they did in response to the intrusion (the diary sheet asks about the same sorts of strategies or

experiences as the post-video questionnaire, but in a yes / no format rather than on a 0-100 scale). From this questionnaire the total numbers of intrusions per day are calculated, as well as the mean amount of distress per intrusion on each day (0-100), the total amount of distress per intrusion (0-700) over the 7-day period, and the amount of each type of behaviour engaged in on each day.

6. The **PTSD Symptom Scale** (PSS, (Foa, 1995) Appendix 11) is a standardized two-part questionnaire. The first part consists of seventeen questions asking about post-traumatic symptoms as given by DSM-IV, and responses are given on a 4-point scale, from “Not at all” to “Very often / More than 5 times in a week”. The total score calculated from this part may range from 0 to 51. The second part of the questionnaire consists of two questions which assess whether the symptoms endorsed have been distressing and whether they have interfered with the person’s daily life (these last two questions help to establish a diagnosis of PTSD according to DSM-IV criteria).

7. The **follow-up questionnaire** (Appendix 12), is administered at the beginning of the second videotape showing, and asks participants to rate how distressing they remember the first showing of the video as being, on a scale from 0 to 100. It also asks participants to rate whether they engaged in any of a list of behaviours during the diary phase, with the same format and items as in the video questionnaire. As in the first video questionnaires, avoidance, state dissociation and emotional exposure scores are calculated from the items.

8. The **second video questionnaire** (Appendix 13), given during the video itself, is similar to the first video questionnaire. Participants rate orally how distressing they found each particular scene (on a scale from 0 to 100). These scores are totalled to give an overall distress score (with a minimum of 0 and a maximum of 600). Participants are also asked to rate how distressing they found the second showing of the video compared to the first, on

scale from -100 (much more distressing), through 0 (equally distressing), to 100 (much less distressing). A comparison score is calculated by subtracting the second showing overall distress score from the first showing overall distress score.

9. The **6-month follow-up questionnaire** (Appendix 14) consists of questions asking about the numbers of unwanted recollections of the videotape participants have experienced (on a scale from 0 (none at all) to 4 (one a day or more)), both in the month immediately following the experiment and in the most recent month, as well as how distressing these unwanted recollections were on a scale from 0 to 100. Participants also rate whether they have worried about road safety, taken more care on the road, or changed their behaviour on the roads at all as a result of watching the videotape.

Procedure Detail:

First section:

Participants completed the Beck Depression Inventory, the State-Trait Anxiety Inventory and the Trait Dissociation Questionnaire.

Participants were then randomly allocated to one of three conditions (the dissociation group, the exposure group, or the neutral group) before being asked to watch the videotape.

During the video, the video questionnaire was administered by the experimenter.

Second section:

Participants were then given a 7-day diary to complete during the second phase of the study, and asked to record any intrusive thoughts about the videotape. Participants were told when they experienced reminders of the videotape to engage in the same strategies as they used in the first showing of the videotape.

Third Section:

After this seven-day period, participants came back for the third phase of the study, the second video session. Participants first filled out the PTSD Symptom Scale and the follow-up questionnaire, and then watched the videotape for a second time. During this showing the second video questionnaire was administered.

Fourth Section:

Six months after the second video session, participants were contacted again by post, and sent the 6-month follow-up questionnaire.

Results

The results are presented according to the major hypotheses as follows:

Part A: Comparability of groups

Part B: Group effects

Hypothesis 1: Participants in the dissociation group will experience less distress during the first video showing than participants in the emotional exposure group, but will experience more intrusions during the diary phase and more distress during the second video showing. At six month follow-up the dissociation group will experience more intrusions and anxiety than the exposure group

- i) first video showing
- ii) diary phase
- iii) second video showing
- iv) six month follow-up

Part C: Effects of behaviour in the experiment

Hypothesis 2: State dissociation during the first video showing will predict less distress during the first showing, but more intrusions in the diary phase and more distress during the second video showing. At six month follow-up it will predict more intrusions and anxiety

- i) first video showing
- ii) diary phase
- iii) second video showing
- iv) six month follow-up

Hypothesis 3: Emotional exposure during the first video showing will predict more distress during the first showing, but fewer intrusions in the diary phase and less distress during the second video showing it will predict fewer intrusions and less anxiety

- i) first video showing
- ii) diary phase
- iii) second video showing
- iv) six month follow-up

Part D: Effects of trait dissociation

Hypothesis 4: Trait dissociation will predict less distress during the first showing of the videotape but more intrusions during the diary phase and more distress during the second showing. At six month follow-up it will predict more intrusions and anxiety

- i) first video showing
- ii) diary phase
- iii) second video showing
- iv) six month follow-up

Because some variables are not normally distributed, all reported correlations are Spearman non-parametric correlations. Where appropriate, non-parametric versions of tests are used.

A. Comparability of groups:

The scores of the three experimental groups on the initial questionnaire measures are given below, with ANOVA F and p values:

Measure	Means for each group (and s.d.s):			d.f. and F value	p<
	Dissociation	Exposure	Neutral		
BDI	8.0 (6.3)	7.4 (5.8)	6.3 (4.9)	(2,53) 0.42	.660
State anxiety	44.6 (10.1)	44.0 (8.8)	42.4 (8.3)	(2,51) 0.27	.763
TDQ	37.8 (23.3)	39.1 (16.2)	40.1 (15.2)	(2,52) 0.07	.930
Trait anxiety	32.2 (6.9)	32.5 (6.0)	38.7 (10.0)	(2,52) 4.17	.021

Table 2: Scores on initial questionnaires for the three experimental groups

Because of the significant difference between the groups in terms of trait anxiety, all between-group comparisons were carried out using trait anxiety as a covariate.

Allocation of male and female participants to the groups was as follows:

Group:	Male	Female
Dissociation	8	10
Exposure	9	10
Neutral	10	9

Table 2: Sex ratios in experimental groups

There were no significant differences between the groups ($\chi^2(2 \text{ d.f.})=0.26, p<.880$)

Table 3 shows the correlations of BDI, trait anxiety, state anxiety with the dependent variables measured during the experiment:

	BDI		Trait anxiety		State Anxiety	
	r=	p<	r=	p<	r=	p<
Distress at first showing	.05	.710	-.13	.319	-.01	.927
Number of intrusions in diary phase	.15	.282	.14	.341	.22	.122
Distress at intrusions	.13	.348	.07	.598	.10	.477
Distress at second showing	.11	.420	.14	.323	.15	.309
Intrusions at 6 months	.03	.821	.20	.154	<u>.30</u>	<u>.035</u>
Distress at intrusions at 6 months	<u>.28</u>	<u>.046</u>	.12	.419	-.05	.727
Worry at 6 months	.17	.233	.21	.133	.14	.345
Taking more care	-.04	.776	-.02	.889	.01	.921
Changed behaviour	.26	.062	<u>.30</u>	<u>.028</u>	<u>.28</u>	<u>.050</u>

As the table shows, there are few significant correlations between the variables.

- The groups were comparable in terms of sex and most psychological characteristics, although they differed in trait anxiety level

B. Group effects:

Instruction Success:

There was a significant difference in the self-rated success of the experimental manipulation of strategy (dissociation group 2.12 (s.d. 1.05), exposure group 2.84 (s.d. 1.07), neutral group 3.58 (s.d. 0.51). Kruskal-Wallis One way ANOVA 2 d.f., $\chi^2=16.2$, $p<.0003$). These scores correspond to responses on the video questionnaire to the question “how well could you follow the instructions given you” ranging from “a fair amount” (a score of 2.0), to “quite well” (a score of 3.0) and “extremely well” (a score of 4.0). Thus all groups rated themselves as being able to follow the instructions adequately. A Tukey post-hoc test showed significant differences between all pairs of groups (at $p<.05$).

Rated success was not correlated with other dependent measures, either in all three groups together or in individual groups.

Behaviour in the first showing of the videotape:

The table below (table 3) indicates the mean amount of each type of behaviour in each group, with One-way ANOVA statistics (covarying for trait anxiety). Underlined figures show significant differences between groups on a particular behaviour, using a Tukey test (at $p<.05$).

Behaviour	Means for each group (and s.d.s):			d.f. and F value		p<
	Dissociation	Exposure	Neutral			
Dissociation	<u>231.3 (94.7)</u>	<u>130.1 (105.3)</u>	173.2 (79.1)	(2,55)	5.71	.006
Exposure	<u>86.3 (44.2)</u>	<u>132.4 (40.5)</u>	98.4 (46.2)	(2,55)	5.32	.008
Avoidance	47.2 (44.1)	33.7 (35.6)	33.4 (41.7)	(2,55)	0.88	.419

The dissociation group engaged in the most dissociative behaviour, the exposure

group engaged in the most emotional exposure behaviour, and there was no significant difference between the groups in terms of the amount of avoidance behaviour.

Behaviour in the diary phase:

There were significant differences between the groups in terms of self-rated behaviour in response to an intrusion, as the table below (table 4) shows (ANOVA statistics, covarying for trait anxiety). Behaviour scores were calculated by summing the number of times participants reported engaging in a behaviour in the seven-day diary. Underlined figures show significant differences between groups on a particular behaviour, using a Tukey test (at $p < .05$).

Behaviour	Means for each group (and s.d.s):			d.f.	F	p<
	Dissociation	Exposure	Neutral			
Dissociation	<u>1.68 (2.30)</u>	<u>0.23 (0.66)</u>	0.89 (1.79)	2,51	3.48	.039
Exposure	0.75 (1.77)	1.65 (2.85)	1.16 (2.83)	2,51	0.67	.518
Avoidance	4.56 (6.47)	3.47 (4.39)	9.32 (11.87)	2,51	2.11	.133

- All groups were able to follow the instructions satisfactorily during the first showing of the videotape. The neutral group found the instructions easiest, and the dissociation group found them the hardest.
- The groups differed significantly in behaviour during the first video showing and during the diary phase

Hypothesis 1:

Participants in the dissociation group will experience less distress during the first video showing than participants in the emotional exposure group, but will experience more intrusions during the diary phase and more distress during the second video showing. At six month follow-up the dissociation group will report more intrusions and anxiety related to road traffic accidents than the exposure group.

i. First video showing

There were no significant differences between the groups in terms of distress during the first showing although the difference was in the direction expected (overall distress score for the dissociation group 275.9 (s.d. 113.9), exposure group 286.2 (s.d. 103.9), neutral group 238.5 (s.d. 84.4). ANOVA, covarying for trait anxiety, $F(2,55)=1.13$, $p<.330$)).

ii. Diary phase

There were no significant differences between the three groups in terms of number of intrusions or distress at intrusions, as the table below (table 5) shows (with ANOVA F and p values, covarying for trait anxiety):

	Means for each group (and s.d.s):			d.f. and F value		p<
	Dissociation	Exposure	Neutral			
Number of intrusions	8.07 (8.33)	8.12 (6.61)	10.05 (8.66)	2,49	0.07	.930
Distress at intrusions	110.0 (84.1)	125.2 (110.5)	93.2 (94.9)	2,49	0.62	.541

However, there were significant differences between the groups in the distribution of the intrusions across the seven days (Repeated measures ANOVA, covarying for trait anxiety: Group effect $F(2,47)=0.05$, $p<.949$. Day effect $F(6,288)=33.47$, $p<.0005$. Group by day effect $F(12,288)=1.93$, $p<.031$).

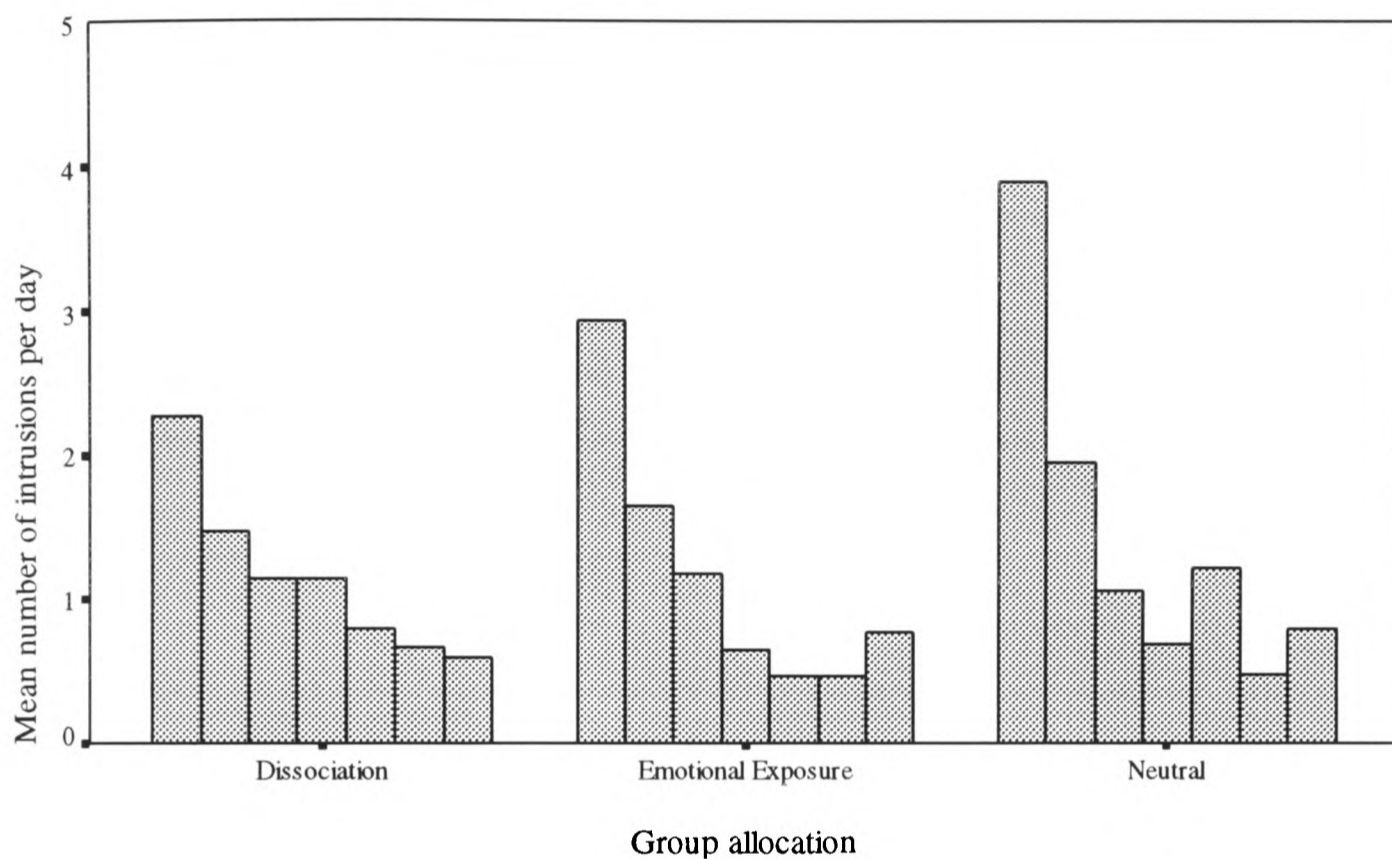


Figure 1: Intrusions over the seven day diary period by group

This pattern is consistent with the hypothesis that the dissociation group will habituate more slowly to any intrusions that they may have, as information processing models of PTSD would predict, due to incomplete processing of the emotional content of the intrusions.

iii. Second video showing

As the table below (table 6) shows, there were no significant differences between the groups in terms of distress during the second showing of the videotape or in terms of how distressing they found the second showing compared to the first. The difference between the groups in distress ratings at the second showing was, however, in the direction expected. ANOVA F and p values are shown, covarying for trait anxiety.

	Means for each group (and s.d.s):			d.f. and F value		p<
	Dissociation	Exposure	Neutral			
Distress at video	264.2 (114.6)	258.9 (115.1)	244.2 (87.5)	2,51	0.36	.701
Comparison distress	-13.0 (91.2)	-31.0 (89.2)	0.7 (62.4)	2,51	0.38	.689

iv. Six month follow-up:

The table below (table 7) shows differences between the groups in terms of intrusions and anxiety. The statistics reported are ANOVA F and p values, covarying for trait anxiety.

	Means for each group (and s.d.s):			d.f.	F	p<
	Dissociation	Exposure	Neutral			
Intrusions	0.35 (0.61)	0.16 (0.37)	0.47 (0.51)	2,50	1.51	.231
Distress at intrusions	25.5 (21.3)	19.2 (18.5)	22.4 (17.1)	2,50	0.54	.587
Worry	19.1 (28.1)	4.8 (5.3)	18.8 (19.6)	2,50	2.81	.070
Taking more care	22.1 (28.1)	10.4 (13.8)	21.2 (19.6)	2,50	1.62	.208
Avoidant behaviour	9.12 (20.8)	3.2 (9.4)	6.5 (19.3)	2,50	1.27	.290

At six months, there were no significant effects of group allocation on number of intrusions.

Anxiety was measured by asking about worry about road travel, about being more careful when on roads, and about changing road behaviour by avoiding certain road conditions or situations. There were no significant effects of group on worrying, being more careful, or changing behaviour, although all observed differences were in the predicted direction.

- **Hypothesis 1** is not supported: the groups do not differ significantly in terms of distress ratings or number of intrusions, although there is a significant difference between the groups in the pattern of intrusions during the diary phase

C. Effects of behaviour in the experiment:

Hypothesis 2:

State dissociation during the first video showing will predict less distress during the first showing, but more intrusions in the diary phase and more distress during the second video showing. At six months it will predict more intrusions and anxiety.

i., ii., and iii. First video showing, diary phase, and second video showing

The table below (table 8) shows the correlations between **dissociation during the first showing** and other dependent measures :

Dependent measure:	Correlation and p value	
distress at first showing	r=.02, n=56	p<.882
number of intrusions	r=.21, n=51	p<.142
distress at intrusions	r=.03, n=52	p<.825
distress at second showing	r=.22, n=52	p<.110
difference in distress ratings	r=.22, n=52	p<.121

The important correlation in testing the relationship between state dissociation and distress is the last one in the table: this shows as predicted a positive relationship between state dissociation and a rise in distress from the first to the second video showing. This correlation is, however, non-significant. The correlation between state dissociation and number of intrusions is positive as predicted, but again is non-significant.

iv. Six month follow-up

Table 10 shows the correlations between dissociative behaviour during the experiment and dependent measures at six-month follow-up:

	Intrusions	Worry about road travel	Taking more care	Avoiding situations
Dissociation at first showing	$r=.38$ $n=53$ $p<.006$	$r=.32$ $n=53$ $p<.018$	$r=.12$ $n=53$ $p<.381$	$r=.10$ $n=53$ $p<.487$

These results must be interpreted cautiously, however, since trait anxiety correlates with dissociation and may itself be affecting symptoms at 6 months.

- There is some support for **Hypothesis 2**. State dissociation does not significantly correlate with distress or number of intrusions in the diary phase, but it does predict the number of intrusions at six months and worry about road travel.

Hypothesis 3:

Emotional exposure during the first video showing will predict more distress during the first showing, but fewer intrusions in the diary phase and less distress during the second video showing. At six month follow-up it will predict fewer intrusions and less anxiety.

i., ii., and iii. First video showing, diary phase, and second video showing

Table 9 shows the correlations of emotional exposure with other dependent measures:

Dependent measure	Correlation and p value	
Distress at first showing	<u>$r=.46, n=56$</u>	<u>$p<.0005$</u>
Number of intrusions	$r=.14, n=51$	$p<.334$
Distress at intrusions	$r=.21, n=52$	$p<.134$
Distress at second showing	<u>$r=.45, n=52$</u>	<u>$p<.001$</u>
Difference in distress ratings	$r=-.09, n=52$	$p<.532$

The important correlation in testing the relationship between emotional exposure and distress is the last one in the table: this shows as predicted a relationship between state dissociation and a drop in distress from the first to the second video showing. This correlation is, however, non-significant, and there is a strong positive correlation between emotional exposure in the first showing and distress in the second showing, which is not predicted. The correlation between emotional exposure and number of intrusions is non-significant.

iv. Six month follow-up

Table 11 shows the correlations between emotional exposure during the experiment and dependent measures at six-month follow-up:

	Intrusions	Worry about road travel	Taking more care	Avoiding situations
Emotional exposure during first showing	r=.02 n=53 p<.773	r=-.08 n=53 p<.574	r=.20 n=53 p<.153	r=-.02 n=53 p<.893

- There is some support for **Hypothesis 3**. Emotional exposure is positively correlated with distress at the first showing of the videotape. However, it is also positively correlated with distress at the second showing, which is the opposite finding to that predicted by Hypothesis 3. Emotional exposure during the experiment is not correlated with the number of intrusions or anxiety at six months

D. Effects of trait dissociation:

Trait dissociation was not significantly correlated with dissociative behaviour at the first showing ($r=.16$, $n=55$, $p<.238$), although within the dissociation group the correlation was higher and neared significance ($r=.41$, $n=18$, $p<.090$).

Trait dissociation was not significantly correlated with dissociative behaviour during the diary phase ($r=.20$, $n=51$, $p<.154$) although within the dissociation group the correlation was higher ($r=.33$, $n=16$, $p<.219$).

Hypothesis 4:

Trait dissociation will predict less distress during the first showing of the videotape but more intrusions during the diary phase and more distress at the second showing of the videotape. At six month follow-up it will predict more intrusions and anxiety.

i. First video showing

TDQ score was not significantly correlated with distress at the first showing ($r=.05$, $n=56$, $p<.721$).

ii. Diary phase

The total on the trait dissociation questionnaire did not predict the number of intrusions in the diary phase, although individual TDQ factors did, as table 12 shows:

Factor:	Correlation
TDQ total	$r=.25, n=50, p<.082$
Detachment from others and world	$r=.18, n=50, p<.211$
Sense of split self	$r=.29, n=51, p<.038$
Lability of mood and impulsivity	$r=.21, n=50, p<.142$
Inattention and memory lapses	$r=.15, n=51, p<.292$
Emotional numbing	$r=.36, n=51, p<.010$
Confusion and altered time sense	$r=.16, n=51, p<.263$
Amnesia for important life events	$r=.02, n=51, p<.914$

The link between the emotional numbing factor and intrusions is as predicted by the information processing models of PTSD.

However, because trait dissociation was found to be significantly correlated with scores on the BDI ($r=.46, n=58, p<.0005$), and Spielberger state anxiety ($r=.51, n=58, p<.0005$), the above analysis was repeated, partialling out the effects of these variables. The correlation of sense of split self dropped below significance ($r=.13, n=45, p<.369$), although the correlation of emotional numbing remained significant ($r=.29, n=45, p<.045$).

iii. Second video showing

TDQ total was not correlated with distress at the second showing ($r=.09, n=51, p<.521$).

iv. Six month follow-up

TDQ total does not predict the number of intrusions at 6 months ($r=.10$, $n=52$, $p<.476$). The only TDQ factor that predicts intrusions after the end of the experiment is the emotional numbing factor, which predicts the number of intrusions in the first month following the experiment ($r=.33$, $n=53$, $p<.017$), although the relationship is non-significant for intrusions in the sixth month following the experiment ($r=.02$, $n=53$, $p<.908$).

TDQ total does not predict anxiety at 6 months in the form of worries about road safety ($r=.02$, $n=52$, $p<.882$), becoming more careful ($r=.03$, $n=52$, $p<.851$), or avoidance of situations ($r=.01$, $n=52$, $p<.910$).

- There is some support for **Hypothesis 4**: emotional numbing predicts intrusions during the diary phase. The emotional numbing factor of the TDQ predicts intrusions in the first month after the experiment, although trait dissociation does not predict numbers of intrusions or anxiety at six months.

Overall Summary of Results:

- **Hypothesis 1** (group allocation will predict distress and intrusions during the experiment) is not supported: the groups do not differ significantly in terms of distress ratings or number of intrusions, although there is a significant difference between the groups in the pattern of intrusions in the diary phase.
- There is some support for **Hypothesis 2** (state dissociation will predict distress and intrusions) State dissociation predicts the number of intrusions at six months and worry about road travel.
- There is some support for **Hypothesis 3** (emotional exposure will predict distress and intrusions). Emotional exposure is positively correlated with distress at the first showing of the videotape.
- There is some support for **Hypothesis 4** (trait dissociation will predict distress and intrusions): emotional numbing predicts intrusions during the diary phase.

Discussion

There is some support for the predictions made about the relationship between dissociation and PTSD symptoms in the form of intrusions. However, the results are clearest when looking at what participants *actually* did, rather than at what they were *instructed* to do. The discussion here is continued in Chapter 4.

Effects of group allocation:

The reason for the information processing strategy manipulation instructions given to the three experimental groups was that this experimental design allows examination of any causal relationship between dissociation and later PTSD symptoms. All participants reported that they were able to follow the experimental instructions to some degree. The effectiveness of the manipulation is also reflected in the fact that participants' behaviour in the first showing of the videotape was consistent with group allocation: those in the dissociation group engaged in more dissociative behaviour, while those in the emotional exposure group engaged in more emotional exposure behaviour.

However, the differences between the groups in terms of self-rated behaviour seems to wear off through the phases of the experiment. This may be one reason why the hypotheses concerning group allocation were in general not supported by experimental evidence: all three groups showed similar levels of distress during the first showing of the videotape, similar numbers of intrusions, and similar distress during the second showing of the videotape. Similarly at six months there were no significant effects of group allocation.

The first problem with using a strategy manipulation design of experiment is that the

manipulation of information processing strategies is difficult: participants may tend to slip back into habitual processing modes - a fact borne out by the finding that participants' actual self-rated behaviour was a better predictor of outcome than was group allocation. Participants may also misunderstand instructions, or be unable to concentrate fully on the experimental stimuli because they are attempting to do something unfamiliar. This study, therefore, cannot adequately answer the question as to whether dissociation is an intentionally activated process, and whether it is a determinant of later PTSD symptoms.

It may be the case that dissociation is not something which all individuals can experience to the same degree: it may be an automatic response to traumatic events, perhaps biologically controlled (Glover, 1992; Pitman, van der Kolk, Orr, & Greenberg, 1990), or it may be that it can be learned and reproduced intentionally by individuals who are repeatedly traumatized (Herzog, Staley, Carmody, Robbins, & van der Kolk, 1993; Lawrence, Cozolino, & Foy, 1995; Lipschitz, Kaplan, Sorkenn, Chorney, & Asnis, 1996). If dissociation is an automatic process, then experimental investigations of dissociation may be difficult to carry out, without using either real traumatic events (as opposed to stimuli such as the videotape used in this study), or using participants who are high in trait dissociation, perhaps selected from at-risk populations such as those who have experienced severe childhood sexual abuse.

Van der Kolk and Fisler argue that experimental investigations of trauma may have little relevance to understanding real reactions to trauma (van der Kolk & Fisler, 1995). This may be true in one sense: it is clear that the response to a videotape of a traumatic event may well not involve the same sense of intense horror and fear that might be felt if one were actually involved in such an event, and the severity of any post-traumatic symptoms, including unwanted recollections, will probably be less. But in many other ways there are similarities between an experimental investigation and real life experience: the experimental participant

witnesses something which they believe to be a recording of a real life traumatic event, and see the same things as actual witnesses at the scene might see. As this study has shown, they find this experience distressing and experience unwanted recollections of it, just as actual witnesses do. They also engage in the same sorts of responses to the initial viewing and to the unwanted recollections as do actual witnesses, and for these reasons it is useful to investigate reactions to trauma in a controlled experimental setting, provided any conclusions are backed up by clinical evidence as well.

If dissociation is a strategy that the majority of individuals can engage in, then it might be possible to develop an improved manipulation strategy for experimental studies, perhaps involving better training in recreating dissociative phenomena and more lengthy practice (the procedure used in this study was in no way standardized or known to be effective), as well as more accurate checks on manipulation success. The manipulation check in this study consisted of a self-report question, which may be subject to bias, and more objective methods of assessment (such as a psychophysiological measure) may be possible - if it is possible to define dissociation in these terms.

A second problem in using a strategy manipulation design of experiment is that the manipulation may confuse findings related to actual behaviour, since participants may not be doing what they naturally do in a given situation and may not be able to engage effectively in the experiment. For this reason, it might be expected that the neutral instruction group might show the most “natural” behaviour and results: this group, however, contains only 19 participants with a limited range of trait dissociation scores and it is therefore difficult to draw strong conclusions from it. This was one reason why the study described in Chapter 4 was carried out: in this study there is no manipulation. Instead, naturally elicited behaviour in a larger group of individuals is studied and related to other dependent measures, using

participants who score at the extreme ends of the scale on the trait dissociation questionnaire.

Effects of participants' behaviour:

Participants' *actual behaviour* was more predictive than was group allocation. Behaviour predicted distress in the first and second showings of the videotape, although it did not significantly correlate with intrusions in the week following the first showing of the videotape. Behaviour did, however, predict intrusions and worry at six-month follow-up.

Consistent with information processing models of PTSD, it was found that state dissociation was correlated with the number of intrusions and anxiety in the later phase of the experiment, at six-month follow-up, even though it was not significantly related to distress and intrusions during the two video showings and the intervening diary phase. As discussed above, however, the relationships between behaviour and other dependent measures may be muddled by the manipulative design of the experiment, and the relationship between state dissociation and other dependent measures is discussed further in Chapter 4.

Emotional exposure was, as predicted, significantly related to distress at the first showing of the videotape. Contrary to predictions, however, it remained significantly related during the second video showing, even though there was a non-significant downward trend in distress ratings related to emotional exposure, as would be predicted. The continued significant relationship between emotional exposure and distress in the second video showing may be due to the fact that this type of strategy reflects a higher degree of empathy and consequent empathic distress that continues from the first into the second showing.

Effects of trait dissociation

The findings with regard to trait dissociation are similar to those related to state dissociation. While there was no relationship between trait dissociation and number of intrusions within the early stages of the experiment, there was a relationship between trait dissociation and number of intrusions in the month following the experiment. As information processing models of PTSD predict, the strength of the relationship between dissociation and intrusive symptoms lies to a large degree in the emotional numbing component of dissociation, a finding which adds further strength to the argument that dissociation, particularly in PTSD research, should not be considered just as a unitary phenomenon, but should instead be investigated in terms of the different components that go to make it up, some of which are more important in the development and maintenance of PTSD than others.

Trait dissociation was not, however, significantly related to intrusions or anxiety at six months, although the correlations were in the direction predicted. Again the effect of the manipulation in this study may have been to reduce the relationship between trait dissociation and dissociative behaviour, and thus also reduce the strength of the relationship between trait dissociation and later intrusions or distress: the connection between trait dissociation and later intrusions and distress is therefore considered further in Chapter 4.

Conclusion

This experiment has partially confirmed some of the hypotheses but failed to confirm others. State dissociation during the experiment predicts a greater number of intrusions and more anxiety at six month follow-up, and trait dissociation predicts more intrusions in the first month following the experiment. However, the experimental manipulation of dissociation proved to have very few significant effects, suggesting either the method of manipulation was not powerful enough or that participants have a tendency to slip into habitual information processing modes regardless of attempted manipulation. Because of this, the following chapter, which is another experimental investigation of the effects of dissociation upon intrusions and distress, does not attempt an experimental manipulation of state dissociation but uses a sample of high and low trait dissociation participants.

CHAPTER 4:

Investigating Dissociation Experimentally:

High versus Low Trait Dissociation

Introduction

Aim:

This second experimental study investigates the relationship between dissociative experiences and reactions to distressing events. It aims to determine whether dissociation both as a trait and a state is involved in the development of post-traumatic symptoms (particularly the reliving cluster: intrusions and distress at intrusions) immediately following exposure to a distressing experience and during the rest of the experiment.

In this experiment the distressing stimulus is the same videotape used in Chapter 3.

The previous chapter examined the role of dissociation in the development of post-traumatic symptoms over a six month period, and attempted to observe the effects of manipulating dissociative behaviour, although this manipulation was not generally successful. This chapter seeks to repeat the previous study but uses a group of participants who either

score in the top 25% of the TDQ or the bottom 25% of the TDQ in order to widen the range of trait dissociation from that in the previous study. The absence of any manipulation means that participants are more likely to behave in a more natural, habitual way and thus the effects of trait and state dissociation on behaviour should be clearer.

This study examines the effects of high versus low trait dissociation upon behaviour in the experiment and upon intrusive memories of the videotape, and also examines the effects of state dissociation upon intrusive memories. This study also examines the relationship between semantic and data-driven processing and later distress and intrusions, following the clinical investigations into this relationship in reported in Chapter 7.

As in the previous study, the experiment is divided into sections: the first showing of the video tape, the one-week diary phase, and the second showing of the video tape. This study differs from the previous one in that the second showing of the video tape uses a shortened version of the initial tape containing only short clips taken from the original scenes: this was done in order to make the clips more like reminders of the original scenes rather than re-exposure. For practical reasons it was not possible to carry out a six month follow-up of participants.

The main predictions made are identical to the previous chapter. It is predicted that both trait dissociation and state dissociation will result in low levels of initial distress but later unpleasant intrusive recollections of the videotape. Following work by Ehlers and Clark (Ehlers & Clark, in press) this experiment also seeks to investigate the relationship between information processing style and distress and intrusive recollections. A data-driven style of processing, characterized by attention to and processing of sensory information, is compared to a semantic style of processing, characterized by attention to and processing of semantic information about the meaning and implications of stimuli. Data-driven processing is predicted

to be correlated with dissociation and to result in low levels of initial distress but later unpleasant intrusive recollections of the videotape, while semantic processing is predicted to be negatively correlated with dissociation and to result in higher levels of initial distress but fewer intrusive recollections of the videotape. This study uses a questionnaire based on the preliminary version used in Chapter 7, developed by Ehlers (1997, unpublished manuscript), and can be seen in appendix 15.

Hypotheses:

1. Trait dissociation will predict less distress during the first video showing but more intrusions during the diary phase and more distress during the second video showing.
2. Trait dissociation will predict state dissociative behaviour during the experiment.
3. State dissociation during the first video showing will predict less distress during the first showing, but more intrusions in the diary phase and more distress during the second video showing.
4. Emotional exposure during the first video showing will predict more distress during the first showing, but fewer intrusions in the diary phase and less distress during the second video showing.
5. Data-driven processing will be positively correlated with trait and state dissociation during the experiment. Semantic processing will be negatively correlated with trait and state dissociation.
6. Data-driven processing will predict less distress during the first video showing but more intrusions during the diary phase and more distress during the second video showing.
7. Semantic processing will predict more distress during the first video showing but fewer intrusions during the diary phase and less distress during the second video showing.

Method

Participants:

The 40 Participants were from Oxford University. The age range was from 18 to 28 (mean age 21.3, s.d. 2.37). 17 were female and 23 were male. Participants were recruited from a larger sample who completed the Trait Dissociation Questionnaire, and were chosen from the top and bottom 25% of scorers (using cut-off points of 25 and 54).

Measures:

The questionnaires were as follows:

1. Trait Dissociation Questionnaire (TDQ)
2. Video questionnaire
3. Information processing questionnaire
4. Seven-day diary
5. Follow-up questionnaire
6. Second video questionnaire
7. Information processing questionnaire

1. The **Trait Dissociation Questionnaire** (TDQ, Appendix 4), developed by the author, and is described in Chapter 2.

2. The **Video questionnaire** (appendix 16) is similar to that used in Chapter 3. This

questionnaire is administered by the experimenter during the first showing of the videotape. After each scene participants are asked to rate how unpleasant they found that particular scene (on a scale from 0 to 100). These scores were recorded and a mean unpleasantness rating calculated from the individual ratings. Participants are also asked to rate their level of physical arousal on a scale from 0 (very relaxed) to 100 (very activated) for each scene. At the end of the video participants are asked to rate their behaviour during the video showing on a number of different scales, as in the video questionnaire in Chapter 3.

3. The **information processing questionnaire** (appendix 15) is a later version of the set of information processing questions used in Chapter 7, and the constructs it aims to measure are discussed in Chapter 5. It consists of 20 statements, and participants are asked to rate on a 4 point scale from 1 (not at all) to 4 (very much) how much each statement applied to them during the videotape showing. Although the entire questionnaire was given to participants, only fourteen of these items measure semantic or data-driven processing, as listed below, and only these items were analyzed:

Data-driven processing items (7 items):

I couldn't really take it all in
I did not fully understand what was going on
It was just like a stream of different impressions following one another
I could not think clearly
I was overwhelmed by the images and sounds and couldn't put everything together
I was confused and could not fully make sense of what was happening
My mind was fully occupied with different impressions and sensations

Semantic processing items (7 items):

I focused on the story
I tried to figure out what would happen next
In my mind I created a "commentary" on what was happening
I could describe what happened in the video without muddling things up
I tried to figure out what kind of people they were
I had a clear impression of how one event followed on from another
I tried to figure out what was happening

4. The **seven-day diary** (Appendix 17) is identical to that used in Chapter 3, except for the fact that the distress rating for each intrusion in that version was replaced in this version by an unpleasantness rating (still on a scale from 0 to 100). As in Chapter 3, the number of intrusions for each day, the total number of intrusions, and the mean unpleasantness of intrusions are calculated from this data.

5. The **follow-up questionnaire** (see appendix 18) is very similar to that used in Chapter 3: it asks participants to rate how unpleasant they found the first showing of the videotape on a scale from 0 to 100, and also asks them to rate their behaviour during the diary phase on a number of scales, which are identical to those used in Chapter 3. Scores for dissociative, avoidant, and emotional exposure behaviour are calculated from these ratings as in Chapter 3.

6. The **second video questionnaire** (appendix 19) is similar to that used in Chapter 3. It is administered by the experimenter, and after each scene participants are asked to rate how unpleasant they found that scene. An overall mean unpleasantness rating is calculated from the individual ratings. Participants are also asked to rate their level of physical arousal on a scale from 0 (very relaxed) to 100 (very activated) for each scene.

7. The second information processing questionnaire is identical to the one used in the first videotape showing.

Procedure:

The study consisted of three main sections, over one week, as below:

1. Participants complete several questionnaire measures before being shown a 10-minute videotape consisting of six scenes of road traffic accidents.
2. Participants fill in short diaries over a seven day period, recording each intrusion about the videotape.
3. Participants return at one week and are asked to complete further questionnaires. They then watch a shortened version of the road traffic accident videotape.

First section:

Participants completed the Trait Dissociation Questionnaire before arriving for the experiment. Participants were told briefly about the content of the videotape, and asked to pay careful attention to it. The video was then started. During the video the experimenter administered the video questionnaire. After the video was over, participants were given the information processing questionnaire.

Second section:

Participants were then given the 7-day diary to complete during the second phase of the study, on which they were asked to record any intrusive thoughts about the videotape.

Third Section:

After this seven-day period, participants came back for the third phase of the study, the second video session. Participants were asked to watch and listen to the shortened version of the videotape carefully and were told they would be asked to rate each scene according to how unpleasant they found it and how activated they were (as in the first section). This version of the videotape contained 10 short clips rather than the original 6 complete scenes. During the showing the experimenter administered the second video questionnaire. Following the video subjects again completed the information processing questionnaire.

Results

The results are divided up according to the major hypotheses as follows:

Part A: Comparability of participants

Part B: Effects of trait dissociation

Hypothesis 1: Trait dissociation will predict less distress during the first video showing but more intrusions during the diary phase and more distress during the second video showing

Hypothesis 2: Trait dissociation will predict state dissociative behaviour during the experiment

Part C: Effects of behaviour in the experiment

Hypothesis 3: State dissociation during the first video showing will predict less distress during the first showing, but more intrusions in the diary phase and more distress during the second video showing

Hypothesis 4: Emotional exposure during the first video showing will predict more distress during the first showing, but fewer intrusions in the diary phase and less distress during the second video showing

Part D: Effects of semantic and data-driven processing

Hypothesis 5: Data-driven processing will be positively correlated with trait and state dissociation during the experiment. Semantic processing will be negatively correlated with trait and state dissociation

Hypothesis 6: Data-driven processing will predict less distress during the first video showing but more intrusions during the diary phase and more distress during the second video showing

Hypothesis 7: Semantic processing will predict more distress during the first video showing but less intrusions during the diary phase and less distress during the second video showing

Because many of the variables are not normally distributed, all correlations reported are Spearman rank correlations. Where appropriate, non-parametric versions of statistical tests are used. All results significant at $p < .05$ are underlined.

A. Comparability of participants:

Table 1 summarizes the characteristics of the two groups of participants (with s.d.s)

Group:	High TDQ	Low TDQ
Men	13	10
Women	7	10
Mean TDQ score	72.0 (16.5)	15.8 (5.7)
Mean age	21.4 (2.5)	21.1 (2.3)

There are no significant differences between the groups in terms of sex ratio ($\chi^2(1 \text{ d.f.})=0.409, p<.522$).

The difference in TDQ score is significant (Mann-Whitney U-test, $Z=5.41, p<.00005$).

The difference in age is non-significant (Mann-Whitney U-test, $Z=0.26, p<.795$).

- The groups are comparable in terms of sex and age

B. Effects of trait dissociation:

Hypothesis 1:

Trait dissociation will predict less distress during the first video showing but more intrusions during the diary phase and more distress during the second video showing.

Table 2 summarizes the correlations between trait dissociation and other dependent measures (means and s.d.s are given, with independent samples t-test results):

	High TDQ	Low TDQ	t-test and p value
Unpleasantness at first showing	37.9 (17.5)	37.6 (20.2)	t(38)=.04 p<.970
Activation at first showing	31.5 (13.4)	29.3 (14.8)	t(38)=.50 p<.623
Number of intrusions	15.1 (10.2)	7.35 (7.4)	<u>t(38)=2.75</u> <u>p<.009</u>
Unpleasantness of intrusions	197.2 (79.5)	66.2 (65.8)	<u>t(38)=5.68</u> <u>p<.0005</u>
Unpleasantness at second showing	43.2 (19.0)	31.1 (15.5)	<u>t(38)=2.19</u> <u>p<.035</u>
Activation at second showing	32.7 (15.8)	24.0 (12.2)	t(38)=1.94 p<.059
Change in unpleasantness ratings	5.3 (16.5)	-6.5 (19.1)	<u>t(38)=2.09</u> <u>p<.043</u>

The high TDQ group find the second showing of the videotape more unpleasant, and find the second showing more unpleasant compared to the first than do the low TDQ group. They also have a greater number of more unpleasant intrusions.

The changes in unpleasantness ratings for the two groups were not individually

significantly different from zero (high TDQ group one-sample t-test $t(19)=1.44$, $p<.167$; low TDQ group one-sample t-test $t(19)=1.52$, $p<.144$).

Individual TDQ factors:

None of the individual TDQ factors were significantly correlated with unpleasantness ratings during the first showing. All the individual TDQ factors were significantly correlated with the number of intrusions and unpleasantness of intrusions.

Significant correlations between TDQ factors and unpleasantness ratings during the second showing were obtained for detachment from others and the world ($r=.39$, $p<.012$), sense of split self ($r=.41$, $p<.009$), and emotional numbing ($r=.31$, $p<.049$).

The only TDQ factor significantly correlated with change in unpleasantness ratings was sense of split self ($r=.35$, $p<.028$): detachment from others and the world ($r=.26$, $p<.105$) and emotional numbing ($r=.23$, $p<.147$) both dropped below significance level.

Pattern of intrusions over the seven day diary period:

Following the finding in Chapter 3 that there was a different pattern to the occurrence of intrusions between the three experimental groups, the high and low TDQ groups in this study were compared in the same way, as the figure below shows:

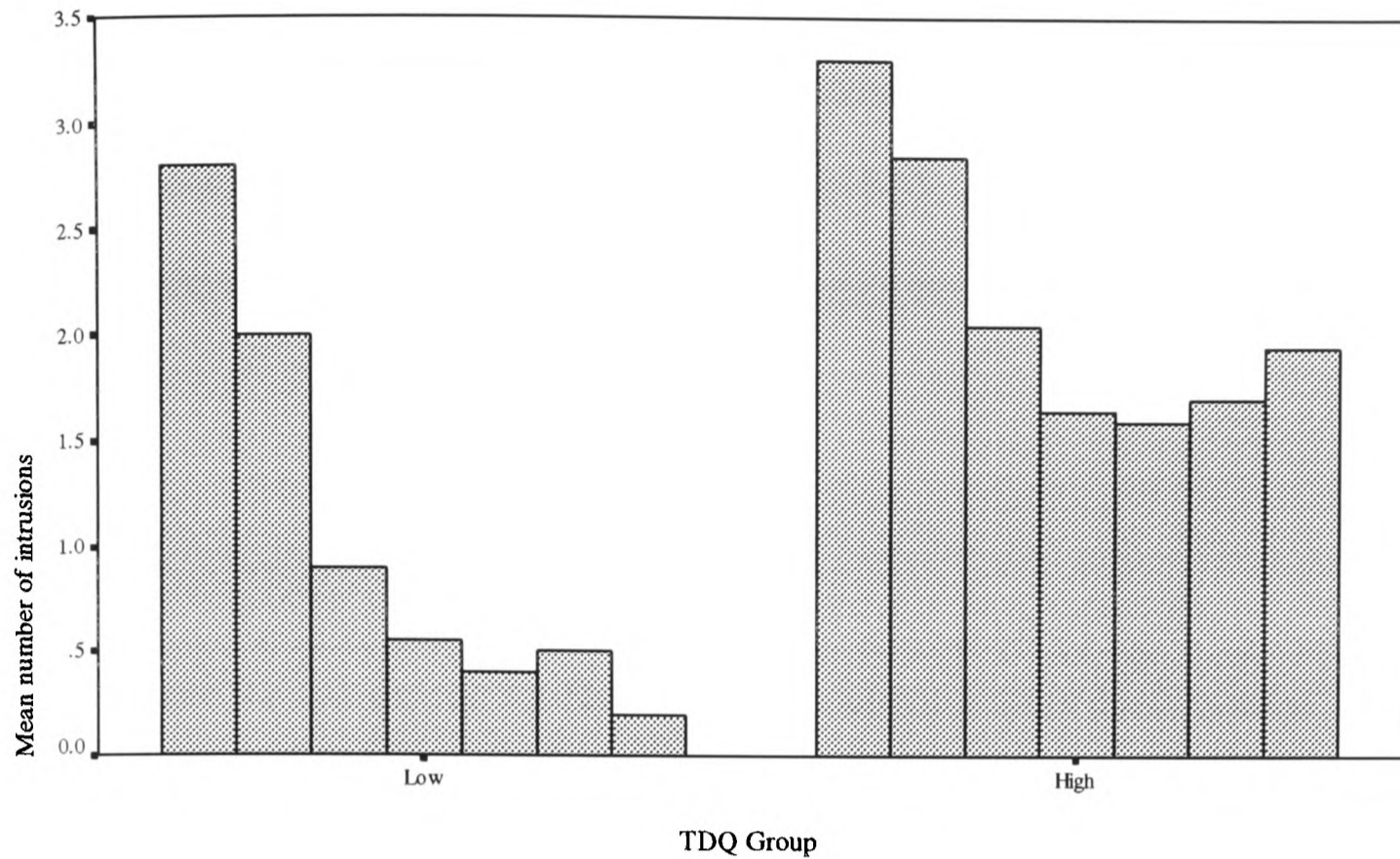


Figure 1: Mean number of intrusions over the seven days in the low and high TDQ groups

The number of intrusions per day are not normally distributed, which means that a repeated measures ANOVA cannot be validly used to test for a group by day interaction, and there is no non-parametric version of this statistical test. A logarithmic transform failed to normalize the data.

There is no significant difference between the groups in terms of intrusions on day 1, while there are significant differences on days 6 and 7, as the table 3 shows:

	High TDQ	Low TDQ	Z and p value
Mean intrusions on day 1	3.3 (2.2)	2.8 (2.3)	0.82 p<.410
Mean intrusions on day 6	1.7 (1.9)	0.5 (1.3)	<u>2.96</u> p<.003
Mean intrusions on day 7	2.0 (2.3)	0.2 (0.7)	<u>3.53</u> p<.0004

Using analysis of variance to test for significant group differences on days 6 and 7 while covarying for number of intrusions on day 1 (since no equivalent non-parametric test exists) produces significant results (day 6 $F(1,39)=5.37$, $p<.026$; day 7 $F(1,39)=10.36$, $p<.003$) although since the data is not normally distributed this result must be treated cautiously.

- There is some support for **Hypothesis 1**: trait dissociation predicts more unpleasant intrusions and greater ratings of unpleasantness at the second showing. Trait dissociation does not, however, predict lower ratings of unpleasantness during the first showing
- There are indications that there is a difference in the pattern of intrusion occurrence between the two experimental groups

Hypothesis 2:

Trait dissociation will predict state dissociative behaviour during the experiment.

There were significant differences between the high-scoring and low-scoring TDQ participants in terms of state dissociative behaviour in the first showing and in the diary phase, as summarized in table 4 below (showing means, s.d.s, and independent samples t-test results or Mann-Whitney U-test results):

	High TDQ	Low TDQ	test results
Dissociation in first showing	171.8 (85.2)	72.5 (50.5)	<u>$t(38)=4.48$</u> <u>$p<.0005$</u>
Dissociation in diary phase	3.9 (6.0)	0.2 (0.7)	<u>$Z=3.34$</u> <u>$p<.0008$</u>

- **Hypothesis 2** is supported: trait dissociation is correlated with state dissociative behaviour

C. Effects of behaviour in the experiment:

Hypothesis 3:

State dissociation during the first video showing will predict less distress during the first showing, but more intrusions in the diary phase and more distress during the second video showing.

Table 5 shows the correlations between dissociation during the first showing and other dependent measures:

Behaviour	Correlation and p value	
First showing:		
Unpleasantness of first showing	r=-.03	p<.852
Activation in first showing	r=-.08	p<.592
Diary phase:		
Number of intrusions	r=.19	p<.233
Unpleasantness of intrusions	r=.25	p<.118
Second showing:		
Unpleasantness of second showing	r=.06	p<.715
Activation in second showing	r=.09	p<.570
Difference in unpleasantness ratings	r=.07	p<.666

The important correlation in testing the relationship between state dissociation and distress is the last one in the table: it is predicted that this should show a positive relationship between state dissociation and a rise in distress from the first to the second video showing. This correlation is, however, non-significant and near-zero. The correlation between state

dissociation and number of intrusions is positive as predicted, but again is non-significant.

● **Hypothesis 3 is not supported**

Hypothesis 4:

Emotional exposure during the first video showing will predict more distress during the first showing, but fewer intrusions in the diary phase and less distress during the second video showing.

Table 6 shows the correlations between emotional exposure during the first showing and other dependent measures:

	Correlation and p value	
First showing:		
Unpleasantness of first showing	r=.21	p<.185
Activation in first showing	r=.16	p<.317
Diary phase:		
Number of intrusions	r=-.30	p<.064
Unpleasantness of intrusions	<u>r=-.39</u>	<u>p<.013</u>
Second showing:		
Unpleasantness of second showing	r=-.16	p<.329
Activation in second showing	r=-.08	p<.607
Difference in unpleasantness ratings	<u>r=-.33</u>	<u>p<.039</u>

Again the important correlation in testing the relationship between emotional exposure and distress is the last one in the table: as predicted there is a relationship between emotional exposure and a drop in distress from the first to the second video showing (i.e. a negative correlation), even though the correlations between emotional exposure and distress within each video showing are non-significant. The correlation between emotional exposure and number of intrusions is negative as predicted.

- **Hypothesis 4** is supported

D. Effects of data-driven processing:

Hypothesis 5:

Data-driven processing will be positively correlated with trait and state dissociation during the experiment. Semantic processing will be negatively correlated with trait and state dissociation

Table 7 summarizes the semantic and data-driven processing scores for the high and low TDQ groups (means and s.d.s are given, with independent samples t-test results):

Score:	High TDQ	Low TDQ	t-test
Data-driven processing score	15.7 (4.7)	12.8 (4.8)	$t(38)=1.90, p<.065$
Semantic processing score	16.5 (4.5)	19.3 (4.4)	$t(38)=2.02, p<.050$

Semantic processing scores were significantly higher in the low TDQ group. There were no significant differences between the two groups in terms of data-driven processing scores although this near-significant difference was in the direction predicted, and it may be that with a larger sample size this difference would reach significance.

Table 8 summarizes the relationships between information processing and state dissociation during the first showing of the videotape:

Correlation:	Dissociative behaviour in the first showing		Dissociative behaviour in the diary phase	
Data-driven processing:	$r=.06$	$p<.704$	<u>$r=.36$</u>	<u>$p<.022$</u>
Semantic processing:	$r=-.22$	$p<.166$	<u>$r=-.32$</u>	<u>$p<.044$</u>

- There is some support for **Hypothesis 5**: data-driven processing is related to dissociative behaviour in the diary phase, while semantic processing is negatively related to behaviour in the diary phase. Processing is also related to trait dissociation

Hypothesis 6:

Data-driven processing will predict less distress during the first video showing but more intrusions during the diary phase and more distress during the second video showing.

Table 9 shows the correlations between data-driven processing during the first showing and the other variables. Because of the correlations between TDQ and information processing, correlations with TDQ partialled out are shown beneath zero-order correlations in brackets:

Variable	Correlation and p value	
Unpleasantness rating at first showing	r=.09 (r=.05)	p<.599 p<.748)
Activation rating at first showing	r=.08 (r=.07)	p<.606 p<.657)
Number of intrusions in diary phase	<u>r=.46</u> (r=.37)	<u>p<.003</u> <u>p<.020)</u>
Unpleasantness of intrusions	<u>r=.36</u> (r=.20)	<u>p<.024</u> p<.228)
Unpleasantness rating at second showing	r=.26 (r=.09)	p<.099 p<.578)
Activation rating at second showing	r=.30 (r=.19)	p<.063 p<.235)

- There is some support for **Hypothesis 6**: there are significant correlations between data-driven processing and unpleasant intrusions in the diary phase

Hypothesis 7:

Semantic processing will predict more distress during the first video showing but fewer intrusions during the diary phase and less distress during the second video showing.

Table 11 shows the correlations between semantic processing during the first showing and the other variables. Because of the correlations between TDQ and information processing, correlations with TDQ partialled out are shown beneath zero-order correlations in brackets:

Variable	Correlation with semantic processing	
Unpleasantness rating at first showing	$r = -.16$ ($r = -.15$)	$p < .312$ $p < .356$
Activation rating at first showing	$r = -.25$ ($r = -.29$)	$p < .115$ $p < .078$
Number of intrusions in diary phase	$r = -.25$ ($r = -.16$)	$p < .124$ $p < .344$
Unpleasantness of intrusions	$r = -.21$ ($r = .01$)	$p < .196$ $p < .957$
Unpleasantness rating at second showing	$r = -.10$ ($r = .09$)	$p < .542$ $p < .592$
Activation rating at second showing	$r = -.16$ ($r = -.02$)	$p < .338$ $p < .925$

- **Hypothesis 7 is not supported**

Overall Summary of Results:

- There is some support for **Hypothesis 1** (trait dissociation will predict distress and intrusions): trait dissociation predicts more unpleasant intrusions and greater ratings of unpleasantness at the second showing. Trait dissociation does not, however, predict lower ratings of unpleasantness during the first showing. There are indications that there is a difference in the pattern of intrusion occurrence between the two experimental groups
- **Hypothesis 2** (trait dissociation will predict state dissociation) is supported
- **Hypothesis 3** (state dissociation will predict distress and intrusions) is not supported
- **Hypothesis 4** (emotional exposure will predict distress and intrusions) is supported: emotional exposure predicts a drop in distress rating between the first and second video showing, and fewer intrusions in the intervening period
- There is some support for **Hypothesis 5** (data-driven processing will correlate with state and trait dissociation): data-driven processing is related to dissociative behaviour in the diary phase, while semantic processing is negatively related to dissociative behaviour in the diary phase. Processing is also related to trait dissociation
- There is some support for **Hypothesis 6** (data-driven processing will predict distress and intrusions): there are significant correlations between data-driven processing and unpleasant intrusions in the diary phase
- **Hypothesis 7** (semantic processing will predict distress and intrusions) is not supported

Discussion

The discussion here continues that in Chapter 3.

Effects of trait dissociation

As predicted, high trait dissociation was linked to a greater number of unpleasant intrusions in the diary phase of the experiment. There were no differences in ratings for unpleasantness of the first showing of the videotape between the high and low TDQ participants, although on the second showing the high TDQ participants rated the videotape as more distressing than did the low TDQ participants.

These last two findings are not directly in line with the experimental hypotheses, and need explanation. The baseline level of distress felt by individual participants when exposed to stimuli like the videotape used in the experiment was not known: it might be the case that high trait dissociation participants find such stimuli more distressing in general than do low trait dissociation participants, and only manage to lower subjective distress to the same level as low trait dissociation participants through dissociation. This could explain why there is no group difference in ratings of unpleasantness at the first showing of the videotape. Another possible explanation is that in the first showing participants are unclear at first as to how the rating scales for unpleasantness are to be used (i.e. what exactly constitutes something meriting a score of 25, or 75, on the rating scale), since they have no fixed reference points. On the second showing, however, they have the first showing to use as a reference, and can rate this showing in comparison to the first showing more easily than they can rate the first showing in comparison to nothing. For this reason it is more important to look at the change in unpleasantness ratings from first to second showings rather than at the original ratings

themselves. Whereas low trait dissociation participants appear to habituate to the unpleasantness of the videotape, high trait dissociation participants do not, and find the videotape more unpleasant on the second showing. This finding is consistent with information processing models of PTSD, which regards dissociation as a way of limiting distress in the short term which leads to more distress in the longer term.

Also consistent with models of PTSD is the finding that there appears to be a different pattern of occurrence of intrusions in the high and low TDQ groups. Although numbers of intrusions do not differ significantly between the two groups on the first day of the diary phase, there are significant differences by days 6 and 7, and observation of figure 1 indicates that the intrusions in the low TDQ group appear to diminish more rapidly than those in the high TDQ group, which appear to persist. This finding is supported by the 6-month follow-up data presented in Chapter 3, which showed that trait dissociation was linked to intrusions in the month following the experiment. The pattern of intrusions is consistent with models of PTSD, which predict that high dissociation prevents proper processing of intrusive memories and is involved in their maintenance. The findings here reflect in miniature, with “normal” memories, what can be observed clinically with traumatized patients who experience very distressing memories: chapters 6 and 7 report on this in more detail.

As the previous chapter found, it is only some of the TDQ factors that are significantly correlated with ratings of unpleasantness, including the emotional numbing factor as predicted by models of PTSD. This demonstrates the importance of describing and investigating individual aspects of dissociation separately as well as together. Nevertheless, the overall TDQ score retains predictiveness and has the advantage that it is measured using a greater number and wider range of items, making it more reliable even if less specific.

Effects of behaviour

The measures of behaviour, including state dissociation, used in this study and in the study in Chapter 3 are relatively simple and consist of only a small number of items, rated retrospectively on a 0 to 100 scale. However, these scales do appear to have validity, since trait dissociation was correlated with state dissociation in this study. The correlations in chapter 3 are non-significant, which may reflect the fact that the experimental manipulation in that study reduced the magnitude of the link between state and trait dissociation.

Ratings of dissociative behaviour, however, did not correlate significantly with either ratings of unpleasantness or the occurrence of intrusions. Ratings of emotional exposure behaviour did correlate significantly (and negatively) with intrusions in the diary phase and was linked to a drop in distress rating between the first and second video showings. However, the correlations between behaviour and intrusions in the diary phase reported in Chapter 3 show a non-significant but positive correlation between emotional exposure and intrusions - the opposite direction to that expected and observed in this study. For this reason no firm conclusions can be made concerning the relationship between emotional exposure and other dependent measures.

The lack of significance observed in this study is perhaps partly due to the low numbers of participants in the experiment. The lack of significance may also be due to the nature of the questions: a simpler and more predictive measure of state dissociation was developed and used with patients in chapters 6 and 7. A third possible explanation is that the levels of dissociation amongst both groups were relatively low and thus correlations were also low due to a constriction of range: amongst traumatized individuals rather than those exposed to the videotape used in the experiment levels of state dissociation would be expected to be higher and also to have a greater range between individuals.

Effects of semantic and data-driven processing

The preliminary investigation of semantic and data-driven processing within a clinical sample is reported in Chapter 7. The data collection for this chapter occurred before the present study, and in the meantime a more sophisticated measure of processing was devised (Ehlers, 1997). However, this questionnaire is as yet not fully validated, and may possibly be measuring components of other constructs, such as mastery or problem severity, indicating that caution must be used in concluding from the results presented below. The data in chapter 7 indicate that data-driven processing, as opposed to semantic processing, is linked to a greater number of PTSD symptoms in the longer term. This study sought to confirm that finding in an experimental setting.

As predicted, there were differences in information processing between the high and low trait dissociation groups: the high trait dissociation group reported significantly less semantic processing during the first showing of the videotape, and more data-driven processing, although this difference failed to reach significance ($p < .065$). A similar relationship was found between state dissociation and information processing.

More important is the relationship between information processing and other dependent measures. As predicted, data-driven processing was linked to a greater number of intrusions in the diary phase. The negative correlation between semantic processing and intrusions was non-significant but in the predicted direction. This finding, using the more sophisticated information processing questionnaire, is consistent with the data reported in Chapters 6 and 7 using a shorter list of items. Further profitable research in clinical populations should be possible with the questionnaire used in this study, both to confirm the experimental results and to investigate whether processes in traumatized individuals operate on a similar basis to those in non-traumatized individuals in an experimental setting.

Conclusion

The main hypotheses from this study were confirmed, and the data are largely consistent with that obtained from Chapter 3. Trait dissociation is a significant predictor of unpleasant intrusions following exposure to a distressing stimulus, and appears to predict the persistence of these intrusions. Data-driven processing is linked to dissociation, and is also predictive of unpleasant intrusions. The findings presented in this and the previous chapter clearly link dissociation and later PTSD symptoms in an experimental setting. However, these findings need to be demonstrated within a traumatized population as well in order to support fully models of PTSD which include dissociation as a causal factor. The following chapters investigate such a population and seek to verify these findings.

CHAPTER 5:

Clinical Studies

Introduction:

Aim

In the following two chapters, two clinical studies are reported: the first of patients *admitted to hospital* following a road traffic accident, and the second on patients with relatively minor injuries following a road traffic accident who *attended hospital for treatment but who were not admitted*.

The aim of these studies is to establish which factors influence post-traumatic stress symptoms over a period of six months after being involved in a road traffic accident. The factors looked at in particular detail are those of trait and state dissociation in the six month period following the accident, information processing strategies affecting memories of the accident, and also type of information processing during the accident itself.

Previous Research

Road traffic accidents are extremely common in Western countries, and as such represent an important area of traumatic events that might lead to the development of post-traumatic symptoms (Norris, 1992). This is an under-researched area, since much of the early work on traumatization and PTSD has concentrated on events such as combat and natural

disasters (Kardiner & Spiegel, 1941; Mott, 1919; Newman, 1976; Ross, 1941; Southward, 1919), and the prevalence of PTSD was thought to be very low in the general population (Helzer, Robins, & McEvoy, 1987). Many studies have concentrated on establishing epidemiological characteristics (Blanchard, Hickling, Taylor, & Loos, 1995b; Mayou, Bryant, & Duthie, 1993) and it is only recently that causative factors have been examined and that the development and maintenance of post-traumatic symptoms has been explored in detail.

Certainly post-traumatic symptoms and PTSD can be quite common following road traffic accidents (Blanchard, Hickling, Taylor, Loos, & Gerardi, 1994; Hickling & Blanchard, 1992; Mayou, 1992; Mayou et al., 1993) and these problems may persist for some time (Blanchard et al., 1996a; Blanchard et al., 1995c). Prevalence estimates for post-traumatic symptoms vary from study to study (from 5% (Malt, Hoivik, & Blikra, 1993) to 46% (Blanchard et al., 1994)), due to differences in participant recruiting or diagnostic techniques.

Factors that may affect outcome:

A large number of factors that predict onset and outcome of PTSD following road traffic accidents and other types of trauma have been examined. Some of the more important of these are summarized here, including those which this thesis seeks to examine in more detail: differences in information processing, and in particular, dissociation. This summary places dissociation within the context of the range of factors that have been linked to PTSD.

Predisposing factors:

1. Gender
2. Age
3. Personality
4. Previous psychiatric history

Characteristics of the trauma and the way it is processed:

5. Trauma severity
6. Injury and perceived injury
7. Perceived life threat
8. Perceived controllability

Maintaining or aggravating factors:

9. Litigation

Information processing:

10. Avoidance
11. Thought suppression and rumination
12. Dissociation
13. Memory fragmentation
14. Semantic and data-driven processing

Table 1: Factors influencing PTSD onset and maintenance

1. Gender

The effects of gender and age on risk of development of post-traumatic symptoms following a traumatic event have been investigated extensively. It has often been found that women are more likely to develop persistent post-traumatic symptoms (e.g. (Green, McFarlane, Hunter, & Griggs, 1993; Norris, 1992)), and this is true in the area of road traffic accident research as well as other areas (Blanchard et al., 1996b; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), although there is conflicting evidence as to whether men and women exposed to the same trauma differ significantly in the probability of developing PTSD (Green et al., 1990; Madakasira & O'Brien, 1987; Smith & North, 1988; Steinglass & Gerrity, 1990). There are a number of possible reasons why women may be more likely than men to

develop PTSD: it is known that women have a higher vulnerability to anxiety disorders in general (Clark & Fairburn, 1997; Hawton, Salkovskis, Kirk, & Clark, 1989; Salkovskis, 1996). Men and women may perceive the same event very differently; they may possess different coping strategies or have different levels of social support (it is known that women ask for and receive more social support (Good, Bower, & Einsporn, 1995; Harrison, Maguire, & Pitceathly, 1995; Kolt, Kirkby, & Lindner, 1995; Von Dras, Williams, Kaplan, & Siegler, 1996), and although social support is usually regarded as a factor which helps prevent PTSD the additional seeking of support amongst women may reflect a higher degree of traumatization); they may have different perceptions about post-traumatic symptoms themselves; or indeed they may characteristically have different sorts of accidents. It may also be the case that biological factors are involved: PTSD development has been linked to abnormalities in adrenocortical functioning and endogenous opioid response, and there are some indications that there are gender differences in these biological variables (Baldwin, Wilcox, & Zheng, 1997; Brown, Siegel, & Etgen, 1996; Manzanares, Wagner, LaVigne, Lookingland, & Moore, 1992; Nehlsen Cannarella et al., 1997; Ritter, Sonnichsen, Mohrle, Richter, & Schwandt, 1991).

2. Age

Studies which have examined the relationship between age and the development of post-traumatic symptoms indicate that younger people are more at risk (Norris, 1992). This again could be due to the same factors: in relation to road traffic accidents younger drivers are less likely to have had previous experience of a road traffic accident due to having been driving for less time, and are more likely if they have an accident to have a serious accident (AA Foundation for Road Safety Research, 1987; AA Foundation for Road Safety Research,

1988; Rolls, 1991). Road traffic accidents and their consequents (e.g. loss of vehicle, loss of earnings or job, and temporary or permanent physical disability) may also have more of an effect on younger individuals, since they tend to have less financial security and their lifestyle is more dependent on physical activity than older individuals.

3. Personality

Many personality variables have been linked to the development of PTSD, including neuroticism (Breslau, Davis, & Andreski, 1995; Breslau, Davis, Andreski, & Peterson, 1991; Casella & Motta, 1990; Talbert, Braswell, Albrecht, Hyer, & Boudewyns, 1993), psychoticism (Casella & Motta, 1990), and agreeableness (Talbert et al., 1993), as well as other individual differences such as intelligence and educational level (Breslau et al., 1991; McNally & Shin, 1995), and external locus of control (Casella & Motta, 1990). However, many studies investigating the links between personality and PTSD are retrospective, and it is possible that personality differences between PTSD patients and individuals who do not suffer PTSD may be due to changes in a trait following traumatization, rather than to preexisting differences.

4. Previous psychiatric history

Numerous studies have indicated that a previous psychiatric history is a predictive factor in the development of PTSD (Brent et al., 1995; Breslau et al., 1991; Emery, Emery, Shama, Quiana, & Jassani, 1991; Smith, North, McCool, & Shea, 1990), possibly because previous psychiatric disturbance is indicative of a history of negative life events and poor social support (also a factor in PTSD development) or because a psychiatric history may be related to poor coping skills or a negative attributional style, factors also linked to the

development of PTSD (Jones & Barlow, 1990; Joseph, Williams, & Yule, 1995; Joseph, Brewin, Yule, & Williams, 1993). The link may also be a biological one, since there appear to be similarities in various biological markers between PTSD and various other psychiatric disorders (Glover, 1992; Grillon, Southwick, & Charney, 1996; Katz, Fleisher, Kjernisted, & Milanese, 1996). Alternatively, the link may be an indirect one due to a link between previous trauma involvement and previous psychiatric problems, and previous trauma involvement and current psychiatric problems (Astin et al., 1995).

5. Trauma severity

The diagnostic criteria for PTSD imply that it is necessary for there to be a severe trauma for PTSD symptoms to develop, and the obvious inference is that trauma severity ought to be related to the severity of post-traumatic symptoms. Obtaining a measure of trauma severity is very difficult in many cases, since clearly what may be traumatic for one person may actually be a mastery experience for another person. A number of different measures have been used to estimate trauma severity, some of the most common being objectively measured injury severity, perceived injury severity, and perceived life threat.

6. Injury and perceived injury

Degree of physical injury is one variable that has been used as a measure of trauma severity, and is particularly relevant when assessing post-traumatic symptoms following a road traffic accident, since physical injuries are common and vary from the very mild to the very severe.

The extent of physical injury may indicate not only how life-threatening, dangerous, or frightening the event may have been, but also may indicate the amount of physical disability

or discomfort a patient may experience over the following weeks and months. Both of these factors may worsen or maintain post-traumatic symptoms.

Establishing a measure of physical injury, however, is quite difficult, since injuries may be of many different types and their effects on the body are difficult to quantify - for instance, is a burns injury which covers 40% of body surface more severe or less severe than an open fracture to the leg and bruising to the chest? Objective measurements, based on observations of the patient's body, such as the AIS (Abbreviated Injury Score, (Yates, 1990)) may give an inaccurate idea of the degree of pain or disability a patient may experience. Self-ratings of injury, on the other hand, are inevitably affected by other biases, such as personality characteristics (Magni, de Bertolini, Dodi, & Infantino, 1986), and may reflect the psychological impact of injuries upon patients rather than the actual pain or disability caused by the injuries. This in turn may cause an apparent correlation between physical injury and later post-traumatic symptoms when in fact the correlation is between distress or a personality variable (such as neuroticism) and post-traumatic symptoms (Breslau et al., 1991; Casella & Motta, 1990; McFarlane, 1988; Talbert et al., 1993) - although some researchers have found no differences between high and low neuroticism patients in terms of reported pain (Mendelson, 1984; Radanov, Begre, Sturzenegger, & Augustiny, 1996).

The results from studies investigating the links between physical injury and post-traumatic symptoms are far from clear: while some studies have found no relationship (Mayou et al., 1993; McFarlane, 1988), others have indicated a link (Blanchard et al., 1995a): and this link has even been found to be in the reverse direction (Delimar, Sivik, Korenjak, & Delimar, 1995). The reason for this last finding may be that patients receive less social support for psychological symptoms if they are not severely physically injured (Perry, Difede, Musngi, Frances, & Jacobsberg, 1992), or because physical injuries may enable patients to distract

themselves from any psychological symptoms.

7. Perceived life threat

Perceived life threat is an important part of the DSM-IV criteria for PTSD, and has been consistently shown to predict PTSD, both in studies of road traffic accidents (Blanchard et al., 1995a; Blanchard et al., 1996b; Mayou et al., 1993) and in other traumas (Green et al., 1991; Pynoos et al., 1987; Resnick, Kilpatrick, Best, & Kramer, 1992; Rowan, Foy, Rodriguez, & Ryan, 1994). In Blanchard et al.'s study (Blanchard et al., 1995a) life threat and injury severity together accounted for 12.2% of the variance in PTSD symptom severity.

8. Perceived controllability

Perceived controllability is another characteristic of the traumatic event that has been linked to the development of PTSD and depression (Foa, Steketee, & Rothbaum, 1989; Foa, Zinbarg, & Rothbaum, 1992; Joseph et al., 1995; Kushner, Riggs, Foa, & Miller, 1992): events that are perceived by the victim to be beyond their control or where they feel helpless are much more likely to result in PTSD. This has been linked to theories of learned helplessness and hopelessness (Abramson, Metalsky, & Alloy, 1988; Abramson, Seligman, & Teasdale, 1978), which predict that individuals who make stable, global attributions about the cause of negative life events are more likely to suffer low mood. Feeling helpless or that one cannot control external events may also cause individuals' control-related schemata to be shattered so that they come to view the world as a dangerous, unfair, and unpredictable place (Janoff Bulman & Frieze, 1983).

9. Litigation

The relationship between litigation and PTSD has been investigated and commented upon by many researchers, since the first cases of “Railway Spine” (Erichsen, 1882). If those involved in litigation are more likely to show PTSD symptoms or have a worse long-term outcome, as some researchers have noted (Kuch, Cox, & Evans, 1996), then there are a number of possible explanations. Some writers have suggested that involvement in litigation proceedings may prolong PTSD symptoms (so-called “compensation neurosis”) or encourage sufferers to exaggerate their symptoms (Bellamy, 1997; Frueh, Gold, & de Arellano, 1997). Although cases of factitious PTSD have been reported (Neal & Rose, 1995), they seem to be the exception rather than the rule. The symptoms of those involved in litigation, though they may be more severe, do not disappear following the settlement of a court case, as would be expected if they were factitious (Mendelson, 1995). Another possible explanation is that those involved in litigation are more severely traumatized (since those who have suffered less may be less likely to attempt to claim compensation). A third possible explanation is that the litigation process itself may exacerbate PTSD symptoms, either by providing constant reminders of the original trauma, or by creating stress for the victim, since litigation is an inherently stressful and possibly humiliating experience for those involved (for example, when a rape victim must testify against her attacker and be cross-examined). However, many researchers (Bogduk, 1994; Bryant, Mayou, & Lloyd-Bostock, in press; Mendelson, 1984; Mendelson, 1991) have failed to find support for the hypothesis that seeking or receiving compensation might have an effect on reported distress or duration of symptoms.

Information-processing:

Information processing strategies during and after a traumatic event may influence how distressing the event itself and the memories of the event are perceived to be. They have been investigated extensively (Creamer, Burgess, & Pattison, 1992; Ehlers & Steil, 1995; Foa & Hearst-Ikeda, 1996; Foa, Riggs, & Gershuny, 1995; Foa et al., 1989; Joseph et al., 1996; Litz & Keane, 1989; McFarlane, 1992; Muran & Motta, 1993). Individual differences in information processing may help to explain severity of distress, why some memories become intrusive and recurrent, and effects on arousal, anxiety, and mood. Information-processing factors that have been investigated include avoidance, thought suppression and rumination, dissociation, and semantic- versus data-driven processing. These are discussed below.

10. Avoidance

Avoidance behaviour and avoidant cognitive strategies are common in people with PTSD (Foa, Riggs, Dancu, & Rothbaum, 1993; Friedman, 1996). Many explanatory models of the development of PTSD, both psychodynamic (Horowitz, 1976; Koller, Marmar, & Kanas, 1992) and cognitive-behavioural (Foa et al., 1989) pick out avoidance as both an important symptom and as a maintaining factor. An avoidant style of coping is a feature of other types of anxiety disorders, and this may one reason why a previous psychiatric history is a predictive factor in PTSD development.

11. Thought suppression and rumination

Attempts at thought suppression are common in people with PTSD and predict the persistence of symptoms in road traffic accident victims (Bryant & Harvey, 1995). It is known that thought suppression can be counter-productive, in that it can result in an increased

occurrence of intrusive thoughts (Clark, Ball, & Pape, 1991; Salkovskis & Campbell, 1994; Trinder & Salkovskis, 1994; Wegner & Zanakos, 1994; Wells & Davies, 1994). Ruminative thinking, while at first sight the opposite of thought suppression, in fact often occurs at the same time (Vollrath & Angst, 1993) and has a tendency to increase levels of depression (Nolen Hoeksema, Parker, & Larson, 1994) and anxiety (Davey, 1995), since it is characterized by worrying without constructive problem-solving (e.g., “I acted so stupidly” or “I’m never going to get better if I keep on this way”). Related to rumination is wishful thinking (e.g. “Why didn’t I act differently?”, or “If only I’d stayed at home that night”), which has also been shown to predict PTSD symptoms in assault victims (Valentiner, Foa, Riggs, & Gershuny, 1996).

12. Dissociation

Another psychological process that has received considerable attention is dissociation. Dissociative symptoms have often been reported as part of the PTSD cluster (American Psychiatric Association, 1994; Branscomb, 1991; Bremner et al., 1992; Cardena & Spiegel, 1993; Carlier, Lamberts, Fouwels, & Gersons, 1996; Carlson & Rosser Hogan, 1991; Dancu, Riggs, Hearst Ikeda, Shoyer, & Foa, 1996; Fonagy & Target, 1995; Marmar et al., 1994). Some researchers, notably Spiegel’s and Foa’s groups (Foa & Hearst-Ikeda, 1996; Spiegel, 1991; Spiegel & Cardena, 1990; Spiegel, Koopman, & Classen, 1994) have argued that it may play a causative or maintenance role in symptoms, although others have not found it to be a predictive factor for later disorder (Malt & Olafsen, 1992). Many existing studies are retrospective in nature and therefore do not allow a proper investigation of possible causative effects (Marmar et al., 1994). There is some mixed support for this from prospective studies

(Dancu et al., 1996; Shalev, Peri, Canetti, & Schreiber, 1996), but some studies have indicated that being involved in a trauma may cause dissociation and may increase the likelihood of subsequent dissociation (Bremner et al., 1992; Chu & Dill, 1990).

The aims of the following two chapters are therefore to:

- demonstrate that a high trait dissociation score predicts PTSD symptoms. Ratings of trait dissociation were obtained within hours or days after the traumatic event and in this sense the studies are closer to being prospective in design since the ratings given on the trait dissociation questionnaire should largely reflect the patient's premorbid state.
- examine whether a trait measure of dissociation changes over the period following a traumatic event, since an increase in trait dissociation following a trauma could indicate a vicious circle of symptoms, with dissociation causing other PTSD symptoms and those in turn producing further dissociation.
- show that state dissociation following a traumatic incident predicts PTSD symptoms later, as suggested by Marmar et al. (Marmar et al., 1994)

13. Memory Fragmentation

Information processing models of PTSD also predict that state dissociation during a traumatic event should be accompanied by fragmented memories of the traumatic incident, and that fragmented memories of the event should prevent later integration of these memories and result in greater longer term distress and PTSD symptoms. Fragmented memories are often a characteristic of PTSD (Foa & Riggs, 1993; Kilpatrick, Resnick, & Freedy, 1992; van

der Kolk & Fisler, 1995) and have been related to dissociative experiences and to disrupted information processing and the formation of implicit rather than explicit memories (Brewin, Dalgleish, & Joseph, 1996; Kihlstrom & Hoyt, 1990; Maercker, Schuetzwohl, Loebe, Eckhardt, & Mueller, 1994), but again, most studies which have investigated fragmented memories have been retrospective in design. The two following chapters therefore aim to:

- investigate prospectively the relationship between memory fragmentation and later post-traumatic symptoms.

14. Semantic and data-driven processing

Information strategies used during a traumatic event that may cause fragmented or unclear memories should, according to information processing models, predict later PTSD symptoms. It has been hypothesized (Ehlers & Clark, in press) that a data-driven processing style, in which attention is focussed on physical characteristics of the situation such as visual images, sounds, and smells (as opposed to a semantic processing style, where attention is focussed on analysing the situation for meaning) will result in a fragmented implicit memory rather than an organized, explicit memory for traumatic stimuli. It has been shown that PTSD patients show an implicit memory bias for recall of trauma-related information (McNally, 1997) and have fragmented memories (van der Kolk & Fisler, 1995), and data-driven processing may be the cause of this.

It is difficult to measure the type of processing used during a traumatic event, and there are no existing standardized measures for this type of processing. Thus the procedure used in these studies were necessarily experimental.

- These studies aim to assess whether type of processing during the accident affects memory fragmentation and later post-traumatic symptoms.

Predicting Chronic Symptoms

Identifying those who will develop chronic post-traumatic symptoms at an early stage is a clinically important task because it would enable early treatment and the possibility of developing and testing preventative strategies. Many individual predictors have been examined as discussed above, and it should be possible to develop a predictive model.

One other relevant issue is the inclusion of a new category in DSM-IV, Acute Stress Disorder (ASD). ASD is defined in terms of the main symptoms of PTSD, with the addition of a number of dissociative symptoms, occurring within four weeks of a traumatic event (the criteria are given in Chapter 1). It might be expected that ASD will predict PTSD (Harvey & Bryant, in press), and these studies aim to test this.

- These studies aim to examine a set of predictive variables for chronic post-traumatic symptoms and the extent to which they explain variance.
- These studies aim to test the relationship between Acute Stress Disorder and PTSD.

Hypotheses:

The hypotheses are as follows:

- Trait dissociation will predict later post-traumatic symptoms
- Trait dissociation score may increase over time in patients with chronic symptoms
- State dissociation will predict later post-traumatic symptoms
- Rumination will predict later post-traumatic symptoms
- Initial processing type will predict memory fragmentation and later post-traumatic symptoms
- Fragmented or unclear initial memories of the event will predict later post-traumatic symptoms
- It is possible to construct a predictive model for PTSD symptoms, based on initial variables.
- Acute Stress Disorder will precede PTSD

CHAPTER 6:

Admitted RTA Patients Prospective Study

Introduction:

Aim:

The aim of this first clinical study is to examine psychological factors which may predict long term post-traumatic symptoms in a group of patients who have been involved in a serious road traffic accident. The relationship between psychological variables, including dissociation, and later post-traumatic symptoms is examined over a period of 6 months.

Patients who have been involved in a serious road traffic accident are a particularly useful group to research on in terms of assessing the links between psychological variables and later post-traumatic symptoms. Because they are admitted to hospital within hours of the accident, it is possible to make a very early assessment of psychological state and to study the course of symptoms closely over the first few weeks

Post-traumatic symptoms, and PTSD itself, are common in this group of patients (see the previous chapter for a review), and this study aims to assess whether these symptoms can

be predicted from initial variables.

The main hypotheses of this study are listed below.

Hypotheses:

- 1. Trait dissociation will predict later post-traumatic symptoms
- 2. Trait dissociation score may increase over time in patients with chronic symptoms
- 3. State dissociation will predict later post-traumatic symptoms
- 4. Rumination will predict later post-traumatic symptoms
- 5. Fragmented or unclear initial memories of the event will predict later post-traumatic symptoms
- 6. Acute Stress Disorder will precede PTSD

Method:

A series of patients admitted to hospital following a road traffic accident were interviewed in hospital within 24 hours of the accident and then sent follow-up postal questionnaires five times over the next six months.

Sample:

Patients were a consecutive series of 28 patients who attended the Accident & Emergency Department of the Oxford Radcliffe Hospital, Oxford, U.K., following a road traffic accident, and who were subsequently admitted as inpatients for treatment (i.e. their injuries were serious enough that they could not be sent home immediately). The mean age of this sample was 33.2 (range 18 to 59, s.d. 12.1) , and it included 23 men and 6 women. This sample contains a higher proportion of men than the general RTA population: men are more likely to be admitted for treatment (presumably because they are more often involved in serious accidents).

Procedure:

Patients were interviewed while still in hospital within 24 hours of being admitted. Following discharge (typically 24-48 hours after the accident) patients were sent a series of five follow-up questionnaires by post, following the schedule below. The numbers of questionnaires completed and returned are also listed:

Questionnaire	Date sent	Number completed
Initial interview and questionnaire	within 24 hours of the accident	29
Second questionnaire	1 week after the accident	17
Third questionnaire	2 weeks after	19
Fourth questionnaire	4 weeks after	16
Fifth questionnaire	12 weeks after	17
Sixth (final) questionnaire + Reminder final questionnaire	24 weeks after 26 weeks after	22

Table 1: Questionnaire schedule and return rate

Measures:

The content of the initial interview and six follow-up questionnaires was as follows:

<p>Initial Interview:</p> <ol style="list-style-type: none"> 1. Background information (age, sex, type of accident) 2. Patient's description of accident 3. Trait Dissociation Questionnaire (TDQ) 4. State Dissociation Questionnaire (SDQ) 5. Rumination Questionnaire (SRQ) 6. PTSD Symptom Scale (PSS) 7. Hospital Anxiety and Depression Scale (HADS) <p>1 week to 12 week follow-up questionnaires:</p> <ol style="list-style-type: none"> 4. SDQ 5. SRQ 6. PSS 7. HADS <p>24 week follow-up questionnaire:</p> <ol style="list-style-type: none"> 3. TDQ 4. SDQ 5. SRQ 6. PSS 7. HADS

Table 2: Measures used in the study

1. **Basic patient information** (age, sex, and type of accident) was collected from the

patients' notes. The degree of physical injury was also assessed from the patients' notes.

The initial interview and questionnaire consisted of a semi-structured interview asking the patient about what they remembered of the accident, followed by a number of questionnaires.

2. Patients were asked for a **description of the accident**, according to the following instructions:

‘I’d like you to tell me as much as you can remember about what happened to you in the accident, in as much detail as possible. I am interested in everything you can remember from just before the accident occurred and what led up to the accident to when you arrived in the hospital itself. I would like to hear what happened, and, more importantly, what you thought and felt at the time. Don’t worry too much about trying to keep the story in a proper time-order: just tell me as things come to you. I won’t stop you, so just keep going until you can’t remember any more.’

If patients stopped after only a brief time, they were prompted to continue if possible with phrases like “please go on”, and “is there anything more you can remember?”. If the account was mostly factual and did not include references to thoughts or emotions of the time, then patients were asked specifically to describe how they felt and what they thought at the time of the accident.

3 - 7. The questionnaires which followed the initial interview were as follows:

the **Trait Dissociation Questionnaire** (TDQ, appendix 4),

the **State Dissociation Questionnaire** (SDQ, Appendix 20),

the **Rumination Questionnaire** (SRQ, Appendix 21, first 6 items),

the **PTSD Symptom Scale** (PSS, Appendix 11), and

the **Hospital Anxiety and Depression Scale** (HADS, Appendix 22).

The TDQ is reviewed in chapter 2, and the SDQ and SRQ are reviewed in chapter 7. The PSS (Foa, 1995) and HADS (Zigmond & Snaith, 1983) are standardized questionnaires used in many other studies.

Questionnaire reliability:

The reliability analysis of the SDQ and the SRQ is detailed in chapter 7 using a larger sample of patients than in this study: both have internal consistency. The reliability analysis of the TDQ is detailed in Chapter 2 (on a sample of non-patients), and the reliability analysis on this patient sample is detailed below.

	r=
Alpha score	.92
Minimum inter-item correlation	-.34
Maximum inter-item correlation	.80
Mean inter-item correlation	.22

Table 3: reliability analysis of the TDQ

The questionnaire has high internal consistency. Comparison of initial scores with 24-week scores to assess test-retest reliability gives a correlation of $r=.74$ ($n=16$, $p<.001$). This is similar to the test-retest correlation of $r=.82$ ($n=77$, $p<.0005$) obtained in a non-patient sample (see Chapter 2 for more details).

Calculating scores from questionnaires:

The following section summarizes how variables used in the statistical analysis were calculated.

Physical injury:

The hospital notes of each patient were studied, and any injuries noted. Injuries were coded according to severity and area of injury. Six areas of injury (head, face, neck, trunk, legs, and arms) were coded, and each of these was given a score from zero to three: zero for no injury, one for bruising only, two for soft tissue injury only, and three for bony injury. In addition, if an arm injury was listed as occurring on the dominant side, then an additional score of one was added to the arm injury severity score.

A total score for degree of injury was calculated by summing the severity of injury for each of the six areas, giving a score with a possible range of 0-19.

State dissociation:

The State Dissociation Questionnaire (SDQ, appendix 20) contains seven items. The items are scored zero for the response “not at all”, one for the response “a little” and two for the response “a lot”. A total score was calculated by summing the scores for the individual items (giving a range from 0 to 21).

Rumination:

The Rumination Questionnaire (SRQ, appendix 21, first six items). These items are scored zero for the response “not at all”, one for the response “a little” and two for the response “a lot”. The total score, calculated from the individual items, has a possible range

of 0 to 18.

Memory fragmentation:

Memory fragmentation was assessed in two ways. Firstly patients' narratives were rated during the initial interview by the interviewer on a four-point scale from 1 (not at all fragmented, confused, or incomplete) to 4 (very fragmented, confused, or incomplete). Secondly one self-report item (the last item in appendix 21) measures memory fragmentation - the item "is your memory of the accident patchy, confused, or incomplete" - to which patients could respond "not at all", "a little", or "a lot". This item was scored 0 for not at all, 1 for "a little", and 2 for "a lot".

Trait Dissociation:

The Trait Dissociation Questionnaire (TDQ, appendix 4) consists of 38 items. Each item is scored from 0 (never) to 5 (always). The total is calculated by summing the scores for each individual item (giving a range from 0 to 190). In addition scores for the seven factors that make up the TDQ are calculated by summing the scores for each of the items that load on a factor.

PTSD Symptoms:

The PTSD Symptom Scale (PSS, appendix 11) consists of 17 items measuring symptoms (part 1 of the questionnaire), 11 items measuring effects on functioning (part 2), and 6 items concerned with the nature of the trauma and perceived life threat (part 3).

Each of the symptom items is scored 0 (not at all) to 3 (almost all the time). The symptom total is calculated by summing the scores for each individual item. The total reliving

score is calculated by summing the scores for items 1 to 5. The total avoidance and numbing score is calculated by summing the scores for items 6 to 12. The total hypervigilance score is calculated by summing the scores for items 13 to 17.

The functioning questions of the PSS (items 18 to 28) and the nature of trauma questions (items 29 to 34) are scored 1 for “yes” and 0 for “no”. The total disruption of functioning score is calculated by summing the scores of the individual functioning items.

At the initial assessment four PSS items were not included since they were not appropriate for patients who had been injured in the previous 24 hours and who were still in hospital. These items are listed below, along with the subscale that they load onto:

Have you had any bad dreams or nightmares about the accident?	Reliving
Have you been trying to avoid activities, people, or places that remind you of the accident?	Avoidance
Have you had much less interest or participated much less often in important activities?	Avoidance
Have you had trouble falling or staying asleep?	Arousal

An adjusted PSS score was calculated for the initial assessment by weighting the score on each subscale to compensate for the missing items: the reliving score was multiplied by 1.25 (since 1 item out of 5 was removed), the avoidance score by 1.4 (since 2 items out of 7 were removed), and the arousal score by 1.25 (since 1 item out of 5 was removed).

PTSD caseness:

Patients were defined as having PTSD according to DSM-IV criteria; i.e. if their scores on the PSS indicated the presence of at least one reliving symptom, three avoidance or numbing symptoms, two hyperarousal symptoms, and one functioning problem. According to DSM-IV criteria, PTSD symptoms must be present for at least four weeks for a diagnosis of PTSD: however this criterion was not adopted here in order to allow direct comparisons of pre-week 4 data and post-week 4 data.

A method for calculating PTSD caseness at the initial assessment adjusted for the smaller number of items in the first PSS was also employed. For this the criterion for avoidance symptoms was reduced to the presence of two symptoms rather than three (since two avoidance items were removed from the PSS at this assessment). The other criteria remained the same.

ASD caseness:

Patients were defined as having ASD (Acute Stress Disorder) according to DSM-IV criteria; i.e. if their scores on the PSS in the first 4 weeks indicated the presence of at least one re-living symptom, one avoidance symptom, one hyperarousal symptom, one functioning problem, and at least three dissociative symptoms on the SDQ (State dissociation Questionnaire).

Results:

Statistical Analysis:

All the correlations listed in the results are non-parametric correlations, since many of the data variables are not normally distributed. Where appropriate, non-parametric tests are used in place of parametric versions.

Prevalence of PTSD Symptoms:

PTSD symptom severity was calculated over the 6-month period of the study for each patient. However, many patients had missing data, due to the failure to return one or more questionnaires. The figure below illustrates the mean PTSD symptom scale score for the whole group, including patients with some missing data. The possible range of scores is from 0 to 51. Also included is the adjusted PSS score for 0 weeks, taking into account the missing PSS items at that assessment.

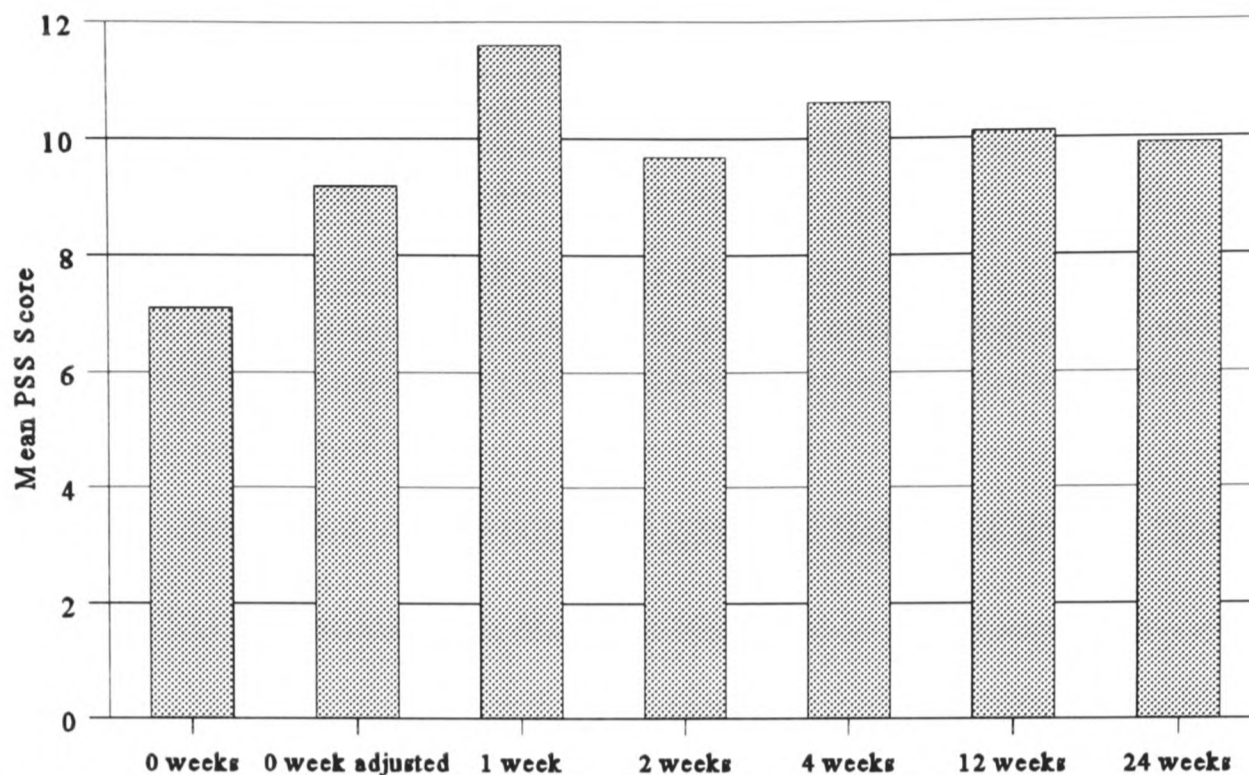


Figure 1: Mean PSS Score for all patients

The mean level of PTSD symptoms was not significantly different over the 6 month period following the accident (repeated measures ANOVA, actual PSS scores $F(5,50)=1.00$, $p<.427$. Adjusted PSS score at 0 weeks $F(5,50)=0.59$, $p<.705$). An important question is whether this represents a stability of score in each patient, or whether there are distinct subgroups of patients, some of whom get better while others get worse.

To assess this, two methods were used. In the first, PSS scores at 0 weeks (using the adjusted method of calculation) were correlated with PSS scores over the subsequent assessments. High correlations would indicate that PTSD symptoms are persistent, while low correlations would indicate that PTSD symptoms may be transient or delayed in onset. The correlations are given below:

Correlation:	1 week	2 weeks	4 weeks	12 weeks	24 weeks
r=	.83	.72	.69	.58	.71
p<	.0005	.001	.003	.014	.0005
n=	18	19	16	17	22

Table 4: Correlations of PSS score at week 0 with subsequent weeks

The table shows that correlations are generally high over the six month period, indicating that PTSD symptoms are in the main persistent in this group of patients.

In the second method, patients were divided into one of four groups: constant high PSS score, constant low PSS score, PSS initially high but falling over time, PSS initially low but rising over time, and PSS initially low but rising over weeks 1 to 12 and then low by week 24. ‘Low’ PSS was defined as a score less than 10, and ‘High’ PSS as a score of 10 or more. The results of this division are shown in the table below (a full table can be found in appendix 23)

PSS group	high-high	low-low	high-low	low-high	low-high-low
Number in group	4	10	1	2	5

Table 5: PSS score change over time

This table shows that the pattern of symptoms for patients varies, and there is no one consistent course of symptoms from patient to patient. There were no significant differences between these groups of patients in terms of initial psychological variables (TDQ, SDQ, SRQ, HADS) - i.e. there were no predictors of which group a patient would fall into.

HADS scores do not correlate with later PTSD symptoms, and so are not reported in this study.

- The pattern of PTSD symptoms varies from patient to patient: even though the mean PSS score is roughly the same over the 6 month period there are large changes for some patients.

PTSD Caseness:

PTSD caseness was assessed at each of the six time-points, including at 0 weeks using the adjusted method of diagnosis to take into account the missing PSS variables. The results of this assessment are given in the table below:

Timepoint:	0 weeks	0 week adjusted	1 week	2 weeks	4 weeks	12 weeks	24 weeks
Patients with complete data	29	24	16	18	16	17	22
Number with PTSD	3	5	3	4	6	8	4
Percentage of whole sample	10.3	17.2	10.3	13.8	20.1	27.6	13.8
Percentage of respondents	10.3	20.8	18.8	22.2	37.5	47.1	18.2

Table 6: PTSD caseness at each timepoint

Again it is of interest to examine stability of diagnosis within individuals.

In order to assess this, patients were divided up into groups according to whether they fulfilled diagnostic criteria for PTSD at 0 weeks, between 1 and 12 weeks, and at 24 weeks (thus making 8 possible groups for allocation). The results of this allocation are given in the table below (a full table can be seen in appendix 24). The digits in brackets indicate PTSD presence at 0, 1-12, and 24 weeks with a 1 for PTSD presence and a 0 for PTSD absence.

Group:	Number in Group:
No PTSD ever (000)	11
Initial PTSD:	
PTSD only at 0 weeks (100)	0
PTSD at 0 weeks and in weeks 1-12 (110)	1
PTSD constantly (111)	2
PTSD only at 0 weeks and 24 weeks (101)	1
Delayed onset PTSD:	
PTSD only in weeks 1-12 (010)	6
PTSD only in weeks 1-12 and at 24 weeks (011)	2
PTSD only at 24 weeks (001)	0

Table 7: PTSD caseness over the 6 months

There were no significant differences between these groups of patients in terms of initial psychological variables (TDQ, SDQ, SRQ, HADS) - i.e. there were no predictors of which group a patient would fall into (although this group is small, and this question is addressed further in chapter 7).

- The table shows that a significant number of patients who do not fulfil diagnostic criteria initially meet symptom criteria for PTSD later, either transiently or with symptoms still persisting at 24 weeks.

Acute Stress Disorder Caseness:

Acute Stress Disorder (ASD) caseness was assessed initially and at each time point up to 4 weeks. 7 patients (24%) fulfilled diagnostic criteria at some point over this period (a full table detailing ASD caseness may be found in appendix 25). The relationship between ASD and PTSD is investigated further in hypothesis 6.

Gender differences:

The sex ratio of this group (79% men) was not biased in terms of inpatient admissions for road traffic accidents, but is very different from the entire population of patients who have some form of road traffic accident (58% men): men are more likely to be involved in serious accidents that require being admitted as an inpatient.

There were no significant sex differences in terms of initial psychological measures (TDQ, SDQ, SRQ, PSS, HADS), nor in terms of injury severity. Because of the non-significant differences between the two groups the main results are reported for the whole group rather than for men and women separately.

Age differences:

The mean age for this sample (33.2 years) is representative of both admitted patients and the entire road traffic accident patient population (mean 32.2 years).

There were no significant relationships between age and initial psychological measures (TDQ, SDQ, SRQ, PSS, HADS), nor between age and injury severity. Because of this results are not stratified by age.

Physical Injury:

Initial psychological measure (TDQ, SDQ, SRQ, PSS, HADS) were not related to extent of physical injury, as assessed from patients' notes. Extent of physical injury was also not related to PSS score over the subsequent 6 months:

Timepoint:	Week 0	Week 1	Week 2	Week 4	Week 12	Week 24
Correlation:	.02	-.11	-.14	.41	.05	-.02
p<	.930	.739	.643	.189	.888	.917
n=	20	12	13	12	12	14

Table 8: Correlations of physical injury with PSS total

- Neither age, sex, or physical injury predicts later PTSD development

Hypothesis 1:

- Trait dissociation will predict later post-traumatic symptoms

The TDQ correlated with PTSD symptoms as measured by the PSS (leaving out the PSS items measuring dissociation (the items “not being able to remember an important part of the accident”, “feeling distant or cut off from people around you”, and “feeling emotionally numb”, to avoid confounding). The table below indicates the results for the questionnaire total (significant correlations are underlined):

Timepoint:	week 0	week 1	week 2	week 4	week 12	week 24
Correlation	<u>.53</u>	<u>.52</u>	<u>.47</u>	<u>.53</u>	.37	.26
p value	.004	.033	.043	.034	.141	.210
n=	27	17	19	16	17	21

Table 9: Correlations between TDQ and PSS

- | |
|--|
| <ul style="list-style-type: none"> • TDQ total predicts PTSD symptoms |
|--|

The correlations between individual factors of the TDQ and PTSD symptoms were also investigated, and are detailed in summary form below (correlations significant at $p < .05$ are underlined).

Factor:	week 0 n=27	week 1 n=17	week 2 n=19	week 4 n=16	week 12 n=17	week 24 n=21
Detachment from others and the world	.22	.00	.07	.24	.20	-.02
Sense of split self	<u>.45</u>	.41	<u>.53</u>	<u>.62</u>	.44	<u>.49</u>
Lability of mood and impulsivity	<u>.62</u>	<u>.52</u>	.42	<u>.58</u>	.36	.20
Memory lapses	.29	-.14	-.15	.21	.03	-.01
Emotional numbing	<u>.41</u>	<u>.49</u>	.44	.29	.27	.11
Confusion and altered time sense	<u>.40</u>	.47	.30	<u>.61</u>	.30	.18
Amnesia for important life events	-.07	.05	-.03	.18	.01	.01

Table 10: Correlations between TDQ factors and PSS

Only some of the dissociation factors correlated with PSS total: sense of split self, lability and impulsivity, emotional numbing, and confusion and altered time sense. However, there were only 16 to 20 patients with data at each individual timepoint, and so conclusions must be cautious. The relationship between individual factors of the TDQ and PSS score are investigated further in Chapter 7.

- **Hypothesis 1 is supported: Trait dissociation predicts PTSD symptoms**

Hypothesis 2:

- Trait dissociation score may increase over time in patients with chronic symptoms

If TDQ score does increase following persistent PTSD symptoms, then the level of change should be correlated with the severity of long-term symptoms (i.e. at 24 weeks). The results for both TDQ total and the individual TDQ factors are shown below (correlated, as in Hypothesis 1, with the PSS minus the items measuring dissociation):

Correlations with PSS at 24 weeks (n=14):	Correlation	n=	p<
TDQ Total change	<u>.65</u>	15	<u>.009</u>
Detachment from others and the world	<u>.64</u>	15	<u>.009</u>
Sense of split self	-.04	14	.887
Lability of mood and impulsivity	<u>.60</u>	15	<u>.017</u>
Memory lapses	<u>.69</u>	15	<u>.004</u>
Emotional numbing	.20	15	.470
Confusion and altered time sense	<u>.53</u>	15	<u>.042</u>
Amnesia for important life events	<u>.81</u>	15	<u>.0005</u>

Table 11: correlations between TDQ change and 24-week PSS

As the table shows, for five of the seven factors a change is associated with persistent PTSD symptoms. Only sense of split self and emotional numbing do not show correlations: both of these are factors that predict PSS totals.

- **Hypothesis 2** is supported: Trait dissociation increases after persistent PTSD symptoms

Hypothesis 3:

- State dissociation will predict later post-traumatic symptoms

Table 12 shows the mean level of state dissociation over the 6 month period:

	Mean (s.d.)	n=
Week 0	4.04 (3.01)	27
Week 1	1.61 (2.09)	18
Week 2	1.11 (1.97)	19
Week 4	0.93 (1.98)	15
Week 12	2.18 (5.16)	17
Week 24	2.55 (4.93)	22

A repeated measures ANOVA shows no overall significant effect of time ($F(5,45)=1.70$, $p<.154$) although a paired-samples t-test comparing the week 0 to week 1 score shows a significant difference ($t(17)=2.91$, $p<.01$).

State dissociation, measured at each timepoint by the SDQ, was correlated with PSS scores (excluding the dissociation items of the PSS), and the results of this are shown below. Correlations significant at $p<.05$ are underlined.

	week 0	week 1	week 2	week 4	week 12	week 24
0 week SDQ	<u>.50</u>	.47	.44	.44	.14	.25
1 week SDQ		<u>.54</u>	<u>.57</u>	.46	.52	<u>.58</u>
2 week SDQ			<u>.53</u>	.51	.51	<u>.52</u>
4 week SDQ				<u>.59</u>	.41	.42

Table 12: correlations between SDQ and PSS

The 1 week and subsequent SDQ scores are more predictive of later symptoms than the initial 0 week SDQ.

- The table shows that state dissociation is positively correlated with post-traumatic symptoms, and is predictive of symptoms over the 6 month period.
- **Hypothesis 3** is supported: state dissociation predicts later PTSD symptoms

Hypothesis 4:

- Rumination will predict later post-traumatic symptoms

Rumination, measured at each timepoint by the SRQ, was correlated with PSS scores, and the results of this are shown below. Correlations significant at $p < .05$ are underlined.

	week 0	week 1	week 2	week 4	week 12	week 24
0 week SRQ	<u>.56</u>	.46	<u>.49</u>	<u>.80</u>	<u>.53</u>	<u>.49</u>
1 week SRQ		<u>.78</u>	<u>.78</u>	<u>.78</u>	<u>.78</u>	<u>.87</u>
2 week SRQ			<u>.74</u>	<u>.75</u>	<u>.68</u>	<u>.70</u>
4 week SRQ				<u>.76</u>	<u>.68</u>	<u>.67</u>

Table 13: correlations between SRQ and PSS

The 1 week and subsequent SRQ scores are more predictive of later symptoms than the initial 0 week SRQ.

- The table shows that rumination is positively correlated with post-traumatic symptoms, and is highly predictive of symptoms over the 6 month period.
- **Hypothesis 4** is supported: rumination predicts later PTSD symptoms

Hypothesis 5:

- Fragmented or unclear initial memories of the event will predict later post-traumatic symptoms

Models of dissociation predict that dissociation during a traumatic event should result in memory fragmentation, and that memory fragmentation prevents proper integration of traumatic memories and therefore maintains PTSD symptoms.

Fragmentation of memory was assessed in two ways:

1. An interviewer rating on a four-point scale of the patient's narrative of what happened during the traumatic event.
2. The patient's self-report of the degree of fragmentation of their memory of the trauma, on a three-point scale.

The correlation between the two measures of memory fragmentation was $r=.31$ ($n=24$, $p<.140$) - non-significant but at least in the expected direction, indicating a degree of validity to both measures.

There were no significant correlations between two measures of memory fragmentation used and either TDQ total score (interviewer rating $r=-.05$, $n=23$, $p<.805$, self-rating $r=.16$, $n=26$, $p<.434$) or any of the TDQ factors. There was, however, a significant correlation between state dissociation during the trauma (as rated by the patient) and the interviewer measure of memory fragmentation ($r=.40$, $n=24$, $p<.05$), as well as state dissociation in week 1 ($r=.63$, $n=17$, $p<.007$), and week 2 ($r=.66$, $n=18$, $p<.003$).

- This finding supports the hypothesis that state, rather than trait, dissociation is linked to memory fragmentation

There were no significant correlations between the patients' self-reported degree of fragmentation and PTSD symptoms. However, the correlations between the interviewer rating and PTSD symptoms (as measured by PSS total) did reach significance, though, and are given below. Correlations significant at $p < .05$ are underlined.

Timepoint:	week 0	week 1	week 2	week 4	week 12	week 24
Correlation	.26	.26	.32	.42	.30	<u>.48</u>
p<	.211	.320	.201	.180	.315	<u>.043</u>
n=	24	17	18	12	13	18

Table 14: Correlations between memory fragmentation and PSS

- All but one of the correlations are non-significant, although all are in the right direction: there is some indication that memory fragmentation is associated with later PTSD symptoms.
- There is partial support for **Hypothesis 5**: memory fragmentation predicts later PTSD symptoms

Hypothesis 6:

- Acute Stress Disorder will precede PTSD

Acute Stress Disorder (ASD) caseness was assessed at 0, 1, 2, and 4 weeks. PTSD caseness was assessed at 24 weeks. The table below summarizes the relationship between ASD and PTSD - i.e. whether ASD reliably precedes chronic PTSD:

Number of cases:	No PTSD	PTSD
No ASD	15	0
ASD	3	4

Table 15: The relationship between ASD and PTSD

A chi-square test shows that PTSD is reliably preceded by ASD ($\chi^2=6.99$ (1 d.f.), $p<.008$).

No patients developed PTSD without first having fulfilled the diagnostic criteria for ASD.

43% of patients (3/7) who fulfilled the diagnostic criteria for ASD did not develop chronic PTSD.

- Although ASD always precedes PTSD in this sample, some patients with ASD do not develop chronic PTSD
- **Hypothesis 6** is supported: ASD predicts PTSD

This relationship will be investigated further in Chapter 7.

Discussion:

The discussion here is continued in Chapter 7.

Physical injury:

In this sample, physical injury, as rated from patients' notes, was not related to the development of post-traumatic symptoms. This is consistent with existing evidence (Mayou, Bryant, & Duthie, 1993; McFarlane, 1988). The measure of severity of physical injury used in this study is a simple clinical assessment, and takes no account of the patient's subjective view. For this reason, Chapter 7, which examines a group of non-admitted patients who have a wider range of injuries (from none at all to serious injuries such as fractures, lacerations and whiplash), also includes a self-report assessment of injury severity to assess whether this may be predictive of later post-traumatic symptoms.

Trait dissociation:

Trait dissociation, as measured by the TDQ, does predict later PTSD symptoms in this group of patients. Some factors in the TDQ seem more predictive than others, although the small sample size and large amount of missing data mean that no strong conclusions can be drawn from this study about this. This finding is consistent with previous research, both retrospective and prospective, which indicates a relationship between dissociation and PTSD development (Dancu, Riggs, Hearst Ikeda, Shoyer, & Foa, 1996; Marmar et al., 1994; Shalev, Peri, Canetti, & Schreiber, 1996). This relationship is considered further in Chapter 7.

Trait dissociation change:

The basic concept of a trait is that it is relatively stable over time. However, a significant life event and its sequelae may result in changes in traits (Daniel, 1973; Zak, 1982), and trait dissociation is no exception (Bremner et al., 1992; Chu & Dill, 1990; Noyes, Hoenk, Kuperman, & et al., 1977). Trait dissociation is affected by having suffered a traumatic road traffic accident and having had post-traumatic symptoms, although two of the factors on the TDQ do not show significant change (sense of split self and emotional numbing). However, the sample size in this study is small, and so no firm conclusions can be made about the relative stability of the individual TDQ traits.

Published research indicates that post-traumatic symptoms such as avoidance and intrusions seem to emerge only after some hours or days (World Health Organization, 1992). However, dissociation can be immediate and result in elevated responses on the TDQ, administered only hours after a trauma. The only way to avoid this problem would be to arrange for subjects to complete the TDQ before being involved in a traumatic event: in practical terms this would be difficult. One possibility would be to study a group extremely likely to be involved in trauma, such as members of the emergency services. However, this population is self-selected and are likely to have distinct psychological characteristics so that results are not generalizable to other groups.

The TDQ does predict later PTSD symptoms, and this study indicates that it also has a tendency to increase following trauma and persistent PTSD symptoms, suggesting a possible “vicious circle” relationship between dissociation and other PTSD symptoms.

State dissociation:

As with trait dissociation, state dissociation, measured at each timepoint in the study, predicts later post-traumatic symptoms. It is interesting that state dissociation in week 1 is more predictive than the initial measure. There are two possible reasons:

1. The method of assessment in the initial interview was different in that the patient was required to complete the questionnaire with the help of the interviewer (many patients felt unable to hold a pen or to see clearly at this first interview), and so the questions and responses were verbal rather than written. However, Chapter 7 reports a similar finding when the method of assessment in all interviews was identical, so this explanation seems unlikely.
2. It may be that immediate state dissociation is mainly a response to the characteristics of the traumatic event, rather than reflecting the individual's habitual coping strategy. State dissociation at week 1 and later may therefore be a better measure of individual differences in coping with distressing memories and therefore more likely to correlate with the later development of PTSD symptoms.

Rumination:

Rumination, as measured by the SDQ, was highly predictive of later PTSD symptoms in this group of patients. This finding is consistent with other research (Ehlers, Mayou, & Bryant, submitted). It is unclear from this small sample how important ruminative worry is compared to other psychological variables in the development of PTSD symptoms: this issue is considered further in Chapter 7.

Memory fragmentation:

Theories of dissociation predict that dissociation during a traumatic event should produce a fragmented, incoherent memory for that event. This fragmentation, it is argued, prevents later complete processing of memories of the event, resulting in a lack of integration of traumatic memories into “normal” memory, and therefore the failure to habituate to distressing intrusions and the maintenance of PTSD. It follows that dissociation ought to be related to memory fragmentation, and memory fragmentation to later PTSD symptoms.

Memory fragmentation as rated by the interviewer did correlate with the patients’ ratings of dissociation at the time of the trauma, while not correlating with the TDQ, a measure of trait dissociation, as expected. There is also support for the second part of the memory fragmentation hypothesis: the interviewer-rated measure of memory fragmentation did correlate with later persistent PTSD symptoms.

The patients’ own ratings of memory fragmentation were not significantly correlated with either state dissociation or the later development of symptoms. However, it is not easy for participants to understand and rate fragmentation and the global self-rating (one question on a three point scale) was in all likelihood inadequate. In order to investigate the relationship between dissociation, memory fragmentation, and later PTSD symptoms more fully it would be necessary to concentrate on much more accurate and detailed measurement of memory fragmentation, either within an interview or a questionnaire setting.

Acute Stress Disorder and PTSD

Acute Stress Disorder (ASD) reliably preceded chronic PTSD, although some patients with ASD did not go on to develop PTSD. This indicates that although the two categories have a close relationship to one another, there may be some descriptive utility in distinguishing, as DSM-IV does, between post-traumatic symptoms which occur in the first month after a traumatic event, and post-traumatic symptoms which occur subsequently. In particular the initial symptoms seem more likely to include dissociation, an important part of the diagnostic criteria for ASD. This sample of patients is a relatively small one, however, and the relationship between ASD and PTSD will be further investigated in Chapter 7.

Conclusion:

This study has found support for all its main hypotheses, and in particular has demonstrated that both trait and state dissociation are predictive of later PTSD symptoms. This study has also examined the development and course of PTSD symptoms closely over the initial six-month period following a traumatic event, and demonstrated that although PTSD prevalence remains fairly constant throughout this period, for each individual PTSD symptoms follow quite different patterns: they may appear at a delayed stage, fade away from an initial high point, or continue persistently. This study has made a preliminary investigation of the relationship between Acute Stress Disorder (ASD) and PTSD, indicating that there is some utility in regarding these as distinct categories, and this and the other issues examined by this study will be explored in more detail in Chapter 7.

CHAPTER 7:

Non-admitted RTA Prospective Study

Introduction:

Aim

The aim of the second clinical study is to replicate the findings from the previous chapter, by using a much larger sample and by including patients who may have suffered a wider range of injuries, including patients who have suffered minor injuries and who therefore may have suffered a less threatening trauma. The relationship between psychological variables, including dissociation, and later post-traumatic symptoms will be investigated, with the aim of developing a predictive model of persistent PTSD.

The previous study examined a group of seriously injured patients, admitted to hospital following a road traffic accident. This group, however, represents only a small proportion of the total population involved in RTAs that are seen in hospital A&E departments. The majority of attenders have relatively minor physical injuries. These patients are discharged and sent home, possibly with a referral to an outpatient clinic (for follow-up care of fractures or physiotherapy, for instance). It was clinically important, therefore, to establish whether the main findings of the previous study of admitted severely injured patients

were also applicable to this much larger category of patients.

Psychiatric morbidity (both of PTSD and other disorders such as depression and anxiety) in this group runs at approximately 20%, although estimates have varied widely (see chapter 5 for a discussion). This implies that the numbers of individuals who must suffer from PTSD as a result of road traffic accidents each year must be huge. Early identification would enable early treatment, and offer an opportunity of preventing problems from becoming chronic and debilitating. An advantage of investigating this population is that the access to larger numbers make recruitment and statistical analysis of data much easier, although there is also a disadvantage in that patients pass through the hospital rapidly and so have to be contacted initially by post rather than in person.

Hypotheses:

- 1. Trait dissociation will predict later post-traumatic symptoms
- 2. Trait dissociation score may increase over time in patients with chronic symptoms
- 3. State dissociation will predict later post-traumatic symptoms
- 4. Rumination will predict later post-traumatic symptoms
- 5. Initial processing type will be predicted by trait dissociation and will predict memory fragmentation and later post-traumatic symptoms
- 6. Fragmented or unclear initial memories of the event will predict later post-traumatic symptoms
- 7. Acute Stress Disorder will precede PTSD
- 8. It is possible to construct a predictive model for PTSD symptoms, based on initial variables.

Method:

The design of this study was based on that of the admitted RTA patients study, but the questionnaires were shortened and the patients contacted only three times (as opposed to six times in the admitted patients study) in order to ensure a high initial response rate and low subsequent drop-out rate.

Sample:

Patients were recruited from a consecutive series of 439 patients who attended the Accident & Emergency Department of the Oxford Radcliffe Hospital, Oxford, U.K., following a road traffic accident and who were not admitted as inpatients for treatment. Some of these patients were treated for injuries in A&E and referred on to their GPs or to a clinic (such as the fracture clinic), others were treated for relatively minor injuries only while in A&E, and others left before treatment (probably because their injuries were minor and they felt unable to wait up to several hours to be seen).

177 patients returned questionnaires (a response rate of 40%). There were 79 female patients and 95 male patients (on 3 questionnaires sex was unidentifiable). This ratio in respondents (55% male) is similar to that in the population sent questionnaires (58% male).

The mean age of respondents was 33.8 years (range 17 to 76, s.d. 13.32). This was representative of the population sent questionnaires (mean age 32.2 years).

Procedure:

Three questionnaires were sent out to patients: an initial questionnaire and two follow-up questionnaires. If the follow-up questionnaires were not returned on time, reminder letters and duplicate questionnaires were sent out. The questionnaires were sent out according to the following schedule:

Questionnaire	Date sent
Initial questionnaire (appendix 26)	within 48 hours of the accident
Second questionnaire (appendix 27)	4 weeks after the accident
Second questionnaire reminder	5 weeks after the accident
Third questionnaire (appendix 28)	24 weeks (6 months) after the accident
Third questionnaire reminder	26 weeks after the accident
Third questionnaire reminder	28 weeks after the accident

Table 1: questionnaire schedule

176 initial questionnaires were returned, and 144 (82%) of these were completed by the patient within seven days of the accident.

146 4-week questionnaires were returned (82% of the original sample). Of these, 101 (69%) were filled in within seven days.

140 24-week questionnaires were returned (80% of the original sample). Of these, 107 (80%) were filled in within fourteen days.

Measures:

The measures included in the three questionnaires were as follows:

<p>Initial questionnaire</p> <ol style="list-style-type: none">1. PTSD Symptom Scale (PSS)2. Information processing questions3. State Dissociation Questionnaire (SDQ)4. Rumination Questionnaire (SRQ)5. Trait Dissociation Questionnaire (TDQ) <p>4-week follow-up questionnaire</p> <ol style="list-style-type: none">1. PTSD Symptom Scale (PSS)3. State Dissociation Questionnaire (SDQ)4. Rumination Questionnaire (SRQ) <p>24-week follow-up questionnaire</p> <ol style="list-style-type: none">1. PTSD Symptom Scale (PSS)3. State Dissociation Questionnaire (SDQ)4. Rumination Questionnaire (SRQ)5. Trait Dissociation Questionnaire (TDQ)
--

Table 2: Questionnaire contents

Basic patient information (age, sex, and type of accident) was collected from the patients' notes. In a subset of patients (the first 86 patients assessed) the patients' notes were available, and from these the degree of physical injury was assessed.

The initial questionnaire (appendix 26) contained all the questions from the **PTSD Symptom Scale** (Foa, 1995) except items 3, 8, 10, and 14 (which ask about behaviours such as avoidance and sleep patterns, that do not become an issue until more than 24 hours after the accident and are therefore not applicable to patients filling in the questionnaire immediately after an accident).

The questionnaire also contained a set of pilot questions asking about **information processing** during the accident (semantic-driven versus data-driven processing), developed

from preliminary work by Ehlers and Clark (Ehlers & Clark, in press).

The **State Dissociation Questionnaire (SDQ)** and the **Rumination Questionnaire (SRQ)** are questionnaires developed by the author for the purpose of this thesis. The **Trait Dissociation Questionnaire (TDQ)**, also developed by the author for the purpose of this thesis, was included in an abbreviated 10-item form, described below.

The 4-week questionnaire (appendix 27) contained all the items from the PSS, including the functioning questions, as well as the SDQ and SRQ.

The 24-week questionnaire (appendix 28) contained all the items from the PSS, including the functioning questions, as well as the SDQ, SRQ, and the short version of the TDQ.

The short version of the Trait Dissociation Questionnaire (TDQ-R):

This 10-item version of the TDQ was created by selecting strongly loading items from each of the seven factors of the original 38-item TDQ. The items included are shown below:

Item	Factor the item loads on
1. I feel distant and cut off from others around	Detachment from others and world
2. I feel that my personality is split into distinct parts	Sense of split self
3. I underestimate or overestimate the amount of time that has passed	Confusion and altered time sense
4. I find new things among my belongings that I do not remember buying	Inattention and memory lapses
5. I feel like I don't belong	Detachment from others and world
6. I feel emotionally numb (e.g. feel sad but cannot cry, unable to have loving feelings)	Emotional numbing
7. I do many things which I regret afterwards	Lability of mood and impulsivity
8. I don't know how to stop myself from doing things	Lability of mood and impulsivity
9. I have problems remembering important details of stressful events	Amnesia for important life events
10. I find it difficult to feel real emotions, such as pain, happiness, sadness, or anger	Emotional numbing

Table 3: Items in the TDQ-R

Questionnaire Reliability:

The reliability analysis for the full 38-item TDQ is given in chapter 2. A reliability analysis was performed on the short version of the TDQ (TDQ-R) using this patient sample, and the results of this are given below.

Reliability analyses were also carried out on the SDQ and SRQ in order to assess whether these scales had sufficient internal consistency to make the total scores from these scales meaningful. The results of these are given below.

The summary of the reliability analyses for the three sets of items are given below:

	TDQ-R	SDQ	SRQ
Alpha score	.86	.79	.77
Minimum inter-item correlation	.15	.11	.15
Maximum inter-item correlation	.76	.53	.50
Mean inter-item correlation	.40	.36	.32

Table 4: reliability analysis of the TDQ-R, SDQ and SRQ

The results of the reliability analysis indicate that the TDQ-R, SDQ and SRQ have high internal consistency and that the total score from each is a meaningful variable.

Item one of the SRQ (“When you remember something about the accident, do you consciously force yourself to think about it, rather than trying to ignore or forget about it?”) did not correlate well with the other items and so was dropped from later analyses using the SRQ.

The test-retest reliability coefficient for the short version of the TDQ over a 6-month period is $r=0.56$ ($n=129$, $p<.0005$).

Calculating scores from questionnaires:

The following section summarizes how variables used in the statistical analysis were calculated.

Physical injury:

The hospital notes of an initial series of 86 patients were studied, and injuries were coded as in Chapter 6.

State dissociation:

There are seven state dissociation items on each questionnaire, following the heading “During the Accident itself” in the initial questionnaire and following the heading “Over the past week” in the follow-up questionnaires. These are coded as in Chapter 6.

Rumination:

There are seven rumination items on each questionnaire, which follow the heading “Now, at this moment” on the initial questionnaire and on the follow-up questionnaires are below the state dissociation questions. However, since item one does not correlate well with the others (see the reliability analysis for this in the results section) only items two to seven are used in analyses. These items are scored zero for the response “not at all”, one for the response “a little”, and two for the response “a lot”. The total score is calculated by summing the individual item scores.

Information processing:

There are six pilot information processing items on the initial questionnaire: items 8 to 13. Items 8 to 10 are semantic driven processing items, while items 11-13 are data driven processing items. Each item is scored zero for the response “not at all”, one for the response “a little / not very much”, two for the response “quite a bit”, and three for the response “a lot / not very much”.

A total semantic driven processing score was calculated by summing the scores for items 8 to 10, and a total data driven processing score was calculated by summing the scores for items 11-13.

A balance of processing score was calculated in two ways. The first balance of processing score was calculated by subtracting the data driven processing total score from the semantic driven processing total score. The second balance of processing score was calculated by subtracting the score for item 13 from the score for item 10 (these two items seemed, post hoc, to be the best predictors of later post-traumatic symptoms).

Memory fragmentation:

There is one memory fragmentation question in the initial questionnaire: item 3. This item is scored zero for the response “not at all”, one for the response “a little / not very much”, two for the response “quite a bit”, and three for the response “a lot / not very much”.

Trait Dissociation:

The initial and 24-week follow-up questionnaires contained a short 10-item version of the Trait Dissociation Questionnaire (TDQ). Each item is scored in the same way as in Chapter 6: from 0 (never) to 5 (always). The total is calculated by summing the scores for

each individual item.

PTSD Symptoms:

The PTSD Symptom Scale (PSS) is contained in full form in the 4 and 24 week questionnaires, and in a slightly shorter form in the initial questionnaire (minus items 3, 8, 10, and 14). Each item is scored 0 (not at all) to 3 (almost all the time), just as in Chapter 6, as are the total scores, and the scores for the items measuring functioning (items 19 to 27). An adjusted PSS total for the 0 week questionnaire was calculated as in Chapter 6 because of the reduced number of items used at this timepoint.

PTSD caseness:

Patients were defined as having PTSD according to DSM-IV criteria as in Chapter 6. As in Chapter 6, an adjusted method was also used for calculating PTSD caseness at 0 weeks, taking into account the lower number of items in the 0 week questionnaire.

ASD caseness:

Patients were defined as having ASD (Acute Stress Disorder) according to DSM-IV criteria as in Chapter 6.

Results:

The results are divided up according to the hypotheses as below:

Part A: Population description

Prevalence of PTSD symptoms

Gender differences

Age differences

Physical injury

Perceived life threat and controllability of the event

Part B: Hypotheses

Hypothesis 1: Trait dissociation will predict later post-traumatic symptoms

Hypothesis 2: Trait dissociation score will increase over time in patients with chronic post-traumatic symptoms

Hypothesis 3: State dissociation will predict later post-traumatic symptoms

Hypothesis 4: Rumination will predict later post-traumatic symptoms

Hypothesis 5: Initial processing type will be predicted by trait dissociation and will predict memory fragmentation and later post-traumatic symptoms

Hypothesis 6: Fragmented or unclear initial memories of the event will predict later post-traumatic symptoms

Hypothesis 7: ASD predicts PTSD

PTSD caseness

ASD caseness

Does ASD predict PTSD?

Hypothesis 8: It is possible to construct a predictive model of post-traumatic symptoms, based on initial variables

models predicting PTSD symptoms

models predicting PTSD caseness

All the correlations listed in the results are non-parametric correlations, since many of the data variables are not normally distributed.

Part A: Population description

PTSD symptom severity

PTSD symptom severity was measured at each timepoint by the PSS: the mean scores for all patients are given in the figure below (including the adjusted PSS total for week 0):

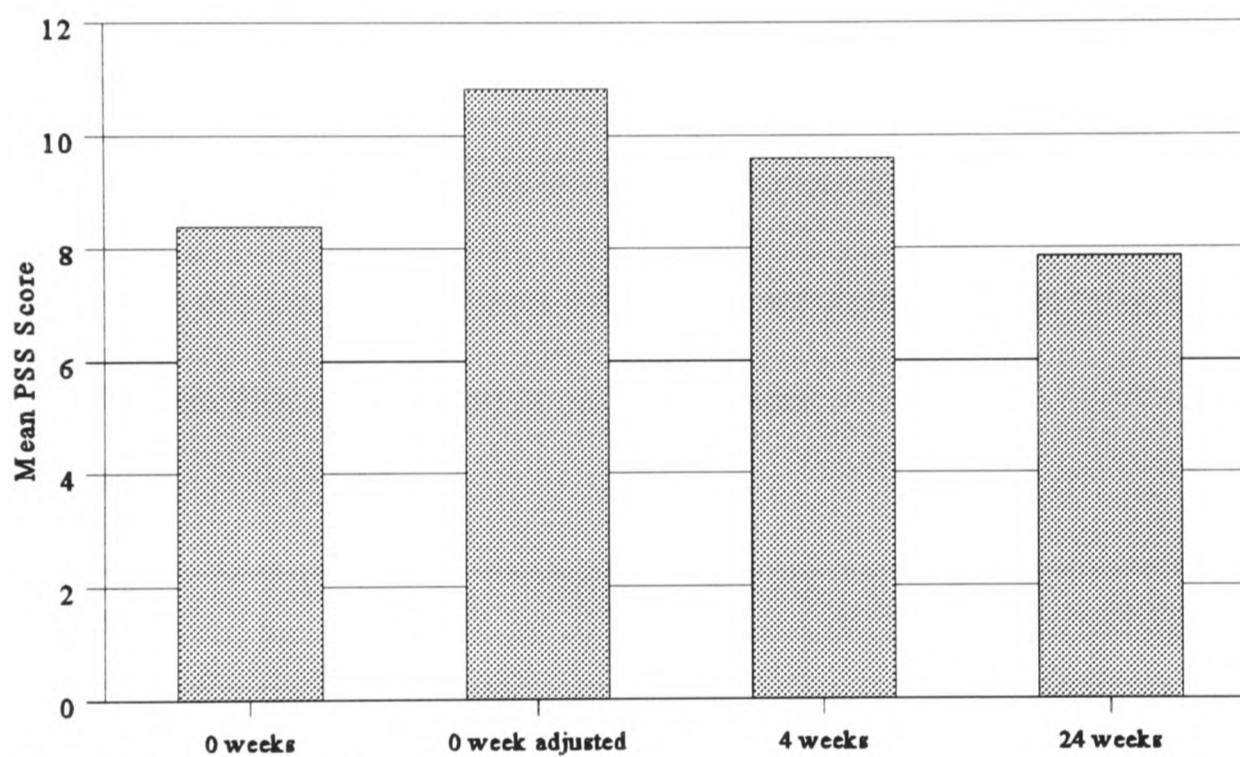


Figure 1: Mean PSS Score over time

These scores are significantly different (repeated measures ANOVA, Actual scores: $F(2,252)=3.04$, $p<.050$. Using adjusted score: $F(2,250)=7.69$, $p<.001$). Using the actual scores, only the 4 and 24 week scores differ significantly (Tukey HSD test at $p<.05$), while with the adjusted 0 week score all pairs of scores differ significantly.

The differences between time periods are relatively small, with the overall mean level of symptoms remaining elevated well above zero. This result is similar to that in Chapter 6.

PTSD Caseness

The numbers of patients diagnosed with PTSD are detailed in the table below, along with mean PSS scores (for all patients) at each time point:

PTSD Diagnosis	Initially	Adjusted Initial	At 4 weeks	At 24 weeks
Number with PTSD	38	54	41	34
Mean PSS score	8.39	10.83	9.60	7.84
Respondents with full data	173	173	145	140
% of 176 with PTSD	21.6%	30.7%	23.3%	19.3%
% of respondents with PTSD	22.0%	31.2%	28.3%	24.3%

Table 5: Proportion of patients with PTSD

In contrast to studies with assault victims, which have reported the proportion fulfilling diagnostic criteria soon after the trauma to be as high as 90-95% and a rapid dropping-off in prevalence (Amir, Stafford, Freshman, & Foa, unpublished; Rothbaum, Foa,

Murdock, Riggs, & Walsh, 1990) the proportion of patients who fulfil diagnostic criteria in this study is lower, and relatively constant (Repeated measures ANOVA, Actual prevalence $F(2,246)=0.63$, $p<.531$. Using adjusted 0-week prevalence $F(2,246)=0.94$, $p<.392$).

As in the previous chapter, however, an important question is whether the relatively constant prevalence represents patients who fulfil diagnostic criteria for PTSD throughout the 6 months, or a large number of individuals having PTSD for varying periods during the 24 weeks. This was examined in two ways:

- The association of PTSD prevalence at 0 weeks (using the adjusted method of diagnosis) with PTSD prevalence at 4 weeks and at 24 weeks was tested, using a Phi statistic. A high association (and significance) would indicate that PTSD is persistent, while a low association (and significance) would indicate that PTSD is transient or delayed in many patients. The association obtained at 4 weeks was $\phi=0.55$ ($p<.00001$), and at 24 weeks was $\phi=0.16$ ($p<.199$). This value indicates that the course of PTSD over the full 6-month period is varied.
- Patients were divided into one of eight possible groups according to whether they qualified for a diagnosis of PTSD initially, at 4 weeks, and at 24 weeks. The results are shown below for patients with complete data at all time points. It is interesting to note that of the 26 patients with PTSD at 0 weeks, 11 (42%) go on to develop chronic PTSD. On the other hand, these 11 patients are outnumbered by the 21 patients who developed chronic PTSD without having PTSD at 0 weeks (i.e. a delayed onset group).

PTSD Group	Number of patients in group
none ever	73
initial PTSD:	
at 0 weeks only	11
at 0 & 4 weeks	8
at 0, 4, & 24 weeks	7
at 0 & 24 weeks	0
Total:	26
delayed onset PTSD:	
at 4 weeks only	4
at 4 & 24 weeks	13
at 24 weeks only	8
	25

Table 6: PTSD caseness over time

Of the 16 patients who fulfilled criteria for PTSD at 0 weeks using the adjusted method only (i.e. who had only 2 avoidance symptoms rather than at least 3), 12 had complete data at 24 weeks, and of these 9 had PTSD (75%).

- Although PTSD prevalence is constant in this sample over 6 months, some patients have a delayed onset of PTSD and others recover within 6 months

Gender differences:

The effects of gender on other initial variables were investigated. The results are summarized in the table below, with Mann-Whitney U-test statistics due to the non-parametric distribution of the data. The differences in caseness are tested using a χ^2 test, for which the χ^2 value is reported. Differences significant at $p < .05$ are underlined.

Variable	female mean (and s.d.)	male mean (and s.d.)	Z	p<
Initial variables:				
Physical injuries	2.0 (1.6)	2.4 (1.5)	1.37	.169
Self-rated injuries	2.4 (0.5)	2.5 (0.7)	0.35	.724
Felt life was in danger	2.4 (1.1)	2.4 (1.1)	0.02	.981
Felt helpless	3.2 (0.9)	3.1 (1.0)	0.43	.666
Felt terrified	2.8 (1.0)	2.5 (1.0)	2.17	<u>.030</u>
TDQ total	8.7 (6.5)	7.8 (7.3)	1.36	.174
PSS total	9.9 (7.1)	6.8 (6.9)	3.45	<u>.0006</u>
Adjusted PSS total	12.7 (9.2)	8.9 (9.0)	3.28	<u>.001</u>
SRQ total	6.1 (2.9)	5.3 (3.0)	1.67	.096
SDQ total	4.8 (3.7)	3.9 (2.9)	1.47	.140
PTSD caseness	31%	13%	$\chi^2=7.36$	<u>.007</u>
Adjusted PTSD caseness	43%	20%	$\chi^2=8.95$	<u>.003</u>
ASD caseness	37%	30%	$\chi^2=0.72$	.395
Follow-up:				
4 week PTSD caseness	23%	31%	$\chi^2=0.76$	.384
24 week PTSD caseness	18%	29%	$\chi^2=1.72$	.190
4 week PSS total	10.1 (9.7)	9.0 (8.7)	0.60	.549
24 week PSS total	7.6 (8.8)	7.9 (8.4)	0.18	.859

Table 9: Differences between patients with ASD at 4 weeks and those without

Women score higher on the PSS initially than men, and are more likely to fulfil symptom criteria for PTSD at this point. The main reasons for this seem to be that women are significantly more likely to meet both the reliving and arousal criteria for ASD and PTSD than men are (Reliving: 94% of women, 81% of men, χ^2 test, $\chi^2(1)=4.80$, $p < .028$. Arousal: 62%

of women, 37% of men, χ^2 test, $\chi^2(1)=10.20$, $p<.001$).

There is a significant increase in PTSD prevalence amongst men between 0 and 4 weeks using actual PTSD caseness, but no significant increase using the adjusted caseness (McNemar matched pairs tests, $n=73$: actual caseness $p<.012$; 0 week adjusted caseness $p<.308$).

There is a non-significant decrease in PTSD prevalence amongst women over the same period using actual PTSD caseness, although this is significant using the adjusted caseness (McNemar matched pairs test, $n=67$: actual caseness $p<.109$; 0 week adjusted caseness $p<.013$).

At 4 and 24 weeks there are no significant differences between men and women in terms of mean PSS scores or PTSD caseness. There is a non-significant difference in PTSD caseness at 24 weeks, however, with a higher proportion of men meeting diagnostic criteria. The reason for this seems mainly due to a higher proportion of men fulfilling the avoidance criterion of PTSD (36% of men compared to 20% of women, χ^2 test, $\chi^2(1)=3.80$, $p<.05$).

Age differences:

Older participants had lower trait dissociation scores (correlation of age and TDQ total $r=-.23$, $n=164$, $p<.003$). This finding is consistent with many other studies of the relationship between dissociation and age (Bernstein & Putnam, 1986; Carlson & Putnam, 1993; Carlson, Putnam, Ross, & et al., 1993; Dubester & Braun, 1995; Frischholz, Braun, Sachs, & al., 1990; Ross, Norton, & Anderson, 1988).

There were no significant correlations of age with any other initially measured psychological variable, nor with PTSD symptom severity or PTSD caseness later on, and so the remainder of the results are reported for the whole sample rather than for old and young

patients separately.

- Age has few significant effects on initial psychological variables or later PTSD symptoms
- Gender does have an effect on initial psychological variables and later PTSD symptoms

Physical injury:

The degree of physical injury sustained was rated in two ways. In one group of 86 consecutive patients a score representing the severity and extent of physical injury was calculated as described above.

In addition all patients were asked to rate the degree of their injuries on a four-point scale from “not at all” to “a lot / very much”.

The correlations of these ratings with PTSD symptoms over the 24 weeks are summarized in the table below: correlations significant at $p < .05$ are underlined.

Variable	Correlation with PSS at 0 weeks	Correlation with PSS at 4 weeks	Correlation with PSS at 24 weeks
Physical injury	-.08 (p<.461) n=86	.01 (p<.928) n=69	.01 (p<.908) n=63
Self-rated injury	.14 (p<.063) n=171	<u>.25 (p<.003)</u> <u>n=142</u>	<u>.21 (p<.016)</u> <u>n=135</u>
Self-rated injury (women only)	.07 (p<.576) n=76	.12 (p<.322) n=67	.05 (p<.710) n=64
Self-rated injury (men only)	<u>.21 (p<.042)</u> <u>n=92</u>	<u>.35 (p<.002)</u> <u>n=73</u>	<u>.31 (p<.010)</u> <u>n=69</u>

Table 10: correlations of physical injury with PSS

Objectively measured degree of physical injury is not correlated with PTSD symptom development. Self-rated injury was related to PTSD symptoms, but this relationship was only significant in men. We need to consider possible explanations:

- It is unlikely to be because the objective measure is in some way biased or inadequate, since there was a significant correlation between the objective and subjective ratings ($r=.22$, $n=84$, $p<.040$).
- It is also not the case that self-rated injury severity is substantially influenced by how frightening, life-threatening, or dangerous the traumatic event itself is, and that this element of fear or life-threat is the real cause of later post-traumatic symptoms. Correlations between self-rated injury severity and ratings of distress or fear during the accident (items 4 to 7 on the initial questionnaire) are mostly non-significant.

Item	Correlation with self-rated injury severity	Correlation with self-rated injury (women only)	Correlation with self-rated injury (men only)
Did you think your life was in danger?	.11 n=170, p<.153	.13 n=75, p<.251	.11 n=92, p<.276
Did you think someone else's life was in danger?	-.02 n=168, p<.749	.16 n=75, p<.182	-.13 n=90, p<.220
Did you feel helpless?	<u>.17</u> <u>n=171, p<.027</u>	.16 n=76, p<.165	.20 n=92, p<.054
Did you feel terrified?	.13 n=170, p<.087	.04 n=75, p<.728	<u>.22</u> <u>n=92, p<.035</u>

Table 11: correlations between self-rated injury severity and fear

Partiallying out these variables from the correlation between self-rated injury severity and later PTSD symptoms still leaves significant correlations, indicating an effect of self-rated injury independent of fear during the trauma:

Correlation:	PSS total at 4 weeks	PSS total at 24 weeks
All patients	.19 (n=134, p<.023)	.22 (n=129, p<.013)
Women only	.05 (n=61, p<.719)	.05 (n=58, p<.710)
Men only	.36 (n=65, p<.003)	.36 (n=63, p<.003)

Table 12: correlations between self-rated injury and later PTSD symptoms, partialling out fear variables

The relationship between injury rating and PTSD symptoms will be examined further in the discussion.

- Self-rated injury predicts later post-traumatic symptoms in men
- Objectively rated injury does not predict later post-traumatic symptoms

Perceived life threat and controllability of the event:

There were no significant correlations between perceived life threat and later PTSD symptoms, nor between perceived helplessness or terror and later PTSD symptoms: the correlations are summarized below:

Item correlated with PSS	4 weeks (n=144)		24 weeks (n=139)	
Did you think your life was in danger?	r=.12	p<.151	r=.08	p<.339
Did you think that someone else's life was in danger?	r=-.01	p<.929	r=.05	p<.531
Did you feel helpless?	r=.07	p<.409	r=.01	p<.934
Did you feel terrified?	r=.12	p<.149	r=.05	p<.576

Table 13: correlations between perceived life threat, controllability and PSS

None of these variables were significant predictors of PTSD symptoms, although helplessness did emerge as a predictive factor of PTSD caseness and PSS total at 6 months in the regression analyses (hypothesis 8). However, analysis of men and women separately demonstrates some important differences:

Item correlated with PSS	4 weeks		24 weeks	
Women only (n=78):				
Did you think your life was in danger?	r=.18	p<.136	<u>r=.25</u>	<u>p<.042</u>
Did you think that someone else's life was in danger?	r=-.01	p<.917	r=.07	p<.597
Did you feel helpless?	<u>r=.24</u>	<u>p<.047</u>	r=.15	p<.239
Did you feel terrified?	<u>r=.26</u>	<u>p<.032</u>	r=.17	p<.173
Men only (n=93):				
Did you think your life was in danger?	r=.04	p<.760	r=-.03	p<.793
Did you think that someone else's life was in danger?	r=-.01	p<.943	r=.07	p<.568
Did you feel helpless?	r=-.11	p<.366	r=-.10	p<.407
Did you feel terrified?	r=-.05	p<.662	r=-.02	p<.864

Table 14: correlations between perceived life threat, controllability and PSS

The table shows that fear and helplessness are correlated with later PTSD symptoms in women, but not in men (although the only significant differences in correlation between men and women are in the helplessness item and the terror item).

- Perceived life threat and fear predict the development of later post-traumatic symptoms in women

Part B: Hypotheses

Hypothesis 1:

- Trait dissociation will predict later post-traumatic symptoms

The total score on the reduced version of the TDQ (TDQ-R) and the individual items were correlated with PSS total at 4 weeks and 24 weeks. The PSS total examined is the total without including the dissociation items (questions 19, 20 and 21 in appendix 1) due to possible confounding. The correlations are summarized in the table below. N=144 at 4 weeks and n=113 at 24 weeks.

Item	correlation at 4 weeks and p value	correlation at 24 weeks and p value
Total questionnaire score	<u>.34 (.0005)</u>	<u>.22 (.009)</u>
1. I feel distant and cut off from others around	<u>.22 (.009)</u>	<u>.19 (.024)</u>
2. I feel that my personality is split into distinct parts	<u>.21 (.010)</u>	.11 (.187)
3. I underestimate or overestimate the amount of time that has passed	<u>.22 (.007)</u>	.15 (.074)
4. I find new things among my belongings that I do not remember buying	<u>.22 (.007)</u>	<u>.19 (.029)</u>
5. I feel like I don't belong	.13 (.134)	-.01 (.902)
6. I feel emotionally numb (e.g. feel sad but cannot cry, unable to have loving feelings)	<u>.36 (.0005)</u>	<u>.23 (.006)</u>
7. I do many things which I regret afterwards	.13 (.109)	.02 (.787)
8. I don't know how to stop myself from doing things	<u>.19 (.027)</u>	.10 (.261)
9. I have problems remembering important details of stressful events	<u>.33 (.0005)</u>	<u>.28 (.001)</u>
10. I find it difficult to feel real emotions, such as pain, happiness, sadness or anger	<u>.22 (.009)</u>	<u>.20 (.015)</u>

Table 15: correlations of TDQ-R items with PSS score at 4 weeks and 24 weeks

Analysis of the data for men and women separately reveals some gender differences:

Item	Women		Men	
	correlation at 4 weeks and p value (n=67)	correlation at 24 weeks and p value (n=64)	correlation at 4 weeks and p value (n=75)	correlation at 24 weeks and p value (n=71)
Total questionnaire score	.22 (p<.080)	.06 (p<.614)	<u>.48 (p<.0005)</u>	<u>.40 (p<.001)</u>
1. I feel distant and cut off from others around	.14 (p<.246)	.10 (p<.435)	<u>.31 (p<.008)</u>	<u>.25 (p<.037)</u>
2. I feel that my personality is split into distinct parts	.09 (p<.480)	-.09 (p<.481)	<u>.38 (p<.001)</u>	<u>.34 (p<.003)</u>
3. I underestimate or overestimate the amount of time that has passed	.09 (p<.477)	.12 (p<.336)	<u>.39 (p<.0005)</u>	.23 (p<.056)
4. I find new things among my belongings that I do not remember buying	.20 (p<.107)	.14 (p<.268)	<u>.28 (p<.014)</u>	.21 (p<.075)
5. I feel like I don't belong	.05 (p<.692)	-.03 (p<.837)	<u>.23 (p<.048)</u>	.11 (p<.363)
6. I feel emotionally numb (e.g. feel sad but cannot cry, unable to have loving feelings)	<u>.33 (p<.006)</u>	.18 (p<.153)	<u>.43 (p<.0005)</u>	<u>.34 (p<.003)</u>
7. I do many things which I regret afterwards	.00 (p<.987)	-.17 (p<.187)	<u>.27 (p<.019)</u>	.17 (p<.147)
8. I don't know how to stop myself from doing things	.06 (p<.602)	.02 (p<.853)	<u>.29 (p<.013)</u>	.19 (p<.109)
9. I have problems remembering important details of stressful events	<u>.31 (p<.010)</u>	.19 (p<.129)	<u>.41 (p<.0005)</u>	<u>.38 (p<.001)</u>
10. I find it difficult to feel real emotions, such as pain, happiness, sadness or anger	.18 (p<.144)	.12 (p<.362)	<u>.29 (p<.011)</u>	<u>.32 (p<.006)</u>

Table 16: correlations of TDQ items with PSS score at 4 weeks and 24 weeks

The table above shows that trait dissociation is predictive of later PTSD symptoms for men, but is not highly predictive for women. There is a significant difference in correlations between men and women at $p<.05$ only for the total TDQ score at week 24 and for factor 2 (split personality) at week 24.

- **Hypothesis 1** is supported: Trait Dissociation predicts later post-traumatic symptoms, particularly in men

Hypothesis 2:

- Trait dissociation score will increase over time in patients with chronic post-traumatic symptoms

TDQ change was calculated by subtracting the TDQ score on the initial questionnaire from the score on the 24 week follow-up questionnaire. Thus a positive change score indicates an increase in the TDQ score, while a negative change score indicates a decrease in the TDQ score.

It is predicted that those patients whose PTSD symptoms persist for 6 months will show an increase in TDQ score. Therefore TDQ change was correlated with PSS score at 24 weeks (leaving out the PSS items measuring dissociation to avoid confounding). The correlations are summarized below, where $n=129$: a positive correlation indicates that PTSD symptoms at 6 months are associated with an increase in TDQ. Correlations significant at $p<.05$ are underlined.

Item change	correlation at 24 weeks and p value
Total questionnaire score	<u>.27 (.002)</u>
1. I feel distant and cut off from others around	<u>.20 (.020)</u>
2. I feel that my personality is split into distinct parts	<u>.27 (.002)</u>
3. I underestimate or overestimate the amount of time that has passed	.08 (.353)
4. I find new things among my belongings that I do not remember buying	.06 (.473)
5. I feel like I don't belong	<u>.35 (.0005)</u>
6. I feel emotionally numb (e.g. feel sad but cannot cry, unable to have loving feelings)	.12 (.161)
7. I do many things which I regret afterwards	<u>.22 (.011)</u>
8. I don't know how to stop myself from doing things	.12 (.186)
9. I have problems remembering important details of stressful events	.04 (.624)
10. I find it difficult to feel real emotions, such as pain, happiness, sadness or anger	<u>.29 (.001)</u>

Table 17: correlations of TDQ-R item change with PSS total at 24 weeks

Although the total score change is correlated with PTSD symptoms at 6 months, the correlations for the individual items indicate that this is due to significant correlations on only 5 items: items 1, 2, 5, 7, and 10. Items 1, 5 and 10 are themselves part of the PTSD symptom constellation, and so it is not surprising that PTSD symptoms at 6 months are associated with an increase in these items. More interesting is increase in item 2 (which measures a sense of split personality) and 7 (which measures impulsivity).

- **Hypothesis 2** is supported: some TDQ-R items do increase following persistent PTSD symptoms

Hypothesis 3:

- State dissociation will predict later post-traumatic symptoms

Table 18 shows the mean state dissociation score over the six month period:

	Mean (s.d.)	n=
Week 0	4.32 (3.28)	176
Week 4	1.01 (1.92)	146
Week 24	0.90 (1.63)	140

A repeated measures ANOVA shows a significant effect of time ($F(2,252)=109.3, p<.0005$).

Paired samples t-tests show significant differences between 0 and 4 weeks ($t(144)=11.87, p<.0005$), and 0 and 24 weeks ($t(138)=11.60, p<.0005$), but not between 4 and 24 weeks ($t(127)=0.49, p<.622$).

All the state dissociation items on the initial questionnaire (the section labelled “During the accident itself” in appendix 1) were correlated with PSS total (excluding the dissociation items) at 4 weeks and 24 weeks. The correlations are given in the table below (correlations significant at $p<.05$ are given in bold type). $N=144$ at 4 weeks and $n=139$ at 24 weeks. There were no gender differences in the pattern of results and so they are reported together for men and women.

Item	Dissociation during the trauma		Dissociation at 4 weeks
	correlation at 4 weeks and p value	correlation at 24 weeks and p value	correlation at 24 weeks and p value
Total state dissociation score	<u>.41 (.0005)</u>	<u>.27 (.001)</u>	<u>.55 (.0005)</u>
1. Did you feel confused or dazed, or unable to take things in properly?	<u>.23 (.005)</u>	.08 (.346)	<u>.48 (.0005)</u>
2. Did the world around you seem strange or unreal?	<u>.32 (.0005)</u>	<u>.19 (.028)</u>	<u>.39 (.0005)</u>
3. Did your body feel as if it was not really yours?	<u>.35 (.0005)</u>	<u>.17 (.043)</u>	<u>.36 (.0005)</u>
4. Did you feel as if you were separate from your own body, and watching it from the outside?	<u>.29 (.0005)</u>	.16 (.069)	<u>.20 (.022)</u>
5. Did you feel as if time was going faster or slower than you know it really was?	<u>.18 (.029)</u>	.16 (.065)	<u>.41 (.0005)</u>
6. Did you feel as if you were living in a dream or a film, rather than in real life?	<u>.30 (.0005)</u>	<u>.19 (.025)</u>	<u>.43 (.0005)</u>
7. Did things around you seem too big or too small, or distorted in shape?	<u>.35 (.0005)</u>	<u>.25 (.004)</u>	<u>.25 (.005)</u>

Table 18: correlations of state dissociation items with PSS total

- **Hypothesis 3** is supported: state dissociation predicts later post-traumatic symptoms

Hypothesis 4:

- Rumination will predict later post-traumatic symptoms

All the rumination items on the initial questionnaire (the section labelled “Now, at this moment” in appendix 1) were correlated with PSS total at 4 weeks and 24 weeks. The correlations are given in the table below with p values in brackets (correlations significant at $p < .05$ are given in bold type). $N=144$ at 4 weeks and $n=139$ at 24 weeks. The pattern of results for men and women was similar and so the results for men and women are reported together.

Item	Rumination at 0 weeks		Rumination at 4 weeks
	correlation with PSS at 4 weeks and p value	correlation with PSS at 24 weeks and p value	correlation with PSS at 24 weeks and p value
Total rumination score	<u>.41 (.0005)</u>	<u>.30 (.0005)</u>	<u>.52 (.0005)</u>
1. Do you go over what happened to you again and again?	<u>.35 (.0005)</u>	<u>.33 (.0005)</u>	<u>.39 (.0005)</u>
2. Do you dwell on what happened, without really solving or deciding anything?	<u>.33 (.0005)</u>	<u>.23 (.007)</u>	<u>.51 (.0005)</u>
3. Do you criticize or lecture yourself about what happened?	<u>.23 (.006)</u>	.02 (.807)	<u>.18 (.044)</u>
4. Do you imagine what it would be like if you could change what happened?	<u>.28 (.001)</u>	<u>.20 (.016)</u>	<u>.40 (.0005)</u>
5. Do you wish that the situation would go away or somehow be over with?	<u>.39 (.0005)</u>	<u>.36 (.0005)</u>	<u>.57 (.0005)</u>
6. Do you think about how things could have been different if you had acted differently?	.08 (.325)	.02 (.849)	.11 (.201)

Table 19: correlations of rumination items with PSS total

Item 6 was the only item that did not predict later symptoms.

- **Hypothesis 4** is supported: rumination predicts later post-traumatic symptoms

Hypothesis 5:

- Initial processing type will be predicted by trait dissociation and will predict memory fragmentation and later post-traumatic symptoms

Table 20 shows the correlations between trait dissociation and information processing type. It is predicted that data-driven processing will be positively correlated with trait dissociation, and that semantic processing will be negatively correlated with trait dissociation. The balance of processing score refers to the amount of semantic driven versus data driven processing, and it is predicted that this will be negatively correlated with trait dissociation. The first balance of processing score uses all six items for calculation, while the second balance of processing score uses items 10 and 13 (found to be the best predictors of the six items). Correlations significant at $p < .05$ are underlined.

	r=	n=	p<
Semantic processing score	.10	170	.208
Data-driven processing score	.06	169	.425
Balance of processing (1) score	.01	168	.858
Balance of processing (2) score	<u>-.18</u>	<u>170</u>	<u>.022</u>

Table 20: Correlations of trait dissociation to information processing

The correlations of all the information processing items on the initial questionnaire (questions 8 to 13 in appendix 1) with the memory fragmentation question on the initial questionnaire, and with the memory fragmentation question at 4 weeks and 24 weeks, were examined. Items 8 to 10 refer to semantic-driven processing, while items 11-13 refer to data driven processing.

The hypothesis predicts that semantic driven processing will be negatively correlated with memory fragmentation, while data driven processing will be positively correlated with memory fragmentation. It is also predicted that balance of processing should be negatively correlated with memory fragmentation.

The correlations between information processing type and memory fragmentation are given in the table below, with p values in brackets (correlations significant at $p < .05$ are underlined). $N=172$ at 0 weeks, $n=142$ at 4 weeks and $n=136$ at 24 weeks. There were no significant gender differences, and so results are reported for men and women together.

Item correlated with memory fragmentation	Correlation at 0 weeks	Correlation at 4 weeks	Correlation at 24 weeks
<i>Semantic driven processing questions:</i>			
8. Did you run through the options you had in your mind?	-.02 (.801)	-.09 (.272)	.00 (.959)
9. Did you try to work out what to do to avoid getting hurt?	-.03 (.670)	-.10 (.218)	-.03 (.689)
10. Did you realise that you were in a dangerous situation?	<u>-.16 (.042)</u>	<u>-.21 (.013)</u>	-.15 (.073)
Total semantic driven processing score	-.09 (.260)	<u>-.18 (.038)</u>	-.08 (.351)
<i>Data driven processing questions:</i>			
11. Did you not fully understand what was going on?	.04 (.618)	.01 (.890)	.04 (.676)
12. Was your mind fully occupied with what you saw, heard, felt, and smelled?	<u>-.21 (.005)</u>	<u>-.21 (.013)</u>	-.03 (.715)
13. Were you overwhelmed by different sensations and impressions?	<u>.18 (.021)</u>	.16 (.063)	.08 (.344)
Total data driven processing score	.01 (.919)	-.04 (.644)	.05 (.582)
Balance of processing (1) score	-.08 (.297)	-.10 (.262)	-.11 (.207)
Balance of processing (2) score	<u>-.23 (.003)</u>	<u>-.27 (.001)</u>	<u>-.20 (.019)</u>

Table 20: correlations of information processing with memory fragmentation

The above table shows that, while some of the information processing items do correlate with memory fragmentation, others do not. There is a general tendency for the

semantic processing questions to be negatively correlated with memory fragmentation (as expected), and for the data-driven processing questions to be positively correlated with memory fragmentation (as expected), although many of the item correlations are non-significant. The second balance of processing score, derived from items 10 and 13, consistently shows a correlation with memory fragmentation but this is a post hoc selection of variables and so cannot be trusted entirely.

The information processing items on the initial questionnaire were also correlated with the total score on the PSS at 4 weeks and 24 weeks. The hypothesis predicts that semantic driven processing will be negatively correlated with PSS total, while data driven processing will be positively correlated with PSS total. The balance of processing score should be negatively correlated with PSS total.

The correlations are given in the table below (correlations significant at $p < .05$ are underlined). $N=144$ at 4 weeks and $n=136$ at 24 weeks. There were no significant gender differences, so the results for men and women are reported together

Item correlated with PSS score	correlation at 4 weeks and p value	correlation at 24 weeks and p value
<i>Semantic driven processing questions:</i>		
8. Did you run through the options you had in your mind?	<u>.21 (.011)</u>	.13 (.122)
9. Did you try to work out what to do to avoid getting hurt?	.13 (.134)	.05 (.572)
10. Did you realise that you were in a dangerous situation?	-.13 (.127)	-.14 (.111)
Total semantic driven processing score	.09 (.316)	.02 (.788)
<i>Data driven processing questions:</i>		
11. Did you not fully understand what was going on?	.03 (.758)	-.02 (.817)
12. Was your mind fully occupied with what you saw, heard, felt, and smelled?	-.09 (.294)	.01 (.900)
13. Were you overwhelmed by different sensations and impressions?	.16 (.055)	.12 (.180)
Total data driven processing score	.02 (.807)	.05 (.539)
Balance of processing (1) score	.06 (.492)	-.00 (.987)
Balance of processing (2) score	<u>-.26 (.002)</u>	<u>-.22 (.010)</u>

Table 21: correlations of information processing items with PSS total

There seems again to be no clear pattern of negative correlations for the semantic driven processing items and positive correlations for the data driven processing questions, although the second balance of processing score shows a similar consistent pattern of correlation with PTSD symptoms.

The above results do not offer strong support for the hypothesis that semantic- and data-driven processing predict post-traumatic symptoms, although the selection of the two best-predicting items does yield significant results.

- Some support for **Hypothesis 5**, that information processing during the accident will be predicted by trait dissociation and will predict memory fragmentation and PTSD symptoms: the balance of processing score is predicted by trait dissociation and predicts PSS total at 4 weeks and 24 weeks

Hypothesis 6:

- Fragmented or unclear initial memories of the event will predict later post-traumatic symptoms

Item 3 on the initial questionnaire asks about memory fragmentation.

This item is significantly correlated with trait dissociation ($r=.25$, $n=172$, $p<.001$).

It also correlates significantly with PSS total at 4 weeks ($r=.32$, $n=143$, $p<.0005$) but not with PSS total at 24 weeks ($r=.12$, $n=136$, $p<.164$). Analysing the data separately for men and women reveals that memory fragmentation is only predictive of later PTSD symptoms in women (although the correlations for men and women are not significantly different at $p<.01$).

	Correlation in women only	Correlation in men only
PSS total at 4 weeks	<u>.46</u> ($n=68$, $p<.0005$)	.19 ($n=73$, $p<.111$)
PSS total at 24 weeks	<u>.26</u> ($n=65$, $p<.039$)	-.04 ($n=69$, $p<.727$)

Table 22: correlations between memory fragmentation and PSS total for men and women

The item on the 4 week questionnaire does predict PSS total at 24 weeks ($r=.23$, $n=128$, $p<.010$).

- **Hypothesis 6** is supported: memory fragmentation does predict later post-traumatic symptoms, but only in women

Hypothesis 7:

- Acute Stress Disorder will precede PTSD

Acute Stress Disorder Caseness:

The table below summarizes the prevalence of ASD at 0 weeks, 4 weeks, and overall.

	0 weeks	4 weeks	At any time during the 4 weeks
Number	50	15	59
Percentage	28.5%	10.3%	33.5%

Table 7: the prevalence of ASD

ASD is a relatively recent DSM-IV diagnostic category, and there are few figures available for prevalence in RTA patients or other groups (Harvey & Bryant, in press). Criteria for the PTSD items in ASD are not as strict as those for PTSD itself, but the diagnosis requires the additional presence of dissociative symptoms, and it has not been clear how the prevalence compares with that of PTSD. The present findings indicate that the prevalence of ASD is somewhat higher in the period immediately after the accident, but is less common at 4 weeks.

Of the patients who fulfilled ASD diagnostic criteria initially but not at 4 weeks (30 cases with complete data), 25 failed at 4 weeks due only to a lack of sufficient dissociative symptoms (11 still had one or two symptoms, while 14 had no symptoms), and the other 5 failed due to a lack of dissociation as well as a lack of one or more other symptoms. Thus a

decline in dissociative symptoms is largely responsible for the decrease in prevalence of ASD over the first 4 weeks. A full table can be found in appendix 36.

The mean state dissociation score at week 0 in the group of patients with ASD is higher than the mean state dissociation score at week 24 in the group of patients with PTSD at 24 weeks (Mann-Whitney U-test; ASD group score=6.4 (s.d. 2.9); PTSD group score=2.3 (s.d. 2.0); $Z=5.81$, $p<.00005$). This indicates that one of the main distinctions between ASD and PTSD is the presence of higher levels of dissociation in ASD.

Patients with ASD at 0 weeks and 4 weeks were compared to patients with ASD only at 0 weeks in order to determine whether these two groups differed in terms of outcome at 24 weeks, and to determine whether any initial psychological variables predict persisting ASD. The two groups were compared using Mann-Whitney U-tests due to the non-parametric distribution of data, where $n=30$ for the group without ASD at 4 weeks and $n=6$ for the group with ASD at 4 weeks.

Patients who still met ASD criteria at 4 weeks had a higher mean PSS score at 24 weeks. Patients who still met ASD criteria at 4 weeks had higher trait dissociation scores although there was no difference in terms of state dissociation. The results are summarized below:

Variable	mean of group recovered from ASD (and s.d.)	mean of group with ASD (and s.d.)	Z	p<
24 week PSS total	9.7 (7.7)	30.0 (1.7)	2.82	<u>.005</u>
TDQ total	10.0 (6.7)	20.2 (8.5)	2.70	<u>.007</u>
SDQ at 0 weeks	6.6 (3.2)	7.3 (1.6)	1.27	.205

Table 8: Differences between patients with ASD at 4 weeks and those without

These result indicates that, although state dissociation is equivalent in these two groups immediately after the accident, a high trait dissociation score predicts whether the dissociative symptoms will still be present in week 4, resulting in a continuing diagnosis of ASD.

- ASD which continues beyond the initial week is predicted by high trait dissociation
- Continuing ASD predicts higher persistent PTSD symptoms

Does ASD predict PTSD?

following table summarizes whether ASD does in fact precede PTSD:

	No PTSD at 24 weeks	PTSD at 24 weeks
No ASD	82	14
ASD	24	20

Table 29: the relationship between ASD and PTSD

45% of those with ASD have PTSD at 24 weeks

15% of those without ASD have PTSD at 24 weeks

A chi-square test of association indicates that ASD is a significant predictor of later PTSD

amongst the group as a whole ($\chi^2=14.0$ (1 d.f.), $p<.0002$; $\phi=.33$, $p<.00008$).

A significant number (24) of patients with ASD do not have PTSD at 24 weeks, and fourteen patients without ASD developed PTSD later. Further analysis of this last group to determine why they did not qualify for a diagnosis of ASD (full listing in appendix 36) reveals that 6 failed due to a lack of avoidance behaviour, 3 due to a lack of intrusions, 7 due to a lack of hypervigilance, and 1 due to not enough dissociation (many patients did not qualify for more than one reason). Of the group that failed due to not enough dissociation, 2 failed purely due to the dissociation criterion, while the remaining 9 failed on other criteria as well. This grouping indicates that there is no single reason why patients are not diagnosed with ASD and then go on to develop PTSD.

These results indicate that while ASD is a predictor of PTSD, it does not precede it consistently.

Because of the gender differences in ASD and PTSD prevalence, the above analysis was carried out again separately for men and women.

		No PTSD at 24 weeks	PTSD at 24 weeks
Men:	No ASD	41	10
	ASD	10	11
Women:	No ASD	40	4
	ASD	14	8

Table 30: the relationship between ASD and PTSD

48% of **men** with ASD have PTSD at 24 weeks.

36% of **women** with ASD have PTSD at 24 weeks.

20% of **men** without ASD have PTSD at 24 weeks.

9% of **women** without ASD have PTSD at 24 weeks.

A chi-square association test indicates that ASD is a significant predictor of later PTSD for **men** ($\chi^2=6.23$ (1 d.f.), $p<.013$; $\phi=.33$, $p<.005$).

A chi-square association test indicates that ASD is a significant predictor of later PTSD for **women** ($\chi^2=5.61$ (1 d.f.), $p<.018$; $\phi=.33$, $p<.007$).

- ASD is a predictor of PTSD: **Hypothesis 7** is supported
- ASD does not always precede PTSD, and does not always result in PTSD

Hypothesis 8:

- It is possible to construct a predictive model of post-traumatic symptoms, based on initial variables

While the correlation between 4-week PTSD symptoms and 24-week symptoms is quite high ($r=.70$, $n=122$, $p<.0005$), the correlation between initial PTSD symptoms and symptoms at 24 weeks is only $.43$ ($n=133$, $p<.0005$). As the figure below shows, the initial PSS score of the group of patients who have PTSD at 24 weeks ($n=36$) is 9.76 (s.d. 6.5), while the initial PSS score of the group of patients without PTSD at 24 weeks ($n=96$) is 7.6 (s.d. 7.1). This difference is significant (Mann-Whitney U-test: $Z=2.21$, $p<.027$) but is not very large.

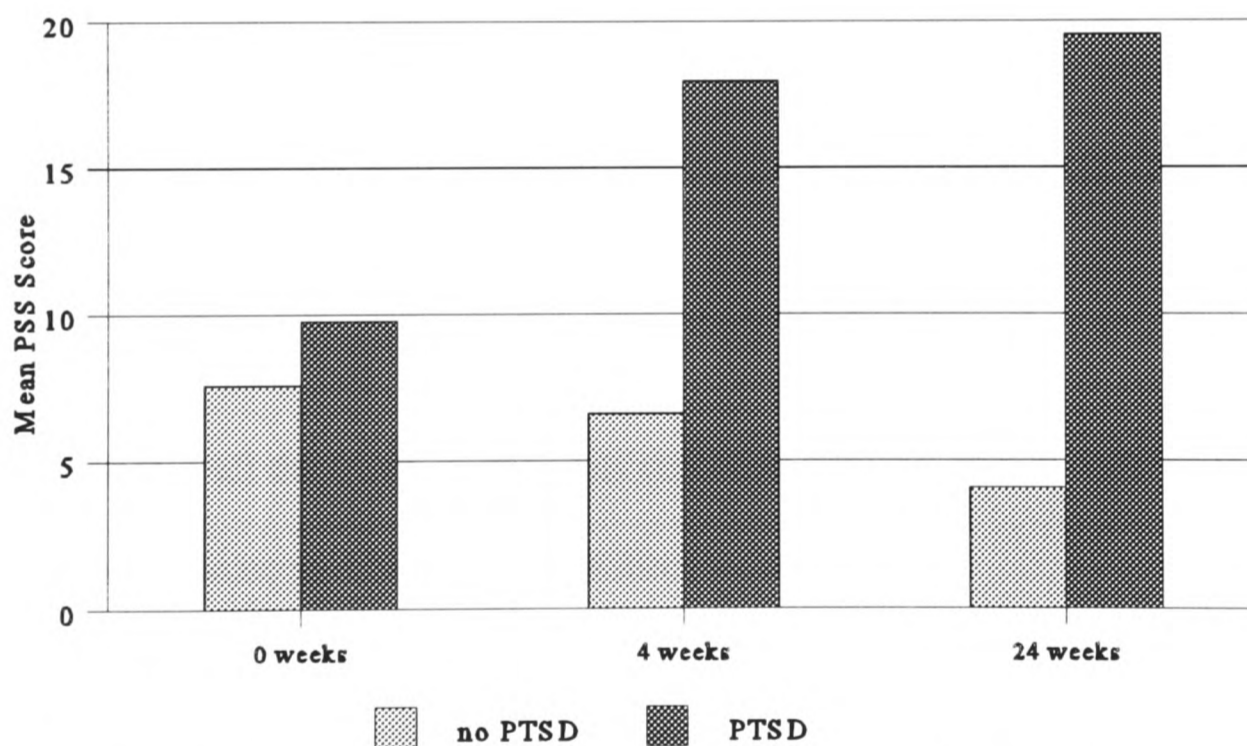


Figure 2: PSS scores for non-PTSD group and chronic PTSD group

A logistic regression analysis with backwards stepwise selection of variables was

performed using the initial PSS items as predictors of PSS total at 24 weeks. The results of this analysis are given in appendix 29. This analysis predicted a maximum of 9.7% of the cases of PTSD, and identified 0% of false positives, using the items listed below (with the symptom cluster they belong to):

17. Experiencing physical reactions when you were reminded of the accident	Reliving
18. Trying not to think about, talk about, or have feelings about the accident	Avoidance
19. Not being able to remember an important part of the accident	Avoidance/Numbing
20. Feeling distant or cut off from people around you	Avoidance/Numbing
22. Feeling as if your future plans or hopes will not come true	Avoidance/Numbing
24. Having trouble concentrating	Arousal
25. Being overly alert	Arousal
26. Being jumpy or easily startled	Arousal

This result indicates that initial PTSD symptoms cannot be used by themselves as a reliable indicator of PTSD symptoms at 24 weeks, which is why a series of regression analyses using initial psychological variables was used to predict both chronic PTSD symptoms and PTSD caseness. Of course the addition of other variables, including the initial PSS items, would be likely to improve proportion of the variance explained: only those variables examined in the hypotheses under investigation in this study are used here.

For this and all the other regressions reported, log transforms were applied to all variables in order to ensure a normal distribution of data.

Predicting PSS Total

A stepwise regression analysis was performed using PSS total at 4 weeks and at 24 weeks as the dependent variable and initial questionnaire variables as possible independent variables. The variables entered into the regression were: TDQ total score, SDQ total score, SRQ total score, balance of processing (2) score, and items measuring self-rated injury, fear, and helplessness -

1. were you physically injured?
3. Are your memories of the accident in any way unclear or jumbled?
4. Did you think that your life was in danger?
6. Did you feel helpless?
7. Did you feel terrified?

The final results of this regression are given below both for the group as a whole and for men and women separately (the full results are given in appendix 30):

PSS total at 4 weeks:

Variable predicting PSS at 4 weeks	Beta	t value and significance	
Self-rated physical injury	.27	3.74	.0003
SDQ total	.17	2.09	.039
SRQ total	.22	2.76	.007
TDQ total	.27	3.53	.004
Variance explained: 29.3%			
Women only:			
Memory fragmentation	.22	2.11	.039
SDQ total	.34	3.27	.002
SRQ total	.34	3.21	.002
Variance explained: 42.5%			
Men only:			
Self-rated physical injury	.40	4.12	.0001
Helplessness	.22	2.23	.029
TDQ total	.49	5.08	.00005
Variance explained: 35.8%			

Table 23: regression results for factors at 0 weeks predicting PTSD symptoms at 4 weeks

The table below indicates the factors that predict at 24 weeks (full results are given in appendix 31):

PSS total at 24 weeks:

Variable predicting PSS at 24 weeks	Beta	t value and significance	
Self-rated physical injury	.22	2.72	.007
Helplessness	.17	2.00	.047
SRQ total	.28	3.31	.001
TDQ total	.24	2.86	.005
Variance explained: 35.8%			
Women only:			
SRQ total	.36	2.96	.005
Variance explained: 11.2%			
Men only:			
Self-rated physical injury	.40	4.18	.0001
Memory fragmentation	.28	2.68	.001
Helplessness	.42	3.83	.0003
SDQ total	.25	2.01	.049
SRQ total	.25	2.25	.028
TDQ total	.45	4.59	.00005
Variance explained: 40.6%			

Table 24: regression results for factors at 0 weeks predicting PTSD symptoms at 24 weeks

Because the proportion of variance explained by this regression was modest, an additional analysis was performed on the 24-week PSS totals using some of the variables measured at 4 weeks: the SDQ and SRQ totals. The results of this regression are summarized below (full results are given in appendix 32):

Variable predicting PSS at 24 weeks	Beta	t value and significance	
4 week SDQ total	.420	5.76	.00005
4 week SRQ total	.375	5.17	.00005
Variance explained: 41.4%			
Women only:			
SDQ total	.45	4.15	.0001
SRQ total	.31	2.91	.005
Variance explained: 37.9%			
Men only:			
SDQ total	.39	3.73	.0004
SRQ total	.42	4.07	.0001
Variance explained: 35.8%			

Table 25: regression results for factors at 4 weeks predicting PTSD symptoms at 24 weeks

Predicting PTSD caseness

A second regression model was used to predict PTSD caseness at 4 and 24 weeks (logistic regression with backward stepwise selection of variables), using the same pool of variables as possible predictors. The results for this are given below, both for the group as a whole, and for men and women separately (full results are in appendix 33):

PSS total at 4 weeks:

Variable predicting PTSD at 4 weeks	B	significance
Self-rated physical injury	7.66	.010
SDQ total	1.58	.038
TDQ total	1.98	.003
PTSD cases identified: 21.6%		
False positives: 7.9%		
Women only:		
Memory Fragmentation	7.80	.018
Feeling terrified	5.43	.106
SDQ total	4.77	.020
PTSD cases identified: 53.9%		
False positives: 7.69%		
Men only:		
Self-rated physical injury	11.0	.005
TDQ total	2.48	.005
PTSD cases identified: 40.9%		
False positives: 6.24%		

Table 26: predictors of PTSD caseness at 4 weeks

The results of the 24 week regression analysis are given below (full results are given in appendix 34):

PSS total at 24 weeks:

Variable predicting PTSD at 24 weeks	B	significance
Self-rated physical injury	6.49	.033
Helplessness (item 6)	5.81	.005
TDQ total	1.79	.009
PTSD cases identified: 6.5%		
False positives: 2.9%		
Women only: no variables in equation		
Men only:		
Self-rated physical injury	16.91	.007
Memory fragmentation	7.62	.033
Helplessness	24.95	.0006
SDQ total	5.17	.018
TDQ total	4.08	.004
Balance of processing	0.84	.026
PTSD cases identified: 70.0%		
False positives: 6.12%		

Table 27: predictors of PTSD caseness at 24 weeks

Because the numbers of cases identified by this last regression analysis were in general small (indeed, for women no variables reached significance level and were therefore excluded by the regression analysis), an additional analysis was performed on the 24-week PSS totals using some of the variables measured at 4 weeks: the SDQ and SRQ totals. The results of this regression are summarized below (full results are in appendix 35):

Variable predicting PTSD at 24 weeks	B	significance
SDQ total	3.41	.0001
SRQ total	2.47	.019
PTSD cases identified: 48.3%		
False positives: 7.1%		
Women only:		
SDQ total	4.19	.001
PTSD cases identified: 27.3%		
False positives: 1.92%		
Men only:		
SDQ total	3.08	.011
SRQ total	2.86	.032
PTSD cases identified: 52.9%		
False positives: 8.89%		

Table 28: predictors of PTSD caseness at 24 weeks

With this regression, 48.3% of PTSD cases were identified, and there were 7.1% false positives.

- **Hypothesis 8** is supported: there are items in the initial questionnaire which together predict PTSD symptoms and caseness at 4 and 24 weeks. The predictiveness would of course be improved if the original PSS items were also added
- Psychological state at 4 weeks is a better predictor than state at 0 weeks of both PTSD symptoms and caseness at 24 weeks

Discussion

The discussion of the results will examine each hypotheses proposed at the start of this chapter in turn.

Part A: Population Description

PTSD symptom prevalence and caseness

The prevalences of PTSD symptoms and PTSD caseness (23% at 4 weeks and 19% at 24 weeks) are similar to those observed in other studies using similar populations and DSM diagnostic criteria (Blanchard, Hickling, Taylor, & Loos, 1995b; Ehlers, Mayou, & Bryant, submitted), although studies using different criteria have reported wider ranges. The prevalence of ASD has received less attention, since it is a new diagnostic category. The overall prevalence of ASD in this sample was 33%, which is higher than that reported in published studies of RTA patients, where prevalence is given as around 13% (Bryant & Harvey, 1995; Bryant & Harvey, 1996a; Harvey & Bryant, in press). However, the Harvey & Bryant study all used a diagnostic interview with a clinical psychologist rather than a self-report questionnaire, and it may be that this causes the criteria to be applied more strictly. A second possible reason for any differences may be a sample bias: in the previous study no patients declined to take part in the study, while in this study the response rate to the initial questionnaire was only 40%, meaning that the sample may not be as representative of the population as in the admitted patients study. However, the prevalence of ASD in the admitted

patients sample was 24% - and the estimate of the prevalence of ASD in this sample should be more accurate, since, although interviews still used the same self-report questionnaire, this study did not have any non-responding patients.

Gender

Many previous studies have reported that women are more at risk of developing PTSD following traumatic events, including RTAs (Blanchard et al., 1996; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). However, the picture is confused somewhat by the fact that men may be more likely to be involved in certain types of trauma (such as combat) or may be more likely to be involved in more serious types of the same trauma (such as in road traffic accidents).

In this study, men suffered less PTSD symptoms than women initially, and were less likely to fulfil diagnostic criteria for PTSD, although at 24 weeks there was no significant difference. There were no significant differences between men and women in terms of physical injury or self-rated physical injury, which rules out an explanation for the gender differences based on severity of the accident itself. Women were more likely to report being terrified during the accident, however, and had significantly higher levels of arousal and intrusions at initial interview than men. This may be part of the reason for the increased prevalence of initial PTSD symptoms amongst women, since amongst women feelings of terror are correlated with PTSD symptoms, particularly intrusions ($r=.47$, $n=77$, $p<.0005$).

There are a number of possible reasons for the initial sex difference and for the disappearance of this difference by 6 months, with men experiencing more symptoms over time and women experiencing less. It may be that there is a sex-related response bias, and that women are more likely to endorse items on the initial questionnaire, although this would not

explain why the sex difference in reported symptoms disappears by 6 months. The reason for this might be that men are more likely to have maladaptive coping strategies, such as avoidance and dissociation. Certainly they are more likely to meet the avoidance criterion for PTSD at 24 weeks, although there are no sex differences in trait or state dissociation at any of the timepoints. It may also be that they ask for and receive less social support following a traumatic event, or talk about the event less, as several studies have shown (Good, Bower, & Einsporn, 1995; Harrison, Maguire, & Pitceathly, 1995; Kolt, Kirkby, & Lindner, 1995; Von Dras, Williams, Kaplan, & Siegler, 1996). All of these have been linked to poorer long term outcome (Basoglu et al., 1994; Buckley, Blanchard, & Hickling, 1996; Davidson, Hughes, Blazer, & George, 1991; McFarlane, 1994; Perry, Difede, Musngi, Frances, & Jacobsberg, 1992; Polles & Smith, 1995; Solomon, Mikulincer, & Avitzur, 1988).

The results show gender differences for many of the hypotheses under investigation: different factors are predictive for men and for women, both in individual hypotheses and in the predictive models. In particular, life threat and feelings of terror are predictive of later PTSD symptoms in women only, while self-rated injury and trait dissociation are predictive of later PTSD symptoms in men only. However, state dissociation, rumination, and memory fragmentation are predictive of later PTSD symptoms in both men and women. Again, the difference in predictiveness for these variables could be due to the fact that different items on the questionnaires are more or less likely to be endorsed by men and women (one obvious example is the question “did you feel terrified?”). Any such response bias might affect the predictiveness of that item.

Physical injury

Objectively measured physical injury did not correlate with later post-traumatic symptoms, but self-ratings of physical injury did predict later symptoms. The data also shows that self-ratings of physical injury severity (although not objective ratings) predict later symptoms independently of ratings of fear or life-threat during the trauma itself. This suggests that ongoing pain and disability may be one factor causing the development and maintenance of post-traumatic symptoms, perhaps through being a constant reminder of the accident, making it difficult for patients to put the accident behind them.

It may be that patients' self-ratings reflect more the effects of these injuries (in terms of work and social functioning) as well as the distress they feel at the physical injuries and it is this effect on functioning or distress that predicts later symptoms. Previous studies which have taken ratings of impact on social functioning (Green, McFarlane, Hunter, & Griggs, 1993) support this explanation. Regardless of the explanation, however, self-ratings of injury severity remain an important predictor of later symptoms and as such may be important in the early prediction of PTSD-vulnerable patients.

Perceived life threat and controllability:

There were no significant correlations between perceived life threat and later PTSD symptoms, nor between perceived helplessness or terror and later PTSD symptoms (although perceived helplessness did emerge as a predictive factor in the regression analyses) for the group as a whole. However, life threat, helplessness, and fear were predictive of later PTSD symptoms in women. This finding was somewhat unexpected, since many previous studies have found these to be strong significant predictors for both men and women (Blanchard et

al., 1995a; Blanchard et al., 1996; Green et al., 1991; Mayou, Bryant, & Duthie, 1993; Pynoos et al., 1987; Resnick, Kilpatrick, Best, & Kramer, 1992; Rowan, Foy, Rodriguez, & Ryan, 1994). This cannot be due to a lack of variance on these items, since many patients reported feeling helpless, terrified, or in fear for their lives: more work is clearly needed to investigate the gender difference here. It may be that is due to the fact that many road traffic accidents are unexpected and are over very quickly (for instance, being struck by a car behind one's own): in this sort of situation there is no opportunity for an individual to feel that their life is being threatened until the danger is over: any feeling of life-threat is retrospective and may therefore be less severe and less likely to be linked to later PTSD development.

Part B: Hypotheses

Trait Dissociation:

Trait dissociation (as measured by the 10-item Trait Dissociation Questionnaire (TDQ)) predicts state dissociation at each time period, and also predicts later post-traumatic symptoms, although this predictive power is significantly higher for men than for women. Not only does TDQ total predict later symptoms, but the items are predictive individually. The highest correlations come from the items measuring emotional numbing and traumatic amnesia (items 6 and 9), a result which is predicted by many existing clinical studies which have indicated that these factors seem to be important predictors of PTSD symptomatology: indeed, amongst women these were the only items that were significantly predictive of PTSD symptoms. This result suggests that it may be more profitable to investigate aspects of dissociation separately in relation to post-traumatic symptoms. Many different, related phenomena are grouped together under the heading of dissociation, and it seems some are more important than others in predicting reactions to trauma. The gender difference in terms of the predictiveness of dissociation is unexpected: although men and women do not differ significantly in terms of trait or state dissociation, TDQ is only strongly predictive of later PTSD symptoms for men, and this finding requires more research.

Trait Dissociation Change:

As I have discussed in Chapter 6, significant life events and their sequelae may result in changes in traits, including dissociation. However, only some of the items on the TDQ show significant change in this study. The items measuring emotional numbing, alienation

from others, impulsivity, and a sense of split personality all increase as a result of persistent post-traumatic symptoms, whereas the other items remain unchanged. This may reflect a kind of vicious circle in which dissociation is likely to lead to more PTSD symptoms, and those symptoms themselves lead to a greater likelihood of dissociation.

State Dissociation:

State dissociation during the traumatic event, measured by the seven-item State Dissociation Questionnaire (SDQ, appendix 1) predicts later post-traumatic symptoms strongly at 4 weeks, and less strongly, though still significantly, at 24 weeks. All the individual items that made up the scale, as well as the total, are predictive, and this confirms other existing clinical studies which link dissociation at the time of trauma to later poor outcome (Bernstein & Putnam, 1986; Foa, Steketee, & Rothbaum, 1989; Spiegel, 1991; Spiegel, Koopman, & Classen, 1994).

Similarly, state dissociation at 4 weeks predicts symptoms and caseness at 24 weeks, supporting the view of information-processing models of PTSD that dissociation acts to maintain post-traumatic symptoms by preventing exposure and habituation to distressing memories of the traumatic event.

It is of interest to note that the initial assessment of state dissociation in this study was more predictive of later PTSD symptoms than the initial assessment in Chapter 6: this may well be because of a difference in timing. The initial assessment in Chapter 6 was carried out within 24 hours of the accident whereas, due the initial assessment in this study was more likely to have occurred between 24 and 72 hours after the accident, due to the assessment being by postal questionnaire. This suggests that initial dissociation, in the first few hours after an accident, is not as maladaptive as dissociation which continues beyond that point over the

next few days and weeks. This hypothesis is supported by the finding in this chapter, as in the previous chapter, that dissociation at 4 weeks is more predictive of later symptoms than dissociation at 0 weeks.

Rumination:

While avoidance, dissociation, and a fragmented memory structure predict long-term post-traumatic symptoms, it is interesting that a ruminative thinking pattern also predicts symptoms both at 4 weeks and 24 weeks. This is an apparent paradox, since rumination is characterized by excessive thinking about an event while avoidance and dissociation are both characterized by a “shutting-off” of thoughts about a traumatic event.

Rumination is an important maintaining factor in many psychological disorders, although its role in PTSD is less clear. It might be predicted from information processing models of PTSD that, since avoidance is a maintaining factor for post-traumatic symptoms, rumination might well act as a kind of “exposure therapy” and actually decrease the level of post-traumatic symptoms. The results of this study suggest that this is not the case.

The processes of avoidance, dissociation, and rumination are not mutually exclusive: in many patients it appears that these processes occur together. On the one hand patients report brooding over and worrying about the event and its consequences while on the other they also report emotional numbing and avoidant behaviour or thinking. One important reason why rumination may not accomplish what exposure does may be that rumination is not characterized by visual imagery, which seems to be particularly important in PTSD intrusions (Bryant & Harvey, 1996b; Shin et al., 1997; Spiegel, Hunt, & Dondershine, 1988) and in exposure therapy for PTSD (Pitman et al., 1996).

Of interest is the fact that item 6 on the rumination questionnaire (“Do you think about

how things could have been different if you had acted differently?") did not predict later post-traumatic symptoms. It may be that this particular item is endorsed by a group of patients who are not engaged in ruminative worry but who are thinking constructively about what they might have done in order to avoid the accident that occurred, with the intention of changing their driving behaviour for the better in future. This is likely to be a factor particularly relevant when studying the effects of road traffic accidents, since in many cases driver behaviour is a major cause of accidents (AA Foundation for Road Safety Research, 1987; AA Foundation for Road Safety Research, 1988), and so this style of thinking can actually accomplish something positive. In the case of traumas like natural disasters or sexual and physical assault this style of thinking may be less relevant.

Data and Semantic driven Processing:

Most of the items measuring processing style were not good predictors of long-term post-traumatic symptoms. Items 10 and 13, however ("did you realise that you were in a dangerous situation?", and "Were you overwhelmed by different sensations and impressions?") did correlate with PTSD symptoms, and were also correlated with trait dissociation, a finding repeated in Chapter 4. The other items were not significantly correlated with later symptoms. This means that no firm conclusions can be drawn from this study as to the link between peritraumatic information processing and later development of PTSD symptoms, since the selection of items 10 and 13 was post hoc and therefore prone to statistical bias.

The six items measuring information processing were, however, created without any previous research to rely on, and it may be that the selection of the best of these, or the generation of new items, may prove useful in predicting post-traumatic symptoms. Indeed,

a newer version of the set of information processing questions was used in the study reported in Chapter 4 (which began after this study) and appears more promising. Alternatively it may be better to investigate semantic- and data-driven processing in a structured interview or in an experimental way, since it is undoubtedly difficult for patients to express in a self-report questionnaire how they processed events in a traumatic situation when it is some hours or days after the event, even if they do understand the questions perfectly and the questions themselves are the correct ones.

Memory Fragmentation:

Fragmented, confused, or incomplete memories are often associated with trauma and PTSD. This study demonstrates that memory fragmentation is linked to trait dissociation, as information processing models of PTSD would predict. The results from this study suggest that fragmented memories are not only part of the symptom complex but are also predictive of later post-traumatic symptoms, although the finding is confined to women in this study. This result supports information processing models of PTSD which propose that memory completeness and orderliness are essential for proper reactivation, exposure, and habituation to distressing memories.

The Status of Acute Stress Disorder:

ASD is a relatively new DSM diagnostic category, proposed to cover the four week period following a trauma, while the category of PTSD is reserved for symptoms which persist beyond this timepoint. ASD was found to be a significant predictor of later PTSD, although it did not always precede PTSD, and was not always followed by PTSD.

Many patients experience the dissociative symptoms that form part of the criteria for ASD (and differentiate it from PTSD itself) in the first few weeks after a trauma: the level of dissociation reported by patients is significantly higher immediately following trauma than at later follow-ups, and it is chiefly the presence of dissociation that distinguishes ASD from PTSD. This is one reason why the category of ASD is clinically useful: it represents a set of symptoms in some way distinct from those associated with chronic PTSD, and is a temporary state: many of those diagnosed with ASD do not go on to develop PTSD. However, it is not clear that the distinction between ASD and PTSD is justified in terms of aetiology or treatment: there is no evidence to suggest that the psychological processes involved in causing ASD are different to those causing PTSD.

Predictive Model:

From a practical point of view, generating a predictive model for chronic post-traumatic symptoms is important, since it allows resources to be targeted to those who are most likely to suffer extensive and continuing psychological distress following a traumatic event. Initial symptoms themselves cannot be used as a guide to later symptoms, since as many previous studies have shown levels of post-traumatic symptoms in the first few weeks may be high in a large proportion of patients (Foa & Riggs, 1993), or, as in this sample of

patients and the sample in the previous study, symptoms measured immediately after the traumatic event may in some patients increase markedly over the subsequent days or weeks. The correlation between initial symptoms and symptoms at 24 weeks is not high, and selected initial psychological variables can only explain a small proportion of the variance in caseness at 24 weeks, although the TDQ, SDQ, and SRQ do explain 16% of the 24 week PSS variance.

The linear regression results from this study, indicate that state dissociation and rumination measured at 4 weeks do predict later post-traumatic symptoms, and suggests that identifying cases of chronic PTSD symptomatology is possible at this time-point: at 24 weeks, 48% of PTSD cases were identified by using these two variables, with only 7.1% false positives. However, this needs replication on another sample, and particularly with other types of trauma. This result suggests that measurement of symptoms at the 4-week point may be the optimum point for predicting whether PTSD symptoms are likely to become chronic or not, rather than measuring symptoms at the initial interview. This conclusion is backed up by the data in Chapter 6, which demonstrated greater predictive power for variables measured at 1 to 4 weeks than for variables measured at the very first interview.

This study has concentrated on only a few of the possible psychological variables that may predict PTSD symptoms and caseness. It should be possible with the addition of other factors that have been identified previously, such as previous psychiatric history, neuroticism, negative interpretation of PTSD symptoms and so on (Ehlers et al., submitted; Koopman, Classen, & Spiegel, 1994; Kushner, Riggs, Foa, & Miller, 1992; McFarlane, 1988; McNally & Shin, 1995), as well as with the addition of PTSD symptoms, to identify an even higher percentage of persistent PTSD cases. Clearly many factors are predictive of PTSD and at this stage the importance of the subgroup of factors examined in this study cannot be conclusively

quantified, since it is possible that they are themselves linked at the time of the initial assessment to general distress and that this more general factor may also be predictive of later outcome.

Conclusion

This study has a number of important conclusions.

- It is clear that PTSD symptoms are relatively common amongst patients who have been involved in road traffic accidents, including those incidents which do not involve severe physical injuries. In fact, both in this study and in the previous study on admitted patients, extent of physical injury (measured objectively) is not a predictor of severity of post-traumatic symptoms. This picture is consistent with previous studies of RTA victims and victims of other traumatic events, which have also found no relationship between physical injury and PTSD symptoms (Mayou et al., 1993; McFarlane, 1988).
- There are significant gender differences in terms of PTSD symptoms and course, and also in terms of which psychological variables are predictive of those symptoms.
- Self-rated physical injury, on the other hand, is an important predictor of long term outcome, a result which underlines the importance of assessing subjective pain and disability in patients.

- In many patients, PTSD symptoms seem to become more severe over the first few weeks, and symptoms at 4 weeks are predictive of continuing symptoms at 24 weeks, while symptoms at the initial assessment (within a few days of the accident) are much less predictive of later symptoms. Many patients with PTSD at 24 weeks did not fulfil the diagnostic criteria for PTSD initially.
- Acute Stress Disorder, a new DSM-IV diagnostic category, is predictive of later PTSD. Many patients that develop persistent PTSD symptoms and PTSD do not, however, fulfil diagnostic criteria for ASD, and it is therefore not a good predictor of longer term outcome: there is utility in viewing this category as separate from PTSD itself for descriptive purposes.
- Several psychological variables predict outcome. As hypothesized, trait and state dissociation predict the development and maintenance of post-traumatic symptoms, as do phenomena associated with dissociation, such as evidence of fragmented memories of the event. Rumination also predicts later post-traumatic symptoms, although this study failed to demonstrate conclusively that information-processing style during the traumatic event itself (semantic- versus data-driven processing) was a significant predictor.
- A regression analysis of the data indicates that a substantial proportion of the variance can be explained with a number of psychological variables, which is of practical importance since from a clinical service provision point of view it may well be advantageous to identify at an early stage those patients who are more likely to suffer long-term post-traumatic symptoms.

CHAPTER 8:

Conclusion

In this chapter I will:

- compare the main results of the studies
- draw general conclusions
- discuss future research and clinical implications

Results comparison

The studies presented in this thesis have a variety of methodologies: in order to allow cross-comparisons between studies the results are presented here in a slightly different format. The three tables below summarize the main findings regarding the relationship of dissociation to PTSD symptoms. It must be borne in mind, however, that the sample sizes vary considerably between these studies, and therefore the larger, non-admitted patient study should be given more weight than the other studies.

Table 1 shows the correlations between *total dissociation score and intrusions*: in the case of the clinical studies the correlations presented are those with the intrusion subscale of the PSS at 0 weeks and 24 weeks, while in the case of the video studies the correlations presented are those to the number of intrusions experienced, either during the diary phase (i.e. in the short term), or at six month follow-up. Results significant at $p < .05$ are underlined.

Study:	Short-term (0-1 weeks)				Long term (at 6 months)			
	State dissociation		Trait dissociation		State dissociation		Trait dissociation	
First video study	.21	p<.142	.25	p<.082	<u>.38</u>	<u>p<.006</u>	.10	p<.476
Second video study	.19	p<.233	<u>.41</u>	<u>p<.009</u>	not applicable		not applicable	
Admitted patients study	.35	p<.071	<u>.38</u>	<u>p<.047</u>	.15	p<.526	.08	p<.725
Non-admitted patients study	<u>.41</u>	<u>p<.0005</u>	<u>.24</u>	<u>p<.002</u>	<u>.26</u>	<u>p<.002</u>	.16	p<.053

The table shows that both trait and state dissociation are predictive of short and long term outcome. Table 2 below shows the correlations between *individual factors from the TDQ and intrusions* (correlations significant at p<.05 are underlined):

Study	TDQ Factor:							Total
	1	2	3	4	5	6	7	
Short term (0-1 weeks):								
First video study	.18	<u>.29</u>	.21	.15	<u>.36</u>	.16	.02	.25
Second video study	<u>.41</u>	<u>.39</u>	<u>.44</u>	<u>.38</u>	.27	<u>.38</u>	<u>.42</u>	<u>.41</u>
Admitted patients study	.12	.28	<u>.46</u>	.35	<u>.42</u>	.26	.12	<u>.38</u>
Non-admitted patients study	<u>.16</u>	.04	.14	<u>.29</u>	<u>.26</u>	<u>.22</u>	<u>.28</u>	<u>.24</u>
Long term (at 6 months):								
First video study	.08	.07	.24	.03	.02	.01	.16	.10
Second video study	not applicable							
Admitted patients study	-.09	.31	.09	.05	.18	-.02	-.09	.08
Non-admitted patients study	.03	.08	.04	.14	<u>.24</u>	<u>.22</u>	<u>.28</u>	.16

Tables 3 and 4 below shows the correlations for the two patients studies between the *individual TDQ factors and the other PTSD symptom clusters (avoidance and arousal)*.

Study	TDQ Factor:							Total	SDQ
	1	2	3	4	5	6	7		
Short term (0-1 weeks):									
Admitted patients study	.17	<u>.48</u>	.32	.00	.27	.29	-.02	<u>.39</u>	.34
Non-admitted patients study	<u>.37</u>	<u>.18</u>	<u>.20</u>	<u>.32</u>	<u>.35</u>	<u>.32</u>	<u>.39</u>	<u>.40</u>	<u>.45</u>
Long term (at 6 months):									
Admitted patients study	-.04	<u>.57</u>	<u>.43</u>	.21	.19	.36	.15	<u>.49</u>	<u>.45</u>
Non-admitted patients study	.14	.11	.03	<u>.21</u>	<u>.28</u>	<u>.24</u>	<u>.31</u>	<u>.25</u>	<u>.27</u>

Table 3: Correlation between avoidance on PSS and dissociation

Study	TDQ Factor:							Total	SDQ
	1	2	3	4	5	6	7		
Short term (0-1 weeks):									
Admitted patients study	.28	.31	<u>.55</u>	.25	.23	.31	-.20	<u>.42</u>	<u>.38</u>
Non-admitted patients study	<u>.32</u>	<u>.18</u>	<u>.29</u>	<u>.28</u>	<u>.36</u>	<u>.26</u>	<u>.36</u>	<u>.40</u>	<u>.36</u>
Long term (at 6 months):									
Admitted patients study	.11	<u>.49</u>	.35	.02	.22	.33	.08	.40	.20
Non-admitted patients study	.15	.16	.09	<u>.20</u>	<u>.22</u>	<u>.18</u>	<u>.25</u>	<u>.24</u>	<u>.25</u>

Table 4: Correlation between arousal on PSS and dissociation

The tables above show that both state and trait dissociation are significantly related to the later occurrence of intrusive memories, both in non-clinical and clinical populations, although the results are generally stronger in the clinical samples, as would be expected, since the trauma they experienced was more distressing than the videotape stimulus used in the experimental studies. Nevertheless, the comparability of results between the clinical and non-clinical samples indicates the validity of studying the relationship between dissociation and intrusive memories in an experimental setting.

General conclusions

The term “dissociation”

There are many questions as to the validity and usefulness of the term “dissociation” - it is at present only loosely defined and poorly understood, a situation that has arisen as a result of confusing historical definitions and a lack, until recently, of research interest. This thesis cannot provide answers to all these questions, and in particular has not been able to investigate what processes underlie dissociation or why it occurs, but it does give indications about the nature of dissociation and its relationship to PTSD.

Dissociation, as the term is used by a many researchers, is divisible into a number of different subcomponents. While most of these components are predictive of PTSD symptoms in the short term, only some have strong longer-term predictive value. An indication of predictive power can be gained by comparing the seven factors in terms of the numbers of high (>.25) and low (<.10) correlations they show with PTSD symptoms, although of course this does not take into account the differences in sample size between the studies. Table 5 below summarizes these figures, both for intrusions (including all four studies), and for all three PSS subscales (for the two patient studies).

Factor	Correlations with intrusions		Correlations with PSS subscales	
	Number of correlations less than $r=.10$	Number of correlations greater than $r=.25$	Number of correlations less than $r=.10$	Number of correlations greater than $r=.25$
1 (detachment)	3	1	3	1
2 (split self)	3	4	2	6
3 (mood lability)	2	2	4	6
4 (memory lapses)	2	3	3	5
5 (numbing)	1	4	1	6
6 (confusion)	2	2	1	7
7 (amnesia)	2	3	4	6
TDQ Total	1	3	1	9
Maximum number possible	7	7	12	12

As the table shows, factor 5 (emotional numbing) is a consistently strong predictor of intrusions and the avoidance and arousal PSS subscales, in both the experimental and clinical studies. Other predictors include factor 2 (sense of split self), and factor 6 (confusion and altered time sense). The worst predictors are factor 1 (detachment from others and the world), factor 3 (lability of mood and impulsivity) and factor 7 (amnesia for important life events).

Thus Foa et al. are correct in criticizing the DES, the measure of dissociation used most frequently in PTSD research, since it neglects the emotional numbing aspect of dissociation (Foa & Hearst-Ikeda, 1996).

However, this is not to say that one should discard the term dissociation altogether: as a whole the Trait Dissociation Questionnaire is still predictive of PTSD, and it may well be that factors which are not predictive of PTSD are predictive of other disorders, since dissociation is not just a phenomenon associated with PTSD, but has been reported in association with many other psychiatric problems, including *borderline personality disorder* (Atlas & Wolfson, 1996; Brodsky, Cloitre, & Dulit, 1995; Russ, Shearin, Clarkin, Harrison, & Hull, 1993); *eating disorders* (Covino, Jimerson, Wolfe, Franko, & Frankel, 1994; Gleaves

& Eberenz, 1995a; Gleaves & Eberenz, 1995b; Rosen & Petty, 1994; Tobin, Molteni, & Elin, 1995; Valdiserri & Kihlstrom, 1995; Vanderlinden, Spinhoven, Vandereycken, & van Dyck, 1995); *pseudoseizures* (Bowman, 1993), and *OCD* (Goff, Olin, Jenike, Baer, & Buttolph, 1992).

What is clear, however, is that dissociation is not a unitary entity: the relatively low inter-correlations of some factors and the varying predictive power of factors indicates that dissociation is best considered as a construct made up of a number of quite different phenomena, which are measurable reliably and validly with the Trait Dissociation Questionnaire.

Dissociation and intrusive memories

This thesis confirms the suggestions by many researchers involved in developing models of PTSD that dissociation is an important factor in the development and maintenance of PTSD (Foa & Hearst-Ikeda, 1996; Spiegel, 1987; Spiegel & Cardena, 1990).

Dissociation, and particularly the emotional numbing component, is an important factor in predicting intrusive memories, which are not only a central aspect of PTSD but which are also seen in depression and low mood (Brewin, Hunter, Carroll, & Tata, 1996c; Kuyken & Brewin, 1994; Sutherland, Newman, & Rachman, 1982; Wilner & Horowitz, 1975) and in non-clinical samples, where they are related to anxiety, depression, and obsessive ritualization (Allsopp & Williams, 1996; Brewin, Christodoulides, & Hutchinson, 1996a).

It remains unclear how dissociation and memory processes are linked: this is one area of research that needs a great deal more attention. The relationship is clearly a complex one: it may be, as Foa argues, that emotional numbing represents poor processing of the traumatic

stimulus and the incomplete activation of fear networks generated following trauma: the results presented in this thesis support this theory. A sense of confusion and of “split self”, the two other factors shown to be highly predictive of PTSD in this thesis, may also cause poor emotional processing and poor integration of intrusive memories of the trauma, and thereby be closely linked to numbing. This may explain the link between dissociation and data-driven processing, which is characterized by attention to sensory details rather than the emotional content of stimuli, and thereby explain the formation of fragmented, often implicit memories of the traumatic event (Ehlers & Clark, in press; Kihlstrom & Hoyt, 1990), thought to be important in the maintenance of PTSD (Brewin, Dalgleish, & Joseph, 1996b). These memories can be easily triggered by environmental stimuli to be experienced as intrusive recollections, flashbacks or nightmares, resulting in further dissociation and avoidance.

The status of Acute Stress Disorder and PTSD

Recent renewed interest in the relationship between dissociation and other post-traumatic symptoms, and a simultaneous interest in the investigation of the processes ongoing immediately following traumatization have led to the introduction of the new DSM category of Acute Stress Disorder. The validity of this term is to a degree supported by this thesis. Although one might object to ASD as a separate diagnostic category from PTSD on the grounds that it replicates the symptom criteria of PTSD, and also predicts PTSD development, this thesis shows that it is distinct, since the early post-traumatic symptom constellation is characterized by a higher degree of dissociation. These early dissociative symptoms are in themselves not as highly predictive of later outcome as are later, more persistent dissociative symptoms. This indicates that these later symptoms may be evidence

of a maladaptive coping strategy, whether controlled or automatic, whereas the earlier symptoms may be more a natural reaction to trauma, perhaps mediated by biological mechanisms (Glover, 1992).

Future research

The results of this thesis on the nature, measurement, and significance of dissociation indicate a number of areas for future research:

One such area would be the standardization of the Trait Dissociation Questionnaire in a larger sample. The distribution of the TDQ is established in a student sample, and for the shortened version of the TDQ in a clinical sample, but it is not clear what the distribution would be in a population of non-students, or (for the full version) in a clinical sample: indications from this thesis are that the mean score in non-students and in RTA patients is lower than that in the student population. Both these are important to investigate, since they enable an individual's TDQ score to be compared to an appropriate population.

A second area of possible future research is the development of better techniques for the manipulation of dissociation, if this is possible, since this would allow more effective experimental investigations. This thesis demonstrated that the manipulation of dissociation is difficult: if effective techniques of manipulation are not available then demonstrating a causal relationship between dissociation and later PTSD symptoms is also difficult, and must rely instead on high-quality prospective clinical studies and on demonstrating a mechanism through which dissociation can produce or influence PTSD symptoms.

This area of research is both important and as yet underdeveloped. At present there has been relatively little work examining dissociation and its subcomponents to determine in more detail their nature and mechanism of operation. Theories of dissociation are currently

not detailed enough and tend to consist of general statements about the concept as a whole, rather than explanations of the workings of a particular aspect of dissociation. There are a number of possible avenues, some of which have already been partly investigated. These include:

- possible biological mechanisms, perhaps with relation to endogenous opioids or other neurochemicals associated with stress and trauma (Glover, 1992),
- neuropsychological or psychophysiological correlates of dissociation (Bremner, Krystal, Southwick, & Charney, 1995),
- reasons for gender differences in the relationship between dissociation and later PTSD symptoms. This thesis indicates that there may be important gender differences in the predictive power of a variety of factors, including dissociation, and the mechanism for these differences is not yet clear: they may be due to a gender-related pattern of response bias in questionnaires, gender differences in the prevalence of dissociation and other phenomena, cognitive or social gender differences that may act as predisposing or protective factors, or possibly even gender-related biological differences that influence the ways in which various factors affect information processing.
- the relationship between dissociation and cognitive activity such as data-driven processing or possibly repression (Brenner, 1994; Counts, 1990; Frankel, 1990; Marmer & Fink, 1994; Spiegel & Schefflin, 1994), and linked to this
- the relationship between dissociation and memory processes, including the formation of implicit and explicit memories and how these memories are recalled or suppressed (Ehlers & Clark, in press; Kihlstrom & Hoyt, 1990; van der Kolk & Fisler, 1995)

Clinical implications

This thesis has increased our understanding of the nature of the early response to one of the commonest forms of clinical trauma, and has implications for the early recognition of problems and for the design of treatments.

- An important area for future clinical research is the establishment of an improved predictive model for PTSD based on a combination of initial symptoms, trait and state measures. This thesis reported on the predictive power a number of factors, including state and trait dissociation, rumination, fear, and perceived physical injury, but there are many other factors which have been linked to later PTSD development, such as social support and previous psychiatric history, that are relatively easy to measure and could be included in a predictive model. A predictive model for PTSD would have important clinical implications, since it would allow the early identification of those most likely to develop PTSD and the possibility of early preventative or treatment intervention.
- The results of this thesis indicate that treatment focussing on teaching patients to replace habitual dissociation with some other more adaptive processing strategy should be effective, as should concentrating on changing fragmented memories into more complete versions. Indeed the indications from existing treatment studies are that focussing on effective emotional processing of intrusive memories, which may counteract the effects of dissociation, is effective in reducing PTSD symptoms (Boudewyns, 1996; Foa, Hearst Ikeda, & Perry, 1995a; Foa, Molnar, & Cashman, 1995b; Foa, Rothbaum, Riggs, & Murdock, 1991; Richards, Lovell, & Marks, 1994; Richards & Rose, 1991; Solomon, Gerrity, & Muff, 1992).

Dissociation is one of a number of important factors involved in the development of PTSD, and is of particular importance because of its prevalence amongst early post-traumatic symptoms. Its nature is still not fully understood, although this thesis has helped to examine its components and the role they play in reacting to traumatic events.

Bibliography

- AA Foundation for Road Safety Research. (1987). *Young drivers' survey*. Basingstoke: Automobile Association.
- AA Foundation for Road Safety Research. (1988). *Motoring and the older driver*. Basingstoke: Automobile Association.
- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1988). The hopelessness theory of depression: Does the research test the theory? In L. Y. Abramson (Ed.), *Social cognition and clinical psychology: A synthesis* (pp. 33-65). New York: Guilford.
- Abramson, L. Y., Seligman, M. E., & Teasdale, J. D. (1978). Learned helplessness in humans; Critique and reformulation. *Journal of Abnormal Psychology*, 87(49-74).
- Adamec, R. E., & Shallow, T. (1993). Lasting effects on rodent anxiety of a single exposure to a cat. *Physiology of Behaviour*, 54(1), 101-109.
- Albach, F., & Everaerd, W. (1992). Posttraumatic stress symptoms in victims of childhood incest. *Psychotherapy and Psychosomatics*, 57(4), 143-151.
- Allsopp, M., & Williams, T. (1996). Intrusive thoughts in a non-clinical adolescent population. *European Child and Adolescent Psychiatry*, 5(1), 25-32.
- American Psychiatric Association. (1952). *Diagnostic and statistical manual of mental disorders. 1st edition*. Washington, D.C.: author.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders. 3rd edition*. Washington, D.C.: author.
- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders. 3rd edition (revised)*. Washington, D.C.: author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders. 4th edition*.
- Amir, N., Stafford, J., Freshman, M. S., & Foa, E. B. (unpublished). Relationship between trauma narratives and trauma pathology .
- Armstrong, J., Putnam, F. W., Carlson, E., Libero, D., & Smith, S. R. (In press). Development and validation of a measure of adolescent dissociation: the adolescent dissociative experiences scale. *Journal of Nervous and Mental Disease*.
- Astin, M.C., Ogland-Hand, S.M., Coleman, E.M., & Foy, D.S. (1995) Posttraumatic stress disorder and childhood abuse in battered women: comparisons with maritally distressed women. *Journal of Consulting and Clinical Psychology*, 63(2), 308-312.
- Atchison, M., & McFarlane, A. C. (1994). A review of dissociation and dissociative disorders. *Australian and New Zealand Journal of Psychiatry*, 28, 591-599.
- Atlas, J. A., & Wolfson, M. A. (1996). Depression and dissociation as features of borderline personality disorder in hospitalized adolescents. *Psychological Reports*, 78(2), 624-626.
- Baggaley, A. R. (1983). Deciding on the ratio of number of subjects to number of variables in factor analysis. *Multivariate Experimental Clinical Research*, 6(2), 81-85.
- Baldwin, D. R., Wilcox, Z. C., & Zheng, G. (1997). The effects of voluntary exercise and immobilization on humoral immunity and endocrine responses in rats. *Physiology of Behaviour*, 61(3), 447-453.

- Bang, L. (1993). Who consults for rape? Sociodemographic characteristics of rape victims attending a medical rape trauma service at the Emergency Hospital in Oslo. *Scandinavian Journal of Primary Health Care, 11*(1), 8-14.
- Barlow, D. H., Cohen, A. S., Waddell, M. T., Vermilyea, B. B., Klosko, T. S., Blanchard, E. B., & Di Nardo, P. A. (1984). Panic and generalized anxiety disorders: nature and treatment. *Behaviour Therapy, 15*, 431-449.
- Barlow, D. H., Craske, M. G., Cerny, J. A., & Klosko, J. S. (1989). Behavioral treatment of panic disorder. *Behaviour Therapy, 20*, 261-282.
- Barlow, D. H., & Lehman, C. L. (1996). Advances in the psychosocial treatment of anxiety disorders. *Archives of General Psychiatry, 53*, 727-735.
- Basoglu, M., Paker, M., Ozmen, E., Tasdemir, O., & Sahin, D. (1994a). Factors related to long-term traumatic stress responses in survivors of torture in Turkey [see comments]. *Journal of the American Medical Association, 272*(5), 357-363.
- Basoglu, M., Paker, M., Paker, O., Ozmen, E., Marks, I., Incesu, C., Sahin, D., & Sarimurat, N. (1994b). Psychological effects of torture: a comparison of tortured with nontortured political activists in Turkey. *American Journal of Psychiatry, 151*(1), 76-81.
- Beck, A. T. (1967). *Depression: clinical, experimental, and theoretical aspects*. New York: Harper & Row.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.
- Beck, A. T. (1988). Cognitive approaches to panic disorder. In S. Rachman & J. D. Maser (Eds.), *Panic: psychological perspectives* (pp. 91-110). Hillsdale, NJ: Lawrence Erlbaum.
- Beck, A. T., Emery, G., & Greenberg, R. L. (1985). *Anxiety disorders and phobias: a cognitive perspective*: Basic Books.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J. E., & Erbaugh, J. K. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561-571.
- Bellamy, R. (1997). Compensation neurosis: financial reward for illness as nocebo. *Clinical Orthopaedics, 336*, 94-106.
- Berger, D., Saito, S., Ono, Y., Tezuka, I., Shirahase, J., Kuboki, T., & Suematsu, H. (1994). Dissociation and child abuse histories in an eating disorder cohort in Japan. *Acta Psychiatrica Scandinavia, 90*(4), 274-280.
- Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of a dissociation scale. *Journal of Nervous and Mental Disease, 174*(12), 727-735.
- Berton, M. W., & Stabb, S. D. (1996). Exposure to violence and post-traumatic stress disorder in urban adolescents. *Adolescence, 31*(122), 489-498.
- Blanchard, E. B., Hickling, E. J., Barton, K. A., Taylor, A. E., Loos, W. R., & Jones Alexander, J. (1996a). One-year prospective follow-up of motor vehicle accident victims. *Behaviour Research and Therapy, 34*(10), 775-786.
- Blanchard, E. B., Hickling, E. J., Mitnick, N., Taylor, A. E., Loos, W. R., & Buckley, T. C. (1995a). The impact of severity of physical injury and perception of life threat in the development of post-traumatic stress disorder in motor vehicle accident victims. *Behaviour Research and Therapy, 33*(5), 529-534.
- Blanchard, E. B., Hickling, E. J., Taylor, A. E., & Loos, W. (1995b). Psychiatric morbidity associated with motor vehicle accidents. *Journal of Nervous and Mental Disease, 183*(8), 495-504.

- Blanchard, E. B., Hickling, E. J., Taylor, A. E., Loos, W. R., Forneris, C. A., & Jaccard, J. (1996b). Who develops PTSD from motor vehicle accidents? *Behaviour Research and Therapy*, *34*(1), 1-10.
- Blanchard, E. B., Hickling, E. J., Taylor, A. E., Loos, W. R., & Gerardi, R. J. (1994). Psychological morbidity associated with motor vehicle accidents. *Behaviour Research and Therapy*, *32*(3), 283-290.
- Blanchard, E. B., Hickling, E. J., Vollmer, A. J., Loos, W. R., Buckley, T. C., & Jaccard, J. (1995c). Short-term follow-up of post-traumatic stress symptoms in motor vehicle accident victims. *Behaviour Research and Therapy*, *33*(4), 369-377.
- Bogduk, N. (1994). Post whiplash syndrome. *Australian Family Physician*, *23*(12), 2303-2307.
- Boscarino, J. A. (1996). Posttraumatic stress disorder, exposure to combat, and lower plasma cortisol among Vietnam veterans: findings and clinical implications. *Journal of Consulting and Clinical Psychology*, *64*(1), 191-201.
- Boudewyns, P. A. (1996). Posttraumatic stress disorder: conceptualization and treatment. *Progressive Behaviour Modification*, *30*, 165-189.
- Bowman, E. S. (1993). Etiology and clinical course of pseudoseizures. Relationship to trauma, depression, and dissociation. *Psychosomatics*, *34*(4), 333-342.
- Branscomb, L. P. (1991). Dissociation in Combat-Related Post-Traumatic Stress Disorder. *Dissociation*, *4*(1), 13-20.
- Braun, P., Greenberg, D., Dasberg, H., & Lerer, B. (1990). Core symptoms of posttraumatic stress disorder unimproved by alprazolam treatment. *Journal of Clinical Psychiatry*, *51*(6), 236-238.
- Bremner, J. D., & Brett, E. (1997). Trauma-related dissociative states and long-term psychopathology in posttraumatic stress disorder. *Journal of Traumatic Stress*, *10*(1), 37-49.
- Bremner, J. D., Krystal, J. H., Southwick, S. M., & Charney, D. S. (1995). Functional neuroanatomical correlates of the effects of stress on memory. *Journal of Traumatic Stress*, *8*(4), 527-553.
- Bremner, J. D., Southwick, S., Brett, E., Fontana, A., Rosenheck, R., & Charney, D. S. (1992). Dissociation and posttraumatic stress disorder in Vietnam combat veterans. *American Journal of Psychiatry*, *149*(3), 328-332.
- Brenner, I. (1994). The dissociative character: a reconsideration of "multiple personality" [see comments]. *Journal of the American Psychoanalysis Association*, *42*(3), 819-846.
- Brent, D. A., Perper, J. A., Moritz, G., Liotus, L., Richardson, D., Canobbio, R., Schweers, J., & Roth, C. (1995). Posttraumatic stress disorder in peers of adolescent suicide victims: predisposing factors and phenomenology. *Journal of the American Academy of Child and Adolescent Psychiatry*, *34*(2), 209-215.
- Breslau, N., Davis, G. C., & Andreski, P. (1995). Risk factors for PTSD-related traumatic events: a prospective analysis. *American Journal of Psychiatry*, *152*(4), 529-535.
- Breslau, N., Davis, G. C., Andreski, P., & Peterson, E. (1991). Traumatic events and posttraumatic stress disorder in an urban population of young adults. *Archives of General Psychiatry*, *48*(3), 216-222.
- Brewin, C. R. (1996). Theoretical foundations of cognitive-behavior therapy for anxiety and depression. *Annual Review of Psychology*, *47*, 33-57.
- Brewin, C. R., Christodoulides, J., & Hutchinson, G. (1996a). Intrusive thoughts and intrusive memories in a nonclinical sample. *Cognition and Emotion*, *10*, 107-112.

- Brewin, C. R., Dalgleish, T., & Joseph, S. (1996b). A dual representation theory of posttraumatic stress disorder. *Psychological Review*, *103*(4), 670-686.
- Brewin, C. R., Hunter, E., Carroll, F., & Tata, P. (1996c). Intrusive memories in depression: an index of schema activation? *Psychological Medicine*, *26*(6), 1271-1276.
- Brodsky, B. S., Cloitre, M., & Dulit, R. A. (1995). Relationship of dissociation to self-mutilation and childhood abuse in borderline personality disorder. *American Journal of Psychiatry*, *152*(12), 1788-1792.
- Brown, L. L., Siegel, H., & Etgen, A. M. (1996). Global sex differences in stress-induced activation of cerebral metabolism revealed by 2-deoxyglucose autoradiography. *Horm Behav*, *30*(4), 611-617.
- Browne, A. (1993). Violence against women by male partners. Prevalence, outcomes, and policy implications. *American Psychologist*, *48*(10), 1077-1087.
- Bryant, B., Mayou, R., & Lloyd-Bostock. (in press). .
- Bryant, R., A., & Harvey, A., G. (in press). Acute Stress Disorder: A Critical Review of Diagnostic Issues. *Clinical Psychology Review*.
- Bryant, R. A., & Harvey, A. G. (1995a). Acute stress response: a comparison of head injured and non-head injured patients. *Psychological Medicine*, *25*(4), 869-873.
- Bryant, R. A., & Harvey, A. G. (1995b). Avoidant coping style and post-traumatic stress following motor vehicle accidents. *Behaviour Research and Therapy*, *33*(6), 631-635.
- Bryant, R. A., & Harvey, A. G. (1996a). Initial posttraumatic stress responses following motor vehicle accidents. *Journal of Traumatic Stress*, *9*(2), 223-234.
- Bryant, R. A., & Harvey, A. G. (1996b). Visual imagery in posttraumatic stress disorder. *Journal of Traumatic Stress*, *9*(3), 613-619.
- Buckley, T. C., Blanchard, E. B., & Hickling, E. J. (1996). A prospective examination of delayed onset PTSD secondary to motor vehicle accidents. *Journal of Abnormal Psychology*, *105*(4), 617-625.
- Butcher, J. N., Dahlstrom, W. G., Graham, J. R., Tellegen, A., & Kaemmer, B. (1989). *Manual for the Minnesota Multiphasic Personality Inventory-2*. Minneapolis: University of Minnesota Press.
- Cardena, E., & Spiegel, D. (1993). Dissociative reactions to the San Francisco Bay area earthquake of 1989. *American Journal of Psychiatry*, *150*(3), 474-478.
- Carlier, I. V., Lamberts, R. D., Fouwels, A. J., & Gersons, B. P. (1996). PTSD in relation to dissociation in traumatized police officers. *American Journal of Psychiatry*, *153*(10), 1325-1328.
- Carlson, E. B., & Putnam, F. W. (1993). An update on the dissociative experiences scale. *Dissociation*, *6*, 16-17.
- Carlson, E. B., Putnam, F. W., Ross, C. A., & et al. (1993). Validity of the Dissociative Experiences Scale in screening for multiple personality disorder: a multicenter study. *American Journal of Psychiatry*, *148*, 1548-1551.
- Carlson, E. B., & Rosser Hogan, R. (1991). Trauma experiences, posttraumatic stress, dissociation, and depression in Cambodian refugees. *American Journal of Psychiatry*, *148*(11), 1548-1551.
- Carlson, E. B., & Rosser Hogan, R. (1994). Cross-cultural response to trauma: a study of traumatic experiences and posttraumatic symptoms in Cambodian refugees. *Journal of Traumatic Stress*, *7*(1), 43-58.
- Casella, L., & Motta, R. W. (1990). Comparison of characteristics of Vietnam veterans with and without posttraumatic stress disorder. *Psychological Reports*, *67*(2), 595-605.

- Chambless, D. L., & Goldstein, A. J. (1982). *Agoraphobia: multiple perspectives on theory and treatment*. New York: John Wiley.
- Chemtob, C. M., Hamada, R. S., Roitblat, H. L., & Muraoka, M. Y. (1994). Anger, impulsivity, and anger control in combat-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 62*(4), 827-832.
- Chemtob, C. M., Novaco, R. W., Hamada, R. S., & Gross, D. M. (1997). Cognitive-behavioral treatment for severe anger in posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 65*(1), 184-189.
- Cheung, P. (1994). Posttraumatic stress disorder among Cambodian refugees in New Zealand. *International Journal of Social Psychiatry, 40*(1), 17-26.
- Chu, J. A., & Dill, D. L. (1990). Dissociative Symptoms in Relation to Childhood Physical and Sexual Abuse. *American Journal of Psychiatry, 147*(7), 887-892.
- Clark, D. M. (1985). Respiratory control as a treatment for panic attacks. *Journal of Behavior Therapy and Experimental Psychiatry, 16*(23-30).
- Clark, D. M. (1986). A cognitive approach to panic. *Behaviour Research and Therapy, 24*(4), 461-470.
- Clark, D. M., Ball, S., & Pape, D. (1991). An experimental investigation of thought suppression. *Behaviour Research and Therapy, 29*(3), 253-257.
- Clark, D. M., & Fairburn, C. G. (Eds.). (1997). *Science and practice of cognitive behaviour therapy*. Oxford: Oxford University Press.
- Clark, D. M., Salkovskis, P. M., Hackman, A., Middleton, H., Anastasiades, P., & Gelder, M. (1994). A comparison of cognitive therapy, applied relaxation, and imipramine in the treatment of panic disorder. *British Journal of Psychiatry, 164*, 759-769.
- Coons, P. M., Bowman, E. S., Pellow, T. A., & Schneider, P. (1989). Post-traumatic aspects of the treatment of victims of sexual abuse and incest. *Psychiatric Clinics of North America, 12*(2), 325-335.
- Counts, R. M. (1990). The concept of dissociation. *Journal of the American Academy of Psychoanalysis, 18*(3), 460-479.
- Covino, N. A., Jimerson, D. C., Wolfe, B. E., Franko, D. L., & Frankel, F. H. (1994). Hypnotizability, dissociation, and bulimia nervosa. *Journal of Abnormal Psychology, 103*(3), 455-459.
- Creamer, M., Burgess, P., & Pattison, P. (1992). Reaction to trauma: a cognitive processing model. *Journal of Abnormal Psychology, 101*(3), 452-459.
- Daly, O., Fleming, B., & Loughrey, G. (1996). Psychological sequelae to assassination attempts. *Medical Science and Law, 36*(1), 25-27.
- Dancu, C. V., Riggs, D. S., Hearst Ikeda, D., Shoyer, B. G., & Foa, E. B. (1996). Dissociative experiences and posttraumatic stress disorder among female victims of criminal assault and rape. *Journal of Traumatic Stress, 9*(2), 253-267.
- Daniel, J. (1973). Adaptation to stress and some traits of personality. *Ergonomics, 16*(3), 331.
- Dansky, B. S., Brady, K. T., Saladin, M. E., Killeen, T., Becker, S., & Roitzsch, J. (1996). Victimization and PTSD in individuals with substance use disorders: gender and racial differences. *American Journal of Drug and Alcohol Abuse, 22*(1), 75-93.
- Darves Bornoz, J. M., Lemperiere, T., Degiovanni, A., & Gaillard, P. (1995). Sexual victimization in women with schizophrenia and bipolar disorder. *Social Psychiatry and Psychiatric Epidemiology, 30*(2), 78-84.
- Davey, G. C. L. (1995). Rumination and the enhancement of fear: some laboratory findings.

Behavioural and Cognitive Psychotherapy, 23, 203-215.

- Davidson, J. (1992). Drug therapy of post-traumatic stress disorder [see comments]. *British Journal of Psychiatry*, 160, 309-314.
- Davidson, J. R., Hughes, D., Blazer, D. G., & George, L. K. (1991). Post-traumatic stress disorder in the community: an epidemiological study. *Psychological Medicine*, 21(3), 713-721.
- De Boer, M., Op den Velde, W., Falger, P. J., Hovens, J. E., De Groen, J. H., & Van Duijn, H. (1992). Fluvoxamine treatment for chronic PTSD: a pilot study. *Psychotherapy and Psychosomatics*, 57(4), 158-163.
- deLahunta, E. A. (1995). Hidden trauma: the mostly missed diagnosis of domestic violence. *American Journal of Emergency Medicine*, 13(1), 74-76.
- Delimar, D., Sivik, T., Korenjak, P., & Delimar, N. (1995). The effect of different traumatic experiences on the development of post-traumatic stress disorder. *Military Medicine*, 160(12), 635-639.
- Demitrack, M. A., Putnam, F. W., Rubinow, D. R., Pigott, T. A., Altemus, M., Krahn, D. D., & Gold, P. W. (1993). Relation of dissociative phenomena to levels of cerebrospinal fluid monoamine metabolites and beta-endorphin in patients with eating disorders: a pilot study. *Psychiatric Research*, 49(1), 1-10.
- Dubester, K. A., & Braun, B. G. (1995). Psychometric properties of the dissociative experiences scale. *Journal of Nervous and Mental Disease*, 183(4), 231-235.
- Dunn, G. E., Ryan, J. J., & Dunn, C. E. (1994). Trauma symptoms in substance abusers with and without histories of childhood abuse. *Journal of Psychoactive Drugs*, 26(4), 357-360.
- Ehlers, A. (1997). Level of processing questionnaire. *Unpublished Manuscript*.
- Ehlers, A., & Clark, D. M. (in press). A cognitive model of chronic post-traumatic stress disorder. *Behaviour Research and Therapy*.
- Ehlers, A., Mayou, R. A., & Bryant, B. (submitted). Psychological predictors of chronic PTSD after motor vehicle accidents. .
- Ehlers, A., & Steil, R. (1995). Maintenance of intrusive memories in Posttraumatic Stress Disorder: A cognitive approach. *Behavioural and Cognitive Psychotherapy*.
- Ellason, J. W., Ross, C. A., & Fuchs, D. L. (1996). Lifetime axis I and II comorbidity and childhood trauma history in dissociative identity disorder. *Psychiatry*, 59(3), 255-266.
- Emery, V. O., Emery, P. E., Shama, D. K., Quiana, N. A., & Jassani, A. K. (1991). Predisposing variables in PTSD patients. *Journal of Traumatic Stress*, 4(3), 325-343.
- Ensink, B. J., & van Otterloo, D. (1989). validation study of the DES in the Netherlands. *Dissociation*, 2, 221-223.
- Erdelyi, M. H. (1994). Dissociation, defense, and the unconscious. In D. Spiegel (Ed.), *Dissociation: Culture, Mind, and Body* (pp. 3-20). Washington, D.C.: American Psychiatric Press.
- Erichsen, J. E. (1882). *On concussion of the spine: nervous shock and other obscure injuries of the nervous system in their clinical and medico-legal aspects*. London: Longmans, Green & Co.
- Feinstein, A., & Dolan, R. (1991). Predictors of post-traumatic stress disorder following physical trauma: an examination of the stressor criterion. *Psychological Medicine*, 21(1), 85-91.
- Fesler, F. A. (1991). Valproate in combat-related posttraumatic stress disorder. *Journal of Clinical Psychiatry*, 52(9), 361-364.

- Fierman, E. J., Hunt, M. F., Pratt, L. A., Warshaw, M. G., Yonkers, K. A., Peterson, L. G., Epstein Kaye, T. M., & Norton, H. S. (1993). Trauma and posttraumatic stress disorder in subjects with anxiety disorders. *American Journal of Psychiatry*, *150*(12), 1872-1874.
- Foa, E. B. (1995). *PTSD Symptom Scale*. Minneapolis USA: National Computer Systems, Inc.
- Foa, E. B., Hearst Ikeda, D., & Perry, K. J. (1995a). Evaluation of a brief cognitive-behavioral program for the prevention of chronic PTSD in recent assault victims. *Journal of Consulting and Clinical Psychology*, *63*(6), 948-955.
- Foa, E. B., & Hearst-Ikeda, D. (1996). Emotional dissociation in response to trauma: an information processing approach. In L. K. Michelson & W. J. Ray (Eds.), *Handbook of Dissociation: Theoretical, Empirical and Clinical Perspectives* (pp. 207-224). New York, N.Y.: Plenum Press.
- Foa, E. B., & Meadows, E. A. (1997). Psychosocial treatments for posttraumatic stress disorder: a critical review. *Annual Review of Psychology*, *48*, 449-480.
- Foa, E. B., Molnar, C., & Cashman, L. (1995b). Change in rape narratives during exposure therapy for posttraumatic stress disorder. *Journal of Traumatic Stress*, *8*(4), 675-690.
- Foa, E. B., & Riggs, D. S. (1993). Post-traumatic stress disorder in rape victims. In J. Oldham, M. B. Riba, & A. Tasman (Eds.), *American psychiatric press review of psychiatry*. Washington, D.C.: American Psychiatric Press.
- Foa, E. B., Riggs, D. S., Dancu, C. V., & Rothbaum, B. O. (1993). Reliability and validity of a brief instrument for assessing post-traumatic stress disorder. *Journal of Traumatic Stress*, *6*(4), 459-473.
- Foa, E. B., Riggs, D. S., & Gershuny, B. S. (1995c). Arousal, numbing, and intrusion: symptom structure of PTSD following assault. *American Journal of Psychiatry*, *152*(1), 116-120.
- Foa, E. B., Rothbaum, B. O., Riggs, D. S., & Murdock, T. B. (1991). Treatment of posttraumatic stress disorder in rape victims: a comparison between cognitive-behavioral procedures and counseling. *Journal of Consulting and Clinical Psychology*, *59*(5), 715-723.
- Foa, E. B., Steketee, G., & Rothbaum, B. O. (1989). Behavioral/cognitive conceptualizations of post-traumatic stress disorder. *Behaviour Therapy*, *20*, 155-176.
- Foa, E. B., Zinbarg, R., & Rothbaum, B. O. (1992). Uncontrollability and unpredictability in post-traumatic stress disorder: an animal model. *Psychological Bulletin*, *112*(2), 218-238.
- Fonagy, P., & Target, M. (1995). Dissociation and trauma. *Current Opinion in Psychiatry*, *8*, 161-166.
- Frankel, F. H. (1990). Hypnotizability and dissociation [see comments]. *American Journal of Psychiatry*, *147*(7), 823-829.
- Freinkel, A., Koopman, C., & Spiegel, D. (1994). Dissociative symptoms in media eyewitnesses of an execution. *American Journal of Psychiatry*, *151*(9), 1335-1339.
- Freud, S. (1894). The defense neuro-psychoses. In P. Rieff (Ed.), *Sigmund Freud: Early Psychoanalytic Writings*. .
- Freud, S., & Breuer, J. (1895). *Studies on Hysteria* (Strachey, J., Trans.). London: Hogarth Press.
- Friedman, M. J. (1994). Neurobiological sensitization models of post-traumatic stress disorder: their possible relevance to multiple chemical sensitivity syndrome.

- Toxicology and Industrial Health*, 10(4-5), 449-462.
- Friedman, M. J. (1996). PTSD diagnosis and treatment for mental health clinicians. *Community Mental Health Journal*, 32(2), 173-189.
- Frischholz, E. J., Braun, B. G., Sachs, R. G., & al., e. (1990). The Dissociative Experiences Scale: further replication and validation. *Dissociation*, 3, 151-153.
- Frueh, B. C., Gold, P. B., & de Arellano, M. A. (1997). Symptom overreporting in combat veterans evaluated for PTSD: differentiation on the basis of compensation seeking status. *Journal of Personality Assessment*, 68(2), 369-384.
- Giaconia, R. M., Reinherz, H. Z., Silverman, A. B., Pakiz, B., Frost, A. K., & Cohen, E. (1995). Traumas and posttraumatic stress disorder in a community population of older adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34(10), 1369-1380.
- Gleaves, D. H., & Eberenz, K. P. (1995a). Assessing dissociative symptoms in eating disordered patients: construct validation of two self-report measures. *International Journal of Eating Disorders*, 18(1), 99-102.
- Gleaves, D. H., & Eberenz, K. P. (1995b). Correlates of dissociative symptoms among women with eating disorders. *Journal of Psychiatric Research*, 29(5), 417-426.
- Glover, H. (1992). Emotional numbing: A possible endorphin-mediated phenomenon associated with post-traumatic stress disorders and other allied psychopathologic states. *Journal of Traumatic Stress*, 5(4), 643-675.
- Goff, D. C., Olin, J. A., Jenike, M. A., Baer, L., & Buttolph, M. L. (1992). Dissociative symptoms in patients with obsessive-compulsive disorder. *Journal of Nervous and Mental Disease*, 180(5), 332-337.
- Good, D. M., Bower, D. A., & Einsporn, R. L. (1995). Social support: gender differences in multiple sclerosis spousal caregivers. *Journal of Neuroscience in Nursing*, 27(5), 305-311.
- Good, M. I. (1989). Substance-induced dissociative disorders and psychiatric nosology. *Journal of Clinical Psychopharmacology*, 9(2), 88-93.
- Gorbunov, V. I., & Gannushkina, I. V. (1990). [The immunological aspects of the periodization of the course of craniocerebral trauma]. *Zh Vopr Neurokhir Im N N Burdenko*, 6, 23-25.
- Green, B. L., Korol, M., Grace, M. C., Vary, M. G., Leonard, A. C., Gleser, G. C., & Smitson Cohen, S. (1991). Children and disaster: age, gender, and parental effects on PTSD symptoms. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30(6), 945-951.
- Green, B. L., Lindy, J. D., Grace, M. C., Gleser, G. C., Leonard, A. C., Korol, M., & Winget, C. (1990). Buffalo Creek survivors in the second decade: stability of stress symptoms. *American Journal of Orthopsychiatry*, 60(1), 43-54.
- Green, M. M., McFarlane, A. C., Hunter, C. E., & Griggs, W. M. (1993). Undiagnosed post-traumatic stress disorder following motor vehicle accidents. *Medical Journal of Australia*, 159(8), 529-534.
- Grillon, C., Southwick, S. M., & Charney, D. S. (1996). The psychobiological basis of posttraumatic stress disorder. *Molecular Psychiatry*, 1(4), 278-297.
- Harrison, J., Maguire, P., & Pitceathly, C. (1995). Confiding in crisis: gender differences in pattern of confiding among cancer patients. *Social Science in Medicine*, 41(9), 1255-1260.
- Harvey, A. G., & Bryant, R. A. (in press). The relationship between acute stress disorder and

- posttraumatic stress disorder: a prospective evaluation of motor vehicle accident survivors. *Journal of Clinical and Consulting Psychology*.
- Hawton, K., Salkovskis, P. M., Kirk, J., & Clark, D. M. (Eds.). (1989). *Cognitive behaviour therapy for psychiatric problems: a practical guide*. Oxford: Oxford University Press.
- Helzer, J. E., Robins, L. N., & McEvoy, L. (1987). Post-traumatic stress disorder in the general population. Findings of the epidemiologic catchment area survey. *New England Journal of Medicine*, *317*(26), 1630-1634.
- Herzog, D. B., Staley, J. E., Carmody, S., Robbins, W. M., & van der Kolk, B. A. (1993). Childhood sexual abuse in anorexia nervosa and bulimia nervosa: a pilot study. *Journal of the American Academy of Child and Adolescent Psychiatry*, *32*(5), 962-966.
- Hickling, E. J., & Blanchard, E. B. (1992). Post-traumatic stress disorder and motor vehicle accidents. *Journal of Anxiety Disorders*, *6*, 285-291.
- Hien, D., & Levin, F. R. (1994). Trauma and trauma-related disorders for women on methadone: prevalence and treatment considerations. *Journal of Psychoactive Drugs*, *26*(4), 421-429.
- Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of event scale: a measure of subjective stress. *Psychosomatic Medicine*, *41*(3), 209-218.
- Horowitz, M. J. (1976). *Stress response syndromes*. New York: Jason Aronson.
- Hyams, K. C., Wignall, F. S., & Roswell, R. (1996). War syndromes and their evaluation: from the U.S. Civil War to the Persian Gulf War. *Annals of Internal Medicine*, *125*(5), 398-405.
- Hyer, L. A., Albrecht, J. W., Boudewyns, P. A., Woods, M. G., & Brandsma, J. (1993). Dissociative experiences of Vietnam veterans with chronic posttraumatic stress disorder. *Psychological Reports*, *73*(2), 519-530.
- International Federation of Red Cross and Red Crescent Societies. (1993). *World disaster report*. Dordrecht, The Netherlands: Martinus Nijhoff.
- Irwin, C., Falsetti, S. A., Lydiard, R. B., Ballenger, J. C., Brock, C. D., & Brenner, W. (1996). Comorbidity of posttraumatic stress disorder and irritable bowel syndrome. *Journal of Clinical Psychiatry*, *57*(12), 576-578.
- Janet, P. (1907). *Major Symptoms of Hysteria*. New York, N.Y.: Hafner.
- Janoff Bulman, R., & Frieze, I. H. (1983). A theoretical perspective for understanding reactions to victimization. *Journal of Social Issues*, *39*(2), 1-17.
- Jeffrey, T. B., & Jeffrey, L. K. (1991). Psychologic aspects of sexual abuse in adolescence. *Current Opinion in Obstetrics and Gynecology*, *3*(6), 825-831.
- Jones, J. C., & Barlow, D. H. (1990). The etiology of posttraumatic stress disorder. *Clinical Psychology Review*, *299*-328.
- Joseph, S., Dalgleish, T., Thrasher, S., Yule, W., Williams, R., & Hodgkinson, P. (1996). Chronic emotional processing in survivors of the Herald of Free Enterprise disaster: the relationship of intrusion and avoidance at 3 years to distress at 5 years. *Behaviour Research and Therapy*, *34*(4), 357-360.
- Joseph, S., Williams, R., & Yule, W. (1995a). Psychosocial perspectives on post-traumatic stress. *Clinical Psychology Review*, *15*(6), 515-544.
- Joseph, S., Yule, W., & Williams, R. (1995b). Emotional processing in survivors of the Jupiter cruise ship disaster. *Behaviour Research and Therapy*, *33*(2), 187-192.
- Joseph, S. A., Brewin, C. R., Yule, W., & Williams, R. (1993). Causal attributions and post-traumatic stress in adolescents. *Journal of Child Psychology and Psychiatry*, *34*(2),

247-253.

- Kardiner, A., & Spiegel, H. (1941). *War Stress and Neurotic Illness*. London: Paul B. Hoeber.
- Katz, L., Fleisher, W., Kjernisted, K., & Milanese, P. (1996). A review of the psychobiology and pharmacotherapy of posttraumatic stress disorder. *Canadian Journal of Psychiatry, 41*(4), 233-238.
- Katz, R. J., Lott, M. H., Arbus, P., Crocq, L., Herlobsen, P., Lingjaerde, O., Lopez, G., Loughrey, G. C., MacFarlane, D. J., McIvor, R., & et al. (1994). Pharmacotherapy of post-traumatic stress disorder with a novel psychotropic. *Anxiety, 1*(4), 169-174.
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52*(12), 1048-1060.
- Kihlstrom, J. F., & Hoyt, I. P. (1990). Repression, dissociation and hypnosis. In J. L. Singer (Ed.), *Repression and dissociation: implications for personality theory, psychopathology, and health* (pp. 181-208). Chicago: University of Chicago Press.
- Kilpatrick, D., Saunders, B., Amick-McMullan, A., Best, C., Veronen, L., & Resnick, H. (1989). Victim and crime factors associated with the development of post-traumatic stress disorder. *Behaviour Therapy, 20*, 199-214.
- Kilpatrick, D. G., Resnick, H. S., & Freedy, J. R. (1992). *Posttraumatic stress disorder field trial report: a comprehensive review of the initial results* (Paper): Annual Meeting of the American Psychiatric Association.
- Kinzie, J. D., & Leung, P. (1989). Clonidine in Cambodian patients with posttraumatic stress disorder [see comments]. *Journal of Nervous and Mental Disease, 177*(9), 546-550.
- Koller, P., Marmar, C. R., & Kanas, N. (1992). Psychodynamic group treatment of posttraumatic stress disorder in Vietnam veterans. *International Journal of Group Psychotherapy, 42*(2), 225-246.
- Kolt, G., Kirkby, R. J., & Lindner, H. (1995). Coping processes in competitive gymnasts: gender differences. *Perceptual and Motor Skills, 81*(3 Pt 2), 1139-1145.
- Koopman, C., Classen, C., Cardena, E., & Spiegel, D. (1995). When disaster strikes, acute stress disorder may follow. *Journal of Traumatic Stress, 8*(1), 29-46.
- Koopman, C., Classen, C., & Spiegel, D. (1993). The Stanford Acute Stress Reaction Questionnaire (SASRO). *Unpublished*.
- Koopman, C., Classen, C., & Spiegel, D. (1994). Predictors of posttraumatic stress symptoms among survivors of the Oakland/Berkeley, Calif., firestorm. *American Journal of Psychiatry, 151*(6), 888-894.
- Kosten, T. R., Frank, J. B., Dan, E., McDougle, C. J., & Giller, E. L., Jr. (1991). Pharmacotherapy for posttraumatic stress disorder using phenelzine or imipramine. *Journal of Nervous and Mental Disease, 179*(6), 366-370.
- Kosten, T. R., & Krystal, J. (1988). Biological mechanisms in posttraumatic stress disorder. Relevance for substance abuse. *Recent Developments in Alcoholism, 6*, 49-68.
- Krystal, H. (1968). *Massive psychic trauma*. New York: International Universities Press.
- Kuch, K., Cox, B. J., & Evans, R. J. (1996). Posttraumatic stress disorder and motor vehicle accidents: a multidisciplinary overview. *Canadian Journal of Psychiatry, 41*(7), 429-434.
- Kushner, M. G., Riggs, D. S., Foa, E. B., & Miller, S. M. (1992). Perceived controllability and the development of posttraumatic stress disorder (PTSD) in crime victims. *Behaviour Research and Therapy, 31*(1), 105-110.

- Kuyken, W., & Brewin, C. R. (1994). Intrusive memories of childhood abuse during depressive episodes. *Behaviour Research and Therapy*, 32(5), 525-528.
- Lang, P. J. (1979). A bio-informational theory of emotional imagery. *Psychophysiology*, 16, 495-512.
- Lansky, M. R., & Bley, C. R. (1995). *Posttraumatic nightmares: Psychodynamic explorations*. Hillsdale, N.J.: Analytic Press.
- Lawrence, K. J., Cozolino, L., & Foy, D. W. (1995). Psychological sequelae in adult females reporting childhood ritualistic abuse. *Child Abuse and Neglect*, 19(8), 975-984.
- Lipschitz, D. S., Kaplan, M. L., Sorkenn, J., Chorney, P., & Asnis, G. M. (1996). Childhood abuse, adult assault, and dissociation. *Comprehensive Psychiatry*, 37(4), 261-266.
- Litz, B. T., & Keane, T. M. (1989). Information processing in anxiety disorders: application to the understanding of post-traumatic stress disorder. *Clinical Psychology Review*, 9, 243-257.
- Lonigan, C. J., Shannon, M. P., Taylor, C. M., Finch, A. J., & Sallee, F. R. (1994). Children exposed to disaster: II. Risk factors for the development of post-traumatic symptomatology. *Journal of the American Academy of Child and Adolescent Psychiatry*, 33(1), 94-105.
- Madakasira, S., & O'Brien, K. F. (1987). Acute posttraumatic stress disorder in victims of a natural disaster. *Journal of Nervous and Mental Disease*, 175, 286-290.
- Maercker, A., Schuetzwohl, M., Loebe, K., Eckhardt, F., & Mueller, U. (1994). Sense of coherence and dissociative experiences in victims of political persecution. *Poster, presented at 10th Annual Meeting of the International Society of Traumatic Stress Studies, Chicago, November 1994*.
- Magni, G., de Bertolini, C., Dodi, G., & Infantino, A. (1986). Psychological findings in chronic anal pain. *Psychopathology*, 19(4), 170-174.
- Malt, U. F., Hoivik, B., & Blikra, G. (1993). Psychosocial consequences of road traffic accidents. *European Psychiatry*, 8, 227-228.
- Malt, U. F., & Olafsen, O. M. (1992). Psychological appraisal and emotional response to physical injury: a clinical, phenomenological study of 109 adults. *Psychiatric Medicine*, 10(3), 117-134.
- Mann, B. J. (1995). The North Carolina Dissociation Index: a measure of dissociation using items from the MMPI-2. *Journal of Personality Assessment*, 64(2), 349-359.
- Manzanares, J., Wagner, E. J., LaVigne, S. D., Lookingland, K. J., & Moore, K. E. (1992). Sexual differences in kappa opioid receptor-mediated regulation of tuberoinfundibular dopaminergic neurons. *Neuroendocrinology*, 55(3), 301-307.
- Marmar, C. R., & Weiss, D. S. (1990). Peritraumatic Dissociative Experiences Questionnaire - Subject Version.
- Marmar, C. R., Weiss, D. S., Metzler, T. J., & Delucchi, K. (1996). Characteristics of emergency services personnel related to peritraumatic dissociation during critical incident exposure. *American Journal of Psychiatry*, 153(7 Suppl.), 94-102.
- Marmar, C. R., Weiss, D. S., Schlenger, W. E., Fairbank, J. A., Jordan, B. K., Kulka, R. A., & Hough, R. L. (1994). Peritraumatic dissociation and posttraumatic stress in male Vietnam theater veterans. *American Journal of Psychiatry*, 151(6), 902-907.
- Marmer, S. S., & Fink, D. (1994). Rethinking the comparison of borderline personality disorder and multiple personality disorder. *Psychiatric Clinics of North America*, 17(4), 743-771.
- Mayou, R. (1992). Psychiatric aspects of road traffic accidents. *International Review of*

Psychiatry, 4, 45-54.

- Mayou, R., Bryant, B., & Duthie, R. (1993). Psychiatric consequences of road traffic accidents. *British Medical Journal*, 307, 647-651.
- McCann, I. L., Sakheim, D. K., & Abrahamson, D. J. (1988). Trauma and victimization: A model of psychological adaptation. *The Counseling Psychologist*, 16(4), 531-594.
- McFarlane, A. C. (1988). The aetiology of post-traumatic stress disorders following a natural disaster. .
- McFarlane, A. C. (1992). Avoidance and intrusion in posttraumatic stress disorder. *Journal of Nervous and Mental Disease*, 180(7), 439-445.
- McFarlane, A. C. (1994). Individual psychotherapy for post-traumatic stress disorder. *Psychiatric Clinics of North America*, 17(2), 393-408.
- McNally, R. J. (1997). Implicit and explicit memory for trauma-related information in PTSD. *Annals of the New York Academy of Science*, 821, 219-24.
- McNally, R. J., Kaspi, S. P., Riemann, B. C., & Zeitlin, S. B. (1990). Selective processing of threat cues in posttraumatic stress disorder. *Journal of Abnormal Psychology*, 99(4), 398-402.
- McNally, R. J., & Shin, L. M. (1995). Association of intelligence with severity of posttraumatic stress disorder symptoms in Vietnam Combat veterans. *American Journal of Psychiatry*, 152(6), 936-938.
- Mendelson, G. (1984). Compensation, pain complaints, and psychological disturbance. .
- Mendelson, G. (1991). Chronic pain, compensation and clinical knowledge. *Theor Med*, 12(3), 227-246.
- Mendelson, G. (1995). 'Compensation neurosis' revisited: outcome studies of the effects of litigation. *Journal of Psychosomatic Research*, 39(6), 695-706.
- Mott, F. W. (1919). *War neuroses and shell shock*. London: Oxford Medical Publications.
- Muller, U. F., Yahav, A. L., & Katz, G. (1993). Moving places: a glance at the Gulf War from the sealed room. *British Journal of Medical Psychology*, 66(Pt 4), 331-339.
- Muran, E. M., & Motta, R. W. (1993). Cognitive distortions and irrational beliefs in post-traumatic stress, anxiety, and depressive disorders. *Journal of Clinical Psychology*, 49(2), 166-176.
- Neal, L. A., & Rose, M. C. (1995). Factitious post traumatic stress disorder: a case report. *Medical Science and Law*, 35(4), 352-354.
- Nehlsen Cannarella, S., Fagoaga, O., Folz, J., Grinde, S., Hisey, C., & Thorpe, R. (1997). Fighting, fleeing and having fun: the immunology of physical activity. *International Journal of Sports Medicine*, 18 Suppl 1, S8-21.
- Newman, C. J. (1976). Children of disaster. Clinical observations at Buffalo Creek. *American Journal of Psychiatry*, 137, 401.
- Nolen Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology*, 67(1), 92-104.
- Norris, F. H. (1992). Epidemiology of trauma: frequency and impact of different potentially traumatic events on different demographic groups. *Journal of Consulting and Clinical Psychology*, 60(3), 409-418.
- Noyes, R., & Kletti, R. (1977). Depersonalization in response to life-threatening danger. *Comprehensive Psychiatry*, 18(4), 375-384.
- Noyes, R. J., Hoenk, P., Kuperman, S., & et al. (1977). Depersonalization in accident victims and psychiatric patients. *Journal of Nervous and Mental Disease*, 164, 401-407.
- Orsillo, S. M., Heimberg, R. G., Juster, H. R., & Garrett, J. (1996). Social phobia and PTSD

- in Vietnam veterans. *Journal of Traumatic Stress*, 9(2), 235-252.
- O'Toole, B. I., Marshall, R. P., Grayson, D. A., Schureck, R. J., Dobson, M., Ffrench, M., Pulvertaft, B., Meldrum, L., Bolton, J., & Vennard, J. (1996). The Australian Vietnam Veterans health study: III. psychological health of Australian Vietnam veterans and its relationship to combat. *International Journal of Epidemiology*, 25(2), 331-340.
- Ottenweller, J. E., Natelson, B. H., Pitman, D. L., & Drastal, S. D. (1989). Adrenocortical and behavioral responses to repeated stressors: toward an animal model of chronic stress and stress-related mental illness. *Biological Psychiatry*, 26(8), 829-841.
- Page, H. (1885). Injuries of the spine and spinal cord without apparent mechanical lesion. In M. R. Trimble (Ed.), *Posttraumatic neurosis: From railroad spine to whiplash* (pp. 29). London: J. Churchill.
- Paolo, A. M., Ryan, J. J., Dunn, G. E., & van Fleet, J. (1993). Reading level of the Dissociative Experiences Scale. *Journal of Clinical Psychology*, 49(2), 209-211.
- Patterson, D. R., Everett, J. J., Bombardier, C. H., Questad, K. A., Lee, V. K., & Marvin, J. A. (1993). Psychological effects of severe burn injuries. *Psychological Bulletin*, 113(2), 362-378.
- Penava, S. J., Otto, M. W., Pollack, M. H., & Rosenbaum, J. F. (1996). Current status of pharmacotherapy for PTSD: an effect size analysis of controlled studies. *Depression and Anxiety*, 4(5), 240-242.
- Perry, S., Difede, J., Musngi, G., Frances, A. J., & Jacobsberg, L. (1992). Predictors of posttraumatic stress disorder after burn injury. *American Journal of Psychiatry*, 149(7), 931-935.
- Pitblado, C. B., & Sanders, B. (1991,). *Reliability and short-term stability of scores on the Dissociative Experiences Scale*. Paper presented at the Eighth International Conference on Multiple Personality and Dissociative States, Chicago, Illinois.
- Pitman, R. K., Orr, S. P., Altman, B., Longpre, R. E., Poire, R. E., Macklin, M. L., Michaels, M. J., & Steketee, G. S. (1996). Emotional processing and outcome of imaginal flooding therapy in Vietnam veterans with chronic posttraumatic stress disorder. *Comprehensive Psychiatry*, 37(6), 409-418.
- Pitman, R. K., van der Kolk, B. A., Orr, S. P., & Greenberg, M. S. (1990). Naloxone-reversible analgesic response to combat-related stimuli in posttraumatic stress disorder. A pilot study. *Archives of General Psychiatry*, 47(6), 541-544.
- Polles, A. G., & Smith, P. O. (1995). Treatment of coexisting substance dependence and posttraumatic stress disorder. *Psychiatric Services*, 46(7), 729-730.
- Putnam, F. W. (1991). Dissociative phenomena. In *Tasman A & Goldfinger SM (eds) Review of Psychiatry (vol 10)*.
- Putnam, F. W., Helmers, K., Horowitz, L. A., & Trickett, P. K. (1995). Hypnotizability and dissociativity in sexually abused girls. *Child Abuse and Neglect*, 19(5), 645-655.
- Putnam, F. W., Helmers, K., & Trickett, P. K. (1993). Development, reliability and validity of a child dissociation scale. *Child Abuse and Neglect*, 17, 731-741.
- Pynoos, R. S., Frederick, C., Nader, K., Arroyo, W., Steinberg, A., Eth, S., Nunez, F., & Fairbanks, L. (1987). Life threat and posttraumatic stress in school-age children. *Archives of General Psychiatry*, 44(12), 1057-1063.
- Pynoos, R. S., Ritzmann, R. F., Steinberg, A. M., Goenjian, A., & Prisecaru, I. (1996). A behavioral animal model of posttraumatic stress disorder featuring repeated exposure to situational reminders. *Biological Psychiatry*, 39(2), 129-134.
- Rachman, S. (1977). The conditioning theory of fear acquisition: a critical examination.

- Behaviour Research and Therapy*, 15, 375-387.
- Radanov, B. P., Begre, S., Sturzenegger, M., & Augustiny, K. F. (1996). Course of psychological variables in whiplash injury--a 2-year follow-up with age, gender and education pair-matched patients. *Pain*, 64(3), 429-434.
- Resnick, H. S., Kilpatrick, D. G., Best, C. L., & Kramer, T. L. (1992). Vulnerability-stress factors in development of posttraumatic stress disorder. *Journal of Nervous and Mental Disease*, 180(7), 424-430.
- Resnick, H. S., Kilpatrick, D. G., Dansky, B. S., Saunders, B. E., & Best, C. L. (1993). Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *Journal of Consulting and Clinical Psychology*, 61(6), 984-991.
- Richards, D. A., Lovell, K., & Marks, I. M. (1994). Post-traumatic stress disorder: evaluation of a behavioral treatment program. *Journal of Traumatic Stress*, 7(4), 669-680.
- Richards, D. A., & Rose, J. S. (1991). Exposure therapy for post-traumatic stress disorder. Four case studies [see comments]. *British Journal of Psychiatry*, 158, 836-840.
- Riggs, D., Foa, E. B., Rothbaum, B. O., & Murdock, T. (1991). Post-traumatic stress disorder following rape and non-sexual assault: a predictive model. *Unpublished manuscript*.
- Riggs, D. S., Dancu, C. V., Gershuny, B. S., Greenberg, D., & Foa, E. B. (1992). Anger and post-traumatic stress disorder in female crime victims. *Journal of Traumatic Stress*, 5, 613-625.
- Ritter, M. M., Sonnichsen, A. C., Mohrle, W., Richter, W. O., & Schwandt, P. (1991). Beta-endorphin plasma levels and their dependence on gender during an enteral glucose load in lean subjects as well as in obese patients before and after weight reduction. *International Journal of Obesity*, 15(6), 421-427.
- Rivers, W. H. R. (1918). An address on the repression of war experience. *The Lancet*, 173-177.
- Roca, R., Spence, R., & Munster, A. (1992). Posttraumatic adaptation and distress among adult burn survivors. *American Journal of Psychiatry*, 149, 1234-1238.
- Roesler, T. A., & McKenzie, N. (1994). Effects of childhood trauma on psychological functioning in adults sexually abused as children. *Journal of Nervous and Mental Disease*, 182(3), 145-150.
- Rolls, G. W. P. (1991). *Accident risk and behavioural patterns of younger drivers*. Basingstoke: Automobile Association.
- Rosen, E. F., & Petty, L. C. (1994). Dissociative states and disordered eating. *American Journal of Clinical Hypnosis*, 36(4), 266-275.
- Ross, C. A., Anderson, G., Heber, S., & Norton, G. R. (1990a). Dissociation and abuse among multiple-personality patients, prostitutes, and exotic dancers. *Hospital and Community Psychiatry*, 41(3), 328-330.
- Ross, C. A., Joshi, S., & Currie, R. (1990b). Dissociative experiences in the general population. *American Journal of Psychiatry*, 147(11), 1547-1552.
- Ross, C. A., Norton, G. R., & Anderson, G. (1988). The Dissociative Experiences Scale: a replication study. *Dissociation*, 1, 21-22.
- Ross, T. A. (1941). *Lectures on War Neuroses*. London: Edward Arnold and Co.
- Rothbaum, B. O., Foa, E. B., Murdock, T., Riggs, D., & Walsh, W. (1990). Post-traumatic stress disorder following rape. *Unpublished manuscript*.
- Rothbaum, B. O., Ninan, P. T., & Thomas, L. (1996). Sertraline in the treatment of rape

- victims with posttraumatic stress disorder. *Journal of Traumatic Stress*, 9(4), 865-871.
- Rowan, A. B., Foy, D. W., Rodriguez, N., & Ryan, S. (1994). Posttraumatic stress disorder in a clinical sample of adults sexually abused as children. *Child Abuse and Neglect*, 18(1), 51-61.
- Russ, M. J., Shearin, E. N., Clarkin, J. F., Harrison, K., & Hull, J. W. (1993). Subtypes of self-injurious patients with borderline personality disorder. *American Journal of Psychiatry*, 150(12), 1869-1871.
- Sack, W. H., Clarke, G., Him, C., Dickason, D., Goff, B., Lanham, K., & Kinzie, J. D. (1993). A 6-year follow-up study of Cambodian refugee adolescents traumatized as children [see comments]. *Journal of the American Academy of Child and Adolescent Psychiatry*, 32(2), 431-437.
- Salkovskis, P. M. (Ed.). (1996). *Frontiers of cognitive therapy*. London: Guilford.
- Salkovskis, P. M., & Campbell, P. (1994). Thought suppression induces intrusion in naturally occurring negative intrusive thoughts. *Behaviour Research and Therapy*, 32(1), 1-8.
- Salkovskis, P. M., Jones, D. R. O., & Clark, D. M. (1986). Respiratory control in the treatment of panic attacks: replication and extension with concurrent measurement of behaviour and pCO₂. *British Journal of Psychiatry*, 148, 526-532.
- Sanders, S. (1986). The Perceptual alteration scale: a scale measuring dissociation. *American Journal of Clinical Hypnosis*, 29(2), 95-102.
- Schneewind, K. A., & Cattell, R. B. (1970). Zum problem der faktorenidentifikation: verteilungen und vertrauensintervalle von Kongruenzkoeffizienten für personlichkeitsfaktoren im bereich objektiv-analytischer tests. *Psychologische Beiträge*, 12, 214-226.
- Servatius, R. J., Ottenweller, J. E., & Natelson, B. H. (1995). Delayed startle sensitization distinguishes rats exposed to one or three stress sessions: further evidence toward an animal model of PTSD. *Biological Psychiatry*, 38(8), 539-546.
- Shalev, A. Y. (1992). Posttraumatic stress disorder among injured survivors of a terrorist attack. Predictive value of early intrusion and avoidance symptoms. *Journal of Nervous and Mental Disease*, 180(8), 505-509.
- Shalev, A. Y., Bonne, O., & Eth, S. (1996a). Treatment of posttraumatic stress disorder: a review. *Psychosomatic Medicine*, 58(2), 165-182.
- Shalev, A. Y., Peri, T., Canetti, L., & Schreiber, S. (1996b). Predictors of PTSD in injured trauma survivors: a prospective study. *American Journal of Psychiatry*, 153(2), 219-225.
- Shin, L. M., Kosslyn, S. M., McNally, R. J., Alpert, N. M., Thompson, W. L., Rauch, S. L., Macklin, M. L., & Pitman, R. K. (1997). Visual imagery and perception in posttraumatic stress disorder. A positron emission tomographic investigation. *Archives of General Psychiatry*, 54(3), 233-241.
- Smith, E. M., & North, C. S. (1988). *Aftermath of a disaster: psychological response to the Indianapolis Ramada jet crash* (Quick Response Research Report 23). Boulder, Colorado: Natural Hazards Research and Application Information Center.
- Smith, E. M., North, C. S., McCool, R. E., & Shea, J. M. (1990). Acute postdisaster psychiatric disorders: identification of persons at risk. *American Journal of Psychiatry*, 147(2), 202-206.
- Smith, P. H., & Gittelman, D. K. (1994). Psychological consequences of battering. Implications for women's health and medical practice. *North Carolina Medical*

- Journal*, 55(9), 434-439.
- Solomon, S. D., Gerrity, E. T., & Muff, A. M. (1992). Efficacy of treatments for posttraumatic stress disorder: an empirical review. *Journal of the American Medical Association*, 268(5), 633-638.
- Solomon, Z., & Flum, H. (1988). Life events, combat stress reaction and post-traumatic stress disorder. *Social Science in Medicine*, 26(3), 319-325.
- Solomon, Z., Mikulincer, M., & Avitzur, E. (1988). Coping, locus of control, social support, and combat-related posttraumatic stress disorder: a prospective study. *Journal of Personality and Social Psychology*, 55(2), 279-285.
- Southward, E. E. (1919). *Shell Shock*. Boston: W.M. Leonard.
- Spiegel, D. (1987). Dissociation and hypnosis in post-traumatic stress disorders. *Journal of Traumatic Stress*, 1(1), 17-33.
- Spiegel, D. (1991). Dissociation and trauma. In Tasman A & Goldfinger SM (eds) *Review of Psychiatry (vol 10)*.
- Spiegel, D. (Ed.). (1994). *Dissociation: culture, mind, and body*. Washington, D.C.: American Psychiatric Press.
- Spiegel, D., & Cardena, E. (1990). Dissociative mechanisms in posttraumatic stress disorder. In M. E. Wolf & A. D. Mosnaim (Eds.), *Posttraumatic Stress Disorder: Etiology, Phenomenology, and Treatment* (pp. 23-34). Washington, D.C.: American Psychiatric Press, Inc.
- Spiegel, D., & Cardena, E. (1991). Disintegrated experience: the dissociative disorders revisited. *Journal of Abnormal Psychology*, 100(3), 366-378.
- Spiegel, D., Hunt, T., & Dondershine, H. E. (1988). Dissociation and hypnotizability in posttraumatic stress disorder. *American Journal of Psychiatry*, 145(3), 301-305.
- Spiegel, D., Koopman, C., & Classen, C. (1994). Acute stress disorder and dissociation. *Australian Journal of Clinical and Experimental Hypnosis*, 22(1), 11-23.
- Spiegel, D., & Schefflin, A. W. (1994). Dissociated or fabricated? Psychiatric aspects of repressed memory in criminal and civil cases. *International Journal of Clinical and Experimental Hypnosis*, 42(4), 411-432.
- Spielberger, C. D., & Sideman, S. J. (1994). State-Trait Anxiety Inventory and State-Trait Anger Expression Inventory. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcome assessment* (pp. 292-321). Hillsdale, New Jersey: Lawrence Erlbaum Associates, Inc.
- Steinberg, M. (1991). The spectrum of depersonalization: assessment and treatment. In Tasman A & Goldfinger SM (eds) *Review of Psychiatry (vol 10)*, 223-247.
- Steinglass, P., & Gerrity, E. (1990). Natural disaster and post-traumatic stress disorder: short-term versus long-term recovery in two disaster-affected communities. *Journal of Applied Social Psychology*, 20, 1746-1765.
- Stretch, R. H., Marlowe, D. H., Wright, K. M., Bliese, P. D., Knudson, K. H., & Hoover, C. H. (1996). Post-traumatic stress disorder symptoms among Gulf War veterans. *Military Medicine*, 161(7), 407-410.
- Sutherland, G., Newman, B., & Rachman, S. (1982). Experimental investigations of the relations between mood and intrusive unwanted cognitions. *British Journal of Medical Psychology*, 55(Pt 2), 127-138.
- Sutherland, S. M., & Davidson, J. R. (1994). Pharmacotherapy for post-traumatic stress disorder. *Psychiatric Clinics of North America*, 17(2), 409-423.
- Talbert, F. S., Braswell, L. C., Albrecht, J. W., Hyer, L. A., & Boudewyns, P. A. (1993).

- NEO-PI profiles in PTSD as a function of trauma level. *Journal of Clinical Psychology*, 49(5), 663-669.
- Thrasher, S. M., Dalgleish, T., & Yule, W. (1994). Information processing in post-traumatic stress disorder. *Behaviour Research and Therapy*, 32(2), 247-254.
- Tichenor, V., Marmar, C. R., Weiss, D. S., Metzler, T. J., & Ronfeldt, H. M. (1996). The relationship of peritraumatic dissociation and posttraumatic stress: findings in female Vietnam theater veterans. *Journal of Consulting and Clinical Psychology*, 64(5), 1054-1059.
- Tobin, D. L., Molteni, A. L., & Elin, M. R. (1995). Early trauma, dissociation, and late onset in the eating disorders. *International Journal of Eating Disorders*, 17(3), 305-308.
- Triffleman, E. G., Marmar, C. R., Delucchi, K. L., & Ronfeldt, H. (1995). Childhood trauma and posttraumatic stress disorder in substance abuse inpatients. *Journal of Nervous and Mental Disease*, 183, 172-176.
- Trimble, M. R. (1981). *Post-traumatic neurosis: from railway spine to the whiplash*. Chichester: Wiley.
- Trinder, H., & Salkovskis, P. M. (1994). Personally relevant intrusions outside the laboratory: long-Term suppression increases intrusion. *Behaviour Research and Therapy*, 32(8), 833-842.
- Valdiserri, S., & Kihlstrom, J. F. (1995). Abnormal eating and dissociative experiences: a further study of college women. *International Journal of Eating Disorders*, 18(2), 145-150.
- Valentiner, D. P., Foa, E., Riggs, D. S., & Gershuny, B. S. (1996). Coping strategies and posttraumatic stress disorder in female victims of sexual and nonsexual assault. *Journal of Abnormal Psychology*, 105(3), 455-458.
- 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(4), 505-525.
- van der Kolk, B. A., Pelcovitz, D., Roth, S., Mandel, F. S., McFarlane, A., & Herman, J. L. (1996). Dissociation, somatization, and affect dysregulation: the complexity of adaptation of trauma. *American Journal of Psychiatry*, 153(7 Suppl), 83-93.
- Vanderlinden, J., Spinhoven, P., Vandereycken, W., & van Dyck, R. (1995). Dissociative and hypnotic experiences in eating disorder patients: an exploratory study. *American Journal of Clinical Hypnosis*, 38(2), 97-108.
- Vollrath, M., & Angst, J. (1993). Coping and illness behavior among young adults with panic. *Journal of Nervous and Mental Disease*, 181(5), 303-308.
- Von Dras, D. D., Williams, R. B., Kaplan, B. H., & Siegler, I. C. (1996). Correlates of perceived social support and equality of interpersonal relationships at mid-life. *International Journal of Aging and Human Development*, 43(3), 199-217.
- Vrana, S., & Lauterbach, D. (1994). Prevalence of traumatic events and post-traumatic psychological symptoms in a nonclinical sample of college students. *Journal of Traumatic Stress*, 7(2), 289-302.
- Waller, N. G., Putnam, F. W., & Carlson, E. B. (1996). Types of dissociation and dissociative types: A taxometric analysis of dissociative experiences. *Psychological Methods*, 1(3), 300-321.
- Watson, J. B., & Rayner, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology*, 3, 1-14.
- Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality*,

62(4), 616-640.

- Weine, S. M., Becker, D. F., McGlashan, T. H., Laub, D., Lazrove, S., Vojvoda, D., & Hyman, L. (1995). Psychiatric consequences of "ethnic cleansing": clinical assessments and trauma testimonies of newly resettled Bosnian refugees. *American Journal of Psychiatry*, *152*(4), 536-542.
- Wells, A., & Davies, M. I. (1994). The Thought Control Questionnaire: a measure of individual differences in the control of unwanted thoughts. *Behaviour Research and Therapy*, *32*(8), 871-878.
- Wilner, N., & Horowitz, M. J. (1975). Intrusive and repetitive thought after a depressing film: a pilot study. *Psychological Reports*, *37*(1), 135-138.
- Wolfe, D. A., Sas, L., & Wekerle, C. (1994). Factors associated with the development of posttraumatic stress disorder among child victims of sexual abuse. *Child Abuse and Neglect*, *18*(1), 37-50.
- World Health Organization. (1948). *Manual of the international statistical classification of diseases, injuries, and causes of death (6th revision)*. Geneva: author.
- World Health Organization. (1992). *Manual of the international statistical classification of diseases, injuries, and causes of death (10th revision)*. Geneva: author.
- Yates, D. W. (1990). Scoring systems for trauma. *British Medical Journal*, *301*, 1090-1093.
- Yehuda, R., Elkin, A., Binder Brynes, K., Kahana, B., Southwick, S. M., Schmeidler, J., & Giller, E. L., Jr. (1996). Dissociation in aging Holocaust survivors. *American Journal of Psychiatry*, *153*(7), 935-940.
- Yitzhaki, T., Solomon, Z., & Kotler, M. (1991). The clinical picture of acute combat stress reaction among Israeli soldiers in the 1982 Lebanon War. *Military Medicine*, *156*(4), 193-197.
- Zak, I. (1982). Stability and change of personality traits: Possible effects of the Yom Kippur War on Israeli youth. *Series in Clinical and Community Psychology Stress and Anxiety*, *8*, 93-96.
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, *67*, 361-370.

Appendices

List of appendices:

Chapter 2

Appendix 1: 101 item pool

Appendix 2: personal details questionnaire

Appendix 3: Factor solution from first sample

Appendix 4: Trait Dissociation Questionnaire (TDQ)

Appendix 5: Factor solution from second sample

Appendix 6: Cross-validation analysis

Chapter 3

Appendix 7: Beck Depression Inventory (BDI)

Appendix 8: Spielberger State-Trait Anxiety Inventory (STAI)

Appendix 9: Video questionnaire

Appendix 10: Seven-day diary

Appendix 11: PTSD Symptom Scale (PSS)

Appendix 12: Follow-up questionnaire

Appendix 13: Second video questionnaire

Appendix 14: 6-month follow-up questionnaire

Appendix 37: Videotape commentary

Appendix 38: Information sheet

Chapter 4

Appendix 15: Information processing questionnaire

Appendix 16: Video questionnaire

Appendix 17: Seven-day diary

Appendix 18: Follow-up questionnaire

Appendix 19: Second video questionnaire

Chapter 6

Appendix 20: State Dissociation Questionnaire (SDQ)

Appendix 21: Rumination Questionnaire (SRQ)

Appendix 22: Hospital Anxiety and Depression Inventory (HADS)

Appendix 23: PSS scores for individual patients

Appendix 24: PTSD caseness for individual patients

Appendix 25: ASD caseness for individual patients

Chapter 7

Appendix 26: 0 week questionnaire

Appendix 27: 4 week questionnaire

Appendix 28: 24 week questionnaire

Appendix 29: Logistic regression using initial PSS items

Appendix 30: 4-week regression analysis using initial variables

Appendix 31: 24-week regression analysis using initial variables

Appendix 32: 24-week regression analysis using 4-week variables

Appendix 33: Logistic regression of 4-week PTSD caseness using initial variables

Appendix 34: Logistic regression of 24-week PTSD caseness using initial variables

Appendix 35: Logistic regression of 24-week PTSD caseness using 4-week variables

Appendix 36: ASD in individual patients

Appendix 1

Appendix 1: 101 item pool

1. Even if something really good happens, I cannot feel happy.
2. Everyday objects seem bigger or smaller than they really are.
3. I have conflicting desires.
4. I am able to ignore pain.
5. I am accused of lying when I do not think that I have lied.
6. I am afraid that I may be going mad.
7. I am approached by people that I do not know who call me by another name or insist that they have met me before.
8. I am not interested in things I used to enjoy doing.
9. Even if other people are nice to me I cannot feel close to them.
10. I am not sure whether things that I remember happening really did happen or whether I just dreamed them.
11. I am slow to respond.
12. I am told that sometimes I do not recognize friends or family members.
13. I can't understand why I get so cross and grouchy.
14. I can't get excited about anything.
15. I cannot get angry about the things that should annoy me.
16. I cannot remember whether I have just done something or have just thought about doing that thing (for example, not knowing whether I have just posted a letter or have just thought about posting it).
17. I do many things which I regret afterwards.
18. I do not have the usual sense of who I am.
19. I do not really care about anything.
20. I do things without thinking.
21. I don't know how to stop myself from doing something.
22. I experience myself as though I were a stranger.
23. I feel a sense of timelessness.
24. I feel as if I am looking at the world through a fog so that people and objects appear far away or unclear. **If you normally wear glasses or contact lenses restrict this to when you *are* actually wearing them.**
25. I feel as if other people live in a different world.
26. I feel as though I am standing next to myself or watching myself do something and I actually see myself as if I were looking at another person.
27. I feel compelled to think and act in a way that is out of character for me.
28. I feel confused and disoriented.
29. I feel dazed, as if I have been hit on the head.
30. I feel dead inside.
31. I feel distant and cut off from others around.
32. I feel distant from my own emotions.
33. I feel emotionally numb (eg. feel sad but can't cry, unable to have loving feelings).
34. I feel estranged or detached from other people.
35. I feel like I am a robot or machine.

36. I feel like I am living in a dream or a film.
37. I feel like I cannot grasp what is going on around me.
38. I feel like I don't belong
39. I feel out of touch with my body.
40. I feel out of touch with who I am.
41. I feel separated from my thoughts.
42. I feel that I am floating beside my body, and watching it from "outside".
43. I feel that I am in control of my actions.
44. I feel that I am more than one person.
45. I feel that my body does not seem to belong to me.
46. I feel that my mind is divided.
47. I feel that my perceptions of the world are distorted somehow.
48. I feel that my personality is split into distinct parts.
49. I feel that other people, objects, and the world around me are not real.
50. I feel that there are two of me.
51. I feel the need to leave one situation and go to another.
52. I feel unable to think straight.
53. I feel very different from the person I used to be.
54. I find it difficult to feel real emotions, such as pain, happiness, sadness or anger.
55. I find it difficult to respond to others in a sympathetic way.
56. I find myself doing things without knowing why.
57. I find myself dressed in clothes that I don't remember putting on.
58. I find myself in a place and have no idea how I got there.
59. I find new things among my belongings that I do not remember buying.
60. I find that I become so involved in a fantasy or daydream that it feels as though it were really happening to me.
61. I find that I have done something unexpected or uncharacteristic.
62. I find writings, drawings, or notes among my belongings that I must have done but cannot remember doing.
63. I forget what I look like.
64. I get torn between doing one thing and another.
65. I have difficulty concentrating.
66. I have difficulty understanding or taking in new information.
67. I have fits of laughing and crying that I cannot control.
68. I have no memory for some important events in my life (for example, a wedding or graduation).
69. I have problems remembering important details of stressful events.
70. I have the experience of being in a familiar place but finding it strange and unfamiliar.
71. I hear voices inside my head that tell me to do things or comment on things that I am doing.
72. I live in a world of my own where no one can reach me.
73. I look at my watch and am surprised at the time it shows.
74. I look in a mirror and do not recognize myself.

75. I remember a past event so vividly that I feel as if I were reliving that event.
76. I say things without meaning to.
77. I see myself differently than other people see me.
78. I sit staring into space, thinking of nothing, and am not aware of the passage of time.
79. I think that something upsetting has happened but I am not sure what it is.
80. I underestimate or overestimate the amount of time that has passed.
81. I want to do two conflicting things at once and find myself arguing with myself.
82. I wish I didn't watch my every move.
83. If something upsetting happens, I find it difficult to remember afterwards.
84. In certain situations I am able to do things with amazing spontaneity that would usually be difficult for me (for example, sports, work, social situations etc).
85. In one situation I may act so differently compared with another situation that I feel almost as if I were two different people.
86. In some situations my mind and my body are just not together.
87. My memory of upsetting events is patchy.
88. My mind goes blank.
89. My mind wants one thing but my body is determined to do another.
90. My moods can really change.
91. People tell me that I have done things for which I have no memory.
92. The world seems unreal or strange.
93. Things I see look different to me from how I know they really are.
94. Things seem to go by faster or slower than they really do.
95. What my body is doing has nothing to do with me.
96. When driving a car I suddenly realize that I don't remember what has happened during all or part of the trip.
97. When I am alone I talk out loud to myself.
98. When I am listening to someone talk I suddenly realize that I did not hear part or all of what was just said.
99. When I am watching television or a movie I become so absorbed in the story that I am unaware of other events happening around me.
100. When I get tired or upset it seems like an outside force comes in to control my actions.
101. When I look back at my past, it seems like it happened to a different person.

Appendix 2

We would like to ask you some questions about your present psychological state and past history: please answer these as openly and truthfully as possible, since they help us to identify those for whom it would be unwise to take part in this experiment, as well as to gain an idea of how you normally react to stressful situations. **PLEASE CIRCLE ONE RESPONSE FOR EACH QUESTION.**

1. Have you ever fainted at the sight of blood, an injection, or at an accident? Yes / No

2. If so, how often does this happen when you do see such things?
(Please mark one response) Rarely
Sometimes
Mostly
Always

3. Have you ever been involved in a serious accident yourself (eg a road traffic accident)? If so, please briefly describe it, including details of the event itself, any injuries, and, if applicable, how long you were in hospital for. Yes / No

4. Do you ever watch horror films or TV programmes involving emergencies, violence etc (eg crime reconstruction programmes, "Casualty" etc)? If so, please specify what type of programme and indicate how much you would see in one month (in hours) Yes / No

amount: _____

5. Have you ever worked in a medical setting (eg as a nurse or paramedic)? If yes, please specify what you did and for how long you did it. Yes / No

6. When you see something traumatic or upsetting (such as blood, accident, or violence), how upset would you generally become? Please check the appropriate box:

Not at all upset

A little upset

Moderately upset

Quite upset

Extremely upset

How old are you (in years):

Sex (please circle one response): **Male / Female**

Have you ever experienced a traumatic event? If so, please tick the appropriate box and give brief details as appropriate, eg. how old you were when it happened, how often it happened, and how serious or distressing it was on a scale from 1 to 5, where:

0=**not distressing or serious,**

1=**a little distressing/slightly serious,**

2=**moderately distressing/ serious,**

3=**quite distressing/serious,**

4=**very distressing/serious**

5=**extremely distressing/serious**

	Seriousness (0-5)	Number of times that it happened	Age when it happened
Road traffic accident			
Physical assault			
Sexual assault other than rape			
Rape			
Other crime (please specify)			
Childhood physical abuse			
Childhood sexual abuse			
Natural Disaster (please specify)			
Other (please specify)			

If you need to put down any further information, please use the space below:

Have you ever taken any of the following drugs (*mark the appropriate box for those you have taken*). Please indicate as well how much you took and how many times you have taken the drug, or how often if you use the drug regularly. (eg. “5 pints of beer (10 units), every night”):

	How much you took	How often (or total number of times taken)
Alcohol		
Marijuana / Cannabis		
Cocaine		
Heroin		
Amphetamines (Speed)		
PCP (Angel Dust, Tranq)		
Ecstasy (MDMA)		
LSD (Acid)		
Tranquilizers (eg. Valium)		
General anaesthetics (eg. nitrous oxide)		
<i>Other drugs which affected your mental state (eg. made you feel high, happy, calm, woozy etc.)</i> Please Specify which.		

Have you ever been treated for a psychiatric illness, or admitted to a psychiatric hospital (please mark one response)?

YES / NO

If so, what was the reason for treatment / admittance?

Appendix 3

Appendix 3: Factor solution from the first sample

Items from the original 101 item pool later selected for use in the 38-item scale

Loadings greater or equal to 0.3

Item	Loadings						
	factor1	factor2	factor3	factor4	factor5	factor6	factor7
1: Lability of mood and impulsivity							
17. I do many things which I regret afterwards	.69343						
90. My moods can really change	.66797	.32550					
21. I don't know how to stop myself from doing something	.65147						
13. I can't understand why I get so cross and grouchy	.60084						
76. I say things without meaning to	.52247						
3. I have conflicting desires	.51290						
56. I find myself doing things without knowing why	.50624				.35128		
2: Detachment from others and the world							
92. The world seems unreal or strange		.72153					
49. I feel that other people, objects, and the world around me are not real		.69339					
25. I feel as if other people live in a different world		.64459	.30991				
38. I feel like I don't belong	.39101	.61182					
31. I feel distant and cut off from others around	.37003	.60834					
72. I live in a world of my own where no one can reach me		.54466	.31668				
3: Sense of split self							
50. I feel that there are two of me			.79333				
48. I feel that my personality is split into distinct parts	.30600		.67752				
44. I feel that I am more than one person			.62601				
42. I feel that I am floating beside my body, and watching it from "outside"			.61110				
26. I feel as though I am standing next to myself or watching myself do something and I actually see myself as if I were looking at another person		.37681	.55981				
46. I feel that my mind is divided	.34811		.52254				
4: Emotional numbing							
54. I find it difficult to feel real emotions, such as pain, happiness, sadness, or anger				.77454			
33. I feel emotionally numb (eg. Feel sad but can't cry, unable to have loving feelings)				.73049			
32. I feel distant from my own emotions		.30172		.67875			
15. I cannot get angry about the things which should annoy me				.58384			
55. I find it difficult to respond to others in a sympathetic way				.50921			
4. I am able to ignore pain				.49208			
5: Confusion and altered time sense:							
80. I underestimate or overestimate the amount of time that has passed					.75861		
73. I look at my watch and am surprised at the time it shows					.73936		
94. Things seem to go by faster or slower than they really do					.70183		
52. I feel unable to think straight	.51302				.51059		
65. I have difficulty concentrating	.57804				.40666		
6: Amnesia for important life events:							
87. My memory of upsetting events is patchy					.85532		
69. I have problems remembering details of stressful events					.82071		
83. If something upsetting happens, I find it difficult to remember afterwards					.79660		
68. I have no memory for some important events in my life (for example, a wedding or graduation)				.37629		.36902	
7: Memory lapses:							
57. I find myself dressed in clothes that I don't remember putting on							.75834
58. I find myself in a place and have no idea how I got there							.68954
59. I find new things among my belongings that I do not remember buying							.62168
62. I find writings, drawings, or notes among my belongings that I must have done but cannot remember doing					.36311		.52225

Appendix 4

This questionnaire is concerned with how often people have certain experiences. Please read each question carefully, but do not spend too much time on each one. Please circle ONE response in answer to each question (For example, if you OFTEN find yourself doing things without knowing why, circle the '3' (often) on question 1). Remember, there are no right or wrong answers. We are interested in your personal experience.

	NEVER	RARELY	SOMETIMES	OFTEN	MOSTLY	ALWAYS
1. I find myself doing things without knowing why.	0	1	2	3	4	5
2. I cannot get angry about the things that should annoy me.	0	1	2	3	4	5
3. I do many things which I regret afterwards.	0	1	2	3	4	5
4. I feel that I am more than one person.	0	1	2	3	4	5
5. I feel as if other people live in a different world.	0	1	2	3	4	5
6. I feel that my mind is divided.	0	1	2	3	4	5
7. I can't understand why I get so cross and grouchy.	0	1	2	3	4	5
8. I feel distant from my own emotions.	0	1	2	3	4	5
9. I don't know how to stop myself from doing something.	0	1	2	3	4	5
10. I have problems remembering important details of stressful events.	0	1	2	3	4	5
11. I have conflicting desires.	0	1	2	3	4	5
12. I feel as though I am standing next to myself or watching myself do something and I actually see myself as if I were looking at another person.	0	1	2	3	4	5
13. I feel unable to think straight.	0	1	2	3	4	5
14. I feel emotionally numb (eg. feel sad but can't cry, unable to have loving feelings).	0	1	2	3	4	5
15. I feel that I am floating beside my body, and watching it from "outside".	0	1	2	3	4	5
16. I feel that my personality is split into distinct parts.	0	1	2	3	4	5
17. I find it difficult to feel real emotions, such as pain, happiness, sadness or anger.	0	1	2	3	4	5
18. I feel that other people, objects, and the world around me are not real.	0	1	2	3	4	5
19. I find it difficult to respond to others in a sympathetic way.	0	1	2	3	4	5
20. Things seem to go by faster or slower than they really do.	0	1	2	3	4	5

21. I find myself dressed in clothes that I don't remember putting on.	0	1	2	3	4	5
22. I find myself in a place and have no idea how I got there.	0	1	2	3	4	5
23. I find new things among my belongings that I do not remember buying.	0	1	2	3	4	5
24. My moods can really change.	0	1	2	3	4	5
25. I find writings, drawings, or notes among my belongings that I must have done but cannot remember doing.	0	1	2	3	4	5
26. I have no memory for some important events in my life (for example, a wedding or graduation).	0	1	2	3	4	5
27. I live in a world of my own where no one can reach me.	0	1	2	3	4	5
28. I look at my watch and am surprised at the time it shows.	0	1	2	3	4	5
29. My memory of upsetting events is patchy.	0	1	2	3	4	5
30. I say things without meaning to.	0	1	2	3	4	5
31. I underestimate or overestimate the amount of time that has passed.	0	1	2	3	4	5
32. If something upsetting happens, I find it difficult to remember afterwards.	0	1	2	3	4	5
33. I feel like I don't belong.	0	1	2	3	4	5
34. The world seems unreal or strange.	0	1	2	3	4	5
35. I am able to ignore pain.	0	1	2	3	4	5
36. I feel that there are two of me.	0	1	2	3	4	5
37. I feel distant and cut off from others around.	0	1	2	3	4	5
38. I have difficulty concentrating.	0	1	2	3	4	5

Appendix 5

Appendix 5: Factor solution from second sample

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
I live in a world of my own where no one can reach me	.72271						
I feel as if other people live in a different world	.71448						
I feel distant and cut off from others around	.71007	.31557					
I feel that there are two of me	.66632						.38713
The world seems unreal or strange	.66518						
I feel that my mind is divided	.66255						
I feel that my personality is split into distinct parts	.60803						.37177
I feel like I don't belong	.59281	.39899					
I feel that other people, objects, and the world around me are not real	.58154						
I feel that I am more than one person	.47143						.35702
I don't know how to stop myself from doing something		.67480					
I do many things which I regret afterwards		.66377					
I can't understand why I get so cross and grouchy		.61459					
I say things without meaning to		.51842			.45361		
I find myself doing things without knowing why		.51192				.35713	
I have difficulty concentrating	.31035	.51142					
I feel unable to think straight		.48762					
My moods can really change		.39725			.37733		
I have conflicting desires		.37623					
I find it difficult to feel real emotions, such as pain, happiness, sadness or anger			.81304				
I feel emotionally numb (e.g. feel sad but can't cry, unable to have loving feelings).			.77891				
I feel distant from my own emotions			.65477				
I cannot get angry about the things that should annoy me			.50112				
I am able to ignore pain		.37254	.41932				
I find it difficult to respond to others in a sympathetic way			.37563				
If something upsetting happens, I find it difficult to remember afterwards				.84465			
My memory of upsetting events is patchy				.82798			
I have problems remembering details of stressful events				.78590			
I have no memory for some important events in my life (for example, a wedding or graduation)				.41478		.39459	
I look at my watch and am surprised at the time it shows					.80799		
I underestimate or overestimate the amount of time that has passed					.73947		
Things seem to go by faster or slower than they really do					.67691		
I find myself dressed in clothes that I don't remember putting on					.74196		
I find new things among my belongings that I do not remember buying						.73127	
I find writings, drawings, or notes among my belongings that I must have done but cannot remember doing						.65829	
I find myself in a new place and have no idea how I got there					.30217	.56724	
I feel as though I am standing next to myself or watching myself do something and I actually see myself as if I were looking at another person						.30663	.73426
I feel that I am floating beside my body, and watching it from "outside"	.32670						.67581

Appendix 6

Appendix 6: Cross-validation analysis

The cross-validation coefficient, R_c , is defined as follows:

$$R_c = \frac{\sum xy}{\sqrt{(\sum x^2 \cdot \sum y^2)}}$$

where x is the loading of the item on its factor in the first sample, and y is the loading of the item upon that factor in the second sample.

Lability of mood and impulsivity

item	x	y	R_c :	
17	0.69343	0.66377		.9834
90	0.66797	0.39725		
21	0.65147	0.67480		
13	0.60084	0.61459		
3	0.5129	0.37623		
56	0.50624	0.51192		
76	0.52247	0.51842		

Sense of split self

item	x	y	R_c :	
50	0.79333	0.38713		.9164
48	0.67752	0.37177		
42	0.6111	0.67581		
44	0.62601	0.35702		
26	0.55981	0.73426		
46	0.52254	0.25296		

Detachment from others and the world

item	x	y	R_c :	
92	0.72153	0.66518		.9886
49	0.69339	0.58154		
25	0.64459	0.71448		
38	0.61182	0.59281		
31	0.60834	0.71007		
72	0.54466	0.72271		

Emotional numbing

item	x	y	R_c :	
54	0.77454	0.81304		.9933
33	0.73049	0.77891		
32	0.67875	0.65477		
15	0.58384	0.50112		
55	0.50921	0.37563		
4	0.49208	0.41932		

Confusion and altered time sense:

item	x	y	R_c :	
80	0.75861	0.73947		.9571
73	0.73936	0.80799		
94	0.70183	0.67691		
65	0.40666	0.21437		

52 0.51059 0.14805

Amnesia for important life events:

item	x	y	R_c :	
87	0.85532	0.82798		.9985
69	0.82071	0.78590		
83	0.7966	0.84465		
68	0.36902	0.41478		

Memory lapses:

item	x	y	R_c :	
57	0.75834	0.74196		.9878
58	0.68954	0.56724		
59	0.62168	0.73127		
62	0.52225	0.65829		

Appendix 7

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the past week, including today. Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

- | | |
|--|--|
| <p>1. 0 I do not feel sad.
1 I feel sad.
2 I am sad all the time and I can't snap out of it.
3 I am so sad or unhappy that I can't stand it.</p> | <p>12. 0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.</p> |
| <p>2. 0 I am not particularly discouraged about the future.
1 I feel discouraged about the future.
2 I feel I have nothing to look forward to.
3 I feel that the future is hopeless, and that things cannot improve.</p> | <p>13. 0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions at all anymore.</p> |
| <p>3. 0 I do not feel like a failure.
1 I feel I have failed more than the average person.
2 As I look back on my life, all I can see is a lot of failures.
3 I feel I am a complete failure as a person.</p> | <p>14. 0 I don't feel I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe that I look ugly</p> |
| <p>4. 0 I get as much satisfaction out of things as I used to.
1 I don't enjoy things the way I use to.
2 I don't get real satisfaction out of things anymore.
3 I am dissatisfied or bored with everything.</p> | <p>15. 0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.</p> |
| <p>5. 0 I don't feel particularly guilty.
1 I feel guilty a good part of the time.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.</p> | <p>16. 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1 - 2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.</p> |
| <p>6. 0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.</p> | <p>17. 0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.</p> |
| <p>7. 0 I don't feel disappointed in myself.
1 I am disappointed in myself.
2 I am disgusted with myself.
3 I hate myself.</p> | <p>18. 0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.</p> |
| <p>8. 0 I don't feel I am any worse than anyone else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.</p> | <p>19. 0 I haven't lost much weight, if any, lately.
1 I have lost more than 5 pounds.
2 I have lost more than 10 pounds.
3 I have lost more than 15 pounds.</p> |
| <p>9. 0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.</p> | <p style="text-align: right;">I am purposely trying to lose weight by eating less
<input type="checkbox"/> Yes <input type="checkbox"/> No</p> |
| <p>10. 0 I don't cry any more than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.</p> | <p>20. 0 I am no more worried about my health than usual.
1 I am worried about physical problems such as aches
2 I am very worried about physical problems and it's hard to think about much else.
3 I am so worried about my physical problems that I cannot think about anything else.</p> |
| <p>11. 0 I am no more irritated now than I ever am
1 I get annoyed or irritated more easily than I used to.
2 I feel irritated all the time now.
3 I don't get irritated at all by the things that used irritate me.</p> | <p>21. 0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.</p> |

Appendix 8

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
1. I feel pleasant	1	2	3	4
2. I feel nervous and restless	1	2	3	4
3. I feel satisfied with myself	1	2	3	4
4. I wish I could be as happy as others seem to be	1	2	3	4
5. I feel like a failure	1	2	3	4
6. I feel rested	1	2	3	4
7. I am "calm, cool, and collected"	1	2	3	4
8. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
9. I worry too much over something that doesn't really matter	1	2	3	4
10. I am happy	1	2	3	4
11. I have disturbing thoughts	1	2	3	4
12. I lack self-confidence	1	2	3	4
13. I feel secure	1	2	3	4
14. I make decisions easily	1	2	3	4
15. I feel inadequate	1	2	3	4
16. I am content	1	2	3	4
17. Some unimportant thought runs through my mind and bothers me	1	2	3	4
18. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
19. I am a steady person	1	2	3	4
20. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Appendix 9

Video Questionnaire

READ OUT QUESTIONS TO SUBJECT AFTER EACH SCENE AND NOTE RESPONSES.

1. Did you look away, shut your eyes, or cover your face during the scene (ie did you miss any of the video)?
2. If so, please estimate how much of the scene, as a percentage, you did not see.

Scene	1	2	3	4	5	6
%						

3. On a scale from 0 (not at all distressed) to 100 (extremely distressed), how distressing did you find the scene?

Scene	1	2	3	4	5	6
rating						

Then at the end ask:

Which scene did you find the most distressing, and why?

PLEASE ANSWER THE FOLLOWING QUESTIONS CAREFULLY:

1. When you were watching the video, and you saw distressing scenes or images, which of the following did you experience and to what degree? (Please indicate opposite, where 0=never and 100=completely):

- I put them out of my mind
- I thought of something else
- I concentrated on the scene
- I felt that they were not real
- I numbed my emotions
- I visualised something else
- I empathized with the people I saw
- I relaxed after each scene
- After each scene, I found myself still thinking about it
- I let my emotions come and go
- I felt unreal
- I felt distant from my emotions
- I felt unable to think straight
- I felt as if I was somehow remote from my body
- I felt that time was passing faster or slower than it really did

2. How well could you follow the instructions given to you before watching the video?

- Not at all
- A Little
- A Fair amount
- Quite Well
- Extremely Well

Appendix 10

Appendix 11

Part 1

Below is a list of problems that people sometimes have after experiencing a traumatic event. Read each one carefully and choose the answer (1-4) that best describes how often the problem has bothered you IN THE PAST MONTH. Rate each problem with respect to the accident you experienced.

- ① Not at all or only one time
 - ② Once a week or less / once in a while
 - ③ 2 to 4 times a week / half the time
 - ④ 5 or more times a week / almost always
-
1. ① ② ③ ④ Having upsetting thoughts or images about the accident that came into your head when you didn't want them to
 2. ① ② ③ ④ Having bad dreams or nightmares about the event
 3. ① ② ③ ④ Reliving the accident, acting or feeling as if it was happening again
 4. ① ② ③ ④ Feeling emotionally upset when you were reminded of the event (for example, feeling scared, angry, sad, guilty, etc.)
 5. ① ② ③ ④ Experiencing physical reactions when you were reminded of the event (for example, breaking out in a sweat, heart beating fast)
 6. ① ② ③ ④ Trying not to think about, talk about, or have feelings about the event
 7. ① ② ③ ④ Trying to avoid activities, people, or places that remind you of the event
 8. ① ② ③ ④ Not being able to remember an important part of the event
 9. ① ② ③ ④ Having much less interest or participating much less often in important activities
 10. ① ② ③ ④ Feeling distant or cut off from people around you
 11. ① ② ③ ④ Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings)
 12. ① ② ③ ④ Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)
 13. ① ② ③ ④ Having trouble falling or staying asleep
 14. ① ② ③ ④ Feeling irritable or having fits of anger
 15. ① ② ③ ④ Having trouble concentrating (for example, drifting in and out of conversations, losing track of a story on television, forgetting what you read)
 16. ① ② ③ ④ Being overly alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.)
 17. ① ② ③ ④ Being jumpy or easily startled (for example, when someone walks up behind you)

Part 2

18. How long have you experienced the problems that you reported in Part 1? (mark ONE)
- ① Less than 1 month
 - ② 1 to 3 months
 - ③ More than 3 months
19. How long after the event did these problems begin? (mark ONE)
- ① Less than 6 months
 - ② 6 or more months

Indicate below if the problems you rated in Part 1 have interfered with any of the following areas of your life DURING THE PAST MONTH. Mark for Yes or for No.

20. Work
21. Household chores and duties
22. Relationships with friends
23. Fun and leisure activities
24. Schoolwork
25. Relationships with your family
26. Sex life
27. General satisfaction with life
28. Overall level of functioning in all areas of your life

Part 3

For the following questions, mark for Yes or for No.

During the event:

29. Were you physically injured?
30. Was someone else physically injured?
31. Did you think that your life was in danger?
32. Did you think that someone else's life was in danger?
33. Did you feel helpless?
34. Did you feel terrified?

Appendix 12

Follow-up questionnaire

1. On a scale of 0 (no distress) to 100 (intense distress), how would you rate how distressing you found the video when you first watched it ? Please indicate opposite.

4. When scenes or images of the video came to mind over the last seven days, which (if any) of the following did you experience? (Please indicate opposite to indicate how much, from 0=not at all, to 100=very much):

I put them out of my mind

I thought of something else

I concentrated on the scene

I felt that they were not real

I numbed my emotions

I visualised something else

I empathized with the people I saw

I relaxed after each scene

After each scene, I found myself still thinking about it

I let my emotions come and go

I felt unreal

I felt distant from my emotions

I felt unable to think straight

I felt as if I was somehow remote from my body

I felt that time was passing faster or slower than it

really did

Appendix 13

Video Questionnaire

To be read to subjects after each scene:

On a scale from 0 (No distress) to 100 (intense distress), how distressing did you find watching this scene of the video this second time?

Scene	1	2	3	4	5	6
rating						

Then ask at the end:

1. On a scale from 0 (much less distressing) through 50 (equally distressing) to 100 (much more distressing), how distressing did you find this second viewing compared to the first viewing?

.....

Appendix 14

We would like to find out whether any memories connected with the video have come to mind at all since you last saw it. Please think back over this time period, and then look at the table below. Tick one box in each of the three columns, to indicate how often you thought of the video

- a) in the first month after you watched it for the second time; and
- b) in the last month.

Do not worry if you cannot remember exactly - just tick the box that best applies, as far as you can remember.

	In the First Month	In the Last Month
None		
One or two in the month		
More than two in a month, but less than one a week		
At least one a week		
One a day or more		

Can you briefly describe a typical memory? Tick as many as apply

- Thought
- Image
- Gut Feeling
- Sound
- Other (please specify)

Did you find memories of the video distressing or upsetting? How distressing would you rate them on a scale from 0 (not at all) to 100 (extremely distressing)?

0	10	20	30	40	50	60	70	80	90	100
									Extremely	
Not at all									Distressing	
Distressing										

Please Turn Over

Appendix 15

We are interested in what went through your mind whilst watching the videotape. Please rate how much each of the following statements applied to you.

	Not at all	Somewhat	Moderately	Very much
I empathized with the people	1	2	3	4
I focused on my impressions and my reactions to them	1	2	3	4
I couldn't really take it all in	1	2	3	4
I focused on the story	1	2	3	4
I numbed my emotions	1	2	3	4
I did not fully understand what was going on	1	2	3	4
I tried to figure out what would happen next	1	2	3	4
I tried to put the pictures out of my mind	1	2	3	4
In my mind I created a "commentary" on what was happening	1	2	3	4
I pretended it was not real	1	2	3	4
It was just like a stream of different impressions following each other	1	2	3	4
I could describe what happened in the video without muddling things up	1	2	3	4
I could not think clearly	1	2	3	4
I tried to figure out what kind of people they were	1	2	3	4
I was overwhelmed by the images and sounds and couldn't put everything together	1	2	3	4
I thought of something else	1	2	3	4
I had a clear impression of how one event followed from another	1	2	3	4
I was confused and could not fully make sense of what was happening	1	2	3	4
I tried to figure out what was happening	1	2	3	4
My mind was fully occupied with different impressions and sensations	1	2	3	4

Appendix 16

Video Questionnaire

READ OUT QUESTIONS TO SUBJECT AFTER EACH SCENE AND NOTE RESPONSES.

- Did you look away, shut your eyes, or cover your face during the scene (ie did you miss any of the video)? If so, please estimate how much of the scene, as a percentage, you did not see.

Scene	1	2	3	4	5	6
%						

0
100

not at all unpleasant
very unpleasant

0
100

very relaxed
very activated

Could you rate that scene on a scale from 0 (not at all unpleasant) to 100 (very unpleasant)?

Scene	1	2	3	4	5	6
rating						

Could you rate that scene on a scale from 0 (very relaxed) to 100 (very activated)?

Scene	1	2	3	4	5	6
rating						

PLEASE ANSWER THE FOLLOWING QUESTIONS CAREFULLY:

1. When you were watching the video, and you saw distressing scenes or images, which of the following did you experience and to what degree? (Please indicate opposite, where 0=never and 100=completely):

- I put them out of my mind
- I thought of something else
- I concentrated on the scene
- I felt that they were not real
- I numbed my emotions
- I visualised something else
- I empathized with the people I saw
- I relaxed after each scene
- After each scene, I found myself still thinking about it
- I let my emotions come and go
- I felt unreal
- I felt distant from my emotions
- I felt unable to think straight
- I felt as if I was somehow remote from my body
- I felt that time was passing faster or slower than it really did

2. How well could you follow the instructions given to you before watching the video?

- Not at all
- A Little
- A Fair amount
- Quite Well
- Extremely Well

Appendix 17

Appendix 18

Follow-up questionnaire

1. On a scale of 0 (not at all unpleasant) to 100 (very unpleasant), how would you rate how you found the video when you first watched it ? Please indicate opposite.

4. When scenes or images of the video came to mind over the last seven days, which (if any) of the following did you experience? (Please indicate opposite to indicate how much, from 0=not at all, to 100=very much):
 - I put them out of my mind
 - I thought of something else
 - I concentrated on the scene
 - I felt that they were not real
 - I numbed my emotions
 - I visualised something else
 - I empathized with the people I saw
 - I relaxed after each scene
 - After each scene, I found myself still thinking about it
 - I let my emotions come and go
 - I felt unreal
 - I felt distant from my emotions
 - I felt unable to think straight
 - I felt as if I was somehow remote from my body
 - I felt that time was passing faster or slower than it really did

Appendix 19

Video Questionnaire

0 100

not at all pleasant very pleasant

0 100

very relaxed very activated

Could you rate that scene on a scale from 0 (not at all unpleasant) to 100 (very pleasant)?

Scene	1	2	3	4	5	6	7	8	9	10
rating										

Could you rate that scene on a scale from 0 (very relaxed) to 100 (very activated)?

Scene	1	2	3	4	5	6	7	8	9	10
rating										

Then ask at the end:

On a scale from -100 (much more unpleasant) through 0 (about the same) to 100 (much more pleasant), how did you find this second viewing compared to the first viewing?

.....

Appendix 20

A Lot A Little Not at All

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you feel confused or dazed, or unable to take things in properly? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Does the world around you seem strange or unreal? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Does your body feel as if it is not really yours? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you feel as if you are separate from your own body, and watching it from the outside? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you feel as if time is going faster or slower than you know it really is? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you feel as if you are living in a dream or a film, rather than in real life? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do things around you sometimes seem too big or too small, or distorted in shape? |

Appendix 21

A lot

A little **Not at all**

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you go over what happened to you again and again? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you spend time thinking about what happened, without really solving or deciding anything? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you criticize or lecture yourself about what happened? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you wish that you could change what happened, or how you feel? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you wish that the situation would go away or somehow be over with? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Do you think about how things could have been different if you had acted differently? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Is your memory of your accident patchy, confused, or incomplete? |

Appendix 22

Please indicate how you have been feeling in the last week, for whatever reason, by ticking a box for each statement. Even if you feel the accident has nothing to do with your present feelings, please complete this page. Please tick only one box for each statement.

I feel tense or 'wound up'

- Most of the time
- A lot of the time
- Time to time, occasionally
- Not at all

I feel as if I am slowed down

- Nearly all the time
- Very often
- Sometimes
- Not at all

I still enjoy the things I used to enjoy

- Definitely as much
- Not quite as much
- Only a little
- Hardly at all

I get a sort of frightened feeling like 'butterflies' in the stomach

- Not at all
- Occasionally
- Quite often
- Very often

I get sort of frightened as if something awful is about to happen

- Very definitely and quite badly
- Yes, but not too badly
- A little, but it doesn't worry me
- Not at all

I have lost interest in my appearance

- Definitely
- I don't take so much care as I should
- I may not take quite as much care
- I take just as much care as ever

I can laugh and see the funny side of things

- As much as I always could
- Not quite so much now
- Definitely not so much now
- Not at all

I feel restless as if I have to be on the move

- Very much indeed
- Quite a lot
- Not very much
- Not at all

Worrying thoughts go through my mind

- A great deal of the time
- A lot of the time
- From time to time but not too often
- Only occasionally

I look forward with enjoyment to things

- As much as I ever did
- Rather less than I used to
- Definitely less than I used to
- Hardly at all

I feel cheerful

- Not at all
- Not often
- Sometimes
- Most of the time

I get sudden feelings of panic

- Very often indeed
- Quite often
- Not very often
- Not at all

I can sit at ease and feel relaxed

- Definitely
- Usually
- Not often
- Not at all

I can enjoy a good book or radio or TV programme

- Often
- Sometimes
- Not very often
- Very seldom

Appendix 23

Appendix 23: PSS scores of individual patients

PATIENT SYMPTO00 SYMPTO01 SYMPTO02 SYMPTO04 SYMPTO12 SYMPTO24

1	4	.	.	3	2	1
2	11	.	.	20	23	23
3	13	.	.	.	.	.
4	13	.	.	22	1	3
5	3	1	1	.	.	2
6	21	24	27	21	29	29
7	8	38	39	.	.	42
8	6	27	23	19	11	6
9	4	3	3	.	.	4
10	11	11	8	31	29	10
11	8	.	.	.	.	.
12	3	3	2	.	0	0
13	0	.	5	2	0	2
14	2	9	9	13	7	5
15	18	.	.	.	.	37
16	0	0	0	.	.	2
17	8	15	11	12	12	6
18	1	0	0	0	0	3
19	8	16	14	7	11	14
20	4	4	1	0	0	0
21	0	.	.	.	22	3
22	4	5	1	0	0	1
23	5	.	.	1	.	.
24	4	10	9	8	4	6
25	13	19	19	.	.	.
26	1	.	.	.	.	.
27	1	.	.	.	.	.
28	6	4	1	.	.	.
29	26	20	11	11	21	.

Appendix 24

Appendix 24: PTSD caseness for individual patients

Caseness at each time period is indicated by a 1, and failure to meet diagnostic criteria by a 0.

PATIENT	week00	week01	week02	week04	week12	week24
1	0	.	.	0	0	0
2	0	.	.	1	1	0
3	0	.	.	.	.	.
4	0	.	.	1	0	0
5	0	0	0	.	.	0
6	1	.	.	1	1	1
7	0	1	1	.	.	1
8	0	1	1	1	1	0
9	0	0	0	.	.	0
10	0	0	0	1	1	0
11	0	.	.	.	.	.
12	0	0	0	.	0	0
13	0	.	0	0	0	0
14	0	0	0	0	0	0
15	1	.	.	.	.	1
16	0	0	0	.	.	0
17	0	1	1	1	1	0
18	0	0	0	0	0	0
19	0	0	1	0	1	1
20	0	0	0	0	0	0
21	0	.	.	.	1	0
22	0	0	0	0	0	0
23	0	.	.	0	.	.
24	0	0	0	0	0	0
25	0	0	0	.	.	.
26	0	.	.	.	.	.
27	0	.	.	.	.	.
28	0	0	0	.	.	.
29	1	.	0	0	1	.

Appendix 25

Appendix 25: ASD caseness for individual patients

Caseness at each time period is indicated by a 1, and failure to meet diagnostic criteria by a 0.

PATIENT	week0	week1	week2	week4	whole period
1	0	.	.	0	0
2	0	.	.	1	1
3	.	.	.	.	.
4	0	.	.	0	0
5	0	0	0	.	0
6	1	.	.	0	1
7	0	1	1	.	1
8	0	1	1	0	1
9	0	0	0	.	0
10	1	1	0	.	1
11	0	.	.	.	0
12	0	0	0	.	0
13	0	.	0	0	0
14	0	0	0	0	0
15	1	.	.	.	1
16	0	0	0	.	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	1	0	0	1
20	0	0	0	0	0
21	0	.	.	.	0
22	0	0	0	0	0
23	0	.	.	0	0
24	0	0	0	0	0
25	0	0	0	.	0
26	0	.	.	.	0
27	0	.	.	.	0
28	0	0	0	.	0
29	0	0	0	0	0

Appendix 26

Name:

Address:

Telephone Number:

Today's Date:

No.:

.....

For the following questions, mark the answer (1-4) that best describes what happened to you during the accident.

① Not at all ② A little / not very much ③ Quite a bit ④ A lot / very much

1. ① ② ③ ④ Were you physically injured?
2. ① ② ③ ④ Was someone else physically injured?
3. ① ② ③ ④ Are your memories of the accident in any way unclear or jumbled?

During the Accident itself,

4. ① ② ③ ④ Did you think that your life was in danger?
5. ① ② ③ ④ Did you think that someone else's life was in danger?
6. ① ② ③ ④ Did you feel helpless?
7. ① ② ③ ④ Did you feel terrified?
8. ① ② ③ ④ Did you run through the the options you had in your mind?
9. ① ② ③ ④ Did you try to work out what to do to avoid getting hurt?
10. ① ② ③ ④ Did you realise that you were in a dangerous situation?
11. ① ② ③ ④ Did you not fully understand what was going on?
12. ① ② ③ ④ Was your mind fully occupied with what you saw, heard, felt and smelled?
13. ① ② ③ ④ Were you overwhelmed by different sensations and impressions?

During the accident itself,

A Lot **A Little** **Not at All**

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Did you feel confused or dazed, or unable to take things in properly? |
| <input type="checkbox"/> | <input type="checkbox"/> | Did the world around you seem strange or unreal? |
| <input type="checkbox"/> | <input type="checkbox"/> | Did your body feel as if it was not really yours? |
| <input type="checkbox"/> | <input type="checkbox"/> | Did you feel as if you were separate from your own body, and watching it from the outside? |
| <input type="checkbox"/> | <input type="checkbox"/> | Did you feel as if time was going faster or slower than you know it really was? |
| <input type="checkbox"/> | <input type="checkbox"/> | Did you feel as if you were living in a dream or a film, rather than in real life? |
| <input type="checkbox"/> | <input type="checkbox"/> | Did things around you seem too big or too small, or distorted in shape? |

Now, at this moment,

A lot **A little** **Not at all**

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | When you remember something about the accident, do you consciously force yourself to think about it, rather than trying to ignore or forget about it? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you go over what happened to you again and again? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you dwell on what happened, without really solving or deciding anything? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you criticize or lecture yourself about what happened? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you imagine what it would be like if you could change what happened? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you wish that the situation would go away or somehow be over with? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you think about how things could have been different if you had acted differently? |

Below is a list of problems that people sometimes have after experiencing a road traffic accident. Read each one carefully and mark the answer (1-4) that best describes how often the problem has bothered you since the accident. Rate each problem with respect to the accident you experienced.

- | | | | | | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|---|
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not at all or only one time |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Once in a while |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | About half the time |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Almost all the time |
| 14. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Having upsetting thoughts or images about the accident that came into your head when you didn't want them to |
| 15. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Reliving the accident, acting or feeling as if it was happening again |
| 16. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Feeling emotionally upset when you were reminded of the accident (for example, feeling scared, angry, sad, guilty, etc.) |
| 17. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Experiencing physical reactions when you were reminded of the accident (for example, breaking out in a sweat, heart beating fast) |
| 18. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Trying not to think about, talk about, or have feelings about the accident |
| 19. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not being able to remember an important part of the accident |
| 20. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Feeling distant or cut off from people around you |
| 21. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings) |
| 22. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life) |
| 23. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Feeling irritable or having fits of anger |
| 24. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Having trouble concentrating |
| 25. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Being overly alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.) |
| 26. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Being jumpy or easily startled (for example, when someone walks up behind you) |

*These questions are concerned with how often people have certain experiences **generally** - i.e. not specifically in connection with an accident. Please read each question carefully, but do not spend too much time on each one. Please circle ONE response in answer to each question. (For example, if you **OFTEN** feel distant and cut off from others, circle the '3' (often) on question 1). Remember, there are no right or wrong answers. We are interested in your personal experience.*

NEVER RARELY SOMETIMES OFTEN MOSTLY ALWAYS

- | | | | | | | |
|--|---|---|---|---|---|---|
| 1. I feel distant and cut off from others around. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. I feel that my personality is split into distinct parts. | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. I underestimate or overestimate the amount of time that has passed. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. I find new things among my belongings that I do not remember buying. | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. I feel like I don't belong. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. I feel emotionally numb (e.g. feel sad but cannot cry, unable to have loving feelings). | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. I do many things which I regret afterwards. | 0 | 1 | 2 | 3 | 4 | 5 |
| 8. I don't know how to stop myself from doing things. | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. I have problems remembering important details of stressful events. | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. I find it difficult to feel real emotions, such as pain, happiness, sadness or anger. | 0 | 1 | 2 | 3 | 4 | 5 |

Thank you very much for answering these questions. Please look back over your answers to check you have not missed any out.

Appendix 27

Today's Date:

No.:

Over the past week,

A Lot A Little Not at All

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you felt confused or dazed, or unable to take things in properly? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Has the world around you seemed strange or unreal? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Has your body felt as if it was not really yours? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you felt as if you were separate from your own body, and watching it from the outside? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you felt as if time was going faster or slower than you know it really was? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you felt as if you were living in a dream or a film, rather than in real life? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Did things around you seem too big or too small, or distorted in shape? |

A lot A little Not at all

- | | | | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | When you remember something about the accident, have you consciously forced yourself to think about it, rather than trying to ignore or forget about it? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you gone over what happened to you again and again? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you dwelled on what happened, without really solving or deciding anything? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you criticized or lectured yourself about what happened? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you imagined what it would be like if you could change what happened? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you wished that the situation would go away or somehow be over with? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you thought about how things could have been different if you had acted differently? |

Below is a list of problems that people sometimes have after experiencing a road traffic accident. Read each one carefully and mark the answer (1-4) that best describes how often the problem has bothered you during the past month. Rate each problem with respect to the accident you experienced.

- ① Not at all / Only one time
 - ② A little / Once in a while
 - ③ Quite a bit / About half the time
 - ④ Very much / Almost all the time
1. ① ② ③ ④ Are your memories of the accident in any way unclear or jumbled?
 2. ① ② ③ ④ Have you had upsetting thoughts or images about the accident that came into your head when you didn't want them to?
 3. ① ② ③ ④ Have you had any bad dreams or nightmares about the accident?
 4. ① ② ③ ④ Have you been reliving the accident, acting or feeling as if it was happening again?
 5. ① ② ③ ④ Have you felt emotionally upset when you were reminded of the accident (for example, feeling scared, angry, sad, guilty, etc.)?
 6. ① ② ③ ④ Have you experienced physical reactions when you were reminded of the accident (for example, breaking out in a sweat, heart beating fast)?
 7. ① ② ③ ④ Have you been trying not to think about, talk about, or have feelings about the accident?
 8. ① ② ③ ④ Have you been trying to avoid activities, people, or places that remind you of the accident?
 9. ① ② ③ ④ Have you been unable to remember an important part of the accident?
 10. ① ② ③ ④ Have you had much less interest or participated much less often in important activities?
 11. ① ② ③ ④ Have you felt distant or cut off from people around you?
 12. ① ② ③ ④ Have you felt emotionally numb (for example, being unable to cry or unable to have loving feelings)?
 13. ① ② ③ ④ Have you felt as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)?
 14. ① ② ③ ④ Have you had trouble falling or staying asleep?

15. ① ② ③ ④ Have you felt irritable or had fits of anger?

16. ① ② ③ ④ Have you had trouble concentrating?

17. ① ② ③ ④ Have you been overly alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.)?

18. ① ② ③ ④ Have you been jumpy or easily startled (for example, when someone walks up behind you)

Indicate below if the problems you just rated have interfered with any of the following areas of your life DURING THE PAST MONTH.

Mark (Y) for Yes or (N) for No.

19. (Y) (N) Work

20. (Y) (N) Household chores and duties

21. (Y) (N) Relationships with friends

22. (Y) (N) Fun and leisure activities

23. (Y) (N) Schoolwork

24. (Y) (N) Relationships with your family

25. (Y) (N) Sex life

26. (Y) (N) General satisfaction with life

27. (Y) (N) Overall level of functioning in all areas of your life

Thank you very much for filling this questionnaire in. Please could you look over your responses to check that you have not missed anything out.

Appendix 28

Today's Date:

No.:

Over the past week,

A Lot A Little Not at All

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you felt confused or dazed, or unable to take things in properly? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Has the world around you seemed strange or unreal? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Has your body felt as if it was not really yours? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you felt as if you were separate from your own body, and watching it from the outside? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you felt as if time was going faster or slower than you know it really was? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you felt as if you were living in a dream or a film, rather than in real life? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Did things around you seem too big or too small, or distorted in shape? |

A lot A little Not at all

- | | | | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | When you remember something about the accident, have you consciously forced yourself to think about it, rather than trying to ignore or forget about it? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you gone over what happened to you again and again? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you dwelled on what happened, without really solving or deciding anything? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you criticized or lectured yourself about what happened? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you imagined what it would be like if you could change what happened? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you wished that the situation would go away or somehow be over with? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you thought about how things could have been different if you had acted differently? |

Below is a list of problems that people sometimes have after experiencing a road traffic accident. Read each one carefully and mark the answer (1-4) that best describes how often the problem has bothered you during the past month. Rate each problem with respect to the accident you experienced.

1. 1 Not at all / Only one time
2. 2 A little / Once in a while
3. 3 Quite a bit / About half the time
4. 4 Very much / Almost all the time
1. 1 2 3 4 Are your memories of the accident in any way unclear or jumbled?
2. 1 2 3 4 Have you had upsetting thoughts or images about the accident that came into your head when you didn't want them to?
3. 1 2 3 4 Have you had any bad dreams or nightmares about the accident?
4. 1 2 3 4 Have you been reliving the accident, acting or feeling as if it was happening again?
5. 1 2 3 4 Have you felt emotionally upset when you were reminded of the accident (for example, feeling scared, angry, sad, guilty, etc.)?
6. 1 2 3 4 Have you experienced physical reactions when you were reminded of the accident (for example, breaking out in a sweat, heart beating fast)?
7. 1 2 3 4 Have you been trying not to think about, talk about, or have feelings about the accident?
8. 1 2 3 4 Have you been trying to avoid activities, people, or places that remind you of the accident?
9. 1 2 3 4 Have you been unable to remember an important part of the accident?
10. 1 2 3 4 Have you had much less interest or participated much less often in important activities?
11. 1 2 3 4 Have you felt distant or cut off from people around you?
12. 1 2 3 4 Have you felt emotionally numb (for example, being unable to cry or unable to have loving feelings)?
13. 1 2 3 4 Have you felt as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)?
14. 1 2 3 4 Have you had trouble falling or staying asleep?

15. 1 2 3 4 Have you felt irritable or had fits of anger?
16. 1 2 3 4 Have you had trouble concentrating?
17. 1 2 3 4 Have you been overly alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.)?
18. 1 2 3 4 Have you been jumpy or easily startled (for example, when someone walks up behind you)?

Indicate below if the problems you just rated have interfered with any of the following areas of your life DURING THE PAST MONTH.

Mark Y for Yes or N for No.

19. Y N Work
20. Y N Household chores and duties
21. Y N Relationships with friends
22. Y N Fun and leisure activities
23. Y N Schoolwork
24. Y N Relationships with your family
25. Y N Sex life
26. Y N General satisfaction with life
27. Y N Overall level of functioning in all areas of your life

Please Turn Over

*These questions are concerned with how often people have certain experiences **generally** - i.e. not specifically in connection with an accident. Please read each question carefully, but do not spend too much time on each one. Please circle ONE response in answer to each question (For example, if you **OFTEN** feel distant and cut off from others, circle the '3' (often) on question 1). Remember, there are no right or wrong answers. We are interested in your personal experience.*

NEVER RARELY SOMETIMES OFTEN MOSTLY ALWAYS

- | | | | | | | |
|--|---|---|---|---|---|---|
| 1. I feel distant and cut off from others around. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. I feel that my personality is split into distinct parts. | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. I underestimate or overestimate the amount of time that has passed. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. I find new things among my belongings that I do not remember buying. | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. I feel like I don't belong. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. I feel emotionally numb (e.g. feel sad but cannot cry, unable to have loving feelings). | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. I do many things which I regret afterwards. | 0 | 1 | 2 | 3 | 4 | 5 |
| 8. I don't know how to stop myself from doing things. | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. I have problems remembering important details of stressful events. | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. I find it difficult to feel real emotions, such as pain, happiness, sadness or anger. | 0 | 1 | 2 | 3 | 4 | 5 |

Thank you very much for filling this questionnaire in. Please could you look over your responses to check that you have not missed anything out.

Appendix 29

Appendix 29: Logistic regression using initial PSS items

Total number of cases: 177 (Unweighted)
 Number of selected cases: 177
 Number of unselected cases: 0

Number of selected cases: 177
 Number rejected because of missing data: 41
 Number of cases included in the analysis: 136

Dependent Variable Encoding:

Original Value	Internal Value
0	0
1	1

Dependent Variable.. PTSD24

Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 148.40172

* Constant is included in the model.

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	104	0	100.00%
	1	32	0	.00%
		Overall		76.47%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
Constant	-1.1787	.2022	33.9951	1	.0000		

Beginning Block Number 1. Method: Backward Stepwise (COND)

Variable(s) Entered on Step Number

1.. LPSS14
 LPSS15
 LPSS16
 LPSS17
 LPSS18
 LPSS19
 LPSS20
 LPSS21
 LPSS22
 LPSS23
 LPSS24
 LPSS25
 LPSS26

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 138.766
 Goodness of Fit 138.852

	Chi-Square	df	Significance
Model Chi-Square	9.636	13	.7234
Improvement	9.636	13	.7234

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	28	4	12.50%
Overall				78.68%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS14	.4844	2.5965	.0348	1	.8520	.0000	1.6232
LPSS15	-1.4222	2.1971	.4190	1	.5174	.0000	.2412
LPSS16	.2761	2.0803	.0176	1	.8944	.0000	1.3180
LPSS17	-3.1240	2.4242	1.6606	1	.1975	.0000	.0440
LPSS18	3.1297	2.0595	2.3094	1	.1286	.0457	22.8673
LPSS19	-1.1331	1.6513	.4708	1	.4926	.0000	.3220
LPSS20	-1.7643	2.6283	.4506	1	.5021	.0000	.1713
LPSS21	.2756	2.4477	.0127	1	.9103	.0000	1.3173
LPSS22	2.8394	2.6414	1.1555	1	.2824	.0000	17.1047
LPSS23	-1.8404	2.3441	.6164	1	.4324	.0000	.1588
LPSS24	4.0023	2.3118	2.9972	1	.0834	.0820	54.7248
LPSS25	-1.1145	2.3485	.2252	1	.6351	.0000	.3281
LPSS26	1.6832	2.5023	.4525	1	.5012	.0000	5.3827
Constant	-2.2872	1.1631	3.8671	1	.0492		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS14	-69.400	.035	1	.8521
LPSS15	-69.593	.421	1	.5163
LPSS16	-69.392	.018	1	.8943
LPSS17	-70.263	1.761	1	.1845
LPSS18	-70.557	2.349	1	.1254
LPSS19	-69.624	.482	1	.4876
LPSS20	-69.615	.464	1	.4959
LPSS21	-69.389	.013	1	.9104
LPSS22	-69.964	1.162	1	.2810
LPSS23	-69.701	.636	1	.4250
LPSS24	-70.955	3.145	1	.0762
LPSS25	-69.498	.231	1	.6305
LPSS26	-69.614	.462	1	.4966

Variable(s) Removed on Step Number
2.. LPSS21

Estimation terminated at iteration number 3 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 138.778
Goodness of Fit 138.680

	Chi-Square	df	Significance
Model Chi-Square	9.624	12	.6490
Improvement	-.013	1	.9104

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	28	4	12.50%
Overall				78.68%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS14	.4805	2.5947	.0343	1	.8531	.0000	1.6169
LPSS15	-1.3953	2.1834	.4084	1	.5228	.0000	.2478
LPSS16	.2847	2.0778	.0188	1	.8910	.0000	1.3294
LPSS17	-3.1360	2.4192	1.6805	1	.1949	.0000	.0435
LPSS18	3.2070	1.9422	2.7266	1	.0987	.0700	24.7058
LPSS19	-1.1220	1.6472	.4640	1	.4958	.0000	.3256
LPSS20	-1.6542	2.4335	.4621	1	.4967	.0000	.1912
LPSS22	2.8215	2.6339	1.1475	1	.2841	.0000	16.8025
LPSS23	-1.8409	2.3435	.6171	1	.4321	.0000	.1587
LPSS24	4.0456	2.2803	3.1475	1	.0760	.0879	57.1444
LPSS25	-1.1342	2.3412	.2347	1	.6281	.0000	.3217
LPSS26	1.6785	2.5018	.4501	1	.5023	.0000	5.3576
Constant	-2.2765	1.1607	3.8468	1	.0498		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS14	-69.406	.034	1	.8532
LPSS15	-69.594	.410	1	.5217
LPSS16	-69.399	.019	1	.8910
LPSS17	-70.281	1.784	1	.1816
LPSS18	-70.782	2.787	1	.0951
LPSS19	-69.626	.474	1	.4909
LPSS20	-69.626	.473	1	.4914
LPSS22	-69.966	1.153	1	.2830
LPSS23	-69.708	.637	1	.4247
LPSS24	-71.043	3.308	1	.0689
LPSS25	-69.510	.241	1	.6232
LPSS26	-69.619	.460	1	.4978

Variable(s) Removed on Step Number
3.. LPSS16

Estimation terminated at iteration number 3 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 138.797
Goodness of Fit 138.253

	Chi-Square	df	Significance
Model Chi-Square	9.605	11	.5663
Improvement	-.019	1	.8910

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	28	4	12.50%
Overall				78.68%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS14	.5671	2.5142	.0509	1	.8215	.0000	1.7631
LPSS15	-1.3871	2.1838	.4035	1	.5253	.0000	.2498
LPSS17	-3.0851	2.3893	1.6672	1	.1966	.0000	.0457
LPSS18	3.2277	1.9354	2.7813	1	.0954	.0726	25.2215
LPSS19	-1.1017	1.6411	.4507	1	.5020	.0000	.3323
LPSS20	-1.6470	2.4318	.4587	1	.4982	.0000	.1926
LPSS22	2.8438	2.6314	1.1680	1	.2798	.0000	17.1814
LPSS23	-1.8240	2.3410	.6070	1	.4359	.0000	.1614
LPSS24	4.0764	2.2728	3.2168	1	.0729	.0906	58.9326
LPSS25	-1.1629	2.3348	.2481	1	.6184	.0000	.3126
LPSS26	1.7225	2.4836	.4810	1	.4880	.0000	5.5984
Constant	-2.2532	1.1470	3.8587	1	.0495		

Model if Term Removed

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS14	-69.424	.051	1	.8216
LPSS15	-69.601	.406	1	.5242
LPSS17	-70.284	1.771	1	.1833
LPSS18	-70.821	2.845	1	.0917
LPSS19	-69.629	.461	1	.4972
LPSS20	-69.633	.470	1	.4930
LPSS22	-69.985	1.173	1	.2789
LPSS23	-69.712	.627	1	.4285
LPSS24	-71.085	3.373	1	.0663
LPSS25	-69.526	.255	1	.6134
LPSS26	-69.644	.491	1	.4834

Variable(s) Removed on Step Number

4.. LPSS14

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 138.848
 Goodness of Fit 138.110

	Chi-Square	df	Significance
Model Chi-Square	9.554	10	.4805
Improvement	-.051	1	.8216

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	28	4	12.50%
Overall				78.68%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS15	-1.2059	2.0339	.3516	1	.5532	.0000	.2994
LPSS17	-2.9794	2.3406	1.6203	1	.2030	.0000	.0508
LPSS18	3.3526	1.8591	3.2519	1	.0713	.0918	28.5768
LPSS19	-1.0961	1.6428	.4451	1	.5046	.0000	.3342
LPSS20	-1.6665	2.4293	.4706	1	.4927	.0000	.1889
LPSS22	2.9375	2.5953	1.2811	1	.2577	.0000	18.8692
LPSS23	-1.8228	2.3448	.6043	1	.4369	.0000	.1616
LPSS24	4.2003	2.2096	3.6134	1	.0573	.1043	66.7064
LPSS25	-1.2222	2.3259	.2761	1	.5992	.0000	.2946
LPSS26	1.7737	2.4729	.5144	1	.4732	.0000	5.8923
Constant	-2.2447	1.1461	3.8358	1	.0502		

Model if Term Removed
 Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS15	-69.601	.355	1	.5514
LPSS17	-70.284	1.721	1	.1896
LPSS18	-71.083	3.319	1	.0685
LPSS19	-69.652	.455	1	.4998
LPSS20	-69.665	.482	1	.4874
LPSS22	-70.067	1.286	1	.2567
LPSS23	-69.736	.624	1	.4294
LPSS24	-71.316	3.785	1	.0517
LPSS25	-69.566	.285	1	.5937
LPSS26	-69.687	.526	1	.4683

Variable(s) Removed on Step Number
 5.. LPSS25

Estimation terminated at iteration number 3 because
 Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 139.132
 Goodness of Fit 135.850

	Chi-Square	df	Significance
Model Chi-Square	9.270	9	.4128
Improvement	-.284	1	.5940

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	30	2	6.25%
Overall				77.21%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS15	-1.3822	2.0193	.4686	1	.4937	.0000	.2510
LPSS17	-2.8414	2.3255	1.4928	1	.2218	.0000	.0583
LPSS18	3.1925	1.8301	3.0432	1	.0811	.0838	24.3498
LPSS19	-1.0394	1.6246	.4093	1	.5223	.0000	.3537
LPSS20	-1.9807	2.3705	.6982	1	.4034	.0000	.1380
LPSS22	3.0178	2.5976	1.3497	1	.2453	.0000	20.4458
LPSS23	-1.8612	2.3224	.6423	1	.4229	.0000	.1555
LPSS24	4.2272	2.1807	3.7577	1	.0526	.1088	68.5235
LPSS26	1.0611	2.0458	.2690	1	.6040	.0000	2.8895
Constant	-2.2846	1.1380	4.0300	1	.0447		

----- Model if Term Removed -----
 Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS15	-69.803	.473	1	.4916
LPSS17	-70.358	1.585	1	.2081
LPSS18	-71.111	3.089	1	.0788
LPSS19	-69.775	.417	1	.5182
LPSS20	-69.925	.719	1	.3966
LPSS22	-70.243	1.353	1	.2447
LPSS23	-69.899	.665	1	.4148
LPSS24	-71.531	3.930	1	.0474
LPSS26	-69.701	.270	1	.6034

Variable(s) Removed on Step Number
 6.. LPSS26

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 139.402
 Goodness of Fit 134.682

	Chi-Square	df	Significance
Model Chi-Square	9.000	8	.3423
Improvement	-.270	1	.6036

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	29	3	9.38%
Overall				77.94%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS15	-1.1569	1.9713	.3445	1	.5573	.0000	.3144
LPSS17	-2.6391	2.3008	1.3157	1	.2514	.0000	.0714
LPSS18	3.3326	1.8029	3.4169	1	.0645	.0977	28.0109
LPSS19	-.9976	1.6183	.3800	1	.5376	.0000	.3688
LPSS20	-1.9424	2.3472	.6848	1	.4079	.0000	.1434
LPSS22	3.0048	2.5903	1.3457	1	.2460	.0000	20.1830
LPSS23	-1.6982	2.2861	.5518	1	.4576	.0000	.1830
LPSS24	4.3148	2.1624	3.9816	1	.0460	.1156	74.7954
Constant	-2.2311	1.1360	3.8574	1	.0495		

Model if Term Removed

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS15	-69.874	.347	1	.5559
LPSS17	-70.400	1.398	1	.2370
LPSS18	-71.444	3.485	1	.0619
LPSS19	-69.894	.387	1	.5338
LPSS20	-70.053	.704	1	.4015
LPSS22	-70.376	1.351	1	.2452
LPSS23	-69.985	.569	1	.4509
LPSS24	-71.791	4.180	1	.0409

Variable(s) Removed on Step Number

7.. LPSS15

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 139.748
 Goodness of Fit 134.941

	Chi-Square	df	Significance
Model Chi-Square	8.654	7	.2785
Improvement	-.346	1	.5561

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	29	3	9.38%
Overall				77.94%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS17	-3.0765	2.2064	1.9442	1	.1632	.0000	.0461
LPSS18	3.1494	1.7689	3.1700	1	.0750	.0888	23.3213
LPSS19	-1.0460	1.6072	.4235	1	.5152	.0000	.3513
LPSS20	-1.7968	2.3264	.5965	1	.4399	.0000	.1658
LPSS22	2.9032	2.5783	1.2679	1	.2602	.0000	18.2321
LPSS23	-1.6691	2.2633	.5439	1	.4608	.0000	.1884
LPSS24	4.1497	2.1356	3.7756	1	.0520	.1094	63.4179
Constant	-2.4169	1.0915	4.9027	1	.0268		

Model if Term Removed

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS17	-70.913	2.078	1	.1494
LPSS18	-71.482	3.216	1	.0729
LPSS19	-70.090	.432	1	.5108
LPSS20	-70.180	.612	1	.4342
LPSS22	-70.512	1.275	1	.2588
LPSS23	-70.154	.559	1	.4545
LPSS24	-71.846	3.944	1	.0470

Variable(s) Removed on Step Number

8.. LPSS19

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 140.180
Goodness of Fit 134.207

	Chi-Square	df	Significance
Model Chi-Square	8.222	6	.2223
Improvement	-.432	1	.5110

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	29	3	9.38%
		Overall		77.94%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS17	-2.8754	2.1679	1.7592	1	.1847	.0000	.0564
LPSS18	2.7637	1.6591	2.7750	1	.0957	.0723	15.8585
LPSS20	-1.7407	2.3080	.5688	1	.4507	.0000	.1754
LPSS22	2.4927	2.4929	.9998	1	.3174	.0000	12.0935
LPSS23	-1.2924	2.1762	.3527	1	.5526	.0000	.2746
LPSS24	3.7292	2.0204	3.4068	1	.0649	.0974	41.6439
Constant	-2.5967	1.0607	5.9928	1	.0144		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS17	-71.023	1.866	1	.1719
LPSS18	-71.483	2.786	1	.0951
LPSS20	-70.381	.583	1	.4452
LPSS22	-70.591	1.002	1	.3168
LPSS23	-70.270	.360	1	.5483
LPSS24	-71.845	3.511	1	.0610

Variable(s) Removed on Step Number
9.. LPSS23

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 140.540
Goodness of Fit 134.585

	Chi-Square	df	Significance
Model Chi-Square	7.862	5	.1640
Improvement	-.360	1	.5486

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	29	3	9.38%
Overall				77.94%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS17	-3.0226	2.1593	1.9596	1	.1616	.0000	.0487
LPSS18	2.8538	1.6429	3.0174	1	.0824	.0828	17.3533
LPSS20	-1.9159	2.2759	.7087	1	.3999	.0000	.1472
LPSS22	2.1689	2.4070	.8119	1	.3675	.0000	8.7486
LPSS24	3.3718	1.9276	3.0598	1	.0803	.0845	29.1308
Constant	-2.7434	1.0280	7.1221	1	.0076		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS17	-71.315	2.089	1	.1483
LPSS18	-71.788	3.036	1	.0814
LPSS20	-70.635	.729	1	.3931
LPSS22	-70.673	.806	1	.3694
LPSS24	-71.844	3.149	1	.0760

Variable(s) Removed on Step Number

10.. LPSS20

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 141.268
 Goodness of Fit 134.092

	Chi-Square	df	Significance
Model Chi-Square	7.134	4	.1290
Improvement	-.728	1	.3935

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	104	0	100.00%
	1	31	1	3.13%
Overall				77.21%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS17	-3.1454	2.1572	2.1261	1	.1448	-.0291	.0430
LPSS18	2.6122	1.6157	2.6141	1	.1059	.0643	13.6295
LPSS22	1.4673	2.2128	.4397	1	.5073	.0000	4.3375
LPSS24	2.9829	1.8608	2.5696	1	.1089	.0620	19.7440
Constant	-2.8743	1.0094	8.1083	1	.0044		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS17	-71.771	2.274	1	.1316
LPSS18	-71.944	2.620	1	.1055
LPSS22	-70.849	.430	1	.5120
LPSS24	-71.944	2.621	1	.1055

Variable(s) Removed on Step Number
11.. LPSS22

Estimation terminated at iteration number 3 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 141.698
Goodness of Fit 134.016

	Chi-Square	df	Significance
Model Chi-Square	6.704	3	.0820
Improvement	-.430	1	.5122

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	103	1	99.04%
	1	30	2	6.25%
Overall				77.21%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS17	-2.9237	2.1162	1.9089	1	.1671	.0000	.0537
LPSS18	2.7748	1.6028	2.9973	1	.0834	.0820	16.0352
LPSS24	3.0718	1.8471	2.7657	1	.0963	.0718	21.5797
Constant	-2.5497	.8828	8.3408	1	.0039		

----- Model if Term Removed -----
 Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS17	-71.864	2.030	1	.1543
LPSS18	-72.345	2.993	1	.0836
LPSS24	-72.266	2.834	1	.0923

Variable(s) Removed on Step Number
 12.. LPSS17

Estimation terminated at iteration number 3 because
 Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 143.719
 Goodness of Fit 133.099

	Chi-Square	df	Significance
Model Chi-Square	4.683	2	.0962
Improvement	-2.021	1	.1552

Note: A negative Chi-Square value indicates that the Chi-Square
 value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	104	0	100.00%
	1	32	0	.00%
Overall				76.47%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS18	2.1436	1.5302	1.9624	1	.1613	.0000	8.5299
LPSS24	1.8642	1.6035	1.3516	1	.2450	.0000	6.4510
Constant	-2.8805	.8394	11.7758	1	.0006		

----- Model if Term Removed -----
 Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS18	-72.832	1.945	1	.1631
LPSS24	-72.535	1.351	1	.2451

Variable(s) Removed on Step Number
 13.. LPSS24

Estimation terminated at iteration number 3 because
 Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 145.066
 Goodness of Fit 134.964

	Chi-Square	df	Significance
Model Chi-Square	3.336	1	.0678
Improvement	-1.347	1	.2458

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	104	0	100.00%
	1	32	0	.00%
Overall				76.47%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS18	2.6665	1.4531	3.3673	1	.0665	.0960	14.3895
Constant	-2.3020	.6621	12.0891	1	.0005		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS18	-74.213	3.361	1	.0668

----- Variables not in the Equation -----

Residual Chi Square 6.079 with 12 df Sig = .9120

Variable	Score	df	Sig	R
LPSS14	.0932	1	.7602	.0000
LPSS15	.2826	1	.5950	.0000
LPSS16	.0803	1	.7768	.0000
LPSS17	.5361	1	.4640	.0000
LPSS19	.0087	1	.9256	.0000
LPSS20	.1001	1	.7518	.0000
LPSS21	.0352	1	.8512	.0000
LPSS22	.4485	1	.5030	.0000
LPSS23	.0206	1	.8860	.0000
LPSS24	1.3647	1	.2427	.0000
LPSS25	.1758	1	.6750	.0000
LPSS26	.1011	1	.7505	.0000

No more variables can be deleted or added.

Appendix 30

Appendix 30: 4-week regression analysis using initial variables

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. LSMPT004

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000
 LPSS1 LPSS3 LPSS4 LPSS6 LPSS7 LSDQ00 LSAQ00 LTDQRTTL BALPROCS

Variable(s) Entered on Step Number

1.. LSAQ00

Multiple R .39111
 R Square .15297
 Adjusted R Square .14679
 Standard Error .42182

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	4.40216	4.40216
Residual	137	24.37615	.17793

F = 24.74122 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
LSAQ00	.720790	.144910	.391111	4.974	.0000
(Constant)	.274596	.115667		2.374	.0190

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LPSS1	.230368	.249771	.995729	3.008	.0031
LPSS3	.190079	.189953	.845912	2.256	.0256
LPSS4	.032352	.034412	.958305	.402	.6886
LPSS6	-.002633	-.002797	.955791	-.033	.9740
LPSS7	-.052703	-.054904	.919257	-.641	.5224
LSDQ00	.203414	.199933	.818285	2.380	.0187
LTDQRTTL	.284939	.297854	.925551	3.639	.0004
BALPROCS	-.121831	-.128125	.936818	-1.507	.1342

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. LSMPT004

Variable(s) Entered on Step Number

2.. LTDQRTTL

Multiple R .47761
 R Square .22811
 Adjusted R Square .21676
 Standard Error .40415

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	6.56473	3.28236
Residual	136	22.21357	.16334

F = 20.09589 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
----------	---	------	------	---	-------

LSAQ00	.577508	.144316	.313364	4.002	.0001
LTDQRTTL	.311198	.085525	.284939	3.639	.0004
(Constant)	.139628	.116865		1.195	.2343

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LPSS1	.248004	.281156	.919700	3.404	.0009
LPSS3	.140482	.144608	.815650	1.698	.0918
LPSS4	.049042	.054549	.883873	.635	.5267
LPSS6	-.045847	-.050436	.900212	-.587	.5583
LPSS7	-.024856	-.026994	.842753	-.314	.7542
LSDQ00	.143913	.144573	.778984	1.698	.0919
BALPROCS	-.083736	-.091336	.885140	-1.066	.2885

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. LSMPT004

Variable(s) Entered on Step Number
3.. LPSS1

Multiple R	.53771
R Square	.28913
Adjusted R Square	.27333
Standard Error	.38928

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	8.32068	2.77356
Residual	135	20.45762	.15154

F = 18.30275 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
LPSS1	1.501003	.440946	.248004	3.404	.0009
LSAQ00	.539766	.139448	.292885	3.871	.0002
LTDQRTTL	.328294	.082531	.300594	3.978	.0001
(Constant)	-.640349	.255289		-2.508	.0133

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LPSS3	.112999	.120534	.808835	1.406	.1622
LPSS4	.019143	.022029	.881398	.255	.7991
LPSS6	-.080362	-.091344	.897227	-1.062	.2902
LPSS7	-.046767	-.052740	.840536	-.611	.5420
LSDQ00	.170111	.177371	.772839	2.086	.0388
BALPROCS	-.105411	-.119414	.877170	-1.392	.1661

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. LSMPT004

Variable(s) Entered on Step Number
4.. LSDQ00

Multiple R	.55812
R Square	.31149
Adjusted R Square	.29094
Standard Error	.38453

Analysis of Variance

Regression	DF	Sum of Squares	Mean Square
	4	8.96429	2.24107
Residual	134	19.81401	.14787

F = 15.15613 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
LPSS1	1.582031	.437299	.261392	3.618	.0004
LSDQ00	.257487	.123418	.170111	2.086	.0388
LSAQ00	.421715	.148917	.228829	2.832	.0053
LTDQRTTL	.290933	.083469	.266384	3.486	.0007
(Constant)	-.725081	.255427		-2.839	.0052

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LPSS3	.083813	.089106	.735766	1.032	.3041
LPSS4	.001581	.001837	.762782	.021	.9831
LPSS6	-.120115	-.135389	.736067	-1.576	.1174
LPSS7	-.058963	-.067373	.738537	-.779	.4375
BALPROCS	-.092564	-.106151	.764443	-1.231	.2204

End Block Number 1 PIN = .050 Limits reached.

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. LSMPT004

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	.2274	1.3369	.8268	.2566	141
*RESID	-.8624	.9487	.0027	.3769	141
*ZPRED	-2.3319	2.0216	.0200	1.0069	141
*ZRESID	-2.2428	2.4671	.0069	.9801	141

Total Cases = 177

Appendix 31

Appendix 31: 24-week regression analysis using initial variables

* * * * M U L T I P L E R E G R E S S I O N * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. LSMPTO24

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000
 LPSS1 LPSS3 LPSS4 LPSS6 LPSS7 LSDQ00 LSAQ00 LTDQRTTL BALPROCS

Variable(s) Entered on Step Number
 1.. LSAQ00

Multiple R .30556
 R Square .09337
 Adjusted R Square .08644
 Standard Error .45954

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	2.84893	2.84893
Residual	131	27.66477	.21118

F = 13.49042 Signif F = .0003

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
LSAQ00	.619613	.168697	.305558	3.673	.0003
(Constant)	.235521	.133011		1.771	.0789

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LPSS1	.176855	.185167	.993854	2.148	.0335
LPSS3	.011419	.010990	.839743	.125	.9005
LPSS4	.024486	.025090	.951919	.286	.7752
LPSS6	-.096095	-.097953	.942029	-1.122	.2638
LPSS7	-.099768	-.100620	.922189	-1.153	.2510
LSDQ00	.091749	.088236	.838546	1.010	.3144
LTDQRTTL	.185888	.190430	.951479	2.212	.0287
BALPROCS	-.151948	-.154124	.932782	-1.779	.0777

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. LSMPTO24

Variable(s) Entered on Step Number
 2.. LTDQRTTL

Multiple R .35531
 R Square .12624
 Adjusted R Square .11280
 Standard Error .45287

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	3.85215	1.92608
Residual	130	26.66154	.20509

F = 9.39142 Signif F = .0002

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
----------	---	------	------	---	-------

LSAQ00	.536582	.170432	.264611	3.148	.0020
LTDQRTTL	.219921	.099435	.185888	2.212	.0287
(Constant)	.122561	.140677		.871	.3852

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LPSS1	.196608	.208672	.942279	2.423	.0168
LPSS3	-.019218	-.018620	.820194	-.212	.8328
LPSS4	.046656	.048369	.897011	.550	.5833
LPSS6	-.134598	-.137419	.910762	-1.576	.1175
LPSS7	-.092219	-.094662	.876456	-1.080	.2822
LSDQ00	.045921	.043611	.788044	.496	.6209
BALPROCS	-.129323	-.132440	.901801	-1.518	.1316

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. LSMPTO24

Variable(s) Entered on Step Number
3.. LPSS1

Multiple R	.40533
R Square	.16429
Adjusted R Square	.14486
Standard Error	.44461

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	5.01310	1.67103
Residual	129	25.50059	.19768

F = 8.45327 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
LPSS1	1.225760	.505801	.196608	2.423	.0168
LSAQ00	.496513	.168140	.244852	2.953	.0037
LTDQRTTL	.243261	.098096	.205617	2.480	.0144
(Constant)	-.515679	.297382		-1.734	.0853

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LPSS3	-.035252	-.034829	.815756	-.394	.6940
LPSS4	.034036	.036008	.891173	.408	.6842
LPSS6	-.168898	-.174341	.890440	-2.003	.0473
LPSS7	-.113012	-.118057	.872433	-1.345	.1810
LSDQ00	.061343	.059427	.784307	.674	.5018
BALPROCS	-.143069	-.149503	.890790	-1.711	.0896

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. LSMPTO24

Variable(s) Entered on Step Number
4.. LPSS6

Multiple R	.43554
R Square	.18969
Adjusted R Square	.16437
Standard Error	.43951

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	4	5.78818	1.44705
Residual	128	24.72551	.19317

F = 7.49112 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
LPSS1	1.377067	.505670	.220877	2.723	.0074
LPSS6	-.718315	.358599	-.168898	-2.003	.0473
LSAQ00	.560353	.169238	.276334	3.311	.0012
LTDQRTTL	.282365	.098916	.238670	2.855	.0050
(Constant)	-.240581	.324467		-.741	.4598

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LPSS3	-.040680	-.040797	.789924	-.460	.6462
LPSS4	.103837	.104610	.782921	1.185	.2381
LPSS7	-.062364	-.062001	.781987	-.700	.4852
LSDQ00	.116806	.110864	.729967	1.257	.2110
BALPROCS	-.126611	-.133585	.852209	-1.519	.1312

End Block Number 1 PIN = .050 Limits reached.

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. LSMPTO24

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	.1527	1.1202	.7030	.2092	134
*RESID	-.8992	.8250	.0029	.4325	134
*ZPRED	-2.6215	1.9991	.0067	.9992	134
*ZRESID	-2.0459	1.8771	.0066	.9840	134

Total Cases = 177

Appendix 32

Appendix 32: 24-week regression analysis using 4-week variables

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. LSMPTO24

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000
 LSDQ04 LSAQ04

Variable(s) Entered on Step Number
 1.. LSDQ04

Multiple R .54657
 R Square .29874
 Adjusted R Square .29313
 Standard Error .41879

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	9.33921	9.33921
Residual	125	21.92270	.17538

F = 53.25083 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
LSDQ04	.978062	.134030	.546572	7.297	.0000
(Constant)	.507268	.044362		11.435	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
LSAQ04	.375231	.421017	.882839	5.169	.0000

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. LSMPTO24

Variable(s) Entered on Step Number
 2.. LSAQ04

Multiple R .65042
 R Square .42304
 Adjusted R Square .41374
 Standard Error .38139

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	13.22514	6.61257
Residual	124	18.03678	.14546

F = 45.46036 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
LSDQ04	.748230	.129909	.418135	5.760	.0000
LSAQ04	.560085	.108362	.375231	5.169	.0000
(Constant)	.210313	.070235		2.994	.0033

End Block Number 1 POUT = .100 Limits reached.

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. LSMPTO24

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	.2103	1.4930	.6841	.3240	127
*RESID	-.8707	.8996	.0000	.3784	127
*ZPRED	-1.4623	2.4969	.0000	1.0000	127
*ZRESID	-2.2830	2.3589	.0000	.9920	127

Total Cases = 177

Appendix 33

Appendix 33: Logistic regression of 4-week PTSD caseness using initial variables

Total number of cases: 177 (Unweighted)
 Number of selected cases: 177
 Number of unselected cases: 0

Number of selected cases: 177
 Number rejected because of missing data: 39
 Number of cases included in the analysis: 138

Dependent Variable Encoding:

Original Value	Internal Value
0	0
1	1

Dependent Variable.. PTSD04

Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 160.45975

* Constant is included in the model.

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

Classification Table for PTSD04

		Predicted		Percent Correct
		0	1	
Observed	0	101	0	100.00%
	1	37	0	.00%
		Overall		73.19%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
Constant	-1.0042	.1922	27.3078	1	.0000		

Beginning Block Number 1. Method: Backward Stepwise (COND)

Variable(s) Entered on Step Number

1.. LPSS1
 LPSS3
 LPSS4
 LPSS6
 LPSS7
 LSDQ00
 LSAQ00
 LTDQRTTL
 BALPROCS

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 129.044
 Goodness of Fit 148.356

	Chi-Square	df	Significance
Model Chi-Square	31.415	9	.0003
Improvement	31.415	9	.0003

Classification Table for PTSD04

		Predicted		Percent Correct
		0	1	
Observed	0	94	7	93.07%
	1	26	11	29.73%
Overall				76.09%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.5745	3.1987	5.6074	1	.0179	.1499	1947.923
LPSS3	1.2457	1.9662	.4014	1	.5264	.0000	3.4752
LPSS4	2.9415	1.8845	2.4365	1	.1185	.0522	18.9439
LPSS6	-1.3564	2.2824	.3532	1	.5523	.0000	.2576
LPSS7	-2.1524	2.0378	1.1157	1	.2908	.0000	.1162
LSDQ00	1.1276	.8478	1.7689	1	.1835	.0000	3.0882
LSAQ00	.9362	1.1902	.6188	1	.4315	.0000	2.5503
LTDQRTTL	1.8698	.7163	6.8145	1	.0090	.1732	6.4868
BALPROCS	-.1996	.1628	1.5031	1	.2202	.0000	.8190
Constant	-8.1657	2.2188	13.5441	1	.0002		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-67.539	6.035	1	.0140
LPSS3	-64.723	.402	1	.5260
LPSS4	-65.818	2.592	1	.1074
LPSS6	-64.696	.348	1	.5552
LPSS7	-65.088	1.131	1	.2875
LSDQ00	-65.438	1.831	1	.1760
LSAQ00	-64.846	.647	1	.4210
LTDQRTTL	-68.676	8.308	1	.0039
BALPROCS	-65.280	1.515	1	.2184

Variable(s) Removed on Step Number

2.. LPSS6

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 129.392
Goodness of Fit 151.370

Chi-Square df Significance

Model Chi-Square 31.068 8 .0001
Improvement -.347 1 .5556

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD04

		Predicted		Percent Correct
		0	1	
Observed	0	95	6	94.06%
	1	26	11	29.73%
Overall				76.81%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.2125	3.1275	5.3185	1	.0211	.1438	1356.330
LPSS3	1.2061	1.9643	.3770	1	.5392	.0000	3.3404
LPSS4	2.7766	1.8447	2.2656	1	.1323	.0407	16.0642
LPSS7	-2.4271	1.9770	1.5072	1	.2196	.0000	.0883
LSDQ00	1.0212	.8248	1.5330	1	.2157	.0000	2.7766
LSAQ00	.9514	1.1875	.6419	1	.4230	.0000	2.5894
LTDQRTTL	1.8212	.7118	6.5460	1	.0105	.1683	6.1793
BALPROCS	-.2017	.1635	1.5215	1	.2174	.0000	.8174
Constant	-8.4368	2.1728	15.0769	1	.0001		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-67.538	5.684	1	.0171
LPSS3	-64.885	.378	1	.5388
LPSS4	-65.890	2.389	1	.1222
LPSS7	-65.465	1.539	1	.2147
LSDQ00	-65.485	1.579	1	.2089
LSAQ00	-65.032	.672	1	.4122
LTDQRTTL	-68.695	7.998	1	.0047
BALPROCS	-65.463	1.534	1	.2155

Variable(s) Removed on Step Number

3.. LPSS3

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 129.769
Goodness of Fit 147.932

	Chi-Square	df	Significance
Model Chi-Square	30.691	7	.0001
Improvement	-.377	1	.5390

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD04

		Predicted		Percent Correct
		0	1	
Observed	0	94	7	93.07%
	1	25	12	32.43%
		Overall		76.81%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.4040	3.1021	5.6967	1	.0170	.1518	1642.597
LPSS4	2.6762	1.8230	2.1552	1	.1421	.0311	14.5303
LPSS7	-2.6277	1.9366	1.8412	1	.1748	.0000	.0722
LSDQ00	1.1133	.8133	1.8738	1	.1710	.0000	3.0445
LSAQ00	1.1494	1.1454	1.0069	1	.3157	.0000	3.1562
LTDQRTTL	1.8544	.7122	6.7793	1	.0092	.1726	6.3878
BALPROCS	-.2182	.1615	1.8246	1	.1768	.0000	.8040
Constant	-8.1119	2.0837	15.1563	1	.0001		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-67.948	6.127	1	.0133
LPSS4	-66.014	2.258	1	.1329
LPSS7	-65.831	1.894	1	.1688
LSDQ00	-65.856	1.942	1	.1634
LSAQ00	-65.421	1.074	1	.3001
LTDQRTTL	-69.051	8.333	1	.0039
BALPROCS	-65.805	1.842	1	.1747

Variable(s) Removed on Step Number
4.. LSAQ00

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 130.838
Goodness of Fit 153.491

	Chi-Square	df	Significance
Model Chi-Square	29.622	6	.0000
Improvement	-1.069	1	.3013

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD04

		Predicted		Percent Correct
		0	1	
Observed	0	96	5	95.05%
	1	25	12	32.43%
Overall				78.26%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.8324	3.0867	6.4385	1	.0112	.1663	2520.938
LPSS4	2.7803	1.8137	2.3498	1	.1253	.0467	16.1239
LPSS7	-2.3159	1.8999	1.4858	1	.2229	.0000	.0987
LSDQ00	1.3797	.7816	3.1165	1	.0775	.0834	3.9738
LTDQRTTL	1.9579	.7009	7.8043	1	.0052	.1902	7.0847
BALPROCS	-.2473	.1572	2.4739	1	.1157	-.0543	.7809
Constant	-7.9030	2.0695	14.5825	1	.0001		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-68.911	6.985	1	.0082
LPSS4	-66.650	2.462	1	.1166
LPSS7	-66.177	1.515	1	.2183
LSDQ00	-67.057	3.277	1	.0702
LTDQRTTL	-70.364	9.891	1	.0017
BALPROCS	-66.681	2.524	1	.1121

Variable(s) Removed on Step Number
5.. LPSS7

Estimation terminated at iteration number 4 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 132.348
Goodness of Fit 151.561

	Chi-Square	df	Significance
Model Chi-Square	28.112	5	.0000
Improvement	-1.510	1	.2191

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD04

		Predicted		Percent Correct
		0	1	
Observed	0	96	5	95.05%
	1	27	10	27.03%
Overall				76.81%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.5733	3.0463	6.1805	1	.0129	.1614	1945.550
LPSS4	1.5108	1.4492	1.0868	1	.2972	.0000	4.5304
LSDQ00	1.3519	.7808	2.9978	1	.0834	.0789	3.8646
LTDQRTTL	1.8999	.6806	7.7928	1	.0052	.1900	6.6849
BALPROCS	-.2161	.1551	1.9406	1	.1636	.0000	.8057
Constant	-8.2850	2.0425	16.4543	1	.0000		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-69.522	6.696	1	.0097
LPSS4	-66.727	1.106	1	.2930
LSDQ00	-67.751	3.154	1	.0758
LTDQRTTL	-71.032	9.716	1	.0018
BALPROCS	-67.162	1.977	1	.1597

Variable(s) Removed on Step Number
6.. LPSS4

Estimation terminated at iteration number 4 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 133.451
Goodness of Fit 140.564

	Chi-Square	df	Significance
Model Chi-Square	27.009	4	.0000
Improvement	-1.103	1	.2935

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD04

		Predicted		Percent Correct
		0	1	
Observed	0	95	6	94.06%
	1	26	11	29.73%
Overall				76.81%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.9775	3.0286	6.9384	1	.0084	.1754	2914.747
LSDQ00	1.4355	.7695	3.4799	1	.0621	.0960	4.2018
LTDQRTTL	1.8842	.6808	7.6596	1	.0056	.1878	6.5810
BALPROCS	-.1959	.1515	1.6717	1	.1960	.0000	.8221
Constant	-7.7639	1.9617	15.6641	1	.0001		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-70.522	7.593	1	.0059
LSDQ00	-68.578	3.706	1	.0542
LTDQRTTL	-71.507	9.563	1	.0020
BALPROCS	-67.572	1.692	1	.1933

Variable(s) Removed on Step Number
7.. BALPROCS

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 135.137
Goodness of Fit 145.377

	Chi-Square	df	Significance
Model Chi-Square	25.323	3	.0000
Improvement	-1.686	1	.1941

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD04

Observed		Predicted		Percent Correct
		0	1	
0	0	93	8	92.08%
1	1	29	8	21.62%
Overall				73.19%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.6634	2.9772	6.6255	1	.0101	.1698	2128.906
LSDQ00	1.5839	.7623	4.3171	1	.0377	.1202	4.8741
LTDQRTTL	1.9816	.6752	8.6127	1	.0033	.2030	7.2546
Constant	-7.8864	1.9462	16.4207	1	.0001		

----- Model if Term Removed -----
 Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-71.152	7.166	1	.0074
LSDQ00	-69.902	4.666	1	.0308
LTDQRTTL	-73.053	10.969	1	.0009

----- Variables not in the Equation -----
 Residual Chi Square 5.973 with 6 df Sig = .4262

Variable	Score	df	Sig	R
LPSS3	1.2464	1	.2642	.0000
LPSS4	.8181	1	.3657	.0000
LPSS6	.2539	1	.6143	.0000
LPSS7	.0824	1	.7741	.0000
LSAQ00	1.4490	1	.2287	.0000
BALPROCS	1.6965	1	.1927	.0000

No more variables can be deleted or added.

Appendix 34

Appendix 34: Logistic regression of 24-week PTSD caseness using initial variables

Total number of cases: 177 (Unweighted)
 Number of selected cases: 177
 Number of unselected cases: 0

Number of selected cases: 177
 Number rejected because of missing data: 44
 Number of cases included in the analysis: 133

Dependent Variable Encoding:

Original Value	Internal Value
0	0
1	1

Dependent Variable.. PTSD24

Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 144.43121

* Constant is included in the model.

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	102	0	100.00%
	1	31	0	.00%
Overall				76.69%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
Constant	-1.1910	.2051	33.7226	1	.0000		

Beginning Block Number 1. Method: Backward Stepwise (COND)

Variable(s) Entered on Step Number

1.. LPSS1
 LPSS3
 LPSS4
 LPSS6
 LPSS7
 LSDQ00
 LSAQ00
 LTDQRTTL
 BALPROCS

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 124.924
 Goodness of Fit 125.383

	Chi-Square	df	Significance
Model Chi-Square	19.507	9	.0212
Improvement	19.507	9	.0212

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	96	6	94.12%
	1	28	3	9.68%
Overall				74.44%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.5770	3.2562	5.4145	1	.0200	.1538	1952.678
LPSS3	-1.9725	1.9795	.9929	1	.3190	.0000	.1391
LPSS4	1.8986	1.9317	.9660	1	.3257	.0000	6.6763
LPSS6	-6.2543	2.4069	6.7523	1	.0094	-.1814	.0019
LPSS7	-3.6020	2.0474	3.0952	1	.0785	-.0871	.0273
LSDQ00	.8849	.9142	.9368	1	.3331	.0000	2.4226
LSAQ00	1.1068	1.1908	.8639	1	.3526	.0000	3.0247
LTDQRTTL	1.7342	.7289	5.6605	1	.0174	.1592	5.6646
BALPROCS	.0386	.1714	.0508	1	.8216	.0000	1.0394
Constant	-2.7225	1.9502	1.9489	1	.1627		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-65.408	5.893	1	.0152
LPSS3	-62.969	1.013	1	.3141
LPSS4	-62.960	.996	1	.3183
LPSS6	-66.086	7.248	1	.0071
LPSS7	-64.070	3.215	1	.0730
LSDQ00	-62.947	.970	1	.3247
LSAQ00	-62.913	.901	1	.3424
LTDQRTTL	-65.871	6.819	1	.0090
BALPROCS	-62.488	.051	1	.8213

Variable(s) Removed on Step Number

2.. BALPROCS

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 124.975
Goodness of Fit 125.096

	Chi-Square	df	Significance
Model Chi-Square	19.456	8	.0126
Improvement	-.051	1	.8213

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	97	5	95.10%
	1	28	3	9.68%
Overall				75.19%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.6302	3.2452	5.5284	1	.0187	.1563	2059.388
LPSS3	-2.0146	1.9704	1.0454	1	.3066	.0000	.1334
LPSS4	1.9497	1.9197	1.0314	1	.3098	.0000	7.0263
LPSS6	-6.2230	2.4022	6.7107	1	.0096	-.1806	.0020
LPSS7	-3.6450	2.0398	3.1930	1	.0740	-.0909	.0261
LSDQ00	.8739	.9143	.9135	1	.3392	.0000	2.3962
LSAQ00	1.0681	1.1751	.8261	1	.3634	.0000	2.9097
LTDQRTTL	1.7274	.7277	5.6347	1	.0176	.1586	5.6261
Constant	-2.6927	1.9437	1.9193	1	.1659		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-65.500	6.024	1	.0141
LPSS3	-63.022	1.068	1	.3014
LPSS4	-63.020	1.065	1	.3020
LPSS6	-66.089	7.204	1	.0073
LPSS7	-64.149	3.322	1	.0684
LSDQ00	-62.961	.946	1	.3307
LSAQ00	-62.917	.859	1	.3541
LTDQRTTL	-65.877	6.778	1	.0092

Variable(s) Removed on Step Number
3.. LSAQ00

Estimation terminated at iteration number 4 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 125.832
Goodness of Fit 123.631

	Chi-Square	df	Significance
Model Chi-Square	18.599	7	.0095
Improvement	-.857	1	.3547

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	97	5	95.10%
	1	29	2	6.45%
Overall				74.44%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.6966	3.2255	5.6938	1	.0170	.1599	2200.813
LPSS3	-1.4099	1.8540	.5783	1	.4470	.0000	.2442
LPSS4	2.0988	1.9118	1.2051	1	.2723	.0000	8.1561
LPSS6	-6.1407	2.3784	6.6661	1	.0098	-.1797	.0022
LPSS7	-3.3577	2.0036	2.8085	1	.0938	-.0748	.0348
LSDQ00	1.0460	.8972	1.3592	1	.2437	.0000	2.8463
LTDQRTTL	1.7877	.7242	6.0943	1	.0136	.1684	5.9760
Constant	-2.5991	1.9278	1.8177	1	.1776		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-66.014	6.197	1	.0128
LPSS3	-63.210	.588	1	.4431
LPSS4	-63.539	1.247	1	.2642
LPSS6	-66.485	7.139	1	.0075
LPSS7	-64.365	2.898	1	.0887
LSDQ00	-63.628	1.423	1	.2329
LTDQRTTL	-66.622	7.413	1	.0065

Variable(s) Removed on Step Number
4.. LPSS3

Estimation terminated at iteration number 4 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 126.419
Goodness of Fit 125.167

	Chi-Square	df	Significance
Model Chi-Square	18.012	6	.0062
Improvement	-.587	1	.4434

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	97	5	95.10%
	1	28	3	9.68%
		Overall		75.19%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
LPSS1	7.3691	3.1794	5.3721	1	.0205	.1528	1586.214
LPSS4	2.0751	1.8980	1.1953	1	.2743	.0000	7.9654
LPSS6	-6.0739	2.3546	6.6544	1	.0099	-.1795	.0023
LPSS7	-3.1899	1.9683	2.6264	1	.1051	-.0659	.0412
LSDQ00	.8699	.8550	1.0352	1	.3089	.0000	2.3867
LTDQRTTL	1.7063	.7079	5.8105	1	.0159	.1624	5.5086
Constant	-2.9365	1.8719	2.4609	1	.1167		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-66.115	5.810	1	.0159
LPSS4	-63.829	1.238	1	.2658
LPSS6	-66.765	7.112	1	.0077
LPSS7	-64.557	2.694	1	.1007
LSDQ00	-63.743	1.068	1	.3015
LTDQRTTL	-66.696	6.972	1	.0083

Variable(s) Removed on Step Number

5.. LSDQ00

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 127.483
 Goodness of Fit 125.723

	Chi-Square	df	Significance
Model Chi-Square	16.948	5	.0046
Improvement	-1.064	1	.3022

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	100	2	98.04%
	1	28	3	9.68%
Overall				77.44%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.0375	3.1489	4.9948	1	.0254	.1440	1138.519
LPSS4	2.1701	1.8861	1.3238	1	.2499	.0000	8.7592
LPSS6	-5.4111	2.2534	5.7664	1	.0163	-.1615	.0045
LPSS7	-3.0724	1.9694	2.4338	1	.1187	-.0548	.0463
LTDQRTTL	1.8440	.6963	7.0127	1	.0081	.1863	6.3218
Constant	-2.8236	1.8586	2.3080	1	.1287		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-66.418	5.353	1	.0207
LPSS4	-64.428	1.372	1	.2415
LPSS6	-66.799	6.115	1	.0134
LPSS7	-64.986	2.489	1	.1146
LTDQRTTL	-68.138	8.792	1	.0030

Variable(s) Removed on Step Number
6.. LPSS4

Estimation terminated at iteration number 4 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 128.850
Goodness of Fit 130.410

	Chi-Square	df	Significance
Model Chi-Square	15.582	4	.0036
Improvement	-1.366	1	.2425

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	100	2	98.04%
	1	29	2	6.45%
Overall				76.69%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	7.0428	3.1418	5.0249	1	.0250	.1447	1144.565
LPSS6	-4.9688	2.2188	5.0149	1	.0251	-.1445	.0070
LPSS7	-1.8453	1.6416	1.2635	1	.2610	.0000	.1580
LTDQRTTL	1.7635	.6899	6.5331	1	.0106	.1772	5.8329
Constant	-2.5632	1.8387	1.9432	1	.1633		

----- Model if Term Removed -----
Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-67.132	5.413	1	.0200
LPSS6	-67.069	5.288	1	.0215
LPSS7	-65.057	1.263	1	.2610
LTDQRTTL	-68.478	8.106	1	.0044

Variable(s) Removed on Step Number
7.. LPSS7

Estimation terminated at iteration number 4 because
Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 130.107
Goodness of Fit 130.053

	Chi-Square	df	Significance
Model Chi-Square	14.324	3	.0025
Improvement	-1.258	1	.2621

Note: A negative Chi-Square value indicates that the Chi-Square
value has decreased from the previous step.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	99	3	97.06%
	1	29	2	6.45%
Overall				75.94%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LPSS1	6.4937	3.0433	4.5528	1	.0329	.1329	660.9328
LPSS6	-5.8133	2.0899	7.7373	1	.0054	-.1993	.0030
LTDQRTTL	1.7873	.6832	6.8439	1	.0089	.1831	5.9730
Constant	-2.7465	1.8136	2.2934	1	.1299		

----- Model if Term Removed -----
 Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LPSS1	-67.467	4.826	1	.0280
LPSS6	-69.314	8.520	1	.0035
LTDQRTTL	-69.318	8.528	1	.0035

----- Variables not in the Equation -----
 Residual Chi Square 5.068 with 6 df Sig = .5352

Variable	Score	df	Sig	R
LPSS3	.1617	1	.6876	.0000
LPSS4	.1564	1	.6925	.0000
LPSS7	1.2771	1	.2584	.0000
LSDQ00	.9115	1	.3397	.0000
LSAQ00	.5435	1	.4610	.0000
BALPROCS	.0676	1	.7948	.0000

No more variables can be deleted or added.

Appendix 35

Appendix 35: Logistic regression of 24-week PTSD caseness using 4-week variables

Total number of cases: 177 (Unweighted)
 Number of selected cases: 177
 Number of unselected cases: 0

Number of selected cases: 177
 Number rejected because of missing data: 50
 Number of cases included in the analysis: 127

Dependent Variable Encoding:

Original Value	Internal Value
0	0
1	1

Dependent Variable.. PTSD24

Beginning Block Number 0. Initial Log Likelihood Function

-2 Log Likelihood 136.46674

* Constant is included in the model.

Estimation terminated at iteration number 3 because Log Likelihood decreased by less than .01 percent.

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	98	0	100.00%
	1	29	0	.00%
		Overall		77.17%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
Constant	-1.2177	.2114	33.1802	1	.0000		

Beginning Block Number 1. Method: Backward Stepwise (COND)

Variable(s) Entered on Step Number

1.. LSDQ04
 LSAQ04

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 100.059
 Goodness of Fit 115.626

	Chi-Square	df	Significance
Model Chi-Square	36.407	2	.0000
Improvement	36.407	2	.0000

Classification Table for PTSD24

		Predicted		Percent Correct
		0	1	
Observed	0	91	7	92.86%
	1	15	14	48.28%
		Overall		82.68%

----- Variables in the Equation -----

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
LSDQ04	3.4106	.8899	14.6884	1	.0001	.3049	30.2841
LSAQ04	2.4697	1.0525	5.5059	1	.0190	.1603	11.8190
Constant	-3.7603	.8160	21.2381	1	.0000		

----- Model if Term Removed -----

Based on Conditional Parameter Estimates

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
LSDQ04	-58.637	17.215	1	.0000
LSAQ04	-53.745	7.430	1	.0064

No more variables can be deleted or added.

Appendix 36

Appendix 36: ASD in individual patients

This lists PTSD at 24 weeks diagnosis, ASD diagnoses at weeks 0 and 4, SDQ score, and avoidance, intrusion and arousal subscales of the PSS, all over weeks 0 and 4. The functioning scale of the PSS at week 4 is also included.

SUBJECT	PTSD24	ASD00	ASD04	SDQ00	SDQ04	AVOIDA00	AVOIDA04	INTRUS00	INTRUS04	AROUSA00	AROUSA04	FUNCTI04
1	.	0	.	3	.	4	.	5	.	4	.	.
15	.	1	0	8	0	3	0	4	5	3	2	2
39	.	0	.	0	.	1	.	0	.	1	.	.
42	.	0	0	1	0	0	0	0	2	0	0	0
49	.	0	.	1	.	0	.	0	.	0	.	.
53	.	1	.	3	.	6	.	7	.	5	.	.
70	.	1	.	6	.	8	.	9	.	6	.	.
84	.	1	.	6	.	1	.	3	.	4	.	.
111	.	1	1	6	6	9	15	3	9	10	15	8
121	.	1	.	5	.	1	.	1	.	1	.	.
129	.	0	0	4	0	2	1	3	0	0	4	2
138	.	0	0	5	0	0	0	1	1	0	0	0
147	.	0	0	10	1	1	1	2	3	2	1	2
148	.	0	0	3	0	3	1	1	4	1	1	0
150	.	0	0	2	1	3	4	0	1	2	5	0
158	.	0	.	2	.	3	.	3	.	1	.	.
187	.	0	.	3	.	2	.	2	.	2	.	.
188	.	1	.	3	.	3	.	7	.	6	.	.
190	.	0	.	3	.	2	.	2	.	3	.	.
196	.	0	.	7	.	0	.	3	.	1	.	.
207	.	1	.	7	.	7	.	5	.	1	.	.
210	.	1	.	9	.	10	.	10	.	7	.	.
211	.	1	1	10	7	7	7	10	10	7	8	6
213	.	0	0	5	0	3	1	2	4	0	4	4
219	.	0	.	8	.	2	.	1	.	0	.	.
221	.	0	.	3	.	1	.	5	.	1	.	.
230	.	1	.	6	.	5	.	5	.	7	.	.
234	.	0	0	0	0	0	6	3	2	0	3	6
243	.	1	.	3	.	4	.	2	.	4	.	.
300	.	1	0	10	2	4	7	12	12	8	6	5
310	.	0	0	2	0	1	2	0	0	0	0	0
311	.	0	0	1	0	0	0	3	0	0	0	0
343	.	0	0	7	1	5	6	3	6	4	4	5
357	.	0	0	3	0	1	4	2	1	0	2	0
359	.	1	.	6	.	3	.	4	.	6	.	.
366	.	1	1	6	6	8	17	11	13	7	11	5
412	.	0	0	1	0	0	5	1	7	0	8	4
4	0	0	0	1	0	1	1	2	2	5	1	3
5	0	0	0	2	0	3	1	3	1	2	1	2
21	0	1	0	5	0	1	0	3	0	3	2	0
23	0	0	0	6	0	0	0	0	0	0	0	0
26	0	0	0	7	4	4	4	3	0	4	1	6
32	0	0	0	3	0	2	0	2	3	0	2	1
51	0	0	0	7	0	1	0	4	1	1	0	0
54	0	0	0	5	0	0	0	1	0	0	0	0
55	0	0	0	2	0	0	0	1	1	1	2	1
56	0	0	0	2	0	2	2	6	5	3	4	5
62	0	0	0	1	0	1	0	0	0	0	0	0
67	0	0	0	1	0	3	0	3	0	2	0	0
73	0	0	0	2	2	0	0	3	0	0	0	1
75	0	1	0	4	1	3	2	4	5	3	5	8
81	0	0	0	3	0	0	0	2	1	2	1	0
91	0	0	0	1	0	1	6	3	0	4	0	6
101	0	0	0	1	0	0	0	1	0	1	0	0
102	0	0	0	0	0	4	1	7	1	5	2	0
103	0	0	0	2	0	0	0	1	1	1	0	2
107	0	0	0	0	0	0	1	2	2	2	4	0
112	0	0	0	1	0	0	0	0	0	1	0	0
113	0	1	0	6	0	9	5	8	1	5	0	3
118	0	0	0	2	0	0	0	0	0	1	0	0

SUBJECT	PTSD24	ASD00	ASD04	SDQ00	SDQ04	AVOIDA00	AVOIDA04	INTRUS00	INTRUS04	AROUSA00	AROUSA04	FUNCTIONI04
119	0	0	0	2	0	3	2	3	1	1	0	0
122	0	0	.	2	.	0	.	1	.	0	.	8
123	0	0	0	3	0	0	3	1	3	1	4	7
125	0	0	0	1	0	0	2	1	0	2	2	0
128	0	0	0	1	0	0	1	2	1	1	2	0
130	0	0	0	4	0	0	0	0	0	0	0	0
132	0	1	1	8	6	6	11	8	10	7	10	8
133	0	0	0	2	0	0	0	0	0	0	0	0
135	0	0	0	11	2	1	3	9	10	5	8	3
136	0	1	0	4	0	1	5	6	4	2	1	2
137	0	1	0	8	0	2	2	8	7	9	7	0
141	0	1	0	4	0	7	4	9	4	9	3	3
142	0	1	0	10	2	6	5	12	9	5	7	5
146	0	0	0	2	0	0	0	2	0	0	0	0
159	0	0	0	1	1	0	0	0	0	0	1	9
165	0	0	0	2	0	12	5	12	0	12	0	5
166	0	1	.	4	.	4	.	1	.	1	.	.
172	0	0	0	1	0	0	0	0	0	0	0	0
177	0	0	0	4	0	3	5	3	3	4	5	3
178	0	0	0	4	0	1	2	3	1	0	2	0
185	0	0	0	8	0	1	0	1	1	1	0	0
186	0	0	0	1	0	0	0	2	3	1	0	0
189	0	0	0	1	0	0	0	0	0	0	0	0
192	0	0	1	1	3	0	2	2	5	2	2	3
198	0	1	0	5	1	1	6	5	1	2	7	3
199	0	0	0	6	0	5	0	3	0	0	0	0
217	0	0	.	5	.	0	.	1	.	1	.	.
220	0	0	0	4	0	0	0	0	1	0	0	0
229	0	0	0	0	0	1	2	4	3	3	5	7
231	0	1	0	14	0	6	4	7	3	2	0	3
233	0	0	0	0	0	0	0	3	0	0	0	4
240	0	0	0	0	0	0	6	1	0	0	8	5
245	0	0	0	1	0	2	0	2	0	2	0	0
247	0	0	0	6	5	2	3	2	1	0	8	1
259	0	0	0	2	0	0	0	2	1	0	2	0
261	0	0	0	14	0	6	3	1	0	1	3	3
289	0	0	0	7	0	0	1	2	0	0	3	0
304	0	0	0	2	2	5	0	4	2	2	3	1
312	0	0	0	7	2	1	2	2	2	0	3	1
313	0	1	0	8	0	9	7	7	9	1	3	0
314	0	0	0	0	0	6	1	3	1	3	0	0
316	0	0	0	4	0	0	0	4	2	1	0	0
317	0	0	0	3	0	0	1	3	1	3	3	3
318	0	0	0	1	0	0	1	1	0	0	0	0
321	0	0	.	3	.	0	.	2	.	4	.	.
325	0	0	0	2	0	1	1	5	2	1	0	0
328	0	0	.	1	.	2	.	2	.	0	.	.
330	0	0	0	0	0	0	2	0	1	0	1	0
331	0	0	0	1	1	1	0	1	1	1	0	1
332	0	0	0	1	0	1	0	3	2	0	0	0
335	0	0	0	5	1	0	3	2	0	2	2	0
337	0	0	0	6	0	0	0	1	0	3	0	0
341	0	0	0	7	0	1	0	1	1	0	1	0
344	0	1	0	4	2	8	12	8	5	12	14	6
348	0	1	0	5	0	2	4	4	7	4	4	7
354	0	0	0	8	1	2	4	7	3	1	3	3
355	0	1	.	3	.	7	.	1	.	1	.	.
360	0	0	.	6	.	2	.	11	.	6	.	0
361	0	1	0	5	0	7	4	5	5	6	5	0
371	0	0	0	6	1	0	2	5	1	2	2	1

SUBJECT	PTSD24	ASD00	ASD04	SDQ00	SDQ04	AVOIDA00	AVOIDA04	INTRUS00	INTRUS04	AROUSA00	AROUSA04	FUNCTI04
372	0	1	0	9	0	3	4	10	6	4	5	0
373	0	1	0	5	0	3	0	10	8	5	4	1
376	0	0	0	1	0	0	0	0	0	0	0	0
378	0	1	0	5	0	6	8	3	6	5	4	2
380	0	0	0	3	0	0	0	0	0	0	0	0
381	0	1	0	5	0	9	4	6	3	5	2	3
382	0	1	0	12	1	7	6	7	2	3	4	4
386	0	0	1	11	9	4	9	6	8	5	8	4
390	0	0	0	8	0	3	3	3	1	2	1	1
392	0	0	0	3	0	2	1	7	3	4	1	0
393	0	0	0	4	0	1	6	2	3	5	3	2
395	0	0	0	4	0	0	0	0	0	0	0	0
401	0	0	0	9	1	6	11	6	3	0	5	6
411	0	0	0	2	0	0	0	2	2	0	0	0
414	0	0	0	3	0	0	1	3	3	1	0	0
415	0	0	0	2	0	10	11	6	5	2	0	2
425	0	0	0	3	0	0	0	2	2	0	3	3
426	0	.	0	.	2	.	2	.	1	.	2	1
433	0	0	0	9	0	6	5	0	1	6	8	2
434	0	0	0	2	0	3	1	3	2	3	3	0
437	0	0	0	1	1	1	1	1	3	0	2	0
438	0	1	0	12	0	2	2	3	3	2	1	1
439	0	0	0	2	0	0	4	2	1	0	5	6
7	1	1	0	4	1	4	3	7	7	3	4	7
8	1	0	0	0	1	0	2	4	2	2	0	4
19	1	.	1	14	7	.	12	11	11	8	15	8
27	1	0	0	1	1	1	3	3	6	2	4	6
83	1	0	1	3	6	0	8	2	5	3	9	5
85	1	1	0	3	0	3	3	6	5	1	2	8
87	1	0	.	1	.	1	.	3	.	2	.	.
99	1	0	0	6	0	1	2	2	4	0	2	4
100	1	1	0	10	0	2	2	4	6	2	5	5
104	1	1	0	6	2	3	3	4	0	3	8	6
139	1	0	0	1	0	0	4	0	7	0	7	8
156	1	0	1	3	3	1	8	2	8	2	8	8
160	1	0	1	10	4	3	12	7	3	5	6	4
191	1	0	0	1	4	0	6	1	4	0	9	9
195	1	0	1	6	5	0	8	3	7	6	7	5
227	1	0	1	5	7	1	9	4	10	0	12	7
249	1	1	.	5	.	2	.	5	.	7	.	.
256	1	1	0	3	1	1	10	1	2	1	4	6
258	1	1	1	8	7	4	6	2	5	2	3	6
285	1	0	0	6	2	0	4	4	6	0	4	2
305	1	1	1	6	3	7	10	12	13	12	11	1
319	1	0	0	0	1	9	7	8	3	0	2	5
334	1	.	0	10	1	6	8	4	7	4	5	5
338	1	1	0	12	1	8	10	4	8	6	11	3
342	1	0	.	9	.	6	.	8	.	6	.	.
350	1	1	0	5	0	5	6	2	5	2	4	5
353	1	0	0	7	0	9	7	0	4	1	7	4
362	1	0	0	12	2	2	5	4	3	0	10	3
369	1	0	.	3	.	3	.	6	.	6	.	.
375	1	1	.	3	.	5	.	1	.	1	.	.
385	1	0	1	1	8	2	12	4	4	3	10	8
396	1	1	0	3	2	5	7	1	3	3	5	5
398	1	1	0	4	2	7	5	7	5	5	4	3
413	1	0	0	1	1	0	2	0	1	2	5	2

Appendix 37

Videotape Contents

Scene 1: A woman is being treated by paramedics.

Length: 2.10

Scene 2: A car with a man trapped inside and a minivan with a woman trapped inside. Both are rescued. The man has severe injuries to his right leg, the woman to both.

Length: 4.09

Scene 3: A car and a heavy goods vehicle involved in a crash. A body is dragged from the car.

Length: 1.17

Scene 4: A body is trapped in a car. 2 bodies are placed in coffins.

Length: 1.50

Scene 5: A burning Porsche, and other vehicles. A woman and baby are taken from a car which is upside down.

Length: 1.44

Scene 6: A man with a beard is lying next to a pool of vomit. He is laid upon his back and his eyes are checked.

Length: 0.36

Total video length, including pauses: 14.40

Appendix 38

Oxford University's Department of Psychiatry is conducting research into the effects of road traffic accidents upon those people who are involved. One problem that accident victims have is that they suffer from distressing memories of the accident: we are aiming to conduct research that will help future victims overcome unpleasant memories.

To carry out this research we need the help of people like you - people who have not just been involved in an accident.

We are carrying out a study using video material to see how people deal with witnessing potentially distressing scenes: the study is divided into three stages as follows:

- Stage 1:** A questionnaire and interview, followed by a brief video showing potentially stressful scenes. The session will last about 1½ hours.
- Stage 2:** A 7-day period in which you will be asked to keep a brief record of some thoughts.
- Stage 3:** A follow-up interview and questionnaire, followed by a second showing of the video. This session will be about 1 hour long.

Some of the scenes on the video may be distressing: however we feel that taking part in this kind of study can be beneficial not only to our understanding of reactions to stress, but also to whoever takes part, since through taking part people can learn about different ways of dealing with stressful events and how better to cope with them.

We would be very grateful if you would consider taking part in order to help us. We are looking for as wide a range of people as possible to take part, right from those who consider themselves easily upset and who might not normally watch a video or film with any stressful or "horror" element at all, to those few people who do not generally find such films distressing at all. If you do decide to take part and you find that you do not wish to continue for any reason, you may leave at any point, without having to give a reason for doing so.

If you would like any further information about this study, then please contact James Murray on **553 26464** (internal telephones) or **226464** (external telephones).