

**Volume 1**

**Children and trauma:  
The role of subjective stress, peritraumatic  
dissociation, and cognitive appraisals.**

**Sarah Chin Yuen Kee  
Doctorate in Clinical Psychology**

**2005**

UMI Number: U593161

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



UMI U593161

Published by ProQuest LLC 2013. Copyright in the Dissertation held by the Author.  
Microform Edition © ProQuest LLC.

All rights reserved. This work is protected against  
unauthorized copying under Title 17, United States Code.



ProQuest LLC  
789 East Eisenhower Parkway  
P.O. Box 1346  
Ann Arbor, MI 48106-1346

## **Abstract**

**Background:** Recent studies have highlighted the importance of peritraumatic reactions and cognitive appraisals on the development of PTSD among adults. Cognitive theories predict firstly, intense stress and dissociation during trauma disrupt mental processing, leading to fragmented memory and increased risk of PTSD and secondly, negative cognitive appraisals of the trauma and/or sequelae maintain PTSD. Emerging evidence suggests that subjective stress and cognitive appraisals are also key factors in the development of PTSD in children but little is known about the effects of peritraumatic dissociation within this age group. This prospective study investigated the influence of these factors, as well as pre-trauma risk factors, among 7-14 year olds attending A&E following a frightening event.

**Method:** Children were assessed for symptoms of depression, anxiety, and PTSD within 4 weeks of the event and again at 2-3 months. Children provided a trauma narrative and described their peritraumatic response and cognitive appraisals. Parents provided information on pre-trauma risk factors.

**Results:** At follow-up, a significant minority reported clinical levels of depression and a third reported symptoms sufficient to warrant a diagnosis of PTSD. More negative appraisals, greater subjective stress and dissociation during the trauma were associated with more trauma symptoms at both time points. However, these variables did not predict chronic trauma symptoms after controlling for pre-trauma risk factors.

**Conclusions:** This exploratory study underscores the importance of assessing pre-trauma risk factors in identifying those children most at risk after traumatic events and brings into question claims that peritraumatic dissociation is a causal factor in the development of PTSD.

Thank you....

...to Alastair, for encouragement and support,

to Chris, for keeping me sane throughout,

and to B. and J.J., for everything.

## Table of Contents

	<b>Page number</b>
<b>1. Introduction</b>	
1.1 Overview	1
1.2 Posttraumatic stress disorder (PTSD)	1
1.2.1 Clinical characteristics	1
1.2.2 Prevalence	4
1.2.3 Co-morbidity	6
1.2.4 Summary	6
1.3 Psychological theories of PTSD	7
1.3.1 Dual representation theory	7
1.3.2 Ehlers and Clark's cognitive theory	11
1.4 Peritraumatic factors and PTSD	16
1.4.1 Subjective stress	16
1.4.2 Dissociation	18
1.4.3 The role of memory	20
1.4.4 The issue of causality	22
1.4.5 Summary	24
1.5 Posttrauma cognitive appraisals and PTSD	24
1.5.1 Summary	27
1.6 Risk Factors and PTSD	27
1.6.1 Individual factors	28
1.6.2 Trauma factors	31
1.6.3 Summary	32
1.7 Research aims and hypotheses	32
<b>2. Method</b>	
2.1 Overview	36
2.2 Participants	36
2.3 Procedure	39

## Table of Contents

	<b>Page number</b>
<b>2. Method cont'd.</b>	
2.4 Measures	40
2.4.1 Demographic and pre-trauma information	40
2.4.2 Symptoms of posttraumatic stress	41
2.4.3 Symptoms of depression and anxiety	42
2.4.4 Objective injury	43
2.4.5 Subjective stress	43
2.4.6 Peritraumatic dissociation	44
2.4.7 Posttrauma cognitive appraisals	45
2.4.8 Fragmented memory	46
2.5 Statistical analysis	46
<b>3. Results</b>	
3.1 Main clinical variables	47
3.1.1 Descriptive statistics	47
3.1.2 Distributional assumptions	49
3.2 Outcome measures: Data reduction	51
3.2.1 Correlation among symptom measures	51
3.2.2 Principle components analysis	53
3.3 Background risk factors	55
3.4 Peritraumatic and posttraumatic factors	57
3.4.1 Descriptive statistics	57
3.4.2 Missing data	59
3.4.3 Testing the hypotheses	61
3.4.4 Hierarchical multiple regression	62
3.4.5 Path analysis	65
3.4.6 Acute symptoms	70
<b>4. Discussion</b>	
4.1 Overview	72
4.2 Prevalence of trauma-related symptoms and PTSD	73
4.3 The influence of risk factors	74

## Table of Contents

	<b>Page number</b>
<b>4. Discussion cont'd.</b>	
4.4 Peritraumatic subjective stress and dissociation	77
4.4.1 Peritraumatic dissociation and PTSD symptoms	78
4.5 The role of memory	83
4.6 Posttraumatic cognitive appraisals	85
4.7 Limitations of the study	87
4.8 Strengths of the study	90
4.9 Implications and future directions	91
<b>5. References</b>	<b>94</b>

### Tables and Figures

Table 1	Descriptives of clinical variables	48
Tables 2.1, 2.2	Values of skewness and kurtosis	50
Tables 3.1, 3.2	Correlation between clinical variables	52
Table 4	Component loadings	54
Table 5	Correlation between risk and outcome	56
Table 6	Descriptives of predictors	58
Table 7	Correlation between predictors & trauma	60
Table 8	Correlation between risk, predictors & trauma	63
Figure 1	Path analysis for acute trauma symptoms	67
Figure 2	Path analysis for chronic trauma symptoms	68

### Appendices

Appendix A	Letter granting ethical approval
Appendix B	Participant recruitment letter
Appendix C	Participant information sheets
Appendix D	Consent forms
Appendix E	Child assessment battery
Appendix F	Parent-completed questionnaires
Appendix G	Trauma narrative coding schedule

## **Chapter 1: Introduction**

### **1.1 Overview**

This prospective study was designed to explore the influence of both peritraumatic factors and posttrauma cognitive appraisals on the development of posttraumatic stress symptoms among children who have experienced a frightening event. It will examine two of the main psychological theories proposed to explain posttraumatic stress disorder (PTSD) namely, dual representation theory (Brewin, 2001; Brewin, Dalgleish, & Joseph, 1996) and Ehlers and Clark's (2000) cognitive appraisal theory. The main empirical findings regarding risk factors for PTSD are reviewed, as well as studies investigating the influence of subjective stress and dissociation during trauma, and cognitive appraisals of subsequent posttraumatic stress symptoms. While the literature is concerned mainly with adult populations, the focus will be on those studies of adolescents and children, leading to the current research questions.

### **1.2 Posttraumatic stress disorder (PTSD)**

Posttraumatic stress disorder (PTSD) is a common reaction to stressful events. While the majority of people exposed to trauma recover in the following weeks or months, a significant minority continue to suffer symptoms. It has been estimated that more than a third of those who experience an episode of PTSD fail to recover even after many years (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

#### ***1.2.1 Clinical characteristics***

The diagnosis of PTSD, developed from clinical observation of adults, was first introduced in 1980 in the Diagnostic and Statistical Manual of the American Psychiatric Association, and with the publication of the revised edition (DSM-III-R;



American Psychiatric Association, 1987), symptoms specific to children were added. In order to meet criteria for a diagnosis of PTSD as outlined in the most recent DSM-IV (American Psychiatric Association, 1994), the individual must first witness or experience actual or threatened harm, either to himself or to someone else. Secondly, the individual must experience intense fear, helplessness, or horror which, in the case of a child, may be expressed as disorganized or agitated behaviour.

The hallmark clinical characteristics of PTSD include: re-experiencing symptoms such as intrusive and distressing recollections of the event, nightmares, and flashbacks; avoidance symptoms such as amnesia and emotional numbing; and hyperarousal symptoms such as exaggerated startle response and disturbed sleep. Although fear is often regarded as the primary affect in PTSD, a range of negative emotions are often linked with the trauma including anger, sadness, as well as shame and guilt (Lee, Scragg, & Turner, 2001). Re-experiencing symptoms typical in children include repetitive play involving the trauma, generalised nightmares, and trauma-specific re-enactment. Psychosomatic symptoms and omen formation (beliefs that omens had provided signs that the trauma would happen) may also occur (Pfefferbaum, 1997).

An interesting and often puzzling aspect of PTSD is the nature of trauma memory. On the one hand, individuals with PTSD report frequent *involuntary* intrusive memories. For example, flashbacks occur, within which features of the trauma are re-experienced in quite vivid sensory detail, and are often accompanied by high levels of physiological arousal. These re-living episodes are spontaneous, often triggered automatically by internal or external cues and may be experienced as

happening in the present. On the other hand, individuals often have difficulty *intentionally* recalling the trauma or specific aspects of it. Narratives of trauma memories are typically fragmented, poorly organised, and contain gaps in recall (e.g., Harvey & Bryant, 1999; Van der Kolk & Fisler, 1995). The factors influencing the encoding and retrieval of memory, and the role these processes play in the maintenance of PTSD, have been a focus of study in recent years. The current study aims to investigate these issues by examining the impact of factors thought to be associated both with encoding (peritraumatic subjective stress and dissociation) and with retrieval (posttraumatic appraisals) in PTSD symptomology.

While it was initially thought that children's responses to trauma were not as serious as those of adults (Meiser-Stedman, 2002), the last two decades have produced much research demonstrating that children and adolescents also suffer psychological reactions significant enough to have detrimental effects on their functioning and hence warrant a diagnosis of PTSD, and furthermore, that their presentation may differ slightly to those of adults. In their study of school children involved in a shooting, Schwarz and Kowalski (1991) reported that avoidance symptoms were more common in younger children, while re-experiencing symptoms were more common in older children. Considering the differences in cognitive and linguistic abilities, and experiential knowledge, between children and adults, and between older children and younger children, it is likely that PTSD manifests differently according to different stages of development (Salmon & Bryant, 2002). It remains to be established whether the mechanisms underlying adults' responses to trauma are the same as those in children (Meiser-Stedman, 2002).

Partial symptomology is common among children (e.g., Giaconia et al., 1995; Hubbard, Realmuto, Northwood, & Masten, 1995). For example, Garrison et al. (1995) reported that while only a minority of adolescents who experienced a hurricane met formal diagnostic criteria for PTSD, the majority of their sample reported some posttrauma symptoms. Researchers have cautioned that even partial PTSD symptomology can be disabling, and treatment should be considered even if full diagnostic criteria are not met, especially with children, given the detrimental effects of chronic PTSD on their development (Pfefferbaum, 1997; Schwarz & Kowalski, 1991).

### ***1.2.2 Prevalence***

The estimated lifetime prevalence of PTSD in the general population varies from 1% to 14% (American Psychiatric Association, 1994; Kessler et al., 1995). Among a community sample of older adolescents, almost half had experienced at least one trauma by 18 years of age, and 6% of the total sample met criteria for a lifetime diagnosis of PTSD (Giaconia et al., 1995).

Rates of posttraumatic stress among adult victims of trauma vary from 15% following admission to a burns unit (Van Loey, Maas, Faber, & Taal, 2003) to 35% following assault (Feeny, Zoellner, Fitzgibbons, & Foa, 2000). While only 12% of emergency room workers met formal diagnostic criteria for PTSD, up to 20% reported clinically significant levels of symptomology (Laposa & Alden, 2003). Studies of adult survivors of road traffic accidents (RTAs) have reported rates of PTSD in the months following the accident from 23% (Holeva & Tarrier, 2001) to 40% (Blanchard et al., 1995). One year post-RTA, as many as 20% may continue to

suffer significant posttraumatic stress (Bryant & Harvey, 1995) and 3 years post-RTA, as many as 11% remain symptomatic (Mayou, Ehlers, & Bryant, 2002).

Studies of children involved in RTAs have reported similar findings, from 25% (Ehlers, Mayou, & Bryant, 2003) to 34% (Stallard, Velleman, & Baldwin, 1998) of victims meeting diagnostic criteria for PTSD in the subsequent months. Approximately half of the adolescent survivors of a ferry sinking were diagnosed with PTSD at some point after the disaster (Yule et al., 2000) and after Hurricane Andrew, almost a third of children reported significant PTSD symptomology in the following months (Vernberg, La Greca, Silverman, & Prinstein, 1996) with a tenth reporting persistent symptoms almost a year later (La Greca, Silverman, Vernberg, & Prinstein, 1996). Higher rates have been reported after multiple or prolonged trauma and after violent trauma (e.g., Goldstein, Wampler, & Wise, 1997; Schwarz & Kowalski, 1991). For example, Hubbard et al. (1995) interviewed young adults who had suffered massive trauma as children while living in Cambodia under the Pol Pot regime; 59% of them met diagnostic criteria for lifetime PTSD. Following a school shooting, 30% of school children suffered moderate PTSD (Schwarz & Kowalski, 1991). Horowitz, Wiene, and Jekel (1995) reported that, among a community sample of adolescent girls, 67% met symptom criteria for PTSD, having experienced a surprisingly high frequency of violent events both in the community and at home. It must be noted that theirs was a high risk sample and not representative of the population prevalence of PTSD in girls. While some of the variation in reported rates is almost certainly due to differences in methodological procedures such as recruitment and assessment, it is probable that the likelihood of developing posttraumatic stress depends to some extent on the nature of the trauma.

### ***1.2.3 Co-morbidity***

To a large extent, studies of younger populations have replicated the findings with adult populations, confirming that the experience of trauma in childhood or adolescence can lead not only to PTSD but to other psychopathology as well (e.g., Bolton, O’Ryan, Udwin, Boyle, & Yule, 2000). For example, having been held hostage in their school, first- and second-graders developed a number of psychiatric disorders at a 2-month follow-up, including PTSD, major depression, specific phobia, and separation anxiety (Vila, Porche, & Mouren-Simeoni, 1999). More than a year after the Armenia earthquake, Goenjian et al. (1995) reported high rates (up to 75% of those closest to the epicentre) of co-occurring PTSD and depression among school-age children. Adolescents with a lifetime diagnosis of PTSD were significantly more likely to show widespread impairment including behavioural/emotional difficulties, academic failure, health problems, and other psychiatric disorders (Giaconia et al., 1995). In a 7-year follow-up of survivors of a bus-train collision, those with greater exposure to the crash presented with more severe psychopathology including depression, somatisation, and phobic anxiety, and were the most frequent users of mental health services (Tyano et al., 1996).

### ***1.2.4 Summary***

It is clear from an extensive body of research that PTSD is a common reaction among both adults and children exposed to traumatic events. While PTSD among children remains less well understood, there is increasing recognition of symptomatic presentations typical to younger individuals with the disorder. The evidence of co-morbidity underscores the importance of assessing symptoms in addition to the

hallmark signs of PTSD. Also, it may be more clinically useful to consider the severity of symptomology in the absence of a formal diagnosis of the disorder.

### **1.3 Psychological theories of PTSD**

Since its official recognition in the third edition of the DSM (DSM-III; American Psychiatric Association, 1980), a growing body of research has investigated the psychological and biological effects of posttraumatic stress disorder, its prevalence and its treatment. Accompanying this research is a growing number of psychological theories attempting to explain the phenomena. Among the more recent theories put forward are Brewin, Dalgleish, & Joseph's (1996) dual representation theory and Ehlers and Clark's (2000) cognitive appraisal theory of PTSD.

#### ***1.3.1 Dual representation theory***

##### *Overview*

In order to explain the clinical phenomena observed in PTSD, this cognitive theory proposes that the experience of trauma gives rise to two types of mental representation of that trauma. Firstly, situationally accessible memories (or SAMs) are so called because they are involuntarily triggered by cues similar to those in the trauma situation. Secondly, verbally accessible memories (or VAMs) can be deliberately retrieved from the autobiographical memory store and verbally communicated with others. It is argued that SAMs account for PTSD features such as flashbacks and that the creation of new memories is an important part of successful emotional processing, as they serve to inhibit further automatic activation of SAMs. Recent cognitive neuroscience data that supports the posited memory systems is briefly outlined.

### *Multiple memory systems*

It is understood that sensory input is subject to both conscious and subconscious information processing (Brewin et al., 1996) and that while conscious processing is limited by its slowness and the individual's inability to hold much information in short-term memory at any one time, subconscious processing is rapid and far more extensive. Further, the results of these different types of processing are likely to be represented differently and/or stored separately. Applying these ideas to trauma, Brewin et al. propose dual representation of trauma in memory. Firstly, situationally accessible memories (SAMs) are the result of extensive, lower-level perceptual processing of the trauma that has received little conscious attention. SAMs are automatically triggered by cues that are similar to features of the traumatic event. These cues may be either external (e.g., the sound of footsteps) or internal (e.g., thinking about the trauma). Because the SAM system does not use a verbal code, it is difficult to verbally communicate these memories with others. SAMs are quite resistant to change as they do not necessarily interact with autobiographical knowledge and cannot be easily edited or updated. Brewin et al. propose that this type of trauma representation supports the flashbacks and trauma-related dreams characteristic of PTSD and that the emotions accompanying SAMs are restricted to those experienced during the trauma or in the subsequent moments of intense arousal.

Secondly, verbally accessible memories (VAMs) are the result of conscious processing and can be deliberately retrieved and verbally communicated with others. Integrated within the autobiographical memory store, these memories are represented within a personal and temporal context, and can be edited and updated with new

information. However, the information contained in VAMs is restricted by the conscious processing that gives rise to this type of memory which is slow and limited by selective attention. Also, anxiety and high states of arousal, typical in situations of threat, are likely to further increase selective attention and decrease short-term memory capacity (Eysenck & Keane, 1990). Thus, under conditions of extreme stress, VAMs are likely to contain significant gaps. Peritraumatic dissociation, which involves an “alteration in mental state and a detachment from ongoing experience during the trauma” (Brewin, 2001, p. 384), is expected to disrupt conscious processing of information and further obstruct the creation of, and later access to, verbal memories.

#### *Emotional processing of the trauma*

Emotional processing is a largely conscious process by which the individual attempts to make sense of the traumatic experience and to accommodate the trauma information into pre-existing beliefs about the self, others, and the world. As part of this cognitive restructuring, the activation of SAMs has the function of bringing detailed sensory information about the event into consciousness. By deliberately focusing on the content of flashbacks, the individual can recode the information into a verbally accessible memory. Assuming the situation no longer poses any danger, this new memory contains information that the danger is in the past, and restores a sense of safety. Ideally, subsequent reminders of the trauma will trigger the new memory which, in turn, inhibits the individual’s fear responses, as it locates the danger in its appropriate context. In a given situation, the likelihood of the new memory being triggered - instead of the old fear memory - depends on their relative accessibility, as well as the number of features the memories have in common with



the situation. Thus, the more detail contained in verbally accessible memory, the greater the probability that SAMs and the associated fear response will be inhibited, reducing the frequency of flashbacks and associated negative affect.

### *The cognitive neuroscience*

These interactions between fear processing, situationally and verbally accessible memory, can be understood from a cognitive science perspective. The amygdala is responsible for initiating hard-wired fear reactions (e.g., triggering behavioural fight/flight responses) in the face of threat, and neuroanatomical data suggest that the hippocampus plays a key role in the extinction of fear, perhaps by inhibitory control over the amygdala (see Brewin, 2001 for a review). Sensory information may reach the amygdala either via rapid subcortical pathways, or via cortical structures such as the hippocampus. While the cortical pathways are much slower, they support much more sophisticated processing. From a review of the neuroanatomical research, Brewin (2001) infers that the hippocampal processing of trauma information results in coherent, integrated representations of conscious experience that may be deliberately recalled and verbally communicated. However, trauma information reaching the amygdala independently of the hippocampus would instead be accessed automatically by perceptual cues similar to those recorded in the fear memory. As described, flashbacks are highly perceptual (and predominantly visual in nature), under limited conscious control, and experienced in the present (i.e., lacking temporal context). Considering the strong anatomical connections between the amygdala and almost all brain regions involved in visual processing, Brewin (2001) reasons that the features of flashbacks suggest an image-based, non-hippocampally dependent form of memory.

The amygdala's functioning is generally enhanced by stress. Conversely, as stress increases, the functioning of the hippocampus is impaired resulting in more impoverished VAMs (Brewin, 2001). Dissociation at the time of trauma is an example of such impairment in memory encoding. Characterised by, for example, a subjective sense of detachment, emotional numbness, and reduced awareness of one's surroundings, dissociation reflects a disengagement from the situation which compromises ongoing conscious processing and creation of VAMs. Thus, during periods of particularly intense fear, VAMs are especially likely to be disorganised or incomplete, whereas SAMs will contain even greater sensory detail. This, in turn, increases the likelihood that trauma reminders will trigger the SAMs (and the accompanying fear), perhaps in the form of a flashback. In sum, the evidence indicating these memory systems and their relative functioning under stress provides a possible neuroanatomical basis for the VAMs and SAMs proposed by the dual representation model.

### ***1.3.2 Ehlers and Clark's cognitive theory***

#### *Overview*

Another cognitive model of PTSD has been described by Ehlers and Clark (2000) to explain both the onset and persistence of PTSD. Essentially, the model proposes that chronic symptoms occur when the individual processes the trauma in a way that leads to a sense of current threat. This sense of current threat results from excessively negative appraisals of the trauma and/or its sequelae, as well as from a disturbance in the individual's memory for the trauma. Both the appraisals of the trauma and its sequelae, and the nature of the trauma memory are influenced by the nature of cognitive processing during the trauma. The resulting perception of threat

is accompanied by symptoms of re-experiencing, hyperarousal, and negative affect. In addition, it triggers the individual to engage in various cognitive and behavioural strategies in order to reduce the perceived threat and distress. However, these strategies also serve to maintain the disorder by directly generating PTSD symptoms and/or preventing any adaptive changes in the individual's appraisals or memory of the trauma.

#### *Appraisal of the trauma and its sequelae*

According to Ehlers and Clark's (2000) model, individuals with chronic PTSD make excessively negative appraisals of the trauma and its aftermath and this leads to a sense of current threat. For example, an individual may consider the fact that the traumatic event happened in the first instance as confirmation of appraisals such as, "Bad things are always happening to me" or, "Nowhere is safe". Extreme fear, feeling overwhelmed by a perceived threat to life, or feeling a lack of control during the traumatic event may generate the belief, "I am incompetent under stress". Such appraisals exaggerate the possibility of further catastrophe and the individual may perceive a variety of places or activities as more dangerous than they really are. For example, an individual who was assaulted at night may deliberately avoid certain places that remind him of the event or avoid going out alone or after dark. These safety behaviours prevent him from disconfirming beliefs like, "The city is not safe at night". Thus, using behavioural strategies in an attempt to lessen the sense of risk and distress also serves to maintain the overgeneralised fear.

Negative appraisal of the consequences of trauma may also prolong PTSD symptoms. Involuntary intrusive memories, nightmares, and reduced concentration

are common reactions in the immediate aftermath of trauma. An individual who considers his symptoms as proof of his inability to cope with stress, or as a sign he has been irreparably damaged, is more likely to feel depressed or anxious. If the individual experiences intrusive thoughts, images, or memories of the trauma as distressing, he is more likely to try to avoid or suppress them (Steil & Ehlers, 2000). Paradoxically, active thought suppression often increases the probability of these thoughts coming to mind (Davies & Clark, 1998) and may be taken as further proof by the individual that he is “going crazy”. A traumatised individual may socially isolate himself, use alcohol, or keep constantly occupied in an effort to avoid talking or thinking about the traumatic event. It is argued that behavioural and cognitive avoidance maintains PTSD by preventing the individual from emotionally processing the trauma and integrating the trauma memory into autobiographical knowledge.

Another common maladaptive cognitive coping style is rumination, mentally going over how the event might have been prevented or how revenge might be achieved. In a similar manner to avoidance strategies, focusing on how the event might have been *different* may prevent the individual from processing the actual event as it was actually experienced and from further elaborating the trauma memory. Appraisals of others’ reactions can also play a key role in maintaining symptoms. For instance, an individual may consider others’ efforts to support him as overwhelming, or as evidence that he is incapable of coping on his own. Alternatively, the individual may judge others’ lack of help as evidence that no-one cares or understands what he went through. Such appraisals are likely to lead to feelings of depression, low self-worth or anger and to affect help-seeking behaviour.

### *Memory of the trauma*

The model explains the nature of traumatic memories (the difficulty in intentional recall and the spontaneous re-living with here-and-now qualities) with respect to the way in which the trauma is encoded and laid down in memory. Autobiographical knowledge may be accessed either by meaning-based retrieval strategies (e.g., remembering the house you grew up in), or via direct triggering by stimuli associated with the event (e.g., a tone of voice or a smell). The autobiographical knowledge base tends to be temporally and thematically structured, and it is this elaboration that enhances the former retrieval route and inhibits the latter. Ehlers and Clark (2000) propose that in persistent PTSD, the trauma memory lacks detail with respect to its context in time and place, and is insufficiently integrated with other autobiographical memories. This lack of elaboration accounts for the problems in deliberate recall, the easy involuntary triggering of trauma memories by associated cues, and the here-and-now quality of re-living episodes. Further, it is argued that there is especially strong perceptual priming for stimuli temporally associated with the traumatic event. In other words, there is a lower perceptual threshold for these cues. Thus, the stimuli that are capable of triggering trauma memories are more likely to be noticed in the first instance.

### *Cognitive processing during the trauma*

Ehlers and Clark claim that the nature of the trauma memory depends on how the individual processes or encodes the information at the time of the trauma. In particular, the authors draw on Roediger's (1990) distinction between *conceptual processing* (i.e., processing the meaning of the situation) and *data-driven processing* (i.e., processing the details such as sensory impressions). It is proposed that those

with chronic PTSD engage mainly in data-driven processing during the trauma. The resulting trauma memory consists predominantly of sensory impressions and lacks the contextual detail to be deliberately recalled and instead, is easily triggered by strong perceptual associations.

Together with data-driven processing, Ehlers and Clark (2000) briefly consider a lack of self-referential processing and dissociation as overlapping indicators of incomplete processing, likely to result in disorganised trauma memories. Firstly, the inability to process the trauma with respect to the self, and to establish it within an autobiographical context, is thought to result in poorly integrated trauma memories. Secondly, it is suggested that the derealisation, depersonalisation, and emotional numbing experienced with dissociation, either during the trauma or when reminded of it, interferes with recovery by impeding the elaboration of the trauma memory. In effect, dissociation during the trauma contributes to the formation of fragmented memories, while subsequent dissociation is considered an avoidance strategy that prevents full access to the trauma memory. These ideas are consistent with the view that dissociation is an indicator of incomplete emotional processing of the trauma (Foa & Hearst-Ikeda, 1996).

The likelihood of an individual either dissociating or engaging in mainly data-driven processing may be enhanced under certain conditions. For example, it is suggested that young children are more likely to engage in data-driven processing during abuse because of difficulty in understanding what is happening to them. Ehlers and Clark also suggest that low intellectual ability, alcohol consumption, and high states of arousal may interfere with more conceptual and organised encoding. The theory

predicts that subjective appraisals of trauma characterised by extreme fear (and high arousal) are more likely to result in poorly elaborated trauma memories and greater risk of PTSD.

#### **1.4 Peritraumatic factors and PTSD**

According to dual representation theory and cognitive appraisal theory, the quality of mental processing at the time of the trauma influences the nature of the trauma memories which, in turn, plays a key role in the development and maintenance of PTSD symptoms. Both theories predict that intense stress and high arousal during trauma will compromise conscious processing and encoding of the situation. The resulting trauma memories are likely to be less elaborated, poorly integrated, and easily triggered by stimuli associated with the trauma. Brewin (2001) further proposes that the impairment in the continuity of hippocampal functioning under stress is a key factor. Although neither theory particularly elaborates on dissociation during the trauma, it is considered, along with other theorists (e.g., Foa & Hearst-Ikeda, 1996), to be an indicator of incomplete processing and, consequentially, linked with more severe PTSD symptoms.

##### ***1.4.1 Subjective stress***

Recently, there has been increasing interest among researchers in the influence of peritraumatic factors (including physiology, affect, and cognition at the time of the trauma) on subsequent PTSD (Gershuny, Cloitre, & Otto, 2003). Subjective stress in the face of threat – for example, appraising the situation to be more frightening, overwhelming or life threatening – has been linked with subsequent PTSD among adults (Halligan, Michael, Clark, & Ehlers, 2003). There is evidence from child

studies to suggest that it may be more predictive of later psychological distress than objective injury (e.g., Ehlers et al., 2003; Stallard et al., 1998), even among those indirectly exposed to trauma (Cresswell, Holmes, & O'Connor, submitted).

In terms of appraisals made during the trauma, perceived life threat has been linked with greater severity of PTSD symptoms in adult survivors of assault (Dunmore, Clark, & Ehlers, 1999) and road traffic accidents (RTAs) (Blanchard et al., 1995; Mayou et al., 2002). Similarly, studies of adolescents and children have reported that appraising the trauma as more life threatening predicted greater PTSD symptoms among those experiencing a ferry sinking (Udwin, Boyle, Yule, Bolton, & O'Ryan, 2000), RTAs (Ehlers et al., 2003; Stallard et al., 1998), natural disasters (Garrison et al., 1995; Vernberg et al., 1996), and terrorist attack (Cresswell et al., submitted; Pfefferbaum et al., 2002).

Tyano et al. (1996) assessed young adult survivors of a traumatic bus-train collision experienced 7 years previously. Bearing in mind the limitations of such retrospective recall, acute stress and fear in the immediate aftermath of the accident were associated with several subsequent mental health measures. In the wake of the Oklahoma bombing, Pfefferbaum et al. (2002) assessed elementary school children's peritraumatic response, including perceived threat (e.g., "I thought I would die"), physiological arousal (e.g., "trembling or shaking"), and dissociation. Peritraumatic response was the strongest predictor of later PTSD symptom severity, even more important than physical exposure, relationship with direct victims, or persistent safety concerns.



### *1.4.2 Dissociation*

Particular attention has been paid to the role of peritraumatic dissociation on the development of PTSD. Dissociation involves “a disruption in the usually integrated functions of consciousness, memory, identity, or perception of the environment” (DSM-IV; American Psychiatric Association, 1994, p.477). The basic mechanism of dissociation is thought to involve the splitting off of aspects of memory or perception to avoid overwhelming anxiety (Scaer, 2001). During trauma, dissociation may protect the individual from appreciating the full meaning or horror of the event or its implications (Foa & Hearst-Ikeda, 1996). There is evidence from several prospective studies linking dissociation during or immediately after the trauma with later PTSD (Murray, Ehlers, & Mayou, 2002; Shalev, Peri, Canetti, & Schreiber, 1996). To date, the research concerns mainly adult populations, with very few exceptions (e.g., Pfefferbaum et al., 2002).

Ehlers, Mayou, and Bryant (1998) asked adults, within days of surviving a RTA, to what extent they had felt “numb and dazed”. Peritraumatic dissociation correlated with both symptom severity and diagnosis of PTSD at 1 year, and this link remained significant 3 years later (Mayou et al., 2002). However, the relationship between peritraumatic dissociation and PTSD was not independent of other peritraumatic factors such as perceived threat, or pre-trauma factors such as female gender or emotional problems. Holeva and Tarrier (2001) assessed adult RTA survivors within a month of hospital admission on a battery of personality and peritraumatic dissociation measures. Although peritraumatic dissociation, neuroticism, and psychoticism correlated with PTSD symptoms, only the personality factors were significant and independent predictors of PTSD severity at 6 months. Shalev et al.

(1996) assessed adults admitted to hospital following a range of traumas. Peritraumatic dissociation, assessed a week after trauma, predicted a diagnosis of PTSD at 6-month follow-up over and above other variables, including exposure and initial scores on the Impact of Event Scale (a measure of intrusion and avoidance symptoms).

Female Vietnam theatre nurses' recall of dissociation in response to trauma predicted PTSD symptoms over and above stress exposure and general dissociative tendencies (Tichenor, Marmar, Weiss, Metzler, & Ronfeldt, 1996). However, these findings must be interpreted with caution as participants were assessed decades after the experience of trauma. Engelhard, Van den Hout, Kindt, Arntz, & Schouten (2003) argue that such retrospective reports of dissociation are liable to be confounded by current distress, and may overestimate the relationship with PTSD. For instance, current dissociative symptoms may bias individuals to overreport dissociation at the time of the trauma (Morgan et al., 2001). In fact, Marshall and Schell Rand (2002) have questioned whether individuals can accurately recall intrapsychic experiences, and whether these memories are stable over time, concluding that, "retrospective data provide, at best, suggestive evidence of a causal connection between recalled peritraumatic dissociation and subsequent PTSD symptom severity" (Marshall & Schell Rand, 2002, p. 627).

The emerging evidence from adult studies poses the question of whether the link between peritraumatic dissociation and subsequent PTSD also holds for children and adolescents. To date, very few studies have assessed peritraumatic dissociation among children or adolescents exposed to trauma. As discussed above, Pfefferbaum

et al.'s (2002) assessment of children's peritraumatic response during a terrorist attack included one item on dissociation. Children were asked to indicate to what extent they felt "On automatic pilot", using a 5-point scale. This measure of dissociation was summed with items of fear and arousal in the analysis and this overall peritraumatic response measure was the strongest predictor of PTSD symptom severity, greater than physical exposure and persistent worry. Ehlers and Clark's (2000) model considers data-driven processing and dissociation to be overlapping indicators of incomplete processing at the time of the trauma. In their study exploring the applicability of this model to children and adolescents, Ehlers et al. (2003) attempted to measure the level of data-driven processing the children engaged in during RTAs. Specifically, participants indicated how "Muddled or confused" they felt at the time, on a 3-point scale. Presumably, the children's subjective confusion was assumed to reflect a corresponding lack of conceptual processing (i.e., a relative failure to process the *meaning* of the situation). This proxy measure of data-driven processing significantly correlated with PTSD at 3 months and showed a trend for a correlation at 6 months.

### ***1.4.3 The role of memory***

A possible explanation for the link between dissociation and PTSD is that peritraumatic dissociation influences the way the trauma is established in memory (Brewin et al, 1996; Ehlers & Clark, 2000; Foa & Hearst-Ikeda, 1996; Van der Kolk & Fisler, 1995). In other words, dissociation signals a failure to engage in "semantic processing" of the trauma (Dunmore et al., 1999), so that the individual processes the emotional and sensory impressions of the event rather than its meaning (Engelhard et al., 2003). As a result, poorly elaborated trauma memories are formed which are, in

turn, responsible for the easy triggering of re-experiencing and hyperarousal symptoms experienced in PTSD (Brewin, 2001; Ehlers & Clark, 2000). It is suggested that subsequent dissociation from trauma-related material further prevents access to the trauma memories for emotional processing, considered essential for recovery (Foa & Hearst-Ikeda, 1996).

There is quite consistent support for the proposed link between dissociative responses and greater fragmentation and disorganization of trauma narrative among adult studies (Brewin & Holmes, 2003). Harvey and Bryant (1999) reported an association between independent ratings of greater disorganisation in the trauma narrative and current dissociation among adult RTA survivors. In another study, dissociation at the time of the RTA was associated with self-reported memory fragmentation but not with independently rated narrative disorganisation (Murray et al., 2002). Among victims of assault, peritraumatic dissociation was related to both self reported memory fragmentation and independently rated disorganisation in trauma narrative, and associated with greater severity of PTSD symptoms (Halligan et al., 2003). Engelhard et al. (2003) assessed expectant women on various measures, including general dissociative tendencies and neuroticism. Those who subsequently suffered pregnancy loss were assessed a month later for peritraumatic dissociation and PTSD symptoms. They were also asked to rate their memories of pregnancy loss in terms of fragmentation, sensory impression, and emotional intensity. Consistent with previous studies, peritraumatic dissociation was strongly related to acute PTSD symptoms and the analysis of the results indicated that this relationship was mediated by self-reported memory fragmentation and thought suppression of pregnancy loss.

Kindt, Van den Hout, and Buck (2003) maintain that if peritraumatic dissociation leads to disrupted memories by interfering with information processing, then disruption in both subjectively and objectively assessed memory should be observed. However, in their series of analogue experiments, dissociation during an aversive film was consistently associated with participants' reports of memory fragmentation, but not to disturbances in objectively assessed memory performance. The authors propose an alternative view – namely that dissociation affects PTSD by interfering instead with the *embedding* of trauma memories into the autobiographical memory store. Distinguishing between the *integration* of trauma memories (i.e., the internal consistency of the memory unit itself) and the *elaboration* (i.e., the interrelatedness of the trauma memory with other memories), Kindt et al. suggest the elaborative dimension is more crucial to understanding dysfunctional processing of trauma.

#### ***1.4.4 The issue of causality***

A number of studies have found significant correlational relationships between measures of dissociation and subsequent PTSD or PTSD-related symptomology. However, Morgan et al. (2001) have urged caution in interpreting the empirical findings as indicative of a causal link between peritraumatic dissociation and PTSD, as dissociative symptoms are extremely common among healthy individuals exposed to acute, highly intense stress (e.g., Cardena & Spiegel, 1993; Engelhard et al., 2002). Furthermore, dissociative symptoms are often transient (WHO, 1992), suggesting that the *persistence* of dissociative symptoms after the trauma may be a better predictor of PTSD than initial reactions. For instance, among adult survivors of RTAs, persistent dissociation assessed at 1 month predicted PTSD severity at 6 months, over and above peritraumatic dissociation (Murray et al., 2002).

Conversely, peritraumatic dissociation may be a better predictor of acute, rather than chronic, PTSD symptoms. *Mental detachment* (described as shutting off from what was happening) during an assault was associated with onset, but not persistence, of PTSD in one study (Dunmore et al., 1999). The authors argue it is possible that peritraumatic detachment prevents the individual from making sense of the event initially, and only individuals who continue to avoid trauma-related material will suffer chronic PTSD.

Furthermore, several studies have found that initial PTSD symptoms are better predictors of later PTSD. For example, Marshall and Schell Rand (2002) assessed adult victims of community violence within days of the event, with 3- and 12-month follow-ups. Recall of peritraumatic dissociation strongly correlated with PTSD symptom severity, even after controlling for objective injury and neuroticism. However, peritraumatic dissociation was not an independent predictor of subsequent PTSD symptoms, after controlling for initial PTSD symptom severity. Similarly, Engelhard et al. (2003) replicated the basic finding of a correlation between dissociation at the time of pregnancy loss and PTSD symptoms assessed at 4 months but this relationship was no longer significant after controlling for initial symptoms at 1 month.

Marshall and Schell Rand (2002) hypothesised that both recall of peritraumatic dissociation and PTSD severity may be influenced by a third factor, such as general psychological distress. Gershuny et al. (2003) attempted to address the question as to which variables account for the relationship between dissociation during trauma and later PTSD. In their study of women exposed to a range of traumas, they reported

that fear of death and losing control during the trauma explained the relationship between peritraumatic dissociation and PTSD severity.

#### ***1.4.5 Summary***

Theoretical models of PTSD have highlighted the influence of cognitive processing at the time of the trauma on subsequent symptomology. Empirical evidence indicates that peritraumatic appraisals of the traumatic situation as more life threatening or more frightening, for example, are generally associated with later psychopathology. By and large, the research also suggests a link between PTSD and peritraumatic dissociation. Some researchers have proposed that other variables such as memory fragmentation and fear of death may mediate the observed relationship between dissociation at the time of trauma and subsequent PTSD. More research is required to elucidate this relationship and to determine whether it also holds for younger populations.

### **1.5 Posttrauma cognitive appraisals and PTSD**

The applicability of Ehlers and Clark's (2000) cognitive model to individuals who have been exposed to a range of traumas has been investigated in a number of studies. Among adults attending Accident and Emergency (A&E) following motor vehicle accidents, negative appraisal of intrusions, thought suppression, and rumination were among the major predictors of PTSD as assessed at 1 year (Ehlers et al., 1998) and 3 years posttrauma (Mayou et al., 2002). According to Steil and Ehlers (2000), the idiosyncratic meanings ascribed to the occurrence and content of intrusive phenomena following trauma significantly correlate with the distress associated with the intrusions, even after controlling for intrusion frequency, accident

severity, and general anxiety-related catastrophic cognitions. Furthermore, individuals making more dysfunctional appraisals (e.g., believing intrusions are a sign of insanity versus a normal part of recovery) were found to engage in more maladaptive strategies such as avoidance and thought suppression which in turn, related to greater PTSD severity. The authors suggest that dysfunctional meanings ascribed to both the occurrence and content of intrusions maintain PTSD by two mechanisms. Firstly, these meanings influence the distress and arousal associated with the intrusions, and secondly, they determine the extent to which the individual attempts to avoid or suppress the intrusions.

Similar findings were reported by Laposa and Alden (2003) who investigated the frequency of intrusions among emergency room workers, as well as their appraisals of and responses to the intrusions. Negative appraisal of intrusions significantly correlated with PTSD symptom severity. Also, both ruminating about intrusions and attempting to suppress them correlated with greater PTSD symptomology, even after controlling for the frequency of intrusions. Thought suppression was also found to be a key variable in the development of PTSD symptoms among women who experienced pregnancy loss (Engelhard et al., 2003). In studies of victims of RTAs, an avoidant coping style correlated with greater frequency of intrusions at 12 months after the accident and, together with whether or not the victims were currently seeking compensation, explained 41% of the variance in intrusions (Bryant & Harvey, 1995). In another RTA study, persistent rumination was one of the strongest predictors of overall PTSD severity, even after controlling for persistent dissociation (Murray et al., 2002).



To date, relatively little research has explored the cognitive processing styles of children exposed to trauma (Stallard, 2003). However, the applicability of Ehlers and Clark's cognitive model, developed from adult studies, has been assessed in a number of studies of younger populations involved in RTAs (Ehlers et al., 2003; Stallard, 2003). The emerging evidence suggests that appraisals of trauma and coping styles are influential in the development of PTSD in children, as in adults. In terms of appraising trauma sequelae, children who met criteria for PTSD 6 weeks after a RTA were significantly less likely to judge themselves as emotionally and physically recovered, and more likely to engage in more behavioural and cognitive avoidance, including trying to forget about the accident and socially withdrawing (Stallard, 2003).

A prospective, longitudinal study by Ehlers et al. (2003) reported that a number of cognitive factors predicted chronic PTSD in children attending A&E following a RTA. Negative interpretation of intrusions was measured as the response to a single item, "Do you ever feel you are going mad because you cannot forget the accident?" Two additional items, "Do you feel like other people really don't understand what you went through?" and, "Do you get angry when you think about the accident?" measured alienation from others and unfairness respectively. Together with measures of rumination and thought suppression, negative interpretation of intrusions, perceived alienation from others, and unfairness significantly predicted PTSD symptom severity at 3 months and 6 months after the RTA, over and above what was predicted by gender, objective injury, perceived threat to life, and peritraumatic fear.

### **1.5.1 Summary**

There is a relatively large body of research, mostly among adults, confirming the role of various cognitive factors in the onset and maintenance of PTSD, as predicted by Ehlers and Clark's (2000) model. Idiosyncratic appraisals of trauma and its sequelae have been found to influence the distress associated with symptoms. Further, such appraisals may determine the extent to which the individual uses maladaptive coping strategies, such as thought suppression and rumination, which further exacerbate symptoms of PTSD. While there is much less empirical evidence on younger individuals, the existing research indicates that these cognitive appraisals and coping styles are important correlates of PTSD in children and adolescents, as in adults.

## **1.6 Risk factors and PTSD**

Much of the research on trauma and PTSD attempts to better understand why some individuals suffer more than others after a stressful event (Gershuny et al., 2003). A number of individual and trauma-specific factors have been found to be associated with an increased risk of developing PTSD following trauma. Some of these factors, such as female gender, personality dimensions, and objective injury have been discussed in studies reviewed in previous sections (e.g., Engelhard et al., 2003; Marshal & Schell Rand, 2002; Mayou et al., 2002). However, the effects of other factors, such as prior experience of trauma, pre-existing emotional/behavioural difficulties, are often not included in analyses (e.g., Pfefferbaum et al., 2002). This section will review some of the relevant literature concerning first, factors related to the individual and second, factors related to the trauma itself.

### *1.6.1 Individual factors*

#### *Age*

On exposure to trauma, a child's developmental age is likely to influence his ability to appreciate risk, to make sense of what is happening, and the strategies he employs to cope with the trauma and its aftermath. However, the relationship between age and response to trauma is not a straightforward one (Vogel & Vernberg, 1993). Studies have reported mixed findings and it remains unclear whether age acts as a protective or a risk factor (Yule et al., 2000). For instance, younger children may not fully appreciate the danger they face and may be protected from extreme fear. Alternatively, they may be less able to make sense of what is happening and feel more overwhelmed.

Schwarz and Kowlaski (1991) observed age-related differences among school children suggesting that re-experiencing and arousal, but not avoidance symptoms, might increase with age. Reviewing assessments completed 1½ years to 2 years after the Buffalo Creek dam collapsed and devastated a local community, Green et al. (1991) found that the youngest group of children, aged 2-7 years old, showed fewer symptoms. Similarly, Garrison et al. (1995) reported that younger children presented with less severe PTSD in the months after hurricane Andrew. However, in both studies, the authors noted that the inability of younger children to articulate their symptoms may have influenced their findings. Indeed, the assessment of PTSD in very young children can be difficult, bearing in mind they may be unable to communicate their subjective, internal experiences, and studies have demonstrated that parents often underestimate their children's distress (Burke, Borus, Burns, Millstein, & Beasley, 1982; Scheeringa & Zeanah, 2001).

### *Gender*

According to the National Co-morbidity Study, 20% of women versus 8% of men develop PTSD following exposure to trauma (Kessler et al., 1995). Many studies of both adults and children, have found that females report significantly more PTSD symptoms than males after experiencing both natural and man-made disasters (Garrison et al., 1995; Green et al., 1991), motor vehicle accidents (Mayou et al., 2002; Stallard et al., 1998), and burns (Van Loey et al., 2003). This gender effect was also found among Cambodian adults reporting similar levels of exposure to trauma (Hubbard et al., 1995). Similarly, in Giaconia et al.'s (1995) survey of older adolescents in the community, although males and females were equally likely to have experienced serious trauma, females were six times more likely to develop PTSD. Although this gender effect is quite robust, it is unclear whether it reflects an actual difference in symptoms or a differential willingness to endorse them (Vogel & Vernberg, 1993).

### *Ethnicity*

The literature on ethnicity is inconsistent. After Hurricane Andrew, African American elementary school children reported significantly higher levels of PTSD symptoms than white and Hispanic children after controlling for exposure (La Greca, Silverman, & Wasserstein, 1998). However, another similar study failed to find any such differences (Vernberg et al., 1996). There is a paucity of literature regarding the influence of ethnicity on posttrauma reactions but some findings suggest that minorities are more likely to suffer PTSD symptoms following trauma. However, this might reflect a possible confounding with lower socioeconomic status, reduced



Sub-Department of Clinical Health Psychology  
**UNIVERSITY COLLEGE LONDON**  
GOWER STREET LONDON WC1E 6BT

General Enquiries: 020-7679 1897  
Clinical Tutor Team: 020-7679 1258  
Teaching Programme Administrator:  
020-7679 5699  
UCL Switchboard: 020-7679 2000  
Code from overseas: +44 20  
Fax: 020-7916 1989  
[www.ucl.ac.uk/clinical-health-psychology/](http://www.ucl.ac.uk/clinical-health-psychology/)

**02 August 2005**

Hi,

**As normal, could you please archive:**

**S Chin Yuen Kee      'Children & Trauma...' Vol 1.**

**S. Chin Yuen Kee      'Case Reports & Service Related Research'  
Vol. 2 Restricted Access**

**Kind Regards**

**Will Fitzmaurice  
Teaching Programme Administrator  
Sub-dept of Clinical Health Psychology**

access to support and resources in the wake of disaster, or increased levels of pre-disaster exposure to trauma (Silverman & La Greca, 2002, in press).

### *Emotional/ behavioural & educational difficulties*

Studies of adult victims have shown that those who reported emotional or psychological difficulties prior to the trauma suffered more severe PTSD after motor vehicle accidents (Ehlers et al., 1998), and physical or sexual assault (Dunmore et al., 1999). Similar findings have been found with younger populations. For example, learning difficulties and mental health problems in childhood were significantly associated with developing PTSD after experiencing the sinking of a ferry in adolescence (Udwin et al., 2000). Elementary school children rated by teachers and their peers as having better academic skills pre-trauma, reported lower levels of posttraumatic stress symptoms 3 months following a hurricane (La Greca et al., 1998). Burke et al. (1982) reported that pre-school children enrolled in a Head Start program as a result of special educational or emotional needs, were at higher risk for psychological problems after a severe flood than those enrolled due to poverty status. Experimental studies have reported that healthy individuals with greater working memory capacity are better at suppression of neutral thoughts (Brewin & Beaton, 2002) and obsessional thoughts (Brewin & Smart, 2005). These findings provide a possible explanation for the link between low intelligence, which is strongly associated with working memory, and greater risk of PTSD. Thus, it seems possible that individuals with limited emotional and cognitive resources are more likely to be overwhelmed in the face of threat (Engelhard et al., 2003).

### *Previous history of trauma*

The relationship between an individual's experience of previous trauma and his response to stress is a complex one (Morgan et al., 2001). Lifetime exposure to violent or traumatic events among adolescents correlated with more severe PTSD symptoms after a hurricane (Garrison et al., 1995). In Stallard et al.'s (1998) study of child RTA survivors, previous trauma was linked with an increased risk of being diagnosed with PTSD after the accident. Conversely, previous accident experiences have been found to predict fewer symptoms following RTAs among children in another study (Keppel-Benson, Ollendick, & Benson, 2002).

### **1.6.2 Trauma factors**

#### *Level of exposure*

Increased exposure, in terms of physical proximity to danger, was linked to the development of PTSD among children and adolescents following the Jupiter sinking (Udwin et al., 2000), a bus-train collision (Tyano et al., 1996), and Hurricane Andrew (Vernberg et al., 1996). However, Schwarz and Kowalski (1991) found no such relationship after a school shooting.

#### *Objective injury*

The evidence linking objective injury and PTSD is mixed. Severity of physical injury was found to relate to psychological distress among children following RTAs (Keppel-Benson et al., 2002). Amongst adults exposed to trauma, objective injury has been found to predict both posttrauma symptom severity (Van Loey et al., 2003) and PTSD diagnosis (Blanchard et al., 1995). On the other hand, objective injury

measures have not predicted symptom severity in other studies (e.g., Bryant & Harvey, 1995; Ehlers et al., 1998; Stallard et al., 1998)

### ***1.6.3. Summary***

Several individual and trauma factors have been identified in the literature as potential risk factors for PTSD. Female gender and pre-existing emotional, behavioural, and educational difficulties have been consistently linked with more severe posttrauma reactions. It is not clear if age mediates the impact of trauma, and there is insufficient research on the influence of ethnicity to draw firm conclusions. The evidence regarding previous trauma, level of exposure, and objective injury is contradictory and more research is needed to better understand how these factors influence the development of posttrauma symptoms. Studies investigating the role of a specific factor on the development and/or maintenance of PTSD need to control for these background risk factors to assess any unique contribution from the specific factor.

## **1.7 Research aims and hypotheses**

### ***Incidence of trauma-related symptoms and PTSD***

One of the aims of the study is to investigate the prevalence of trauma-related symptomology, including depression and anxiety, as well as the prevalence of PTSD, among a sample of 7-14 year olds attending A&E after experiencing a frightening event.



### *Risk factors and posttraumatic stress symptoms*

The literature has identified various risk factors in the development of posttraumatic stress among individuals exposed to trauma. Based on the available studies, this study aims to explore the influence of several individual and trauma-specific risk factors on the development of trauma-related symptoms among a non-referred, community sample of children and adolescents exposed to different types of trauma. Specifically, the study will investigate the affect of age, gender, ethnicity, pre-existing educational and emotional/behavioural difficulties, physical health, previous trauma, as well as objective injury, on the severity of trauma-related symptoms. Due to the mixed findings reviewed in the literature, no specific predictions are made.

### *Peritraumatic reactions and PTSD*

Ehlers and Clark's (2000) cognitive model predicts that individuals responding to trauma with extreme fear, accompanied by high arousal states, are more likely to cognitively process the trauma in a way that results in poorly elaborated trauma memories. They further specify dissociation as one indicator of such incomplete cognitive processing. Dual representation theory also predicts that extreme distress is likely to disrupt the encoding of trauma memories, and considers peritraumatic dissociation to be one mechanism that disrupts conscious processing of the trauma, causing significant gaps in recall of VAMs (Brewin et al., 1996). Both theories predict that the resulting disruption in trauma memories poses a greater risk of PTSD.

There is a growing body of research on the influence of subjective response at the time of the trauma (including physiological arousal, fright, and perceived threat to

life) on subsequent posttraumatic stress among both adults (e.g., Dunmore et al., 1999; Gershuny et al., 2003) and children (e.g., Stallard et al., 1998; Tyano et al., 1996). To my knowledge, only one study has directly assessed peritraumatic dissociation in children (Pfefferbaum et al., 2000). Based on the theory and the empirical studies available, the current study aims to contribute to the emerging child literature by exploring the effects of peritraumatic response, and peritraumatic dissociation in particular, on posttraumatic stress symptoms.

***Hypothesis 1:***

Peritraumatic responses characterised by more intense fear, helplessness, and perceived threat relate to more severe posttraumatic stress symptoms.

***Hypothesis 2:***

Specifically, peritraumatic responses characterised by greater dissociation correlate with more severe posttraumatic stress reactions.

***Fragmented memories and PTSD***

Theory proposes that the detrimental effects of peritraumatic dissociation are due to the way the trauma is established in memory (Brewin et al., 1996; Ehlers & Clark, 2000; Foa & Hearst-Ikeda, 1996; Van der Kolk & Fislser, 1995). Several preliminary adult studies suggest memory fragmentation mediates the relationship between peritraumatic response and posttraumatic stress (e.g., Engelhard et al., 2003; Halligan et al., 2003; Kindt et al., 2005). Based on theoretical predictions and these tentative findings, this study addresses the hypothesis that similar relationships exist between

peritraumatic dissociation, disrupted memory, and posttraumatic stress among the current sample of 7-14 year olds attending A&E.

***Hypothesis 3:***

Fragmented memory, as indicated by disorganised narratives of the frightening event, relates to subsequent posttraumatic symptoms and mediates the relationship between peritraumatic dissociation and subsequent posttraumatic stress symptoms.

*Cognitive appraisals and PTSD*

According to Ehlers and Clark's (2000) cognitive model, excessively negative appraisals of trauma and its sequelae maintain PTSD symptoms by contributing to a current sense of threat. Increasing evidence supports the idea that cognitive appraisals of trauma play a critical role in subsequent PTSD among both adults (e.g., Laposa & Alden, 2003; Mayou et al., 2002; Steil & Ehlers, 2000) and children (e.g., Ehlers et al., 2003; Stallard, 2003). The current study aims to test the influence of cognitive appraisals made after the frightening event on posttraumatic stress symptoms, as predicted by Ehlers and Clark's (2000) theory, among 7-14 year olds attending A&E.

***Hypothesis 4:***

More negative posttraumatic cognitive appraisals of the trauma and its sequelae relate to more severe posttraumatic stress symptoms.

## **Chapter 2: Method**

### **2.1 Overview**

This study was part of a larger investigation exploring various factors that may influence the development and maintenance of posttraumatic stress symptoms among children who have experienced a frightening event. One colleague investigated the influence of parental beliefs, including beliefs about the value of talking as a way of coping after adverse events, while another colleague observed child-parent interactions via a filmed discussion task and word puzzle. Only the child factors will be examined in this paper.

### **2.2 Participants**

Children between 7-14 years of age attending the Accident and Emergency (A&E) department following a frightening event were recruited into this prospective study. Those invited to participate were involved in a range of events which were judged to be time-limited, one-off events, including road traffic accidents (RTAs), falls, and physical assaults. Those children presenting with more chronic conditions (e.g., asthma, infections, generally feeling “unwell”) were excluded from the study. One young girl with severe epilepsy and moderate developmental disorder was also excluded.

Children who met the inclusion criteria were identified from daily hospital records. Standard information was gathered including basic demographic details, whether or not the child was admitted to hospital, as well as an objective measure of injury severity as determined by a triage priority scale. The triage rating is a standardized 6-point priority system to ensure that those attending A&E are seen in order of clinical need, as opposed

to time of arrival. A rating of 1 indicates the child requires immediate attention, while a rating of 6 describes a non-urgent case where the child needs to be seen within 4 hours.

Each child and his or her parent were sent information sheets about the study (see Appendix C) and an introductory letter (see Appendix B) explaining that a researcher would contact them by telephone shortly. When such contact information was not available from hospital records, the letter invited them to call the research team if they were interested in taking part. A judgment was made during the initial telephone conversation about whether or not the child had found the event frightening. If it was clear the child had not felt frightened during the accident, he or she was excluded from the study. In addition, children or parents who required interpreting services for the interviews were excluded from the study as such services were unavailable. If both the child and his or her parent were happy to take part, a time and venue were arranged for the initial interview.

A total of 52 children and their parents were invited to take part in the study. Of these, 42 (81%) children and their parents agreed to participate. There was no significant difference between participants and non-participants in terms of age ( $t(50) = 1.65, p = .105$ ), or gender ( $\chi^2(1; N = 52) = 1.59, p = .208$ ). However, children who were involved in assaults were significantly less likely to participate than those involved in other frightening events ( $\chi^2(1; N = 52) = 9.51, p = .006$ ). Thirty-six (86%) of the participants who were assessed initially were available at follow-up. One child/parent pair refused to meet for their 2-3 month appointment, two families did not respond to follow-up letters or phone calls, and the researchers lost contact with a fourth family after they moved

residence. At the time of submission, two additional families had not yet completed their 2-3 month assessment.

Sixty-two percent of the children interviewed were male whereas most of the parents interviewed (90%) were female. The average age of the children was 10.1 years ( $SD = 2.5$  years); 55% of participants were 10 years or younger. Sixty-one percent of participants identified themselves as white, 20% as black, 5% as Asian, and 14% as "Other". Participants' ethnicity was re-coded as either "White" (61%) or "Non-white" (39%) for the purposes of analysis. The majority of participants (90%) were not receiving special educational support at school. Twenty-one percent of children were rated by their parents as having significant emotional/behavioural problems in the months prior to the frightening event. Approximately half the parents interviewed (45%) were currently employed. One fifth (18%) of the parents had no formal qualifications, a quarter (23%) had obtained GCSEs, and a further quarter (25%) had at least a degree.

Almost half of the children (48%) were involved in road traffic accidents as pedestrians, cyclists, or passengers in a vehicle. Another 11 participants (26%) visited A&E following a fall, while 6 participants (14%) were victims of assaults, and 2 (5%) were bitten by an animal. Three participants' frightening events were coded as "Other accidents"; one child's foot was trapped in a train door, another's finger was broken in a door, and one child was accidentally shot in the eye with a pellet gun.

More than half of the children (60%) received a triage rating of “Urgent” or “Very urgent” and a further 7% received a triage rating indicating “Immediate attention”. The remaining children (33%) received a triage rating of “Standard” or “Non-urgent”. Only two children had been admitted to hospital, both following road traffic accidents.

### **2.3 Procedure**

At the beginning of the initial interview, written, informed consent was obtained from both the child and his or her parent (see Appendix D). Participants were initially assessed within one month of the frightening event (Time 1) and again 2-3 months after the frightening event (Time 2).

Ninety-three percent of participants were met in their own homes, one participant was still an inpatient at the time of his first assessment and was seen on the hospital ward, and two others travelled to University College London for their interviews. Two researchers typically met with the child and his or her parent so each could be interviewed individually and concurrently. Wherever possible, each child was interviewed without his or her parent present, to ensure that the child could complete the questionnaires and speak about the accident freely. At the 2-3 month follow-up, each child received a £5 book token as a thank-you for taking part in the study.

Approval for the study was obtained from the University London College Local Ethics Committee (see Appendix A).

## 2.4 Measures

A battery of measures was administered at the initial assessment and some of these measures were administered at the follow-up (see Appendix E for the child assessment battery). An effort was made to ensure the assessment battery was kept as brief as possible to make it practicable for the younger children. Each child interview was conducted by one of three clinical psychology trainees<sup>1</sup>.

### 2.4.1 Demographic and pre-trauma information

At the initial assessment, each parent completed a questionnaire designed to gather demographic information about the child and his or her parent. This questionnaire included items regarding the family's ethnicity, the parent's educational background and current employment status. Additional items elicited information about significant physical health problems the child may have had since birth and whether or not the child received Special Educational Needs (SEN) support at school.

As a measure of the child's previous experience of trauma, the checklist of stressful life events from the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990) was completed by each parent on behalf of the child. At the initial assessment, each parent also completed the Strengths and Difficulties questionnaire (SDQ; Goodman, 1997) on behalf of the child. The parent report version of the SDQ presents a list of attributes and

---

<sup>1</sup> The data collection for the larger investigation was shared between the three researchers. While I interviewed the majority of children, my colleagues collected a subset of the child data reported here.



asks respondents to indicate to what extent each attribute applies to the child. For the purposes of the current study, parents were asked to rate their child's behaviour over the 6 months *prior to* the frightening event (see Appendix F for the parent-completed questionnaires). The SDQ comprises several sub-scales assessing emotional difficulties, conduct problems, hyperactivity-inattention, and peer problems. These were summed to produce a total emotional/behavioural difficulties score. The SDQ has been validated on children in the 5-15 year age range (Goodman, 2001)

#### *2.4.2 Symptoms of posttraumatic stress*

The main dependent variable was the severity of posttraumatic stress symptoms as described by DSM-IV (American Psychiatric Association, 1994). The posttraumatic stress disorder section of the *Anxiety Disorders Interview Schedule for DSM-IV: Child Version* (ADIS for DSM-IV:C; Silverman & Nelles, 1988) was administered to assess the severity of posttraumatic stress symptoms at both assessment times and to diagnose posttraumatic stress disorder at the 2-3 month follow-up. The ADIS for DSM-IV:C is validated for use with 7-17 year olds.

Children also completed the 15-item Impact of Events Scale at both assessment times (IES-15; Horowitz, Wilner & Alvarez, 1979). The IES is one of the most widely used self-report measures of response to a range of traumas (Joseph, 2000) and includes two subscales measuring intrusive re-experiencing of the trauma and avoidance of trauma-related stimuli. It is a descriptive rather than a diagnostic tool whereby respondents rate how often symptoms have occurred during the last week using a 4-point scale; "Not at all" (0), "Rarely" (1), "Sometimes" (3), and "Often" (5). Although originally designed

for use with adults, the 15-item IES has been successfully administered to children from the age of 7 years (Stallard, Velleman, & Baldwin, 1999). Total scores have a possible range of 0-75 and a score of 30 or more has been advocated to indicate significant posttraumatic stress among children (Bryant & Harvey, 1995; Horowitz et al., 1979).

### *2.4.3 Symptoms of depression and anxiety*

The Birleson Depression Inventory (BDI; Birleson, 1981) and the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) were administered at initial assessment and again at follow-up to assess symptoms of depression and anxiety respectively.

The BDI comprises 18 self-report items measuring affective, cognitive, and behavioural symptoms of depression and has been used with children between 7-18 years old (Stallard et al., 1999). Respondents are asked to rate the frequency of symptoms over the previous week, using a 3-point scale from "Never" (0) to "Most of the time" (2). Individual items were summed to provide an overall depression score. Birleson, Hudson, Buchanan, and Wolff (1987) have advocated that a cut-off of 15 or more is 6 times more likely to be associated with a diagnosis of depression.

The RCMAS contains 37 self-report items (28 anxiety items and 9 social conformity items) and assesses anxiety-related symptoms. It has been validated on children between 6-19 years of age. Respondents are presented with a list of statements (e.g., "I wake up scared some of the time"; "Often I feel sick in my stomach") and are asked to indicate whether each is true (1) or false (0) for them, in general. Each child's overall

anxiety score was calculated by summing the individual items (excluding the social conformity items). Stallard, Velleman, Langsford, and Baldwin (2001) recommend that an overall cut-off of 19 or more is recommended in order to identify those experiencing significant levels of anxiety.

#### **2.4.4 Objective injury**

An objective measure of injury severity was obtained from A&E hospital records. Each child's triage rating was recorded, as well as whether or not the child was admitted to hospital. As only two children among the total sample were admitted to hospital, only the triage rating was used as a measure of objective stressor severity.

#### **2.4.5 Subjective stress**

At the initial assessment, children completed the Child Peritraumatic Response Scale (CPRS), a 21-item self-report scale developed for the study. The CPRS was designed to measure subjective stress during the frightening event and includes 17 items assessing the child's sense of fear, helplessness, horror, and perception of life threat. The scale also includes four items assessing peritraumatic dissociation, which will be discussed separately, in the following section. Children were asked to indicate to what extent they experienced various reactions at the time of the frightening event using a Likert 5-point scale ranging from "Not at all" (0) to "A lot" (4).

The children's perception of threat to life or physical safety was assessed with four items asking children how much they thought they or someone else was going to die or get hurt. Two items measured how afraid they felt at the time ("I felt frightened"; "I was

scared by how people around me acted”), while 6 items measured physiological responses (e.g., “There was a sick feeling in my tummy”; “My heart was beating fast”). There were 4 items measuring the child’s sense of helplessness (e.g., “It was out of my control”; “I felt powerless”) and 1 item measuring horror (“it was so terrible I could not believe it was happening”).

An overall measure of subjective stress was calculated by summing these 17 non-dissociation items on the CPRS. The possible range of scores was 0 to 68, with a higher score indicating greater subjective stress at the time of the frightening event. Cronbach’s alpha was .90 for this sample, indicating that the items had high internal consistency.

#### ***2.4.6 Peritraumatic dissociation***

Four items on the Child Peritraumatic Response Scale (CPRS) assessed dissociation at the time of the frightening event (e.g., “It was like I was in a dream”; “Things around me did not feel real”). Pfefferbaum et al.’s (2002) assessment of children’s peritraumatic response comprised 1 dissociation item asking to what extent they felt “On automatic pilot”. To ensure children’s understanding of this item during the assessment, it was further described as, “Going along without being aware of, or thinking about, what you are doing.” The CPRS developed for the current study included 4 peritraumatic dissociation items which had high internal consistency, reflected in a Cronbach’s alpha of .84. These items were summed together to give a peritraumatic dissociation score which was analysed separately from the non-dissociation CPRS items. The possible range of scores was 0 to 16, with higher scores indicating greater dissociation.

#### ***2.4.7 Posttrauma cognitive appraisals***

At the initial assessment, children also completed The Child Posttrauma Adaptive Scale (CPAS), another self-report scale developed for the present study. This 9-item scale measured cognitive appraisals concerning the frightening event and its sequelae. The child endorsed each statement using a Likert 5-point scale ranging from “Strongly disagree” (0) to “Strongly agree” (4).

Ehlers et al.’s (2003) appraisal measures comprised 3 items including, “Do you ever feel like you are going mad because you cannot forget the accident?”; a measure of alienation from others, “Other people do not understand what I went through”; and an indirect measure of appraisal relating to unfairness, “I get angry when I think about the frightening event”. The CPAS developed for this study utilised these 3 items from Ehlers et al., and several additional items, including 2 positive statements, “Things are back to normal now” and, “I am fully recovered now”. The original CPAS included 2 self-appraisal items regarding the child’s behaviour at the time of the trauma, “I feel upset about how I acted at the time” and, “I feel proud of the way I acted at the time”. However, reliability analysis on the 9 items indicated a low item-total correlation for the item “I am proud of the way I acted at the time” ( $r = .10$ ). This item was deleted from the final analysis and Cronbach’s alpha was .76 for the resulting 8-item scale. An overall cognitive appraisal score was calculated by summing these 8 items. The possible range of scores was 0 to 32, with a higher score indicating more negative appraisals.

#### **2.4.8 *Fragmented memory***

At the initial interview, the child was invited to describe the frightening event, both the actual event and his or her thoughts and feelings at the time. Each narrative lasted for up to 3 minutes and was audiotaped and subsequently transcribed verbatim. As a measure of fragmented memory, these narrative transcripts were coded with respect to the organisation and coherence of language and content. The coding scheme took into account disorganised or confused language, repetition, unfinished sentences, and switching of pronouns or tenses (see Appendix G). Organisation was reflected in the overall clarity of the child's account. The construction of the narrative coding schedule was guided by Harvey and Bryant's (1999) and Kindt et al.'s (2005) analysis of narratives. Ten narrative transcripts were randomly selected and coded by a second rater. At the time of coding, both raters were blind to both the participants' symptom severity scores and their PTSD status. Scores for the two raters showed relatively high agreement ( $r = .67, p < .05$ ) although there was a small difference in average ratings indicated by a lower Intraclass Correlation coefficient of .58.

#### **2.5 Statistical analysis**

Relationships between the background risk factors and trauma-related symptoms were tested using standard Pearson's correlation coefficients (for continuous variables), biserial correlations (for binary variables), and Kendall's tau (for ordinal variables). Hierarchical multiple regression analyses were used to determine possible predictors of PTSD symptom severity. Path analyses were used to further investigate the causal relationships between potential predictor variables and trauma-related distress at Time 1 and Time 2.

## Chapter 3: Results

### 3.1 Main clinical variables

#### 3.1.1 Descriptive statistics

The means and standard deviations for the main clinical variables at both assessment times are presented in Table 1.

#### *Depression and anxiety symptoms*

Within one month of the frightening event, 46% of participants' BDI scores were above the cut-off for an increased risk of a diagnosis of depression. At follow-up, 31% of participants still scored within this clinical range. A similar pattern was observed in the anxiety scores. At initial interview, 33% of the sample presented with significant levels of anxiety as indicated by their scores on the RCMAS, while 22% of participants did so at follow-up.

#### *PTSD symptoms and diagnosis*

Fifty-three percent of the participants scored above the cut-off on the IES at Time 1, indicating significant posttraumatic stress symptoms. At follow-up, 22% of participants still scored within this clinical range on the IES. As the IES is a descriptive rather than a diagnostic tool, the ADIS-C was used to diagnosis PTSD 2-3 months after the frightening event. Thirty-one percent of the participants who were assessed at Time 2 met the diagnostic criteria for PTSD.

**Table 1**

*Clinical characteristics of the total sample within 4 weeks (Time 1) and 2-3 months (Time 2) following the frightening event*

	<b>Time 1</b>	<b>Time 2</b>
<b>Clinical measure</b>	<i>N</i> = 42	<i>N</i> = 36
	Mean ( <i>SD</i> )	Mean ( <i>SD</i> )
BDI total	13.64 (5.55)	11.63 (5.76)
RCMAS total	14.02 (8.10)	11.19 (8.17)
<b>PTSD symptoms:</b>		
IES avoidance	18.26 (10.41)	10.33 (10.70)
IES intrusion	12.17 (10.83)	6.56 (8.00)
IES total	30.43 (19.83)	16.89 (17.82)
ADIS re-experiencing	1.95 (1.46)	1.14 (1.38)
ADIS avoidance	3.64 (2.05)	2.58 (1.65)
ADIS arousal	2.33 (1.63)	2.00 (1.47)
ADIS total	7.93 (4.29)	5.72 (3.99)



### ***3.1.2 Distributional assumptions***

A conservative alpha level ( $p < .01$ ) was used to evaluate the significance of skewness and kurtosis among the main clinical variables, in accordance with Tabachnick and Fidell's (2001) recommendations for small to moderate sized samples. The values of skewness and kurtosis for the main variables at Time 1 and Time 2 are shown in Tables 2.1 and Table 2.2 respectively. At follow-up, the re-experiencing subscale of the ADIS was significantly positively skewed, as was the intrusion subscale of the IES, and the IES total. Log transformation normalised the distributions of the IES intrusion subscale (Log Mean = 1.43, Log  $SD$  = 1.43) and the ADIS re-experiencing subscale (Log Mean = 0.58, Log  $SD$  = 0.60). The avoidance subscale of the IES was significantly platykurtic but as the measure of skew was not significant, no transformation was applied to this measure.

**Table 2.1***Values of skewness and kurtosis for main clinical variables at Time 1*

	Skewness	Std error	z-score	Kurtosis	Std error	z-score
BDI total	-0.51	0.37	-1.38	-0.70	0.72	-0.98
RCMAS total	-0.07	0.37	-0.20	-1.00	0.72	-1.40
IES avoidance	-0.21	0.37	-0.57	-1.03	0.72	-1.44
IES intrusion	0.74	0.37	2.03	-0.55	0.72	-0.70
IES total	0.32	0.37	0.86	-0.96	0.72	-1.35
ADIS re-experiencing	-0.11	0.37	-0.30	-1.09	0.72	-1.53
ADIS avoidance	-0.06	0.37	-0.17	1.04	0.72	1.46
ADIS arousal	0.03	0.37	0.08	-1.24	0.72	-1.73
ADIS total	0.13	0.37	0.35	-1.14	0.72	-1.59

**Table 2.2***Values of skewness and kurtosis for main clinical variables at Time 2*

	Skewness	Std error	z-score	Kurtosis	Std error	z-score
BDI total	-0.20	0.40	-0.51	-1.19	0.78	-1.53
RCMAS total	0.32	0.40	0.79	-0.93	0.78	-1.20
IES avoidance	0.84	0.40	2.11	-2.52	0.78	-3.24*
IES intrusion	1.34	0.40	3.35**	0.91	0.78	1.18
IES total	1.10	0.40	2.77*	0.50	0.78	0.64
ADIS re-experiencing	1.04	0.40	2.61*	-0.23	0.78	-0.29
ADIS avoidance	0.74	0.40	1.92	0.20	0.78	0.26
ADIS arousal	0.29	0.40	0.73	-0.69	0.78	-0.90
ADIS total	0.68	0.40	1.72	-0.50	0.78	-0.64

\* $p < .01$ , \*\* $p < .001$

## **3.2 Outcome measures: Data reduction**

### ***3.2.1 Correlation among symptom measures***

Pearson correlations between clinical measures at Time 1 and Time 2 are shown in Table 3.1 and Table 3.2 respectively. A multistage Bonferroni correction (Larzelere & Mulaik, 1977) was used to control the Type I error rate at 5% when assessing the significance of these correlations. Scores on the BDI did not correlate with those on the RCMAS or any of the ADIS or IES subscales at either assessment. Thus, symptoms of depression were analysed separately. However, at both assessments, scores on the RCMAS, ADIS, and IES subscales were significantly inter-correlated.

**Table 3.1***Correlation coefficients between main clinical variables at Time 1*

	BDI total	RCMAS total	IES avoid	IES intrusion	ADIS re-exp	ADIS avoid
RCMAS total	.20					
IES avoidance	-.05	.69*				
IES intrusion	.20	.73*	.74*			
ADIS re-exp	.11	.61*	.63*	.69*		
ADIS avoidance	-.03	.43*	.58*	.43*	.50*	
ADIS arousal	.27	.62*	.50*	.58*	.63*	.51*

\* significant,  $p < .05$ , after Bonferroni correction**Table 3.2***Correlation coefficients between main clinical variables at Time 2**(lg indicates log transformation)*

	BDI total	RCMAS total	IES avoid	lg IES intrusion	lg ADIS re-exp	ADIS avoid
RCMAS total	.26					
IES avoidance	.07	.69*				
lg IES intrusion	-.05	.61*	.76*			
lg ADIS re-exp	.00	.60*	.75*	.70*		
ADIS avoidance	-.09	.58*	.76*	.67*	.77*	
ADIS arousal	-.17	.56*	.62*	.63*	.63*	.67*

\* significant,  $p < .05$ , after Bonferroni correction

### ***3.2.2 Principle components analysis***

To produce a single measure of trauma-related stress symptoms at Time 1, the RCMAS score, and scores on the sub-scales for both ADIS and IES obtained at initial assessment were entered into a principle-component analysis. As anticipated, there was a single component solution explaining 66.2% of the variance. This analysis was repeated with scores at Time 2. Again, there was a single-component solution, accounting for 72.4% of the variance. The component loadings for both analyses are reported in Table 4. To obtain a composite trauma-related distress score for each participant at each time point, component scores were generated (Bartlett method). These standard scores provide an estimate of the scores participants would have obtained if the component (trauma-related distress) had been measured directly. These composite scores, derived from the anxiety and PTSD symptom scores at each time point, were used as measures of trauma symptom severity.

**Table 4***Component loadings from principle-component analysis**(lg indicates log transformation)*

<b>Measure (Time 1)</b>	<b>Loading</b>	<b>Measure (Time 2)</b>	<b>Loading</b>
IES intrusion	.87	IES avoidance	.90
IES avoidance	.86	ADIS avoidance	.88
RCMAS total	.84	lg ADIS re-experiencing	.88
ADIS re-experiencing	.83	lg IES intrusion	.86
ADIS arousal	.79	ADIS arousal	.80
ADIS avoidance	.69	RCMAS total	.79

### 3.3 Background risk factors

Bivariate correlations were calculated to examine the relationship between risk factors, trauma symptom severity, and depression, at both assessment time points. These correlations are presented in Table 5. Again, a multistage Bonferroni correction was used to control the Type I error rate.

None of the pre-trauma and trauma-specific risk factors were found to significantly correlate with symptoms of depression reported either at initial assessment or at follow-up. However, previous emotional/behavioural difficulties significantly correlated with trauma-related symptoms at Time 1 and at Time 2. In other words, children whose parents rated them as having more emotional/behavioural difficulties in the months prior to the trauma reported significantly more trauma symptoms. Previous trauma was also significantly correlated with severity of trauma-related symptoms at Time 2 but not at Time 1. The negative correlation between age and trauma-related symptoms at Time 2 failed to reach significance ( $p = .07$ ), but suggests that younger children were more likely to suffer trauma-related symptoms at follow-up. No significant associations were found between severity of trauma symptoms and gender, ethnicity, learning difficulties, the presence of physical health problems, or the measure of objective injury.

**Table 5**

*Correlation coefficients between depression and trauma symptoms and background risk factors within 4 weeks (Time 1) and 2-3 months (Time 2) after the frightening event*

	Depression		Trauma symptoms	
	Time 1	Time 2	Time 1	Time 2
<b>Pre-trauma variables:</b>				
Age	.07	-.11	-.11	-.31
Female gender <sup>1</sup>	.27	-.14	.20	.14
Ethnicity <sup>1</sup>	.02	.06	.17	.11
Learning difficulties <sup>1</sup>	-.24	.00	.05	.04
Emotional/behavioural problems	.15	.11	.48*	.52*
Physical health problems	-.13	.09	.18	.24
Previous trauma	.08	.06	.30	.50*
<b>Trauma variables:</b>				
Objective injury severity <sup>2</sup>	-.30	-.01	.08	.14

\* significant,  $p < .05$ , after Bonferroni correction

<sup>1</sup>Point-biserial correlation coefficient reported

<sup>2</sup>Kendall's tau correlation coefficient reported



### **3.4 Peritraumatic and posttraumatic factors**

#### **3.4.1 Descriptive statistics**

Descriptive statistics for the peritraumatic and posttraumatic variables, assessed within 4 weeks of the frightening event, are displayed in Table 6. Owing to late amendments to the items included in the CPAS questionnaire, three children did not complete the full list of cognitive appraisal items ( $N = 39$ ). With respect to the trauma narratives, twelve were unavailable for transcription and coding analysis ( $N = 30$ ).

In terms of peritraumatic response, 28 children (67%) rated the item “I felt frightened” to the extent, “Quite a bit – I felt terrible” or, “A lot – I could hardly stand it”. Twenty-five children (59%) similarly rated the item, “It was so terrible, I could not believe it was happening.” All of the children believed they were going to be hurt and 21 children (50%) believed to some extent that they might die. Thirty-four children (81%) endorsed at least one peritraumatic dissociation item and 25 children (60%) rated at least one dissociation item, “Quite a bit – I felt terrible” or, “A lot – I could hardly stand it.” The most frequently endorsed dissociation item was, “It was like I was in a dream” (60%).

With respect to the organisation of trauma narratives, the majority (73%) of the children’s narratives were rated as, “Very organised” or, “Mostly organised.” When asked about their appraisals of the consequences of the trauma, most of the children agreed they were, “Fully recovered” (67%) and, “Back to normal” (71%). However, 9 children (21%) thought they were, “Going crazy” and 7 children (17%) believed they would, “Never go back to normal again.”

**Table 6***Predictor variables assessed within 4 weeks of frightening event*

<b>Descriptive statistics</b>				
	<b>N</b>	<b>Mean (SD)</b>	<b>Observed range</b>	<b>Possible range</b>
<b>Peritraumatic factors:</b>				
Subjective stress	42	35.14 (16.04)	9 - 65	0 - 68
Dissociation	42	6.55 (5.28)	0 - 16	0 - 16
<b>Posttraumatic factors:</b>				
Narrative organisation	30	2.03 (0.72)	1 - 3	1 - 4
Cognitive appraisals	39	12.49 (6.77)	3 - 25	0 - 32

### ***3.4.2 Missing data***

Due to the unavailability of 6 participants at Time 2 and missing data from the Strengths and Difficulties Questionnaire (SDQ) and the Child Posttrauma Adaptive Scale (CPAS) at Time 1, there were only 30 participants with complete data at Time 2. A missing data analysis did not reveal any systematic pattern in the missing values and it was therefore decided to use the Expectation Maximization (EM) method in SPSS MVA (Missing Values Analysis: SPSS Inc., 1997) to estimate the missing values, in order to maximise the power of the regression analyses reported below. Due to the large number of missing narratives, the restricted observed range of this measure (1-3), and the fact that narrative organisation scores did not correlate with any other variables, it was decided not to estimate missing values for narrative organisation. Table 7 presents the zero-order correlations between the predictors and trauma symptoms, with and without the estimated missing values for those measures with missing data. Inspection of the table reveals that there is little change in the values of the coefficients or in the pattern of correlations following missing data estimation.

**Table 7**

*Correlation coefficients between predictor variables and trauma symptoms within 4 weeks (Time 1) and 2-3 months (Time 2) after the frightening event*

	Trauma symptom severity <sup>1</sup>	
	Time 1	Time 2
<b>Peritraumatic variables:</b>		
Subjective stress	.84*	.55* (.55*)
Dissociation	.64*	.40* (.43*)
<b>Posttraumatic variables:</b>		
Narrative organisation <sup>2</sup>	-.01	.01 (.09)
Cognitive appraisals	.77* (.75*)	.60* (.61*)

\* significant,  $p < .05$ , after Bonferroni correction

<sup>1</sup> correlation coefficients in brackets based on data including estimated missing values

<sup>2</sup> Kendall's tau correlation coefficient reported

### ***3.4.3 Testing the hypotheses***

Firstly, as predicted, subjective stress correlated with trauma symptoms at Time 1 and Time 2. The correlations indicate that children reporting greater fear, perceived threat, and physiological arousal during the trauma, also reported more trauma symptoms within 4 weeks and 2-3 months after the trauma. Secondly, dissociation also correlated significantly with trauma symptoms at both time points, although less strongly than subjective stress. Children describing greater dissociation at the time of the trauma also reported more severe trauma symptoms at Time 1 and Time 2. In addition, subjective stress at the time of the trauma significantly correlated with peritraumatic dissociation ( $r = .68$ ). Thirdly, as predicted, the measure of posttrauma cognitive appraisal was significantly correlated with reported trauma symptoms at both time points, so that children making more negative posttrauma appraisals were significantly more likely to report more severe trauma symptoms. As can be seen in Table 7, the relationships between these predictor variables and trauma symptoms were stronger at Time 1 than at Time 2.

Finally, contrary to predictions, memory fragmentation (as indexed by trauma narrative disorganisation) was not significantly associated with either peritraumatic dissociation ( $r = .13$ ), or trauma symptom severity at either time point (see Table 7). For this reason, no further analysis was carried out on the data from the trauma narratives.

#### ***3.4.4 Hierarchical multiple regression***

Hierarchical multiple regression analyses was used to determine whether peritraumatic and posttraumatic factors predicted trauma symptom severity, over and above what could be predicted by background risk factors. The full correlation matrix for the predictors and outcome variables used in following analyses is presented in Table 8. In the first analysis, trauma symptom severity at Time 1 (referred to as acute symptoms) was the dependent variable (DV). This analysis was repeated with trauma symptom severity at Time 2 (referred to as chronic symptoms) as the DV. Only those risk factors that significantly correlated with trauma-related symptom severity at each time point were entered into regression analysis.

**Table 8**

*Correlation coefficients between risk factors, predictors, and trauma symptoms with estimated missing values (all N = 42)*

	1	2	3	4	5	6
1. SDQ <sup>a</sup>						
2. Previous trauma	.28					
3. Dissociation	.26	.03				
4. Subjective stress	.33	.06	.68*			
5. Posttrauma appraisals	.41	.26	.43*	.65*		
6. Trauma at Time 1	.49*	.30	.64*	.84*	.75*	
7. Trauma at Time 2	.52*	.47*	.43*	.55*	.61*	.69*

<sup>a</sup> SDQ – measure of emotional/behavioural problems

\* significant,  $p < .05$ , after Bonferroni correction

The first analysis tested whether subjective stress and dissociation at the time of the trauma, and cognitive appraisals made after the trauma, predicted acute trauma symptoms, over and above background risk factors. The measure of emotional/behavioural difficulties (the only risk factor with a significant zero-order correlation with trauma symptoms at Time 1) was entered into the first step of the analysis. This pre-trauma risk factor accounted for 24% of the variability ( $R^2 = .239$ ,  $F(1,40) = 12.56$ ,  $p = .001$ ). In the second step, dissociation and subjective stress were entered into the analysis. The peritraumatic variables significantly improved the prediction ( $R^2$  change = .520,  $F(2,38) = 40.93$ ,  $p < .001$ ) and the model accounted for 76% of the variability in acute trauma symptoms. Posttrauma cognitive appraisal was entered into the third and final step of the analysis and led to a small but significant improvement in the prediction of acute trauma symptoms ( $R^2$  change = .050,  $F(1,37) = 9.66$ ,  $p = .004$ ). Thus, the final model accounted for 81% of the variability in acute trauma symptoms, and both peritraumatic subjective stress ( $\beta = .50$ ,  $t = 4.27$ ,  $p < .001$ ) and posttrauma cognitive appraisal ( $\beta = .31$ ,  $t = 3.11$ ,  $p = .004$ ) independently predicted trauma symptoms at Time 1, but dissociation did not ( $\beta = .12$ ,  $t = 1.24$ ,  $p = .223$ ). Emotional/behavioural difficulties was also an independent predictor of acute trauma symptoms ( $\beta = .16$ ,  $t = 2.06$ ,  $p = .047$ ).

This regression analysis was repeated, with trauma symptoms at Time 2 as the DV. Previous trauma and emotional/behavioural difficulties (the two risk factors with significant zero-order correlations with trauma symptoms at Time 2) were entered into the first step of the analysis. These pre-trauma risk factors accounted for 38% of the variability ( $R^2 = .384$ ,  $F(2,39) = 12.165$ ,  $p < .001$ ). In the second step, dissociation and

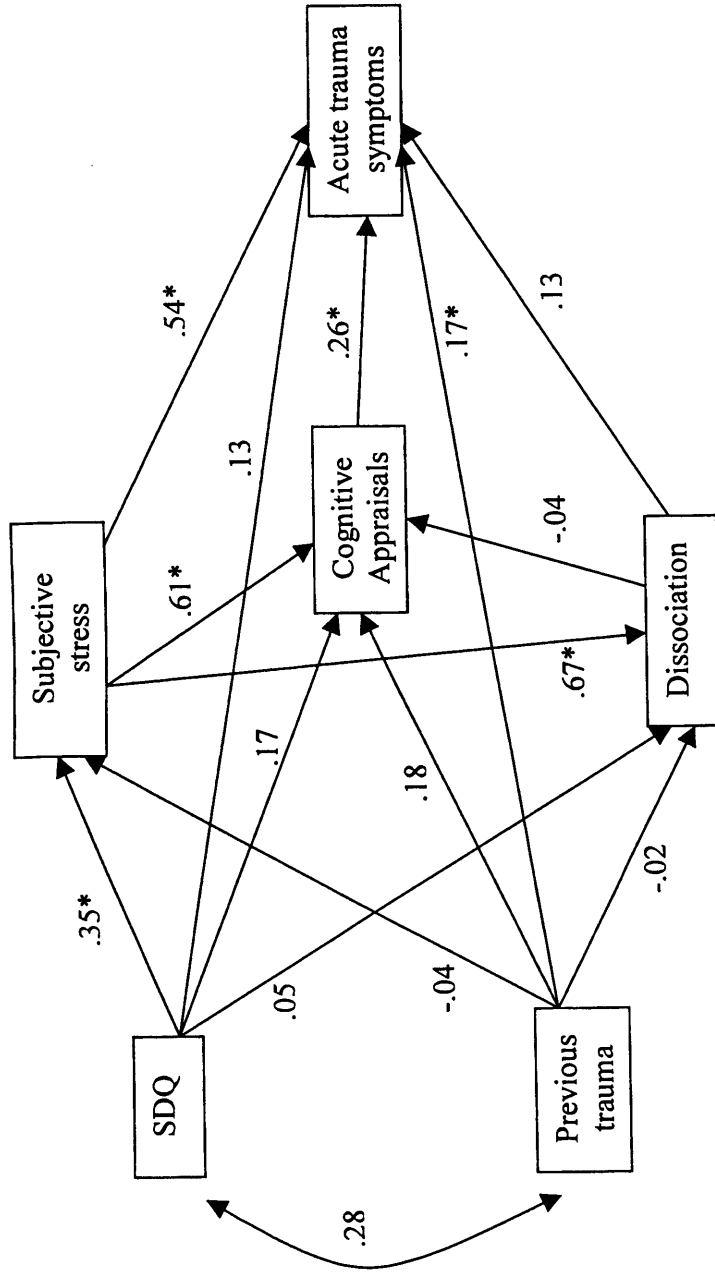


subjective stress significantly improved the prediction of chronic trauma symptoms ( $R^2$  change = .178,  $F(2,37) = 7.54$ ,  $p = .002$ ) and this model accounted for 58% of the variability in trauma symptoms at Time 2. Posttrauma cognitive appraisals, entered in the third step, failed to significantly improve the prediction ( $R^2$  change = .026,  $F(1,36) = 2.24$ ,  $p = .143$ ). This final model accounted for 59% of the variability in chronic trauma symptoms, and previous trauma was the only variable independently predicting trauma symptoms at Time 2 ( $\beta = .34$ ,  $t = 2.96$ ,  $p = .005$ ).

#### **3.4.5 Path analysis**

Path analysis was used to further explore the relationships between pre-, peri- and post-trauma factors and subsequent trauma symptoms. Two models were constructed; the first for trauma symptoms within 4 weeks (acute symptoms) and the second for trauma symptoms 2-3 months after the event (chronic symptoms). While previous trauma significantly correlated with trauma symptoms at Time 2, the zero-order correlation between previous trauma and trauma symptoms at Time 1 was only marginally significant prior to Bonferroni correction ( $r = .30$ ,  $p = .051$ ). For this reason, it was not included in the first regression analysis described above. However, for the purposes of comparison between the two models, previous trauma was included in both path analyses. Thus, in both models, emotional/behavioural difficulties and previous trauma were entered as exogenous variables, and dissociation, subjective stress, cognitive appraisal, and trauma symptoms as endogenous variables.

The direct effects were estimated via four multiple regressions: (1) subjective stress onto previous trauma and emotional/behavioural difficulties, (2) dissociation onto previous trauma, emotional/behavioural difficulties, and subjective stress, (3) cognitive appraisals onto previous trauma, emotional/behavioural difficulties, subjective stress, and dissociation and, (4) trauma symptoms (either at Time 1 or Time 2) onto previous trauma, emotional/behavioural difficulties, subjective stress, dissociation, and cognitive appraisals. The two path models are shown in Figure 1 (Time 1: acute symptoms) and Figure 2 (Time 2: chronic symptoms).

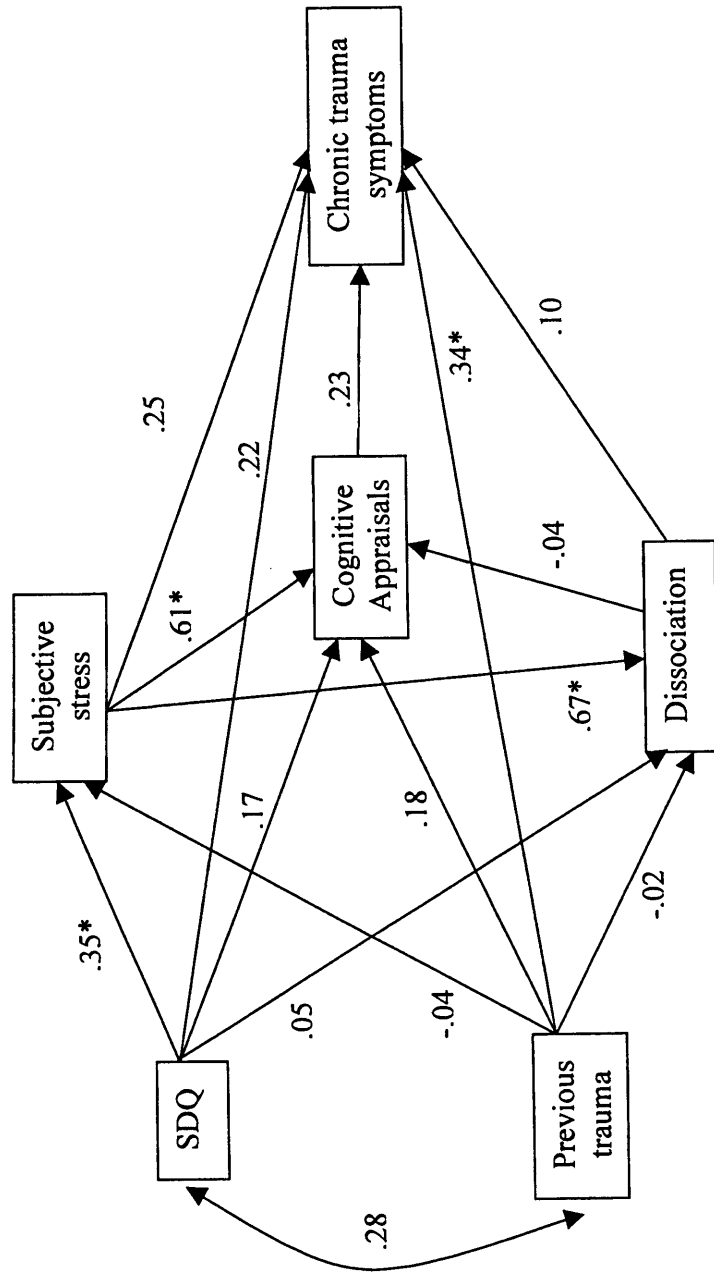


**Figure 1**

Path analysis and beta coefficients for predictors of acute trauma symptoms.

SDQ – measure of emotional/behavioural difficulty

\*  $p < .05$



**Figure 2**  
 Path analysis and beta coefficients for predictors of chronic trauma symptoms.

SDQ – measure of emotional/behavioural difficulty

\*  $p < .05$

The following tentative conclusions may be drawn from the first path analysis regarding the links between predictors and acute trauma symptoms. Considering first the background risk factors, there was a weak but significant relationship between previous trauma and acute trauma symptoms. The relationship between emotional/behavioural difficulties and acute trauma symptoms was almost entirely mediated by subjective stress. Thus, emotional/behavioural difficulties predicted subjective stress during the trauma, which in turn, predicted acute symptoms. Subjective stress during the trauma predicted peritraumatic dissociation and posttrauma cognitive appraisals and it was also the strongest predictor of acute symptoms, followed by posttrauma cognitive appraisals. Finally, the direct link between dissociation and acute symptoms was not significant, suggesting that the apparent relationship (zero-order correlation) between these variables is spurious and can be attributed to a common antecedent; the strong relationships between subjective stress and dissociation, and between subjective stress and acute trauma symptoms.

In the second path analysis, the only significant direct link to trauma symptoms at Time 2 was that from previous trauma. The links between subjective stress and dissociation, and between subjective stress and cognitive appraisal, were again significant. However, the links between subjective stress and chronic symptoms, and between cognitive appraisals and chronic symptoms, were no longer significant. There was also weak evidence ( $p = .08$ ) for a direct link between emotional/behavioural difficulties and trauma symptoms at Time 2.

A comparison between the two models reveals the path linking subjective stress to trauma symptoms is considerably weaker in the second model, while the paths linking emotional/behavioural difficulties and previous trauma to trauma symptoms are stronger in the second model (although only the latter is significant). The path coefficient for the link between cognitive appraisals to trauma symptoms is similar in magnitude in both models (but not significant in the second model). Finally, there is little change in the magnitude of the weak link between dissociation and trauma symptoms.

#### ***3.4.6 Acute symptoms***

While the relationship between acute depressive symptoms (i.e. those assessed within 4 weeks of the trauma) and trauma symptoms at Time 2 was insignificant ( $r = .01$ ), acute trauma symptoms was the measure most strongly correlated with trauma symptoms reported at 2-3 months ( $r = .69, p < .001$ ). Additional analyses were carried out to test whether peritraumatic factors and posttrauma cognitive appraisals significantly predicted the variability in trauma symptoms at Time 2 after controlling for trauma symptoms at Time 1.

A regression analysis was carried out with trauma symptoms at Time 2 as the DV. In the first step, emotional/behavioural difficulties, previous trauma, and acute trauma symptoms were entered. Background risk factors and acute symptoms together accounted for 58% of the variability in trauma symptoms at Time 2 ( $R^2 = .576, F(3,38) = 17.18, p < .001$ ). In the second step, subjective stress and dissociation during the trauma, and cognitive appraisals posttrauma were entered. These variables did not significantly improve the prediction ( $R^2$  change = .021,  $F$  change (3,35) = .61,  $p = .616$ ).

In the final model, 60% of the variance was accounted for and only previous trauma independently predicted trauma symptoms at Time 2 ( $\beta = .30$ ,  $t = 2.44$ ,  $p = .020$ ). Measures of subjective stress and dissociation during the trauma, and cognitive appraisals after the trauma failed to predict any unique variance in trauma symptoms at Time 2 after controlling for acute symptoms and background risk factors.

The results from this last regression analysis must be interpreted with particular caution. Given the strong correlations between a number of the predictor variables (notably between cognitive appraisals and acute trauma symptoms, and between subjective stress and acute trauma symptoms) it was likely that multicollinearity was affecting the model. Variance inflation factor (VIF) values for subjective stress (4.44), cognitive appraisal (2.38), and trauma symptoms at Time 1 (6.02) suggested that this was the case. The presence of collinearity tends to inflate error terms, and makes it difficult to determine the relative importance of individual predictors (Field, 2000; Tabachnick & Fidell, 2001).

## **Chapter 4: Discussion**

### **4.1 Overview**

The aims of the study were first, to determine the severity of trauma-related symptoms and the prevalence of PTSD among a community sample of children attending A&E after a frightening event. Second, the study investigated the influence of several individual and trauma-specific characteristics thought to increase the risk of PTSD following exposure to trauma. Third, the study tested several hypotheses relating to the role of peritraumatic and posttraumatic factors on the development of trauma symptoms. This study builds on the emerging literature regarding the influence of peritraumatic reactions and posttrauma cognitive appraisals among children and is the first to investigate the specific influence of peritraumatic dissociation in children.

In this discussion section, the current study's findings will be appraised within the context of the theories of PTSD and the body of available research. The prevalence of trauma-related symptoms and their relationship with background risk factors will be reviewed. Also, the findings regarding the relative influences of peritraumatic factors and posttrauma cognitive appraisals will be examined. Finally, the strengths and limitations of the research will be discussed and implications for future research and clinical practice are considered.

Two to three months after experiencing a frightening event, a significant minority of children in this study reported clinical levels of depression and reported symptoms sufficient to meet diagnostic criteria for PTSD. Subjective stress and dissociation at the time of the trauma, and negative cognitive appraisals made after the trauma, correlated



with chronic trauma symptoms. These predictors, together with previous trauma and emotional/behavioural difficulties prior to the trauma, accounted for 59% of the variability in trauma symptoms at 2-3 months. However, only previous trauma independently predicted chronic trauma symptoms. Each of these findings will be discussed in detail in the sections that follow.

#### **4.2 Prevalence of trauma-related symptoms and PTSD**

Among this community sample of 7-14 year olds attending A&E, the most frequent frightening event was a RTA, experienced by almost half of the participants. A third of those followed-up at 2-3 months reported symptoms significant enough to meet criteria for PTSD, as indicated by clinician-administered interviews. The study's inclusion criteria specified only time-limited events (similar to Terr's (1991) distinction between "single-blow" versus "long-standing" traumas), which were experienced as frightening by the child. However, considering that the children in the study had experienced a range of fairly commonplace accidents, it is worrying that as many as one in three suffered symptoms sufficient to warrant a diagnosis of PTSD in the months immediately afterwards. The prevalence rate of PTSD in this group is similar to those reported in other studies of children and adolescents involved exclusively in RTAs who were assessed within 3 months after the accident (25%, Ehlers et al., 2003; 34%, Stallard et al., 1998). As might be expected, longer-term studies assessing children between 6 and 9 months post-RTA report lower rates of PTSD (18%; Ehlers et al., 2003; 14%, Keppel-Benson et al., 2002), indicating considerable improvement in functioning in the following months. It must be noted that children and adolescents visiting A&E after an assault were significantly less likely to participate in the study. One might speculate that

the prevalence of PTSD may have been higher than 31% had more victims of assaults been included in the sample, as there is some indication that violent events are linked with increased rates of PTSD (e.g., Goldstein et al., 1997).

It is common, following a traumatic event, for children and adolescents to present with psychological symptoms other than PTSD (Giaconia et al., 1995), with studies reporting depressive disorder a frequent outcome following trauma exposure (Halligan et al., 2003; Shalev et al., 1998). The current study assessed for symptoms of depression without attempting to establish a diagnosis. In addition to the re-experiencing, avoidance, and hyperarousal symptoms that characterize PTSD, a third of the children reported clinically significant levels of depression up to 3 months after experiencing a frightening event.

#### **4.3 The influence of risk factors**

Although significant levels of depression were reported by the children, none of the background risk factors significantly correlated with reported symptoms of depression. These findings may be surprising, particularly in the case of gender, as it is generally found that girls score higher than boys on self report measures of depression, as well as anxiety and stress reactions, in the aftermath of trauma (Yule, 1996). While some trauma studies have found no gender differences (e.g. Ehlers et al., 2003), the majority report a fairly consistent link between female gender and more severe trauma symptomology (Giaconia et al., 1995; Green et al., 1991; Stallard et al., 1998). In the current sample, however, gender did not predict trauma severity. It is possible that factors such as gender differences are more likely to emerge in studies with larger

samples (Vogel & Vernberg, 1993). Similarly, age did not predict severity of trauma symptoms after a frightening event. The literature on the effects of age is mixed (Yule et al., 2000) and while the current data suggests that younger children reported more trauma symptoms, this was not a significant finding. While the participant group was relatively ethnically diverse, there was no relationship between ethnicity and trauma symptom severity among this sample of children.

Children rated by their parents as having had more emotional/behavioural difficulties in the months prior to the frightening event reported significantly more trauma symptoms afterwards. This result is in line with other studies of adults (Ehlers et al., 1998) and children (Burke et al., 1982) linking previous emotional difficulties with more severe reactions after trauma. In fact, previous emotional/behavioural difficulties independently predicted acute trauma symptoms after accounting for peritraumatic stress and dissociation, posttrauma cognitive appraisals, and previous trauma among the current sample.

Contrary to previous reports that better academic abilities may serve as a protective factor following disaster (La Greca et al., 1998; Udwin et al., 2000), special educational needs (SEN) status did not predict more severe trauma reactions. Experimental studies (Brewin & Beaton, 2002; Brewin & Smart, 2005) have proposed that working memory and fluid intelligence may be key factors in the ability to effectively suppress unwanted thoughts. Thus, aspects of intelligence or specific cognitive abilities, rather than intelligence per se, may be better predictors of PTSD due to correlation with individual differences in ability to inhibit intrusive phenomena (Brewin & Beaton, 2002). On

reflection, it is likely that SEN status was too crude a proxy measure of intelligence to predict greater severity of trauma symptoms following a frightening event. The experience of previous trauma predicted more severe reactions 2-3 months posttrauma, similar to studies of children who have experienced natural disasters (Garrison et al., 1995) and RTAs (Stallard et al., 1998). In fact, previous trauma independently predicted trauma symptoms at 2-3 months after controlling for peritraumatic stress and dissociation, posttrauma cognitive appraisals, and emotional/behavioural difficulties.

Finally, objective injury was unrelated to trauma symptom severity in the current sample. The findings of previous studies on children involved in RTAs have been mixed, with some reports that severity of injury relates to later psychological distress (Keppel-Benson et al., 2002) and others finding no such link (Ehlers et al., 1998; Ehlers et al., 2003; Stallard et al., 1998). The children and adolescents involved in the study visited A&E after experiencing a broad range of accidents. While triage rating was recorded as an overall indication of objective injury, it became apparent in the course of the study that many A&E professionals routinely aim to attend to children as a matter of priority. This may explain why triage rating, used in the current study as a rather global measure of physical injury, failed to predict trauma severity. Also, the majority of the children were not severely injured as a result of their frightening event and it is possible that the restricted range of physical injury among the children partly accounted for the finding that objective injury did not correlate with later trauma symptoms. On the other hand, it is likely that objective measures of severity are less important than subjective measures of severity in predicting the individuals' psychological responses to trauma. Harvey and Bryant (1995) investigated adult survivors of RTAs and reported that

subjective measures of trauma severity, but not objective measures of injury, predicted posttraumatic stress symptoms. Further, subjective and objective measures of accident severity were poorly correlated with each other.

#### **4.4 Peritraumatic subjective stress and dissociation**

Consistent with previous children's studies emphasising the importance of subjective stress over physical exposure (e.g., Pfefferbaum et al., 2002; Stallard et al., 1998), the current study found that children's subjective experiences of the trauma as more frightening and life threatening, were more strongly associated with subsequent trauma symptoms than the measure of objective injury. When other predictors and pre-trauma risk factors were considered, subjective stress independently predicted acute, but not chronic, trauma symptoms. Children reporting greater physiological arousal, fear, and perceived threat also reported more dissociation during the frightening event. Commenting on the relationship between dissociation and physiological hyperarousal, Engelhard et al. (2003) acknowledge that, "although the concept of peritraumatic dissociation is poorly defined, taken together, the cluster of symptoms might be conceived of as a marker for the individual's inability to tolerate acute and later arousal and intrusions" (p.74). Peritraumatic dissociation was commonly reported by the children, with the majority (60%) endorsing at least one item of dissociation "Quite a bit" or, "A lot." To my knowledge, no studies have reported prevalence of peritraumatic dissociation in children experiencing trauma. However, this rate is comparable to 70% of women reporting dissociation immediately after pregnancy loss (Engelhard et al., 2003).

This study also replicated the link between peritraumatic dissociation and later trauma symptoms reported in numerous studies of adults (e.g., Holeva & Tarrrier, 2001; Shalev et al., 1996). The finding that dissociation during the trauma was more strongly associated with acute trauma symptoms than with chronic symptoms is also consistent with other studies (Dunmore et al., 1999; Ehlers et al., 2003; Engelhard et al., 2003; Murray et al., 2002). Some authors have emphasised how commonly dissociative symptoms occur among healthy individuals when they are exposed to acute, intense stress (Engelhard et al., 2002; Morgan et al., 2001). Also, given that dissociative symptoms are often transient (WHO, 1992), it has been suggested that persistent dissociation, rather than peritraumatic dissociation, is a better indicator of those individuals vulnerable to chronic PTSD (e.g., Murray et al., 2002). The current finding that peritraumatic dissociation was more strongly correlated with trauma symptoms within 4 weeks than those at 2-3 months might be interpreted as support for the notion that peritraumatic dissociation is a better predictor of shorter-term adjustment and may be associated with onset, rather than the maintenance, of PTSD.

#### ***4.4.1 Peritraumatic dissociation and PTSD symptoms***

Closer examination of previous studies' findings reveals that, despite a correlational relationship between the two variables, peritraumatic dissociation failed to independently predict PTSD severity after accounting for perceived life threat, gender, emotional problems (Ehlers et al., 1998; Mayou et al., 2002), personality factors (Holeva & Tarrrier, 2001), and initial PTSD symptoms (Engelhard et al., 2003; Marshall & Schell Rand, 2002). Similarly, dissociation during the trauma did not independently predict trauma severity among the current sample of children when subjective stress, cognitive

appraisal, previous trauma, and emotional/behavioural difficulties were controlled for. In fact, path analysis demonstrated that the link between peritraumatic dissociation and later trauma-related distress was eliminated after accounting for subjective stress at the time of the trauma. On the one hand, it is possible that potential overlap between measures of subjective stress and dissociation makes it difficult to distinguish the independent effects of each on subsequent trauma symptoms. On the other hand, it may be argued that dissociation does not, in fact, predict PTSD symptoms and links between the two are spurious.

It is possible that the failure to find a more robust relationship between peritraumatic dissociation and later trauma symptoms is due to the inaccuracy and/or unreliability of memory for intrapsychic experiences. Studies on adults have demonstrated that reports of peritraumatic dissociation (Marshall & Schell Rand, 2002) and emotion (Zoeller, Sacks, & Foa, 2001) during trauma are not stable over time. A review of the research has led some researchers to conclude that, “individuals’ retrospective reports about negative events that they experienced in the past are far from accurate. Much the same is true when people report about past mental states or symptoms” (Candel & Merckelbach, 2004, p.46). There have been few studies investigating the characteristics of children’s memory for trauma (Berliner, Hyman, Thomas, & Fitzgerald, 2003) and to my knowledge, none have focused on the accuracy of children’s recall of peritraumatic dissociation. Children’s reports in the current study may have underestimated the degree of dissociation during an event that occurred weeks previously. Another possibility is that some of the younger children misunderstood certain items assessing dissociation such as, “On automatic pilot” despite all attempts to check children’s understanding at

the time of the assessment. However, reliability analysis confirmed that the several dissociation items had good internal consistency, suggesting that the items were accurately tapping into the same underlying construct.

### *Recalling peritraumatic dissociation*

Then again, the proposal that peritraumatic dissociation is a key indicator of subsequent PTSD may be premature. The present study interviewed children within 4 weeks of the frightening event, asking them to describe their current trauma-related symptoms, as well as the extent of their subjective stress and dissociation at the time of the event. The correlation between the children's current trauma symptoms and their recall of peritraumatic stress and dissociation may be interpreted in several ways. For instance, greater fear and arousal at the time of the trauma may increase the likelihood of dissociation, as a defence against overwhelming stress (Scaer, 2001). Subjective experiences characterised by greater physiological arousal, fear, and dissociation may in turn, lead to more severe trauma symptoms of intrusion, avoidance, and hyper arousal in the subsequent weeks. Alternatively, current symptomology may magnify perceptions of event severity and emotional reactions (Zoeller et al., 2001). Assessing children 7 weeks after the Oklahoma bombing, Pfefferbaum et al. (2002) found that peritraumatic response (including dissociation) was the strongest predictor of trauma-related symptoms but noted that retrospective report of peritraumatic response may have been biased by current symptomology. In short, a child suffering more severe psychological distress may remember the event as more stressful and accompanied by a greater degree of dissociation, as one way of understanding current symptoms. According to Candel and Merckelbach (2004), it is a commonly used heuristic to conclude that severe



consequences (e.g., PTSD symptoms) must have intense causes (e.g., reaction during the traumatic event). It is also likely that negative mood leads to selective memories of feeling more helpless or frightened, while reports of peritraumatic distress may be inflated by current dissociation (Morgan et al., 2001). Thus, current psychological factors might bias the recall of dissociation during the trauma, inflating the relationship between peritraumatic dissociation and subsequent symptoms.

Marshall & Schell Rand (2002) investigated the relationship between current PTSD symptoms and recall of peritraumatic dissociation within days of the trauma and again at 3- and 12-month follow-ups. At successive assessments, they found that *changes* in PTSD-related distress strongly correlated with *changes* in memory of peritraumatic dissociation. The authors speculate that believing dissociation accompanied the trauma could be one facet of the phenomenology of PTSD, along with re-experiencing and avoidance. They also speculate that both PTSD symptoms and recall of peritraumatic dissociation are influenced by a third factor. Possible candidates for the third factor have been suggested. Holeva and TARRIER (2001) found that neuroticism and psychoticism predicted PTSD 4-6 months after RTAs, but that peritraumatic dissociation, while correlated with both personality factors, did not predict PTSD. One possible conclusion is that underlying personality factors may influence both the degree of peritraumatic dissociation and later PTSD-related symptoms. However, it must be noted that neuroticism has not always been found to predict peritraumatic dissociation (Engelhard et al., 2003).

### *Possible mediation*

Gershuny et al. (2003) reported that the effect of peritraumatic dissociation on PTSD severity among their non-clinical sample of adult women was eliminated when peritraumatic fears of death and loss of control were accounted for. The authors interpreted these findings such that the influence of peritraumatic dissociation on PTSD severity was *mediated* by specific fears about death and losing control during the event. The finding of the present study and that of Gershuny et al. are somewhat similar. The current study measured the children's subjective stress, which included items relating to perceived threat to life and feelings of helplessness, and found that the relationship between peritraumatic dissociation and trauma symptoms was eliminated after accounting for subjective stress. Gershuny et al. interpreted their finding as a mediational effect but their conclusion goes somewhat beyond the scope of their statistical analysis of the data. Furthermore, the path analysis reported in this paper demonstrates a very different pattern of relationships.

The model presented in this paper makes certain assumptions about the directionality of relationships between variables (see Figures 1 and 2). Specifically, it is assumed that subjective stress leads to peritraumatic dissociation, and not the other way around. Thus, both peritraumatic dissociation and trauma symptoms share a common antecedent, namely, subjective stress. When subjective stress is included in the model, the apparent relationship between dissociation and trauma symptoms (the zero-order correlation) is practically eliminated. Based on the model presented, it can be concluded that the effect of peritraumatic dissociation on trauma symptoms is indirect and explained on the one hand, by the strong correlation between dissociation and subjective stress and on the

other hand, by the correlation between subjective stress and trauma symptoms. In other words, the relationship between peritraumatic dissociation and trauma symptoms is an indirect relationship due to a common antecedent and *not* an indirect causal effect mediated by subjective stress, as reported by Gershuny et al. (2003). Admittedly, due to the limitations of the present small-scale study, the conclusions that can be drawn are only tentative but propose an alternative understanding of the relationship between peritraumatic dissociation and later trauma. It should also be noted that statistically ruling out a mediating role for peritraumatic dissociation assumes that subjective stress is measured without bias, which of course is open to question. Similar questions about retrospectively reported peritraumatic dissociation would apply equally to perceptions of stress.

#### **4.5 The role of memory**

Despite a growing body of evidence from adult studies linking fragmented memory to dissociative responses (Harvey & Bryant, 1999; Murray et al., 2002) and to subsequent PTSD (Halligan et al., 2003), the present study failed to replicate these findings among the present sample of children. Contrary to the hypothesis, fragmented memory as indexed by disorganised trauma narrative ratings was not associated with either peritraumatic dissociation or with subsequent trauma symptoms. Several factors may have contributed to this.

In terms of theory, it has been proposed that the stressful nature of trauma leads to disruptions in peritraumatic cognitive processing (dissociation being one example) which results in fragmented memories (Brewin et al., 1996; Ehlers & Clark, 2000; Van

der Kolk & Fisler, 1995). Kindt et al. (2005) point out firstly, that the argument that dissociation creates memory disturbances is based mainly on subjective assessments of memory disturbance and secondly, if dissociation interrupts information processing, then objectively assessed memory disturbances should be observed as well. In their series of analogue experiments, dissociation was associated with subjectively assessed, but not with objectively assessed, memory disturbances. Based on these findings, the authors suggest that the claim that dissociation disturbs information processing, leading to memory disturbances is unwarranted. They consider the possibility that subjective lack of coherence is part of the phenomenology of PTSD, rather than a causing or maintaining factor. The authors also consider that dissociation may affect PTSD by interfering with the *integration* of trauma memories with other autobiographical knowledge, rather than with the *elaboration* or coherence of the trauma memory itself. Kindt et al. (2005) maintain that the research to date has focused on the elaboration aspect of trauma memories whereas the integration aspect of trauma memories is more pertinent to understanding the disturbances in information processing of trauma that lead to PTSD.

To date, the preliminary evidence linking fragmented memory, peritraumatic dissociation, and PTSD comes from research on adult populations. It is possible that the mechanisms underlying children's responses to trauma are different to that of adults' (Meiser-Stedman, 2002) and fragmented memory may play a more or less important role in the development of PTSD in children. It is possible that other factors, such as social support (Keppel-Benson et al., 2002) or parental well-being, play a more important role in the persistence of symptoms among children.

In terms of methodology, the coding schedule used to rate the children's accounts of trauma for disorganisation of language focused on the occurrence of incomplete sentences, confusing language, and switching of tenses or pronouns. Similar coding schemes have been used to analyse adult narratives demonstrating links between disorganised narratives, dissociation, and PTSD (Harvey & Bryant; 1999; Kindt et al., 2005). However, varying levels of language development among the current sample of 7-14 year olds may have influenced the ratings of disorganised language to a greater extent, masking any potential effects of memory fragmentation. Thus, varying levels of language development and verbal expression suggest that assessment of fragmented memory through disorganised verbal narratives may not be as straightforward among children. In another small-scale study with children of similar age, Berliner et al. (2003) compared 8-16 year olds' memories for a traumatic event with those for a positive event. Rather than analysing verbal narratives, memory characteristics were assessed with self-report questionnaire items (e.g., "My memory has details I can see: none, a little, pretty much, a lot"). There are several differences between Berliner et al.'s study and the present study. Berliner et al. focused on the sensory qualities, intensity, and impact of the memories, rather than their coherence and the majority of the children had been victims of sexual and ongoing trauma, and were currently seeking treatment for the effects of the trauma. Nevertheless, Berliner et al.'s study suggests an alternative way of assessing (self-reported) fragmented memories in children exposed to trauma.

#### **4.6 Posttraumatic cognitive appraisals**

The current findings support the hypothesis that more negative posttrauma appraisals about the trauma and its consequences relate to more trauma symptoms. Children

believing that something was wrong with them in the weeks after the frightening event, or that they may never go back to normal, reported more trauma symptoms within 4 weeks and at 2-3 months after the trauma. After accounting for peritraumatic factors, previous trauma, and emotional/behavioural difficulties, cognitive appraisals independently predicted trauma symptoms reported within 4 weeks of the frightening event. However, cognitive appraisals did not independently predict symptoms at 2-3 months, after controlling for these same predictors.

Ehlers and Clark's (2000) cognitive appraisal theory predicts that excessively negative appraisals are linked with chronic PTSD. It is suggested that these negative appraisals maintain PTSD symptoms by creating a sense of current threat and by promoting the use of maladaptive strategies which can directly exacerbate symptoms (Davies & Clark, 1998). Numerous studies of adults have provided empirical evidence to support a link between PTSD symptoms and cognitive factors, including negative appraisals of intrusions, rumination, and thought suppression (e.g., Mayou et al., 2002) even after controlling for frequency of intrusions (Laposa & Alden 2003; Steil & Ehlers, 2000), objective injury (Bryant & Harvey, 1995; Steil & Ehlers, 2000), perceived severity (Bryant & Harvey, 1995), and persistent dissociation (Murray et al., 2002). Adult studies have also supported the proposed role of maladaptive strategies including avoidance (Bryant & Harvey, 1995) and thought suppression (Engelhard et al., 2003; Steil & Ehlers, 2000). While the present findings offer provisional support for the link between negative cognitive appraisals of the trauma sequelae and trauma symptoms, they do not shed light on the specific mechanisms involved. It was beyond the scope of

this study to investigate whether more negative appraisals predicted the use of various cognitive and behavioural strategies, such as rumination and avoidance.

To date, very few studies have extended the research on cognitive factors to children. In their study of children involved in RTAs, Ehlers et al. (2003) found that negative interpretation of intrusions, as well as thought suppression and rumination, predicted PTSD severity at 3 and 6 months, over and above gender, objective injury, and peritraumatic perception of threat and fear. Stallard (2003) conducted a retrospective analysis of data on children involved in RTAs and reported that negative appraisals of trauma sequelae (e.g., perceiving self to be “physically/emotionally unrecovered”) explained variance in PTSD symptoms 6 weeks after the accident, over and above gender. Measures of behavioural avoidance (e.g., being less sociable since the accident) and maintaining cognitive strategies (e.g., thought suppression, distraction, and rumination) separately predicted variance in PTSD symptoms above what could be explained by gender alone. Stallard’s analysis did not control for appraisals of life threat made during the accident. Despite the limited findings with respect to cognitive appraisals, this prospective study offers additional support for the applicability of some of the key elements of Ehlers and Clark’s model to children involved in everyday accidents requiring medical attention.

#### **4.7 Limitations of the study**

While the design of the study was prospective, in that measures taken soon after the trauma were used to predict psychological distress at a later date, all measures were taken after the event, so the issue of contamination arises. Firstly, although the initial

assessment took place as soon after the frightening event as possible, children were, more often than not, asked to describe an event which took place several weeks ago. Therefore, the accuracy of children's accounts of peritraumatic factors may have been affected by forgetting over time. Secondly, it is assumed from a strict modelling perspective that peritraumatic measures predict later symptoms but current symptoms may also bias the recall of peritraumatic measures. The present study asked children to describe both the extent of their subjective stress and dissociation at the time of the event, as well as their current trauma-related symptoms. It is possible that current distress biased children's recall of stress and dissociation during the frightening event. Similarly, parents were asked to report on their children's emotional and behavioural difficulties in the months *before* the frightening event but it is possible that current difficulties may have influenced their recall. Thirdly, a review of the relevant literature further emphasises the instability of memories for emotion and internal states. Indeed, it is questionable whether adults can accurately report dissociative experiences and one might question whether the concept of dissociation was too complex for the children to understand. Thus, retrospective recall is vulnerable to forgetting, as well as to bias from current factors. Ultimately, there are no objective measures against which to verify subjective reports of peritraumatic dissociation and perception of threat, for example. Thus, when considering the present study's findings, it is important to bear in mind the problem of relying on individual self-report of subjective and/or internal states. Unfortunately, this is a ubiquitous problem within this area of research.

The standardised child measures used in the study had been previously used with children of similar ages. However, multi-informant measures may have further



increased the reliability of symptom measures. For example, although the administration of both the child and parent interview schedules of the ADIS is recommended in order to arrive at a composite diagnosis of PTSD, in an effort to keep the assessment battery to a minimum, only the child version was used. The present study relied exclusively on children's self-report of depressive and posttraumatic stress symptoms. However, it is worth considering the frequent finding that there is only limited parent-child agreement on child symptoms and that agreement is generally lower for internalising symptoms, such as those related to depression and PTSD (Vogel & Vernberg, 1993). One study assessing PTSD symptoms in children directly involved in the World Trade Centre bombing but whose parents' primary exposure was uncertainty about their children's well-being, found that parents reported lower estimates of their children's PTSD reactions and reported greater decreases in symptoms over time than did children (Kopelwicz et al., 2002). This discrepancy poses the question, who is the more reliable informant of the child's symptoms?

Another limitation of the study is the relatively short follow-up period. Due to time restrictions, children were generally assessed no later than 3 months after the frightening event. Thus, no conclusions can be drawn from the present data about the children's longer-term adjustment. It must also be noted that the interviewer who met with a child at Time 1 often met with the child at Time 2, in order to provide some continuity and to foster engagement. This meant that in most cases, the interviewer conducting the diagnostic interview at follow-up was not blind to the child's initial reports of the trauma and associated distress. Finally, the conclusions drawn from both the regressions and the path analyses reported in this paper must be interpreted with some caution, given the

relatively small sample size. This potentially lowers both the power of the statistical tests, and the reliability of the estimates of the parameter values (i.e., the standardised regression/path coefficients).

#### **4.8 Strengths of the study**

Mindful of research highlighting the instability of memory for dissociation and emotion over time (Marshall & Schell Rand, 2002; Zoeller et al., 2001), all of the children were interviewed within 4 weeks of the event to minimise the likelihood of forgetting. To my knowledge, this is the first study to specifically address children's dissociation during trauma. Pfefferbaum et al. (2002) included one dissociation item in their assessment of peritraumatic response but this was incorporated into an overall peritraumatic response measure in their analysis. The present study included three additional items in an effort to make the concept of dissociation clearer to the children and attempted to distinguish the effects of dissociation from those of a more general measure of subjective stress. Similarly, the study extended Ehlers et al.'s (2003) assessment of subjective stress during the traumatic event. While they assessed fear and perceived threat with one item each, the present study included several items assessing fear and perceived threat, and incorporated additional items measuring physiological arousal. Analysis of both the subjective stress and dissociation scales developed for the present study suggested that the items in each scale were reliably tapping into the same underlying constructs.

The sample represented a fairly broad range in terms of ethnicity and socioeconomic backgrounds. Although victims of assault were significantly less likely to participate in the study, the response rate among those who met inclusion criteria was quite high.

Those who took part were a non-clinical sample of children and adolescents who had experienced a wide range of accidents. While several studies have been conducted on children involved exclusively in RTAs (e.g., Ehlers et al., 2003; Stallard et al., 1998), trauma studies often investigate responses among children exposed to natural disasters (e.g., Garrison et al., 1995; Vernberg et al., 1996), man-made disasters (e.g., Green et al., 1991; Udwin et al., 2000), or terrorism (e.g., Koplewicz et al., 2002; Pfefferbaum et al., 2002) where typically, larger numbers of people are involved. The effects of large scale disasters affecting say, the entire school or most of the community may be very different to more individually experienced traumas. Thus, the findings of the present study are perhaps more easily generalised to a wider range of children in the community.

#### **4.9 Implications and future directions**

Among the present sample of children, prior emotional/behavioural difficulties predicted more severe subjective responses during the trauma, and children who perceived the trauma to be more frightening were more likely in turn, to suffer trauma symptoms subsequently. Children making more negative appraisals of the impact of the trauma were also likely to report more trauma-related distress 2-3 months after experiencing a frightening event, as were children with a history of previous trauma. These findings emphasise the importance of assessing pre-trauma factors, subjective severity, and cognitive appraisals in order to identify those children in greatest need of support in the wake of a traumatic event. Among this sample of children, peritraumatic dissociation was more strongly correlated with acute, rather than chronic, trauma symptoms, and it did not independently predict trauma symptoms after controlling for other predictors. These findings suggest that assessing peritraumatic dissociation does not improve the

prediction of who is most at risk of chronic PTSD, after assessing subjective stress during the event.

In terms of clinical implications, these findings suggest that the cognitive appraisals and associated emotional responses at the time of the trauma are crucial targets of intervention among children. Cognitive behavioural therapy combined with exposure is currently the treatment of choice for adults with PTSD (Roth & Fonagy, 1996) and the importance of focusing on those periods during the trauma associated with intense emotion, referred to as “hotspots,” has been highlighted (e.g., Grey, Holmes, & Brewin, 2001). Treatment of children with PTSD consists largely of cognitive-behavioural adaptations of approaches with adults (Yule, 1996). The current findings provide support for the targeting of cognitive appraisals and emotions associated with intense arousal during the trauma among children as well as adults.

Assuming the model presented accurately reflects the causal relationships between the variables investigated, path analysis suggests that the apparent relationship between peritraumatic dissociation and subsequent trauma-related distress is spurious and can be accurately explained by the association between peritraumatic dissociation and subjective stress, and subjective stress and trauma symptoms, particularly with respect to acute symptoms. A key assumption of the model is that peritraumatic dissociation is a response to overwhelming fear and perceived threat. In contrast, Gershuny et al. (2002) concluded that the experience of dissociation *provoked* fear and that the effects of peritraumatic dissociation on PTSD were mediated by specific fears of death and losing control. Gershuny et al.’s conclusions must be treated with caution as their statistical

analysis did not support this conclusion, but it is important to note that the *pattern* of the relationships between dissociation, subjective stress (or fear) and PTSD symptoms was identical in the two studies, and neither study found a direct link between dissociation and PTSD symptoms. The difference in interpretation of the results is critically dependent upon the assumed direction of causation between dissociation and subjective stress, and clearly, further investigation is needed to clarify the nature of the relationships between subjective stress, dissociation, and PTSD symptoms among both children and adults exposed to trauma. It is hoped that the findings from this study will stimulate further research in order to clarify the roles of both peritraumatic and cognitive factors in the development and maintenance of PTSD, and to improve our understanding of why some children suffer more than others after experiencing a potentially traumatic event.

## References

American Psychiatric Association (1980). Diagnostic and statistical manual of mental disorders (3<sup>rd</sup> Edition, DSM-III). Washington, DC: American Psychiatric Association.

American Psychiatric Association (1987). Diagnostic and statistical manual of mental disorders (3<sup>rd</sup> Edition, revised, DSM-III-R). Washington, DC: American Psychiatric Association.

American Psychiatric Association (1994). Diagnostic and statistical manual of mental disorders (4<sup>th</sup> Edition, DSM-IV). Washington, DC: American Psychiatric Association.

Berliner, L., Hyman, I., Thomas, A., & Fitzgerald, M. (2003). Children's memory for trauma and positive experiences. *Journal of Traumatic Stress, 16*, 229-236.

Birleson, P. (1981). The validity of depressive disorder in childhood and the development of a self-rating scale: A research report. *Journal of Child Psychology and Psychiatry, 22*, 73-88.

Birleson, P., Hudson, I., Buchanan, D.G., & Wolffe, S. (1987). Clinical evaluation of a self-rating scale for depressive disorder in childhood (Depression Self-rating Scale). *Journal of Child Psychology and Psychiatry, 28*, 43-60.

Blake, D.D., Weathers, F.W., Nagy, L.M., Kaloupek, D.G., Klauminzer, G., Charney, D.S., & Keane, T.M. (1990). A clinician's rating scale for assessing current and lifetime PTSD: The CAPS-1. *The Behavioural Therapist*, *13*, 187-188.

Blanchard, E.B., Hickling, E.J., Mitnick, N., Taylor, A.E., Loos, W.R., & Buckley, T.C. (1995). 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*, 529-534.

Bolton, D., O'Ryan, D., Udwin, O., Boyle, S., & Yule, W. (2000). The long-term psychological effects of a disaster experienced in adolescence: II: The General psychopathology. *Journal of Child Psychology and Psychiatry*, *41*, 513-523.

Brewin, C.R. (2001). A cognitive neuroscience account of posttraumatic stress disorder and its treatment. *Behaviour Research and Therapy*, *39*, 373-393.

Brewin, C.R., & Beaton, A. (2002). Thought suppression, intelligence, and working memory capacity. *Behaviour Research and Therapy*, *40*, 923-930.

Brewin, C.R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of post-traumatic stress disorder. *Psychological Review*, *103*, 670-686.

Brewin, C.R. & Holmes, E.A. (2003). Psychological theories of posttraumatic stress disorder. *Clinical Psychology Review*, *23*, 339-376.

Brewin, C.R., & Smart, L. (2005). Working memory capacity and suppression of intrusive thoughts. *Journal of Behaviour Therapy and Experimental Psychiatry*, 36, 61-68.

Bryant, R.A. & Harvey, A.G. (1995). Avoidant coping style and post-traumatic stress following motor vehicle accidents. *Behaviour Research and Therapy*, 33, 631-635.

Burke, J.D., Borus, J.F., Burns, B.J., Millstein, K.H., & Beasley, M.C. (1982). Changes in children's behaviour after a natural disaster. *American Journal of Psychiatry*, 139, 1010-1014.

Candel, I. & Merckelbach, H. (2004). Peritraumatic dissociation as a predictor of post-traumatic stress disorder: A critical review. *Comprehensive Psychiatry*, 45, 44-50.

Cardena, E. & Spiegel, D. (1993). Dissociative reactions to the San Francisco Bay Area earthquake of 1989. *American Journal of Psychiatry*, 150, 474-478.

Creswell, C., Holmes, E., & O'Connor, T.G. (submitted). Post-traumatic stress symptoms in London school children following terrorist attacks on 11 September 2001.

Davies, M.I. & Clark, D.M. (1998). Thought suppression produces a rebound effect with analogue post-traumatic intrusions. *Behaviour Research & Therapy*, 36, 571-582.



Dunmore, E., Clark, D.M., & Ehlers, A. (1999). Cognitive factors involved in the onset and maintenance of posttraumatic stress disorder (PTSD) after physical or sexual assault. *Behaviour Research and Therapy*, 37, 809-829.

Ehlers, A., & Clark, D.M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38, 319-345.

Ehlers, A., Mayou, R.A., & Bryant, B. (1998). Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. *Journal of Abnormal Psychology*, 107, 508-519.

Ehlers, A., Mayou, R.A., & Bryant, B. (2003). Cognitive predictors of posttraumatic stress disorder in children: Results of a prospective longitudinal study. *Behaviour Research and Therapy*, 41, 1-10.

Engelhard, I.M., Van den Hout, M.A., Kindt, M., Arntz, A., & Schouten, E. (2003). Peritraumatic dissociation and posttraumatic stress after pregnancy loss: A prospective study. *Behaviour Research and Therapy*, 41, 67-78.

Eysenck, M.W. & Keane, T.M. (1990). *Cognitive psychology*. Hove, England: Erlbaum.

Feeny, N.C., Zoellner, L.A., Fitzgibbons, L.A., & Foa, E.B. (2000). Exploring the roles of emotional numbing, depression, and dissociation in PTSD. *Journal of Traumatic Stress, 13*, 489-498.

Field, A. (2000). *Discovering statistics using SPSS for Windows*. Sage Publications, London.

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*. New York: Plenum Press.

Garrison, C.Z., Bryant, E.S., Addy, C.L., Spurrier, P.G., Freedy J.R., & Kilpatrick, D.G. (1995). Posttraumatic stress disorder in adolescents after Hurricane Andrew. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 1193-1201.

Gershuny, B.S., Cloitre, M., & Otto, M.W. (2003). Peritraumatic dissociation and PTSD severity: Do event-related fears about death and control mediate their relation? *Behaviour Research and Therapy, 41*, 157-166.

Giaconia, R., 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*, 1369-1380.

Goenjian, A.K., Pynoos, R.S., Steinberg, A.M., Najarian, L.M., Asarnow, J.R., Karayan, I., Ghurabi, M., & Fairbanks, L.A. (1995). Psychiatric comorbidity in children after the 1988 earthquake in Armenia. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 1174-1184.

Goldstein, R.D., Wampler, N.S., & Wise, P.H. (1997). War experiences and distress symptoms of Bosnian children. *Pediatrics, 100*, 873-878.

Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38*, 581-586.

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 1337-1345.

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, 60*, 945-951.

Grey, N., Holmes, E., & Brewin, C.R. (2001). Peritraumatic emotional "hot spots" in memory. *Behavioural and Cognitive Psychotherapy, 29*, 367-372.

Halligan, S.L., Michael, T., Clark, D., & Ehlers, A. (2003). Posttraumatic stress disorder following assault: The role of cognitive processing, trauma memory, and appraisals. *Journal of Consulting and Clinical Psychology, 71*, 419-431.

Harvey, A.G. & Bryant, R.A. (1999). A qualitative investigation of the organization of traumatic memories. *British Journal of Clinical Psychology, 38*, 401-405.

Holeva, V. & Tarrier, N. (2001). Personality and peritraumatic dissociation in the prediction of PTSD in victims of road traffic accidents. *Journal of Psychosomatic Research, 51*, 687-692.

Horowitz, K., Weine, S., & Jekel, J. (1995). PTSD symptoms in urban adolescent girls: Compounded community trauma. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 1353-1361.

Horowitz, M.J., Wilner, N., & Alvarez, W. (1979). Impact of events scale: A measure of subjective stress. *Psychosomatic Medicine, 41*, 209-218.

Hubbard, J., Realmuto, G.M., Northwood, A.K., & Masten, A.S. (1995). Comorbidity of psychiatric diagnoses with posttraumatic stress disorder in survivors of childhood trauma. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 1167-1173.

Joseph, S. (2000). Psychometric evaluation of Horowitz's impact of event scale: A review. *Journal of Traumatic Stress, 13*, 101-113.

Keppel-Benson, J.M., Ollendick, T.H., & Benson, M.J. (2002). Post-traumatic stress in children following motor vehicle accidents. *Journal of Child Psychology and Psychiatry, 43*, 203-212.

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*, 1048-1060.

Kindt, M., Van den Hout, M., & Buck, N. (2003). Dissociation related to subjective memory fragmentation but not to objective memory disturbances. *Journal of Behaviour Therapy and Experimental Psychiatry, 36*, 43-59.

Koplewicz, H.S., Vogel, J.M., Solanto, M.V., Morrissey, R.F., Alonso, C.M., Abikoff, H., Gallagher, R., & Novick, R.M. (2002). Child and parent response to the 1993 World Trade Centre bombing. *Journal of Traumatic Stress, 15*, 77-85.

La Greca, A.M., Silverman, W.K., & Wasserstein, S. B. (1998). Children's predisaster functioning as a predictor of posttraumatic stress following Hurricane Andrew. *Journal of Consulting and Clinical Psychology, 66*, 883-892.

La Greca, A.M., Silverman, W.K., Vernberg, E.M., & Prinstein, M.J. (1996). Symptoms of posttraumatic stress in children after hurricane Andrew: A prospective study. *Journal of Consulting and Clinical Psychology, 64*, 712-723.

Laposa, J.M. & Alden, L.E. (2003). Posttraumatic stress disorder in the emergency room: Exploration of a cognitive model. *Behaviour Research and Therapy, 41*, 49-65.

Larzelere, R.E. & Mulaik, S.A. (1977). Single-sample tests for many correlations. *Psychological Bulletin, 84*, 557-569.

Lee, D.A., Scragg, P., & Turner, S. (2001). The role of shame and guilt in traumatic events: A clinical model of shame-based and guilt-based PTSD. *British Journal of Medical Psychology, 74*, 451-466.

Marshall, G.N. & Schell Rand, T.L. (2002). Reappraising the link between peritraumatic dissociation and PTSD symptom severity: Evidence from a longitudinal study of community violence survivors. *Journal of Abnormal Psychology, 111*, 626-636.

Mayou, R.A., Ehlers, A., & Bryant, B. (2002). Posttraumatic stress after motor vehicle accidents: 3-year follow-up of a prospective longitudinal study. *Behaviour Research and Therapy, 40*, 665-675.

Meiser-Stedman, R. (2002). Towards a cognitive-behavioural model of PTSD in children and adolescents. *Clinical Child and Family Psychology Review*, 5, 217-232.

Morgan, C.A., Hazlett, M.G., Wang, S., Richardson, E.G., Schnurr, P., & Southwick, S.M. (2001). Symptoms of dissociation in humans experiencing acute, uncontrollable stress: A prospective investigation. *American Journal of Psychiatry*, 158, 1239-1247.

Murray, J., Ehlers, A., & Mayou, R.A. (2002). Dissociation and post-traumatic stress disorder: Two prospective studies of road traffic accident survivors. *British Journal of Psychiatry*, 180, 363-368.

Pfefferbaum, B. (1997). Posttraumatic stress disorder in children: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 1503-1511.

Pfefferbaum, B., Doughty, D.E., Chandrashekar, R., Patel, N., Gurwitch, R.H., Nixon, S.J., & Tivis, R.D. (2002). Exposure and peritraumatic response as predictors of posttraumatic stress in children following the 1995 Oklahoma City bombing. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 79, 354-363.

Reynolds, C.R. & Richmond, B.O. (1978). What I think and feel: A revised measure of children's manifest anxiety. *Journal of Abnormal Child Psychology*, 6, 271-280.

Roediger, H.L. (1990). Implicit memory: Retention without remembering. *American Psychologist*, 45, 1043-1056.

Roth, A. & Fonagy, P. (1996). *What works for whom? A critical review of psychotherapy research*. New York: Guilford Press.

SPSS Inc. (1997). *SPSS Missing Value Analysis 7.5*. Chicago: SPSS Inc.

Salmon, K. & Bryant, R.A. (2002). Posttraumatic stress disorder in children: The influence of developmental factors. *Clinical Psychology Review*, 22, 163-188.

Scaer, R. (2001). The neurophysiology of dissociation and chronic disease. *Applied Psychophysiology and Biofeedback*, 26, 73-91.

Scheeringa, M.S. & Zeanah, C.H. (2001). A relational perspective on PTSD in early childhood. *Journal of Traumatic Stress*, 14, 799-815.

Schwarz, E.D. & Kowalski, J.M. (1991). Malignant memories: PTSD in children and adults after a school shooting. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 936-944.

Shalev, A., Peri, T., Canetti, L., & Schreiber, S. (1996). Predictors of PTSD and injured trauma survivors: A prospective study. *American Journal of Psychiatry*, 153, 219-225.



Silverman, W.K. & La Greca, A.M. (2002, in press). Children experiencing disasters: Definitions, reaction, and predictors of outcomes. In M.C. Roberts (Ed) (in press), *Helping children cope with disasters: Integrating research and practice*. Washington, DC: American Psychological Association.

Silverman, W.K. & Nelles, W.B. (1998). The anxiety disorders interview schedule for children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 27, 772-778.

Stallard, P. (2003). A retrospective analysis to explore the applicability of the Ehlers and Clark (2000) cognitive model to explain PTSD in children. *Behavioural and Cognitive Psychotherapy*, 31, 337-345.

Stallard, P., Velleman, R., & Baldwin, S. (1998). Prospective study of post-traumatic stress disorder in children involved in road traffic accidents. *British Medical Journal*, 317, 1619-1623.

Stallard, P., Velleman, R., & Baldwin, S. (1999). Psychological screening of children for post-traumatic stress disorder. *Journal of Child Psychology and Psychiatry*, 40, 1075-1082.

Stallard, P., Velleman, R., Langsford, J., & Baldwin, S. (2001). Coping and psychological distress in children involved in road traffic accidents. *British Journal of Clinical Psychology*, 40, 197-208.

Steil, R. & Ehlers, A. (2000). Dysfunctional meaning of posttraumatic intrusions in chronic PTSD. *Behaviour Research and Therapy*, 38, 537-558.

Tabachnick, B.G. & Fidell, L.S. (2001). *Using Multivariate Statistics* (4th Edition)  
Boston: Allyn & Bacon.

Terr, L.C. (1991). Childhood traumas: An outline and overview. *American Journal of Psychiatry*, 140, 10-20.

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 theatre veterans. *Journal of Consulting and Clinical Psychology*, 64, 1054-1059.

Tyano, S., Iancu, I., Solomon, Z., Sever, J., Goldstein, I., Touviana, Y., & Bleich, A. (1996). Seven-year follow-up of child survivors of a bus-train collision. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 365-373.

Udwin, O., Boyle, S., Yule, W., Bolton, D., & O'Ryan, D. (2000). Risk factors for long-term psychological effects of a disaster experienced in adolescence: Predictors of post traumatic stress disorder. *Journal of Child Psychology and Psychiatry*, 41, 969-979.

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

Van Loey, N.E.E., Maas, C.J.M., Faber, A.W., & Taal, L.A. (2003). Predictors of chronic posttraumatic stress symptoms following burn injury: Results of a longitudinal study. *Journal of Traumatic Stress, 16*, 361-369.

Vernberg, E.M., La Greca, A.M., Silverman, W.K., & Prinstein, M.J. (1996). Prediction of posttraumatic stress symptoms in children after Hurricane Andrew. *Journal of Abnormal Psychology, 105*, 237-248.

Vila, G., Porche, L., & Mouren-Simeoni, M. (1999). An 18-month longitudinal study of posttraumatic disorders in children who were taken hostage in their school. *Psychosomatic Medicine, 61*, 746-757.

Vogel, J.M. & Vernberg, E.M. (1993). Children's psychological responses to disasters. *Journal of Clinical Child Psychology, 22*, 464-484.

World Health Organization (1992). The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines. Geneva: WHO.

Yule, W. (1996). Post-traumatic stress disorder in children. In P.M. Salkovskis (Ed), *Trends in Cognitive and Behavioural Therapies*. John Wiley & Sons Ltd.

Yule, W., Bolton, D., Udwin, O., Boyle, S., O’Ryan, D., & Nurrish, J. (2000). The long-term psychological effects of a disaster experienced in adolescence: I: The incidence and course of PTSD. *Journal of Child Psychology and Psychiatry*, 41, 503-511.

Zoeller, L.A., Sacks, M.B., & Foa, E.B. (2001). Stability of emotions for traumatic memories in acute and chronic PTSD. *Behaviour Research and Therapy*, 39, 697-711.

## **Appendix A**

### **Letter granting ethical approval**



Our ref: RM/cw/04A437

The Joint UCL/UCLH Committees on the Ethics of Human  
Research (Committee A)  
Research & Development Directorate  
1st Floor, Maple House  
149 Tottenham Court Road  
London  
W1P 9LL

Ph: 0207 380 6977  
Fax: 0207 380 9937

29<sup>th</sup> November 2004

**Dr. Pasco Fearon**  
Lecturer in Psychology  
Sub-Department of Clinical Health Psychology  
University College London  
Gower Street  
London  
WC1E 6BT

Dear Dr. Fearon,

**Study title:** *A prospective study of the development of posttraumatic stress reactions in children after frightening events*

**REC reference:** 03/0081

**Amendment date:** 19<sup>th</sup> November 2004

Thank you for your letter of 19<sup>th</sup> November 2004, notifying the Committee of the above amendment.

The amendment has been considered and approved by the Chair of Committee A.

The Committee does not consider this to be a "substantial amendment" as defined in the Standard Operating Procedures for Research Ethics Committees. The amendment does not therefore require ethical review by the Committee and may be implemented immediately, provided that it does not affect the management approval for the research given by the R&D Department for the relevant NHS care organisation.

### Approved documents

The documents approved are as follows:

1. Covering Letter proposing study closes in June 2005. Dated 19<sup>th</sup> November 2004.
2. Additional Questionnaire to be used:
  - The Holmes-Rahe Scale for adults
  - The Children's Life Events Schedule CLES-C (1999)
  - The Social Support Questionnaire (SSQ6). Nfer-Nelson. (Separate versions for Adults & Children). (Sarason et al, 1983).
  - The COPE (Separate versions for Adults & Children). (1989; 1988)

**Statement of compliance**

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

**REC reference number: 03/0081****Please quote this number on all correspondence**

Yours sincerely,

## **Appendix B**

### **Participant recruitment letter**





Sub-Department of Clinical Health Psychology

**UNIVERSITY COLLEGE LONDON**

GOWER STREET LONDON WC1E 6BT

«Date» July 22, 2005

«Title» «FirstName» «LastName»

«Address1»

«Address2»

«PostalCode»

Dear Title» «FirstName» «LastName»,

«Hopsital»is sending us the names and addresses of all 7-14 year olds who have visited their accident and emergency department having experienced a frightening event.

We would like to invite your child and yourself to take part in our study that looks at how children and their parents cope following a frightening event. Please read the information sheet enclosed. There is also a copy for your child.

We will telephone you in the next few days to see if you are willing to take part. Please don't hesitate to contact us on **020 7679 5955** if you have any queries or are interested in taking part.

Thank you for your time.

Yours sincerely,

Sarah Kee  
Trainee Clinical Psychologist  
University College London

Research team:

Richard Bailie, Trainee Clinical Psychologist, University College London

Wendy Isenwater, Trainee Clinical Psychologist, University College London

## **Appendix C**

### **Participant information sheets**



Sub-Department of Clinical Health Psychology

**UNIVERSITY COLLEGE LONDON**

GOWER STREET LONDON WC1E 6BT

### **Child Information Sheet**

#### **How children and parents cope after a frightening event**

You are invited to take part in a project about children who have had a frightening experience. Please read this information sheet because it tells you why we are doing this project and what we will ask you to do if you say yes.

#### ***Why are we doing this project?***

Lots of children have a frightening experience like a car accident so we need to understand more about how children cope and manage afterwards. We hope that what you tell us will help us understand how to look after children who are still upset a long time after the frightening event happened. We are interested to hear what every child and their parent have to say even if you are not upset.

#### ***Why have I been chosen?***

We are inviting all children aged 7 - 12 who have been in a frightening event and had to go to hospital afterwards. We would like to see at least 100 children and their mum or dad.

#### ***Do I have to do it?***

You do *not* have to take part in the project if you do not want to. If you decide to take part and then change your mind, that is OK and you won't have to tell us why you wanted to stop. If you decide to take part it will not change anything that happens to you in hospital. When we meet for the first time, we will ask you to sign a form to say that you will take part.

#### ***What will I have to do?***

If you decide to take part in the project you and your mum or dad will meet us twice, either at home or in the centre of London. The first time will be in about 2 weeks. We will ask you to tell us a little bit about the accident, do a tricky puzzle together in front of a video camera and fill in a questionnaire about your ideas about the accident and your health. It will take about 50 minutes (about the same amount of time as a class at school). The second time we meet will be after 3 months and we will ask you to fill in the questionnaire again to see if you have changed or stayed the same. This time it will take about 30 minutes (about half the length of a class).

***Are there any risks?***

We don't think there are any risks, but there might be a small chance that some children may get a bit upset when talking about the accident or when doing the tricky puzzle. If this happens, we will try and help you to feel better by the time you leave. If you don't feel better, we will tell you about somewhere that you could go to talk to someone who can help.

***Why will it be good to take part?***

The things that you and the other children (and parents) tell us will be very useful and will help us find out how to help other children who have a frightening event in the future and stay upset for long time.

***What happens to the questionnaires and videotapes?***

Whatever you tell us will be kept confidential; that means that it will be a bit like secret and no one will see the questionnaires or videotapes except for the people doing the project (the names below). Your name will *not* be on the questionnaires or tapes.

***What if something goes wrong?***

We do not expect anything to go wrong, but if it does we will talk to your mum or dad about what they can do.

***What will happen to the results of the project?***

We hope to write a report for other people to see so that they can help other children who are upset by a frightening event. Your names will *not* be in the report.

Thank you for helping us. If you have any questions or worries about the study you can telephone or email any of us.

Telephone

Richard Bailie  
Wendy Isenwater  
Sarah Kee

Principle investigators: Dr. Paso Fearon and Dr. Cathy Creswell, UCL  
Clinical lead: Mr Gavalas, A&E Consultant, UCH

Joint University College London/University College London Hospitals Ethics Committee has reviewed this study.



Sub-Department of Clinical Health Psychology  
**UNIVERSITY COLLEGE LONDON**  
GOWER STREET LONDON WC1E 6BT

### **How children and parents cope after a frightening event**

You and your child are invited to take part in a research study looking at how children cope after experiencing a frightening event and how parents support their child during this time.

This information sheet tells you about why we are doing this research and what you would be asked to do. Please take a few minutes to read it. We will contact you in the next two weeks to ask whether you would be interested in taking part.

#### Information Sheet

##### *What is the purpose of the study?*

We hope that you and your child's views and experiences will help us understand more about how children cope after a frightening event. In the future, we hope this information will help us to advise and support families who experience such events, particularly the minority who experience longer-term problems.

We are interested in all children, so you and your child's views will be helpful to us even if you feel that he or she has *not* been affected by the event.

##### *Why have I been chosen?*

We are interesting in meeting all children between the ages of 7 and 12 who attended either UCLH or the Whittington Accident & Emergency departments following a frightening event. We would like to meet with at least 100 children and their parents.

##### *Do I have to take part?*

It should be emphasised that you do not have to take part in this study if you do not want to. If you decide to take part, you may withdraw at any time without giving a reason. Your decision to take part or withdraw will not affect your medical care and management in any way. When we first meet, we will make sure you have a copy of this information sheet and ask you to sign a consent form.

##### *What would I have to do?*

If you and your child do choose to take part in the study then we will arrange to meet with you either in central London or in your home (whichever you prefer) on two occasions. First, we will ask you and your child to tell us briefly about the accident, do a tricky puzzle together in front of a video camera and complete a few simple questionnaires that ask your ideas about the accident and your health before and after the accident. This meeting will take no more than 50 minutes. We would like to meet again

3 months later to ask you both to complete the questionnaires again to see whether things have changed or stayed the same over time. This meeting will take about 30 minutes.

*Are there any risks to us if we take part in the study?*

We do not expect there to be any risks to taking part in the study. We ask you to tell us about the accident and some people may find talking about it upsetting. If you and your child have concerns, we will be happy to discuss these with you. If you feel it would be helpful, we can put you in touch with sources of support.

*What are the benefits of taking part?*

We hope that the information that we gather in this study will help us in the future to treat children who experience difficulties following a frightening event. On finishing the study, we will send you a summary of our findings.

*What happens to the information collected?*

All the information you provide will be kept completely confidential. Instead of using your name, we use a code to label the questionnaires and videotapes. A list of names and their codes will be kept separately and securely so that only the named researchers below can access it. In addition to using the information for this study, we may wish to use it to answer other questions in the future. We will therefore continue to keep the information securely so that only the researchers named below can access it. We will ask your permission to contact you again about future research.

*What if something goes wrong?*

We are obliged to inform all participants that whilst we do not anticipate any problems, if something goes wrong there are no special compensation arrangements available. In the event of negligence, you may have grounds for a legal action but you may have to pay for it. Regardless of this, if you wish to complain, or have concerns of this study, the normal National Health Service complaints mechanisms should be available to you.

*Ethical review*

University College London Hospital NHS Trust Ethics Committee has reviewed this study.

Thank you in advance for your help, please feel free to telephone or email us if you have any questions

Richard Bailie  
Wendy Isenwater  
Sarah Kee  
Telephone

Principle investigators: Dr. Pasco Fearon and Dr. Cathy Creswell, UCL.  
Clinical Lead: Mr. M. Gavalas, UCH

## **Appendix D**

### **Consent forms**



Sub-Department of Clinical Health Psychology

**UNIVERSITY COLLEGE LONDON**

GOWER STREET LONDON WC1E 6BT

**CHILD CONSENT FORM**

Title of project: **How children and parents cope after a frightening event**

Participant ID Number: \_\_\_\_\_

UCLH Project ID number: **03 / 0081**

Date: \_\_\_\_\_

**CONFIDENTIAL**

1. I have read and understood the information sheet dated and have asked any questions that I wanted to.
  
2. I have had enough time to decide if I want to take part in the project.
  
3. I understand that I only need to take part if I want to and that I am free to stop doing the project at any time, without giving any reason.
  
4. I understand that the people doing the research project (Dr. Pasco Fearon, Dr. Cathy Creswell, Richard Bailie, Wendy Isenwater or Sarah Kee) may look at my hospital notes if they need to. This is OK if my parent lets them.
  
5. I agree to take part in this project.

\_\_\_\_\_  
Name of participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of Person taking consent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

*Comments or concerns during the study*

If you have any comments or concerns you may discuss these with the principle investigator **Pasco Fearon - 020 7679 5955**. If you wish to go further and complain about any aspect of the way you have been approached or treated during the course of the study, you should write or get in touch with the Complaints Manager, UCL hospitals. Please quote the UCLH project number at the top this consent form.





## **Appendix E**

### **Child assessment battery**

CONFIDENTIAL

**Child narrative instructions (to be read by experimenter)**

“I understand that you experienced .....  
I would like you to tell me about what happened and how you felt at the time.

“Some of it may be hard to remember or may bring back uncomfortable feelings or memories. Sometimes people find it helpful to talk about experiences like this but it is up to you how much you want to tell me.”

**Allow at least 3 minutes.**

ADIS – child

TRAUMATIC EVENT? Yes

Please specify:

.....

- Has something really terrible or upsetting happened, like being very sick or badly hurt?
- Have you seen anyone else get badly hurt or die?
- Have you been in a really bad accident or fire where you could have died?

LESS THAN 1 MONTH SINCE EVENT? Yes

Please specify: .....

RE-EXPERIENCING SYMPTOMS:

- |   |                          |                          |
|---|--------------------------|--------------------------|
| 11. Do you have a lot of thoughts that you don't want to have about [frightening event]?  | Yes                      | No                       |
|   | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Do you ever play or draw pictures about [event]?  | Yes                      | No                       |
|   | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Do you have a lot of bad dreams about [event]?  | Yes                      | No                       |
|   | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Do you sometimes feel that [event] is about to happen again?  | Yes                      | No                       |
|   | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. When things remind you of [event], do you get uncomfortable feelings in your body?<br>Eg, does your heart beat real fast?<br>Do you sweat or shake? | Yes                      | No                       |
|   | <input type="checkbox"/> | <input type="checkbox"/> |

➤ STOP. If "Yes" for one or more among 11-15 then tick

**AVOIDANCE SYMPTOMS:**

- |  |                                 |                                |
|--|---------------------------------|--------------------------------|
| 16. Do you try very hard not to think about [event]?   | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 17. Do you try to stay away from things that remind you of [event]?  | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 18. Are there some things about [event] that you don't remember?   | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 19. Since [event], have you stopped doing things that you used to enjoy?<br>Eg, playing games, going on outings, doing hobbies?  | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 20. Have you become less interested in seeing friends since [event]?   | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 21. Since [event], has it become difficult for you to show other people how you feel?<br>Eg, are you hiding your feelings and keeping them to yourself?  | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 22. Do you think that when you grow up, you will be able to do all of the things that you would like to do, such as going to college, getting married, getting a job, having children or things like that? | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 23. Since [event], are you doing some things now that you haven't done since you were a little kid, like maybe wetting your pants/bed, sucking your thumb or always wanting to be with your mum or dad?    | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |

➤ **STOP.** If "Yes" for **three** or more among 16-23 then tick



**HYPERAROUSAL SYMPTOMS:**

Have you had any of these problems since [event]?

- |     |  |                                 |                                |
|-----|--|---------------------------------|--------------------------------|
| 24a | Trouble sleeping   | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 24b | Losing your temper   | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 24c | Having a hard time paying attention  | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 24d | Being on the "look out" so you will be ready if something bad happens  | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| 24e | When things happen by surprise or all of a sudden. Like hearing a loud noise that you didn't expect, does it make you "jump"?<br>➤ mime startle response | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |

➤ **STOP.** If "Yes" for **two** or more among 24a-24e then tick



**INTERFERENCE:**

"Okay, I want to know how much you feel this problem has messed things up in your life. That is, how much has it messed things up for you with friends, in school, or at home? How much does it stop you from doing things you would like to do?"

If clinical interference is indicated, tick



If all six criterion circles are ticked, then consider PTSD diagnosis.

**CONFIDENTIAL**

**Child Peritraumatic Response Scale (CPRS)**

On \_\_\_\_\_ you experienced \_\_\_\_\_.

Below is a list of sentences. Please read each one carefully and put a tick in the box, showing how much it was true for you **AT THE TIME OF THE FRIGHTENING EVENT**. If it was not true at the time, please mark the "not at all" column.

**A little** – it did not bother me much

**Some** – but I could manage it

**Quite a bit** – I felt terrible

**A lot** – I could hardly stand it

	<b>Not at all</b>	<b>A little</b>	<b>Some</b>	<b>Quite a bit</b>	<b>A lot</b>
There was a sick feeling in my tummy					
I felt helpless					
I thought I was going to die					
It was like I was in a dream					
I was scared by how people around me acted					
I felt frightened					
My legs felt wobbly/unsteady					
It was out of my control					
I felt like I was on "autopilot"					
I was breathing fast					
I thought someone else was going to be hurt					
I felt shaky all over					
There was nothing I could do					
I felt like I was in a daze					
My heart was beating fast					
I thought I was going to be hurt					
It was so terrible, I could not believe it was happening					
I was trembling					
I thought someone else was going to die					
Things around me did not feel real					
I felt powerless					

CONFIDENTIAL

Child Posttrauma Adaptive Scale (PAS)

On \_\_\_\_\_ you experienced \_\_\_\_\_.

Below is a list of sentences. Please read each one carefully and put a tick in the box, showing how much it was true for you SINCE THE FRIGHTENING EVENT.

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
I think I am going crazy					
I feel upset about how I acted at the time					
I am fully recovered now					
I will never go back to normal again					
I get angry when I think about the frightening event					
I am proud of the way I acted at the time					
Other people do not understand what I went through					
There is something wrong with me					
Things are back to normal now.					



**CONFIDENTIAL**

**Impact of Events Scale (IES-15)**

On \_\_\_\_\_ you experienced \_\_\_\_\_.

Below is a list of things some people say after frightening events. Please read each one carefully and put a tick in the box, showing how much it was true for you DURING THE PAST SEVEN DAYS. If it was not true during that time, please tick the "not at all" column.

	<b>Not at all</b>	<b>Not very often</b>	<b>Sometimes</b>	<b>Often</b>
I thought about it when I didn't mean to.				
I avoided letting myself get upset when I thought about it or was reminded of it.				
I tried to remove it from memory.				
I had trouble falling asleep or staying asleep, because of pictures or thoughts about it that came into my mind.				
I had waves of strong feelings about it.				
I had dreams about it.				
I stayed away from reminders of it.				
I felt as if it hadn't happened or it wasn't real.				
I tried not to talk about it.				
Pictures about it popped into my mind.				
Other things kept making me think about it.				
I was aware that I still had a lot of feeling about it, but I didn't deal with them.				
I tried not to think about it.				
Any reminder brought back feelings about it.				
My feelings about it were kind of numb.				

CONFIDENTIAL

Child Manifest Anxiety Scale (R-CMAS)

Below is a list of sentences. Please read each one carefully and put a tick in the box, showing if it is TRUE or FALSE for you. There are no right or wrong answers. Please answer as honestly as you can.

	True	False
I have trouble making up my mind		
I get nervous when things do not go the right way for me		
Others seem to do things easier than I can		
I like everyone I know		
Often I have trouble getting my breath		
I worry a lot of the time		
I am afraid of a lot of things		
I am always kind		
I get mad easily		
I worry about what my parents will say to me		
I feel that others do not like the way I do things		
I always have good manners		
It is hard for me to get to sleep at night		
I worry about what other people think about me		
I feel alone even when there are other people with me		
I am always good		
Often I feel sick in my stomach		
My feelings get hurt easily		
My hands feel sweaty		
I am always nice to everyone		
I am tired a lot		
I worry about what is going to happen		
Often other children are happier than I		
I tell the truth every single time		
I have bad dreams		
My feeling get hurt easily when I am fussed at		
I feel someone will tell me I do things the wrong way		
I never get angry		

Please turn over...

	<b>True</b>	<b>False</b>
I wake up scared some of the time		
I worry when I go to bed at night		
It is hard for me to keep my mind on my schoolwork		
I never say things I shouldn't		
I wiggle in my seat a lot		
I am nervous		
A lot of people are against me		
I never lie		
I often worry about something bad happening to me		

CONFIDENTIAL

Birleson Depression Inventory (BDI)

Below is a list of sentences. Please read each one carefully and put a tick in the box, showing how much it was true for you DURING THE PAST SEVEN DAYS.

There are no right or wrong answers but it is important to say how you have felt. Please answer as honestly as you can.

	<b>Most of the time</b>	<b>Sometimes</b>	<b>Never</b>
I look forward to things as much as I used to.			
I sleep very well.			
I feel like crying.			
I like to go out to play.			
I feel like running away.			
I get tummy aches.			
I have lots of energy.			
I enjoy my food.			
I can stick up for myself.			
I think life isn't worth living.			
I am good at things I do.			
I enjoy the things I do as much as I used to.			
I like talking with my family.			
I have horrible dreams.			
I feel very lonely.			
I am easily cheered up.			
I feel so sad I can hardly stand it.			
I feel very bored.			

Thank you.

## **Appendix F**

### **Parent-completed questionnaires**

## Demographics and Child Medical History

**We would like to find out a little about you as a family.**

1. Are you working? If YES what is your occupation? \_\_\_\_\_
2. At what point did you finish your education? (circle)  
Vocational    CSE            O Level        GCSE  
A Level        Degree            Other (specify) \_\_\_\_\_
3. How would you describe your ethnicity? (*prompts – white, black, Asian, African*)  
\_\_\_\_\_

**We would now like to find out a little about your child's health.**

4. Did you or your child have any health problems during the pregnancy of your child? (*prompts – for example did you experience hypertension, have a fall, or did you take medication?*)  
\_\_\_\_\_
5. Did you or your child have health problems during the birth of your child? (*prompts – did you have a caesarean section, was the child in intensive care, did the child breathe at first?*)  
\_\_\_\_\_
6. What was the birth weight of your child? \_\_\_\_\_
7. Has your child ever been admitted to a hospital? (*prompts – for example for an accident, operation, or if they had been knocked unconscious*)  
\_\_\_\_\_
8. Has your child ever had prolonged ill health requiring regular treatment by a Doctor? (*prompt – do they take any medication on an ongoing basis, e.g. for asthma?*)  
\_\_\_\_\_
9. Does your child receive Special Educational Needs support at school? (*prompt – have they had a statement of SENs? Literacy or numeracy difficulties?*)  
\_\_\_\_\_

## CAPS Checklist

*Completed by the parent on behalf of the child*

Listed below are a number of difficult or stressful things that sometimes happen to people. For each event, check one or more of the boxes to the right to indicate that:

- a) it has happened to your **child**
- b) your **child** witnessed it happening to someone else
- c) your **child** learned about it happening to someone close to you
- d) you're not sure if it fits
- e) it doesn't apply to your child

Be sure to consider your child's entire life, as you go through the list of events.  
Some questions may not apply

Event	Happened to my child	My child witnessed it	My child learned about it	Not sure	Doesn't apply
1. Natural disaster (for example, flood, hurricane, tornado, earthquake)					
2. Fire or explosion					
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)					
4. Serious accident at work, home or during recreational activity					
5. Exposure to toxic substance (for example dangerous chemicals, radiation)					
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)					
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)					
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)					
9. Other unwanted or uncomfortable sexual experience					
10. Combat or exposure to a war zone (in the military or as a civilian)					
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)					

Event	Happened to my child	My child witnessed it	My child learned about it	Not sure	Doesn't apply
12. Life threatening illness or injury					
13. Severe human suffering					
14. Sudden, violent death (for example, homicide, suicide)					
15. Sudden, unexpected death of someone close to you					
16. Serious injury, harm or death you caused to someone else					
17. Any other very stressful event or experience					



## Strengths and Difficulties Questionnaire

To be completed by a main carer of a child aged between 4 and 16

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all the items as best you can even if you are not absolutely certain, or the items seem daft! Please give your answers on the basis of the child's behaviour over the last six months *before* the frightening event.

	Not true	Somewhat true	Certainly true
1. Considerate of other people's feelings			
2. Restless, overactive, cannot sit still for long			
3. Often complains of headaches, stomach aches or sickness			
4. Shares readily with the other children (treats, toys, pencils etc )			
5. Often has temper tantrums or hot tempers			
6. Rather solitary, tends to play alone			
7. Generally obedient, usually does what adults request			
8. Many worries, often seems worried			
9. Helpful if someone is hurt, upset or feeling ill			
10. Constantly fidgeting or squirming			
11. Has at least one good friend			
12. Often fights with other children or bullies them			
13. Often unhappy, downhearted or tearful			

	Not true	Somewhat true	Certainly true
14. Generally liked by other children			
15. Easily distracted, concentration wanders			
16. Nervous or clingy in new situations, easily loses confidence			
17. Kind to younger children			
18. Often lies or cheats			
19. Picked on or bullied by other children			
20. Often volunteers to help others (parents, teachers, other children)			
21. Thinks things out before acting			
22. Steals from home, school or elsewhere			
23. Gets on better with adults than with other children			
24. Many fears, easily scared			
25. Sees tasks through to the end, good attention span			

**Overall**, do you think that your child has difficulties in one or more of the following areas: emotions, concentration, behaviour or being able to get on with other people?

No difficulties

Yes - minor difficulties

Yes - more serious difficulties

Yes - severe difficulties

If you have answered 'Yes', please answer the following questions about these difficulties (overleaf):

• **How long have these difficulties been present?**

Less than a month

1 – 5 months

5 –12 months

Over a year

• **Do the difficulties upset or distress your child?**

Not at all

Only a little

Quite a lot

A great deal

• **Do the difficulties interfere with you child's everyday life in the following areas?**

**Home life**

Not at all

Only a little

Quite a lot

A great deal

**Friendships**

Not at all

Only a little

Quite a lot

A great deal

**Classroom learning**

Not at all

Only a little

Quite a lot

A great deal

**Leisure activities**

Not at all

Only a little

Quite a lot

A great deal

• **Do the difficulties put a burden on you or your family as a whole?**

Not at all

Only a little

Quite a lot

A great deal

## **Appendix G**

### **Trauma narrative coding schedule**

## Narrative coding schedule

### ORGANISATION / COHERENCE of narrative

**Q: are you clear about the frightening event?**

What exactly happened? Who was there? How was the child frightened or hurt?

Or, is the language too confusing or disorganised?

Look for switching of tenses and pronouns, unfinished sentences, repetitions.

Or, is the narrative too short to get a good understanding of the frightening event?

**Note:** Do NOT judge whether the child seemed reluctant to speak about the frightening event or required considerable prompting.

But DO make a judgement about the overall clarity of the child's account and how clear you are on the frightening event having read through the transcript.

1. The child offers a very clear account of the frightening event (who, what, where, when). The language may be very simple but is clear and easy to follow. The narrative may not be detailed or in chronological order but you have a good, overall picture of the frightening event. You may also know about the child's thoughts or feelings at the time (even if this required prompting).
2. Once again, the language may be very simple, the narrative may not be detailed or in chronological order but most of the account is clear and you have a reasonable understanding of the frightening event. Perhaps some points are unclear or some of the language is slightly confusing or disjointed. Perhaps the child drifted off topic once or twice, or offered a relatively brief narrative.
3. Some details are clear. However you do not have a clear picture of the frightening event. Perhaps the language is rather disorganised (quite a few unfinished sentences, switching of tenses) or the story is disjointed and confusing. Perhaps the child said s/he couldn't remember, gave very short answers or the narrative was too short to get a good understanding.
4. It is hard to make sense of the narrative at all, or it is extremely short. Child offers little or no actual details or, narrative is very confused or chaotic. The language is very disorganised and difficult to follow. Perhaps the child's narrative is not focused on the event.