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Posttraumatic stress symptoms in London school children following September 11, 2001: An exploratory investigation of peri-traumatic reactions and intrusive imagery

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Abstract

Threatening intrusive images are central to posttraumatic stress disorder. It has been suggested that intrusive imagery in the context of a sense of threat leads to the development and persistence of posttraumatic stress symptoms. This study investigates London school children's ($N = 76$; age 10–11 years) self-reported posttraumatic stress symptoms in response to viewing the attacks of September 11, 2001 on television. Assessments were made at two time points. A minority of participants reported moderate–severe symptoms with functional impairment at 2 months (14.5%) and 6 months (9.2%) after viewing the September 11 events. After controlling for symptom stability, persistent symptoms were associated with peri-traumatic factors, notably perceiving that one's life was in danger. The combined effect of intrusive imagery and peri-traumatic life threat was associated with symptom persistence. Assessments of intrusive image content via checklist and free-report indicated that the images were directly related to September 11 and were fairly stable over time. Implications for treating children's intrusive images following stressful events are explored.

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1. Introduction

The current study investigated possible posttraumatic stress reactions following September 11, 2001 in London school children with a focus on intrusive imagery. On September 11, 2001 the USA was subjected to terrorist attacks on an unprecedented scale using hijacked planes on the World Trade Center buildings in New York City and the Pentagon in Washington, DC; a further hijacked plane was crashed in Pennsylvania. The official death toll was 2823 (Okwu, 2002). People around the USA watched the attacks and their aftermath on television (TV), most within half an hour of the events occurring (Smith, Rasinski, & Toce, 2001). The events of September 11 were also extensively reported around the world, through television coverage, radio, and photographs in the print media. The content of the traumatic scenes depicted in this media coverage contained death, serious injury and extensive human suffering. Our aim was to test the hypothesis that children's intrusive imagery in combination with their peri-traumatic responses to the event (in this case, their cognitive responses reported to occur at the time of trauma) may predict their short- and long-term posttraumatic stress reactions.

It has been established that both adults and children can experience symptoms of posttraumatic stress following indirect exposure to traumatic events in the media (e.g. Pfefferbaum et al., 2000, 2001; Terr et al., 1999). Several studies in the USA document the effects of September 11 in relation to indirect exposure on adults (e.g. Ahern et al., 2002; Blanchard, Rowell, Kuhn, Rogers, & Wittrock, 2005; DeLisi et al., 2003; Galea et al., 2002; Lawyer et al., 2006; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002) and children (e.g. Columbia University Mailman School of Public Health & New York State Psychiatric Institute, 2002; Duggal, Berezkin, & John, 2002; Gil-Rivas, Holman, & Silver, 2004; Schuster et al., 2001). Schlenger et al. (2002) found that 60% of parents in New York City reported that their child was upset by the attacks. Using more specific assessments of posttraumatic stress, Schuster et al. (2001) found that 35% of parents reported that their child had at least one posttraumatic stress symptom in a national telephone survey of parents conducted 3–5 days after the events.

Parental reports of their child's symptoms may be influenced by the impact of the attacks on the parents themselves. It is therefore useful to complement this literature with studies in which children report on their own symptoms. One study in New York City that assessed children's own reports found that 10.5% reported symptoms consistent with criteria for PTSD 6 months after the event (Columbia University Mailman School of Public Health & New York State Psychiatric Institute, 2002).

Among an adolescent population indirectly exposed to the events of September 11, Gil-Rivas, Holman and Silver (2004) found that adolescents reported mild to moderate acute stress symptoms 2 weeks after the attacks and low levels of event trauma-related symptoms 1 year later. In this particular study, the first wave of surveys occurred 9–14 days after the index event, while the second wave occurred at approximately 1 year after the index event and included an additional invite for a parent of those adolescents who participated in the surveys to also participate. Questions from the surveys included asking about personal experiences surrounding the terrorist attacks, assessments of posttraumatic stress and general affect as well as perceived parental support (to be answered by the adolescent) and parenting self-efficacy (to be answered by the parent). Greater parent–adolescent conflict was positively associated with distress, posttraumatic symptoms and functional impairment. Whilst this study was limited by a reliance on cross-sectional methods to examine the

1 association between stress symptoms and parental variables, this study is notable in that it
3 includes an attempt to identify potential predictors of children's longer-term outcome such
as parent-adolescent conflict. These data are clinically valuable, but do not address what it
is about the peri-traumatic experience that may lead to persisting problems.

5 By following British school children, the current study provided a novel opportunity to
7 test predictors of the development of traumatic stress reactions following indirect exposure
to traumatic events of September 11. Due to the geographical remoteness from the index
9 trauma, we know that these children were objectively safe-London was not attacked,
although there were concerns about possible attack in the media. Accordingly, there was
11 no doubt about the indirect nature of the trauma exposure (as there is among children
from NYC).

13 The central aim of the study was to examine report of intrusive imagery of the events of
September 11 in children, both in terms of content and in relation to the development and
15 persistence of posttraumatic stress symptoms associated with these events. Our focus was
on symptom development, rather than diagnostic criteria per se. However, it is noted that
17 re-experiencing the trauma—in the form of intrusive images—is a hallmark feature of
posttraumatic stress disorder (PTSD)—see [Brewin and Holmes \(2003\)](#) for a review of
19 cognitive models. The content of posttraumatic re-experienced images should be of the
traumatic event itself (DSM-IV, 1994).

21 We have previously suggested that there may be a continuum of intrusive traumatic
imagery, which range from those images evoked by viewing trauma films in the laboratory,
23 to intrusive images of trauma evoked by viewing traumatic media viewed in the 'real world'
rather than the laboratory (such as media viewing of September 11), to intrusive images
25 from directly experienced or witnessed traumatic events, which in their most extreme form
constitute PTSD flashbacks ([Holmes, 2004](#)). For example, laboratory experiments on
27 viewing traumatic film footage of road traffic accidents indicates that participants can
develop intrusive images of the film for a week after film viewing ([Holmes & Bourne, in](#)
Q1 [press; Holmes, Brewin, & Hennessy, 2004](#); [Stuart, Holmes, & Brewin, 2006](#)). Images from
29 trauma films shown in the laboratory have also been associated with a broader cluster of
posttraumatic symptoms (using a purposed-designed questionnaire) to the material,
31 including fear, avoidance, arousal and distress to intrusions ([Halligan, Clark, & Ehlers,](#)
[2002](#)). Laboratory studies have demonstrated that emotional memory is stronger than
33 memory for neutral materials. Furthermore, emotional memory is more likely to take an
image-based (perceptual) rather than verbal form ([Artanz, de Groot, & Kindt, 2005](#)).
35 Further, using imagery is associated with higher levels of emotion (e.g. on standardized
measures of state anxiety) than verbal processing of the same material ([Holmes &](#)
37 [Mathews, 2005](#); [Holmes, Mathews, Dalgleish, & Mackintosh, 2006](#)). These findings
underscore the importance of examining "image-based" cognitions rather than just
39 "verbal thoughts" in the context of intrusive memory.

41 The role of intrusive imagery in children's adjustment to traumatic events has received
little research attention, and much less than in adults. For example, studies of children's
43 reactions to remote trauma, including the terrorist attacks of September 11, have typically
not included specific information on the content of children's intrusive images. This is an
45 important limitation because some samples included children with elevated rates of PTSD
pre-September 11 (e.g., [Columbia University Mailman School of Public Health & New](#)
[York State Psychiatric Institute, 2002](#)); in other words, it could not be concluded that the
47 posttraumatic stress symptoms were linked to the index trauma because these studies did

1 not include a direct assessment of imagery (e.g., images underlying PTSD symptoms may
2 have been about burglaries or assaults that were witnessed or experienced). Furthermore,
3 intrusive images can also feature in other anxiety disorders, such as social phobia,
4 obsessive compulsive and agoraphobia (e.g. Day, Holmes, & Hackmann, 2004; de Silva,
5 1986; Hackmann, Clark, & McManus, 2000). It is therefore important to distinguish the
6 content of posttraumatic stress related images (i.e. of an index trauma) from other anxiety-
7 related images (e.g. of imagined future threat in agoraphobia). In the current study, we
8 assessed the presence and content of children's intrusive images of September 11 using
9 both checklist and free-report formats.

10 Cognitive models of PTSD suggest that it is not imagery *per se*, but imagery combined
11 with a sense of threat that leads to the development and persistence of symptoms (e.g.
12 Ehlers & Clark, 2000). Cognitive models of PTSD suggest that disruptions during
13 encoding of the traumatic event, such as intense fear at moments of life threat, lead to
14 impaired memory processing and later intrusive memories (Brewin, Dalgleish, & Joseph,
15 1996; Ehlers & Clark, 2000). In fact, a meta-analysis indicated that peri-traumatic factors,
16 such as peri-traumatic dissociation and high levels of peri-traumatic emotions, may be the
17 most predictive variables of posttrauma stress symptoms (Ozer, Best, Lipsey, & Weiss,
18 2003). Studies of children's response to direct trauma have highlighted the peri-traumatic
19 appraisal of life threat in the formation of PTSD symptoms (Ehlers, Mayou, & Bryant,
20 2003; Stallard, 2003; Udwin, Boyle, Yule, Bolton, & O'Ryan, 2000). Furthermore,
21 Pfefferbaum et al. (2002) found that peri-traumatic response was the primary predictor of
22 PTSD in children following the Oklahoma bombing—regardless of whether exposure was
23 direct or indirect via the media.

24 Ehlers and Clark (2000) propose that intrusive images of traumatic events can contain a
25 sense of current threat. In other words, if, at the time of trauma, a person thought “I'm
26 going to die” and felt extremely fearful (i.e. a negative peri-traumatic response), then
27 associated intrusive images of these parts of the trauma could be accompanied by similar
28 emotions and life-threat appraisal (e.g. Holmes, Grey, & Young, 2005). The sense of
29 current threat stimulated by a (re-experienced) image is thought to lead to a range of
30 avoidance strategies. A cycle is thereby enacted in which the trauma memory remains
31 inadequately processed and symptoms persist. Thus highly negative imagery plays a part in
32 fuelling the maintenance cycle of PTSD. However, if the imagery was not as negative, then
33 this would be less likely to provoke avoidance. This possibility is important to consider
34 since people's intrusive images are not necessarily negative, e.g. Bernsten and Rubin
35 (2002). The peri-traumatic response at the time when the image was encoded in memory is
36 one factor influencing the image's associated negativity. Negative peri-traumatic responses
37 (either at the time or realized later, Holmes et al., 2005) should be associated with more
38 highly negative imagery of the trauma than benign peri-traumatic responses. In our view, a
39 corollary is that intrusive imagery in the absence of a reported negative peri-traumatic
40 response is not predicted, nor typically expected to lead to persistent PTSD symptoms.

41 It is noted that the above cycle will not describe all instances of posttraumatic stress, but
42 pertains to our current area of interest—intrusive imagery following viewing traumatic
43 media. PTSD can be diagnosed (more unusually) in the absence of intrusive imagery if
44 other re-experiencing symptoms are present (e.g. emotional upset in the presence of
45 traumatic reminders). Not everyone can report on their peri-traumatic experience, e.g.
46 since some people lack memory for the time of trauma. Imagery is clearly not the only
47

factor fueling a fear of current threat or avoidance (see Ehlers & Clark, 2000), and we are only dealing with one component of their model.

We were interested in children's viewing of real-world traumatic media (of September 11), and whether intrusive imagery of this media footage in addition to reporting negative responses during the original media viewing would lead to persistent posttraumatic stress symptoms. This hypothesis was tested in the current study which examined intrusive imagery, reported peri-traumatic reactions, and the interaction between the two in predicting children's posttraumatic stress symptoms. That is, intrusive imagery in conjunction with negative peri-traumatic responses was expected to contribute to the development and persistence of posttraumatic stress symptoms. In addition to imagery and peri-traumatic responses, we assessed other factors that might explain individual differences in reaction to media exposure, such as child characteristics and affiliation with the US (e.g., having visited or having relatives living in the US or New York City).

In summary, we explored posttraumatic stress symptoms after September 11, 2001 reported by London school children at 2 and 6 months after the events. We predicted that intrusive imagery of the events and reported peri-traumatic response would predict the development of PTSD symptoms 2 months after the event and persistence of symptoms 6 months after the event. The content and persistence of children's reported images was also explored in order to check whether the reported imagery was actually of the events of September 11 (rather than of other events).

2. Method

2.1. Participants

After September 11, 2001, the head-teachers of 14 London inner-city primary schools were approached to take part in a study of children's reactions to the terrorist attacks. Five schools, with a total of 131 students in the participating school year (UK year 6), consented to the assessments 2 and 6 months after September 11. Two schools declined because they did not want to focus on this issue and seven declined due to other commitments that pre-empted an in-class survey (e.g., it was thought to be too disruptive to teaching time). The take-up rate reflects the general difficulty in recruiting inner-city public schools for research in the UK, as they are under considerable pressure to meet academic standards.

Written consent from both parents and pupils was obtained after the provision of written information to parents, and verbal information to children. The study was approved by the University College London and University College London Hospital Research Ethics Committee. Of the sample of 131 children, 20 children or their parents declined consent using an active opt out procedure, 13 were absent at the 2-month assessment, and 17 were absent at the 6-month assessment (these absentee rates are typical). One student had an insufficient level of English to complete the measures. A further four children reported that they had not seen the events on TV and were excluded. In total, data were available on 76 children at both time points. The sample consisted of 39 girls and 37 boys from their last year at primary school (aged 10–11 years); 42.1% were white British. The rate of special educational needs was 6.6%; 34.2% qualified for free school meals indicating a moderate-level of social economic deprivation.

The 76 children participating in this study did not differ from the 55 children in the same schools who did not participate on gender ($\chi^2(1) = .97, p = .16$), ethnic minority membership ($\chi^2(1) = .47, p = .50$), special educational needs ($\chi^2(1) = .29, p = .59$) or eligibility for free school meals (an index of socio-economic status; $\chi^2(1) = 1.70, p = .19$).

Furthermore, schools participating in the study did not differ significantly from non-participating primary schools in the whole educational region ($N = 44$) on indices of ethnic minority membership, special educational needs, or eligibility for free school meals.

2.2. Procedure and measures

On 11 November 2001 and again on 11 March 2002, teachers distributed questionnaires to children within the classroom. Teachers were provided with written instructions by the experimenters, and read these aloud to the class. Teachers were available to provide help in completing the questionnaires where necessary. Teachers were encouraged to involve and consult the experimenters in the classroom administration if there were any questions about the measures; no teacher did this.

2.2.1. Method of exposure, affiliation, communication and peri-traumatic response

At the first assessment, children completed a purpose-designed questionnaire consisting of 10 items regarding their exposure to the events of 11 September (listed in Table 1) based on informal piloting to index the type of media they had been exposed to, communication with others and affiliation to the US. Children then completed five questions about their subjective experience at the time of witnessing the events (peri-traumatic response) and one about their posttrauma appraisal of safety (Table 1). These questions addressed emotions

Table 1

Percentage of children endorsing each peri-traumatic experience, as well as exposure, communication and affiliation variables

Exposure, communication and affiliation	% Endorsed
Did you see the aeroplanes fly in to the buildings on the TV?	100
Did you see pictures in a newspaper/magazine?	88.2
Did you hear about it on the radio?	55.3
Have your parent(s)/adults talked with you about it?	84.2
Has your teacher talked with you about it?	92.1
Have you talked with friends?	76.3
Have you ever been to New York City?	9.2
Have you ever been to the USA?	21.1
Do you have any family living in the USA?	40.8
Do you have any friends living in the USA?	25.0
<i>Peri-traumatic experience</i>	
When you saw the attack on the buildings did you feel scared?	27.6
Did it feel like your life was in danger?	18.4
When you saw the attack on the buildings did you feel like there was nothing you could do?	38.2
Did you feel sick when you saw the attack? ^a	14.5
Did it feel like it wasn't real?	21.1
Does the world feel a more dangerous place since the attack?	38.2

^aIn British English sick refers to feeling nauseous.

1 associated with a diagnosis of PTSD: fear, helplessness, horror, dissociation and perceived
 3 life threat. Responses were rated on a three-point scale (“0 = Not at all”, “1 = A bit”,
 “2 = Very much”).

2.2.2. PTSD symptoms

7 At both assessments, children’s report of symptoms associated with posttraumatic stress
 9 was assessed using the Child PTSD Symptom Scale (CPSS; Foa, Johnson, Feeny, &
 11 Treadwell, 2001). This is a self-report checklist of 17 posttraumatic symptoms (listed in
 13 Table 2) with good levels of reliability and validity (Foa et al., 2001). Children rated
 15 whether or not each symptom was experienced in the last 2 weeks on a four-point scale,
 17 anchored with “0 = not at all or only once”, to “3 = almost always/5 or more times a
 week”. Critically for this study, it was made clear that the event concerned was witnessing
 the events of September 11 (rather than other traumatic events), and the wording of every
 item was adapted to make specific reference to this (e.g. “Having bad dreams or
 nightmares about the attacks”). Total CPSS scores ranged from 0 to 51; subscale scores
 ranged from 0 to 15 for re-experiencing, 0 to 21 for avoidance and 0 to 15 for arousal.

19 Table 2

21 Percentage of children reporting individual stress symptoms at a moderate-severe level on the Child PTSD
 Symptom Scale (CPSS), and functional impairment report, at 2 and 6 months after September 11

23 Re-experiencing symptoms	2 Months %	6 Months %
25 Upsetting thoughts or images	17.1	6.6
Nightmares	6.6	2.6
Acting or feeling as if event happening again	7.9	7.9
27 Feeling upset about the event	19.7	9.2
Feelings in body when thinking of the attack	10.5	3.9
29 <i>Avoidance symptoms</i>		
Try not to think about the attack	17.1	2.6
Try not to do things that are reminders of the attack	11.8	5.3
31 Not remembering the attack	13.2	6.6
Less interest in usual activities	5.3	2.6
33 Not close to others	2.6	5.3
Inability to have strong feelings	7.9	3.9
Feelings of having no future	6.6	9.2
35 <i>Arousal symptoms</i>		
37 Sleep problems	14.5	11.8
Irritable/angry	7.9	5.3
Concentration problems	2.6	9.2
39 Too careful	21.1	11.8
Jumpy	18.4	7.9
41 <i>Functional impairment</i>		
43 Jobs/chores	10.5	10.5
Friendships	11.8	18.4
Fun and hobbies	13.2	18.4
Schoolwork	13.2	14.5
45 Getting on with family	9.2	13.2
47 Happiness	21.1	14.5

Consistent with Foa et al. (2001), we found the internal consistency of the measure was high ($\alpha = .87$).

The CPSS also has seven questions in which the child indicates whether or not the problems rated led to functional impairment in six areas (Table 2; in the current study one item 'doing your prayers' was removed). Consistent with Foa et al. (2001) we found a high level of internal consistency ($\alpha = .84$) for this subscale.

2.2.3. Intrusive imagery

At both assessments, children were given an explanation of intrusive imagery. They were told that memories could be made up of pictures rather than words, and that:

These questions are about picture memories of the attack on the buildings in America which suddenly pop into your head as if they came from nowhere... and might feel as if you are seeing the attack happening again now.

They were asked "Have any picture memories of that day popped in to your head when you didn't want them to in the last two weeks?". They were then asked about the presence or absence of specific images (the "checklist images" shown in Table 3). The checklist of images purpose-designed for the study based on informal piloting, e.g. picture of airplanes flying into the building. A free report section was added to capture any additional images.

Children were also given the opportunity to report up to three additional images that they had experienced by writing a sentence to describe them. Coding categories were defined following Joffe and Yardley (2004), through a mixture of inductive coding from inspecting the current data (e.g. people jumping from windows) and deductive coding from existing literature on intrusions after trauma (e.g. fragments of larger scenes such as 'smoke', Ehlers et al., 2002). Six categories were derived ("free report images" shown in

Table 3

Number of children endorsing each image on the checklist, and free-report image categories at 2 and 6 months, and percentage with same image content at both times

Image type on checklist/free report category	Number endorsing at time 1	Number endorsing at time 2	Same image at time 2 as time 1
<i>Checklist image:</i> Any images?	26	18	
Pictures of the buildings falling down	25	14	12 (86%)
Pictures of people trying to get out or away from the buildings	22	11	8 (73%)
Pictures of people who were with you when you first heard the news	18	8	4 (50%)
Pictures of aeroplanes flying in to the buildings in America	18	12	8 (67%)
Pictures of upset people in the street	16	10	6 (60%)
<i>Free report image:</i> any additional images?	17	12	
People crying, screaming or dying	8	4	4 (100%)
Fragments/ details of scenes	7	3	1 (33%)
Imaginary scenes (including self)	5	4	3 (75%)
People jumping out of the windows	3	3	1 (33%)
Bin Laden	3	3	2 (67%)
Miscellaneous	2	1	0 (0%)

Table 2). Two raters independently assigned each free report image to a category. The inter-rater reliability had a good level of agreement, Cohen's kappa = 0.81 (Barker, Pistrang, & Elliott, 1996).

3. Results

The distribution of posttraumatic stress symptom endorsement on the CPSS was skewed, with 16 (21.1%) children reporting no symptoms at time 1 and 29 (38.2%) reporting no symptoms at time 2. Therefore, all analyses were conducted on the raw and log-transformed scores; significance was based on both parametric and non-parametric tests. Results are reported as significant if consistent across analytic procedures. Qualitative examples of intrusive images of September 11 are given at the end of this section.

3.1. Prevalence and stability of self-reported posttraumatic stress symptoms on the CPSS

Table 2 shows the proportion of children who had a moderate-severe level of each symptom on the CPSS at the 2- and 6-month assessments as well as reported functional impairment associated with these symptoms. For the total score, there was a significant decrease over time ($t(75) = 4.22, p < .001$; at 2 months $M = 7.84, SD = 7.82$ and 6 months $M = 4.93, SD = 7.27$). A similar pattern was shown for the symptom sub-scales: Re-experiencing ($t(75) = 5.71, p < .001$, at 2 months $M = 2.77, SD = 2.94$ and 6 months $M = 1.31, SD = 2.15$); Avoidance ($t(75) = 2.45, p = .017$, at 2 months $M = 2.47, SD = 3.24$ and 6 months $M = 1.66, SD = 2.80$); Arousal, $t(75) = 1.77, p = .08$, at 2 months $M = 2.57, SD = 2.82$ and 6 months $M = 1.98, SD = 1.96$). There was no mean decrease in functional impairment ratings over time ($t(75) = .40, p = .69$; at 2 months $M = .83, SD = 1.52$ and 6 months $M = .90, SD = 1.61$).

3.2. Factors associated with severe posttraumatic stress symptoms at 2 and 6 months

There was no consistent significant association between child characteristics (gender, ethnicity, special educational needs or eligibility for free school meals) and reported posttraumatic stress symptomatology at either assessment. Similarly, self-report of method of exposure to the events, affiliation to New York or America, or communication about the events (described in Table 1) were not significantly associated with reported posttraumatic stress symptoms.

3.2.1. Peri-traumatic experience

As predicted, at both time points, the mean posttraumatic stress symptom score was significantly higher for those who endorsed "yes" to the following peri-traumatic measures (see also Table 1): Scared [time 1: $t(74) = 3.34, p = .001$; time 2: $t(74) = 2.47, p = .016$], Life in danger [time 1: $t(74) = 4.08, p < .001$; time 2: $t(74) = 4.82, p < .001$], Helplessness [time 1: $t(74) = 2.49, p = .015$; time 2: $t(74) = 1.15, p = .26$], Sick [time 1: $t(74) = 1.93, p = .057$; time 2: $t(74) = 2.77, p = .007$], and Feeling that the world was now a more dangerous place [time 1: $t(74) = 2.92, p = .005$; time 2: $t(74) = 2.09, p = .04$]. Endorsement of feeling as if the events were unreal was not associated with symptoms at either time

point. Functional impairment scores were not consistently associated with any peri-traumatic variable.

3.2.2. Intrusive imagery reported of September 11

Thirty-five percent of children reported that they experienced intrusive images of September 11 at 2 months post, and 25% at 6 months post (data for one child were missing). Reporting imagery (coded yes/no) was associated with total score on the CPSS at 2 and 6 months post September 11 (time 1: $t(73) = 6.09, p < .001$; time 2: $t(73) = 4.96, p < .001$). Since one item on the CPSS asked about intrusive imagery, this analysis was repeated with removal of this item. Identical results were obtained.

3.3. Prediction of posttraumatic stress symptom change from 2 to 6 months

Hierarchical multiple regression analyses were used to test stability and change in symptoms from 2 to 6 months post September 11. We focused on peri-traumatic factors and imagery because none of the other potential predictors listed in Table 1 were significantly associated with posttraumatic response.

In the first analysis predicting total CPSS score at 6 months, CPSS total at 2 months was entered at the first step ($R^2 = 0.47, F(1,74) = 65.41, p < .001$). On the second step, we entered the peri-traumatic variables in separate models. Feeling that one's own life was in danger was the only peri-traumatic variable to significantly predict 6-month symptoms after controlling for symptoms at 2 months ($\beta = .24, p = .01$; results from final model, $R^2 = .52, F(2, 73) = 38.91, p < .001$). This variable remained significant when all peri-traumatic variables were entered together, i.e., it predicted persistence of symptoms independent of the other peri-traumatic factors ($R^2 = .54, F(7,68) = 11.51, p < .001$; $\beta = 0.24, p = .016$).

Next, we examined the combined effect of peri-traumatic threat and imagery on change in total CPSS symptom score. After entering CPSS at step 1, presence of imagery and peri-traumatic life threat were entered together in the second step ($R^2 = .52, F(3,72) = 26.11, p < .001$; R^2 change (2,72) = .052, $p = .025$). Peri-traumatic life threat made an independent prediction ($\beta = .22, p = .022$); imagery did not ($\beta = .09, p = .38$). The interaction of these variables, entered on the third step, was significant ($R^2 = .56, F(4,71) = 22.26, p < .001$; R^2 change (1,71) = .037, $p = .017$). Fig. 1 illustrates the interaction between mean change in CPSS score from 2 to 6 months according to reported peri-traumatic life threat (yes/no) and presence of intrusive images of September 11 (yes/no). For children reporting no life threat, and no images, symptoms were low, and thus symptom change low. For children reporting either life threat (but no images), or images (but no life threat), symptoms decreased over time. In contrast, if children both reported life threat and images, their symptoms persisted.

3.4. Content of children's intrusive images

The number of children who endorsed each different type of image in the checklist provided is shown in Table 3, for both 2 and 6 months. Children also had the opportunity to write down up to three additional intrusive images that they experienced. Of those children who had already endorsed at least one checklist image, 65% reported additional images at time 1, and 66% at time 2. In total 31 additional images were described at time 1

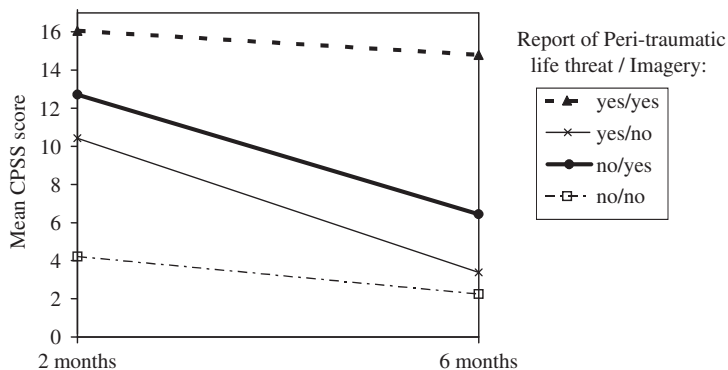


Fig. 1. Mean CPSS score at 2–6 months according to report of peri-traumatic life threat (yes/no) and presence of intrusive images of September 11 (yes/no), illustrating symptom persistence when reporting both.

Table 4

Number of children reporting symptoms consistent with diagnostic criteria on the CPSS, with and without functional impairment, at both 2 and 6 months

	Symptom criteria (moderate–severe)			
	2-Month assessment		6-Month assessment	
	Absent	Present	Absent	Present
Functional impairment				
Absent	47 (61.8%)	4 (5.3%)	51 (67.1%)	1 (1.3%)
Present	14 (18.4%)	11 (14.5%)	17 (22.4%)	7 (9.2%)

and 23 at time 2. Verbatim examples of free report images include, “I see people sitting, standing, lying and just filled with tears”, “Black smoke coming round the building”, “People jumping out windows”, “I have pictures of Bin Laden laughing”, “George Bush and his army in the White House”, “I saw my Uncle trying to get out”, and “As if I was in Manhattan and was right next to the World Trade Center”. All images provided in the free response format were rated as being linked to September 11.

3.4.1. Image content persistence

The persistence over time of each category of image is shown in Table 3. Overall, of the images endorsed by participants at time 2, 67% (49/73) were the same as those they had described at time 1 Table 4.

4. Discussion

4.1. Key findings

Two key findings emerged from the current study. First, a significant minority of our sample of London school children who witnessed the attacks of September 11 on TV (from

1 a geographically remote location), reported posttraumatic stress type symptoms up to 6
2 months after the attacks. Second, we found that report of intrusive imagery combined with
3 peri-traumatic experience of threat, predicted persistence of traumatic stress symptoms
4 from 2 to 6 months.

5 Our findings extend the increasing literature that suggests that individuals can
6 experience posttraumatic stress type symptoms after viewing distressing media footage
7 such as the traumatic events of September 11 (e.g. in adults; Ahern et al., 2002; Blanchard
8 et al., 2005; DeLisi et al., 2003; Galea et al., 2002; Lawyer et al., 2006; Silver, Holman,
9 McIntosh, Poulin, & Gil-Rivas, 2002; and in children Duggal et al., 2002; Schuster et al.,
10 2001; Gil-Rivas et al., 2004). Whilst indirect exposure to traumatic events by the media
11 may not constitute a specific traumatic event in terms of the DSM-IV PTSD stressor
12 criterion A1 (DSM-IV, 1994), recent research has shown that people can suffer from PTSD
13 symptoms without meeting the traumatic event criterion for DSM-IV. For example, in
14 their general population survey, Mol et al. (2006) found that “life events” (e.g. divorce,
15 unemployment) generated at least as many PTSD symptoms as “traumatic events” (e.g.
16 accidents, abuse). PTSD is the only psychiatric condition to require a specific event to have
17 occurred for the diagnosis (actual or threatened death or serious injury) and Mol et al.
18 (2006) suggest there is room for debate on how immediate this threat to life should be. Our
19 current data suggests that viewing media footage of geographically remote events led to
20 posttraumatic symptoms in those children who experienced the footage as threatening to
21 themselves.

22 4.1.2. *Intrusive imagery and peri-traumatic response*

23 The current study provided some evidence that children reported intrusive imagery
24 content that was specifically related to the index trauma viewed in the media (i.e. the
25 attacks of September 11) up to 6 months after the event. Image content was fairly stable
26 over time. Inspection indicated that most images were of the media coverage, while a few
27 children imagined themselves actually at the site of the attacks. Therefore, the imagery
28 content data is consistent with the view that the symptoms reported were attributable to
29 the index stressful media footage (rather than for example, other anxiety concerns or other
30 traumas).

31 Report of negative peri-traumatic response—especially the appraisal that one’s life was
32 in danger—was associated with self-reported posttraumatic symptoms at both 2 and 6
33 months, and with persistence in these symptoms over time. This finding supports previous
34 work on posttraumatic reactions and cognitive models of PTSD (Brewin et al., 1996;
35 Ehlers & Clark, 2000; Ozer et al., 2003; Pfefferbaum et al., 2002; Udwin et al., 2000).

36 4.2. *Cognitive therapy models and research of intrusive trauma imagery*

37 A focus on intrusive imagery is central to cognitive models of PTSD (though it is noted
38 that peri-traumatic response and intrusive imagery are only some of many factors
39 alongside current appraisals involved in the PTSD maintenance cycle). Ehlers, Mayou, and
40 Bryant (2003) have shown that cognitive factors specified in the Ehlers and Clark (2000)
41 model are important in children as well as adults. Intrusive images are thought to arise
42 from points of maximum emotional disruption during a trauma (‘hotspots’) leading to
43 faulty points of memory encoding (Brewin et al., 1996; Ehlers & Clark, 2000). These
44 ‘hotspots’ are those specific moments in a trauma liable to intrude as images (Ehlers &
45

Q2 Clark, 2000; Holmes, Grey, & Young, 2005; Grey & Holmes, 2007). It is thought that these images intrude carrying with them those emotions and cognitions laid down from encoding (Ehlers & Clark, 2000), bringing with them a sense of current threat. For example, if someone believed their life to be in danger and was extremely frightened at the time these images were formed (i.e. peri-traumatically), this sense of life threat would be also expected to intrude at recall (at least initially) and feed into the maintenance cycle of posttraumatic stress symptoms described earlier. It is in this context that the current finding of an interaction between imagery and peri-traumatic fear is particularly interesting. That is, imagery appears to be predictive of a traumatic reaction, but only in the presence of intense fear peri-traumatically. It is the pairing of imagery with intense fear from the initial exposure to the event that seems to predict lasting disturbance. Further work is needed to replicate this finding. Given our focus on intrusive imagery as a problem in this sample, we suggest that future research may wish to consider imagery treatment strategies for children developed from cognitive therapy for PTSD.

4.3. Limitations

There are several limitations to our study. First, a relatively small sample was used and focused on a narrow age range. Furthermore, the study relied on self-report questionnaires which have clear limitations, and as in all studies that retrospectively assess peri-traumatic response (i.e. all studies except those conducted in the laboratory), there may be a bias in recall, particularly when tested at 2 months as in the current study. In future studies, the use of direct clinical interviews would provide useful confirmation of the questionnaire data and it would be helpful to index peri-traumatic responding as close in time to the traumatic event as possible. Future work may also benefit from additionally examining current appraisals/posttraumatic responding. In addition, we were unable to look at prior psychopathology or other vulnerability factors as we did not have assessment data prior to September 11 2001. Finally, although the terrorist attacks on September 11 constituted a distinct traumatic event, news coverage concerning the attacks and subsequent events (e.g., the subsequent military campaigns in Afghanistan) continued in the following 6 months, but we did not assess the extent of this media viewing. It is possible that this continuing coverage may account for some of the stress reactions observed, as the amount of TV viewing has been implicated in the severity of the stress reaction (Pfefferbaum et al., 2001). However, as these authors argue, it is possible that viewing is a consequence as much as a cause of traumatic reactions.

Why some but not other children reported having peri-traumatic responses, such as intense fear, could not be determined from this investigation. Other research suggests that children with pre-existing emotional and behavioral difficulties may be more likely to appraise an event as dangerous or threatening (Asarnow et al., 1999; La Greca et al., 2002). The reaction of others, particularly adults present at the time of witnessing the trauma, may also influence children's peri-traumatic interpretations, for example by vicarious conditioning (Field, Argyris, & Knowles, 2001) or lack of adequate support (e.g. Gil-Rivas et al., 2004). As previously noted, several children in our study endorsed images of others around them at the time of witnessing the event on TV.

4.3.1. Clinical implications

Generally, an explicitly cognitive approach to childhood PTSD, like that described by Ehlers and Clark (2000) may be also useful for children suffering from posttraumatic stress. The results of the current study are consistent with the suggestions that assessing children's perceptions of danger to themselves in response to events witnessed remotely deserves greater clinical research attention (Vogel & Vernberg, 1993). In cases of significant disturbance in children, treatment may benefit from directly targeting the precise associated intrusive images. In brief, typical cognitive behavioral therapy for PTSD aims to aid further processing of the trauma memory. One way to achieve this is by bringing the image to mind in detail in the context of reliving/exposure therapy, as is done in adult treatment for PTSD (Brewin et al., 1996; Ehlers & Clark, 2000; Foa, Keane, & Friedman, 2000; Grey, Young, & Holmes, 2002). However, it is also possible that other recent imagery re-scripting techniques may be useful (as is the topic of the current Special Issue), in which the combination of the appearance of the image and its threatening meaning can be addressed in tandem. For example, the image re-scripting component used in treating traumatic childhood memories by Giesen-Bloo et al. (2006) involves bringing in "safety" meanings into the re-scripted image. For example, in imagery re-scripting a caregiver could enter the image and comfort the child reassuringly in order to counteract a distressing meaning associated with the image (e.g. my life is in danger), see also Weertman and Arntz (2007). The findings presented here highlight the potential clinical value of examining children's emotional and cognitive responses during media viewing, the content of any intrusive imagery, and ways to help modify persistent troublesome imagery of media trauma.

Q3 Uncited references

American Psychiatric Association (1994); Fletcher (1996).

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References

- Ahern, J., Galea, S., Resnick, H., Kilpatrick, D., Bucuvalas, M., Gold, J., et al. (2002). Television images and psychological symptoms after the September 11 terrorist attacks. *Psychiatry: Interpersonal and Biological Processes*, 65, 289–300.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV*. Washington, DC: American Psychiatric Association.
- Applied Research and Consulting, LLC, Columbia University Mailman School of Public Health & New York State Psychiatric Institute (2002). *Effects of the World Trade Center Attack on NYC Public School Students*. Initial report to the New York City Board of Education.

- 1 Artntz, A., De Groot, C., & Kindt, M. (2005). Emotional memory is perceptual. *Journal of Behavior Therapy and*
Experimental Psychiatry, 36(1), 19–34.
- 3 Asarnow, J., Glynn, S., Pynoos, R. S., Nahum, J., Guthrie, D., Cantwell, D. P., et al. (1999). When the earth stops
 shaking: Earthquake sequelae among children diagnosed for pre-earthquake psychopathology. *Journal of the*
American Academy of Child and Adolescent Psychiatry, 38, 1016–1023.
- 5 Barker, C., Pistrang, N., & Elliott, R. (1996). *Research methods in clinical and counselling psychology*. Chichester:
 Wiley.
- 7 Berntsen, D., & Rubin, D. (2002). Emotionally charged autobiographical memories across the life span: the recall
 of happy, sad, traumatic, and involuntary memories. *Psychology and Aging*, 17(4), 636–652.
- 9 Blanchard, E. B., Rowell, D., Kuhn, E., Rogers, R., & Wittrock, D. (2005). Posttraumatic stress and depressive
 symptoms in a college population one year after the September 11 attacks: The effect of proximity. *Behaviour*
Research and Therapy, 43, 143–150.
- 11 Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of post-traumatic stress disorder.
Psychological Review, 670–686.
- 13 Brewin, C. R., & Holmes, E. A. (2003). Psychological theories of posttraumatic stress disorder. *Clinical*
Psychology Review, 23(3), 339–376.
- 15 Day, S. J., Holmes, E. A., & Hackmann, A. (2004). The occurrence of imagery and its link with early memories in
 agoraphobia. *Memory*.
- 17 DeLisi, L. E., Maurizio, A., Yost, M., Papparozi, C. F., Fulchino, C., Katz, C. L., et al. (2003). A survey of New
 Yorkers after the Sept. 11, 2001, terrorist attacks. *American Journal of Psychiatry*, 160, 780–783.
- deSilva (1986). Obsessive-compulsive imagery. *Behaviour Research and Therapy*, 24, 333–350.
- 19 Duggal, H. S., Berezkin, G., & John, V. (2002). PTSD and TV viewing of World Trade Centre. *Journal of the*
American Academy of Child and Adolescent Psychiatry, 41(5), 494–495.
- 21 Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and*
Therapy, 38(4), 319–345.
- 23 Ehlers, A., Hackmann, A., Steil, R., Clohessy, S., Wenninger, K., & Winter, H. (2002). The nature of intrusive
 memories after trauma: The warning signal hypothesis. *Behaviour Research and Therapy*, 40(9), 995–1002.
- 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.
- 25 Field, A. P., Argyris, N. G., & Knowles, K. A. (2001). Who's afraid of the big bad wolf: A prospective paradigm
 to test Rachman's indirect pathways in children. *Behaviour Research and Therapy*, 39, 1259–1276.
- 27 Fletcher, K. D. (1996). Childhood posttraumatic stress disorder. In E. J. Mash, & R. Barkley (Eds.), *Child*
psychopathology (pp. 242–276). New York: Guilford Press.
- 29 Foa, E. B., Keane, T. M., & Friedman, M. (2000). *Effective treatments for PTSD: Practice guidelines from the*
International Society for Traumatic Stress Studies. New York, NY, US: Guilford Press.
- Foa, E. B., Johnson, K. M., Feeny, N. C., & Treadwell, K. R. (2001). The child PTSD Symptom Scale: A
 preliminary examination of its psychometric properties. *Journal of Clinical Child Psychology*, 30, 376–384.
- 31 Galea, S., Resnick, H., Ahern, J., Gold, J., Bucuvalas, M., Kilpatrick, D., et al. (2002). Posttraumatic stress
 disorder in Manhattan, New York City, after the September 11th terrorist attacks. *Journal of Urban Health—*
Bulletin of the New York Academy of Medicine, 79, 340–353.
- 33 Gil-Rivas, V., Holman, E. A., & Silver, R. C. (2004). Adolescent vulnerability following the September 11th
 terrorist attacks: A study of parents and their children. *Applied Developmental Science*, 8, 130–142.
- 35 Giesen-Bloo, J., van Dyck, R., Spinhoven, P., van Tilburg, W., Dirksen, C., van Asselt, T., et al. (2006).
 Outpatient psychotherapy for borderline personality disorder: A randomized clinical trial of schema focused
 therapy versus transference focused psychotherapy. *Archives of General Psychiatry*, 63, 649–658.
- 37 Grey, N., Young, K., & Holmes, E. (2002). Cognitive restructuring within reliving: A treatment for peritraumatic
 emotional “hotspots” in posttraumatic stress disorder. *Behavioural and Cognitive Psychotherapy*, 30, 37–56.
- 39 Hackmann, A., Clark, D. M., & McManus, F. (2000). Recurrent images and early memories in social phobia.
Behaviour Research and Therapy, 38, 601–610.
- 41 Halligan, S. L., Clark, D. M., & Ehlers, A. (2002). Cognitive processing, memory, and the development of PTSD
 symptoms: Two experimental analogue studies. *Journal of Behaviour Therapy and Experimental Psychiatry*, 33,
 73–89.
- 43 Holmes, E. A. (2004). Intrusive, emotional mental imagery and trauma: Experimental and clinical clues.
Imagination, Cognition and Personality, 23(2&3), 147–154.
- 45 Holmes, E. A. & Bourne, C. Inducing and modulating intrusive emotional memories: A review of the Trauma
 Film Paradigm. *Acta Psychologica*, in press.
- 47 **Q4**

- Holmes, E. A., Brewin, C. R., & Hennessy, R. G. (2004). Trauma films, information processing, and intrusive memory development. *Journal of Experimental Psychology: General*, *133*(1), 3–22.
- Holmes, E. A., Grey, N., & Young, K. A. D. (2005). Intrusive images and “hotspots” of trauma memories in posttraumatic stress disorder: An exploratory investigation of emotion and cognitive themes. *Journal of Behaviour Therapy and Experimental Psychology*, *36*, 3–17.
- Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: A special relationship? *Emotion*, *5*(4), 489–497.
- Holmes, E. A., Mathews, A., Dalgleish, T., & Mackintosh, B. (2006). Positive interpretation training: Effects of mental imagery versus verbal training on positive mood. *Behavior Therapy*, *37*(3), 237–247.
- Joffe, H., & Yardley, L. (2004). Content and thematic analysis. In D. Marks, & L. Yardley (Eds.), *Methods in health psychology*. London: Sage.
- La Greca, A. M., Silverman, W. K., Vernberg, E. M., & Roberts, M. C. (Eds.). (2002). *Helping children cope with disasters and terrorism*. Washington, DC: American Psychological Association.
- Lawyer, S. R., Resnick, H. S., Galea, S., Ahem, J., Kilpatrick, D. G., & Vlahov, D. (2006). Predictors of peritraumatic reactions and PTSD following the September 11th terrorist attacks. *Psychiatry—Interpersonal and Biological Processes*, *69*, 130–141.
- Mol, S. S. L., Arntz, A., Metsemakers, J. F. M., Dinat, G-J., Vilters-Van Montford, P. AP., & Knottnerus, J. A. (2006). Symptoms of post-traumatic stress disorder after non-traumatic events: Evidence from an open-population study. *British Journal of Psychiatry*, *186*, 494–499.
- Okwu, M. (2002). Ceremony closes ‘Ground Zero’ cleanup. Retrieved May 30, 2002, from <<http://www.cnn.com/2002/US/05/30/rec.wtc.cleanup/>>.
- Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin*, *129*, 52–73.
- Pfefferbaum, B., Doughty, D. E., Reddy, C., Patel, N., Gurwitch, R. H., Nixon, S. J., et al. (2002). Exposure and peritraumatic response as predictors of posttraumatic stress in children following the 1995 Oklahoma city bombing. *Journal of Urban Health*, *79*(3), 354–363.
- Pfefferbaum, B., Nixon, S. J., Tivis, R. D., Doughty, D. E., Pynoos, R. S., Gurwitch, R. H., et al. (2001). Television exposure in children after a terrorist incident. *Psychiatry*, *64*(3), 202–211.
- Pfefferbaum, B., Pfefferbaum, R. L., North, C. S., & Neas, B. R. (2002). Commentary on “Television images and psychological symptoms after the September 11 terrorist attacks: Does television viewing satisfy criteria for exposure in posttraumatic stress disorder? *Psychiatry: Interpersonal and Biological Processes*, *65*, 306–309.
- Pfefferbaum, B., Seale, T., McDonald, N. B., Brandy, E. N., Rainwater, S. M., Maynard, B. T., et al. (2000). Posttraumatic stress two years after the Oklahoma city bombing in youths geographically distant from the explosion. *Psychiatry*, *63*(4), 358–370.
- Schlenger, W. E., Caddell, J. M., Ebert, L., Jordan, B. K., Rourke, K. M., Wilson, D., et al. (2002). Psychological reactions to terrorist attacks—Findings from the national study of Americans’ reactions to September 11. *JAMA—Journal of the American Medical Association*, *288*, 581–588.
- Schuster, M. A., Stein, B. D., Jaycox, L., Collins, R. L., Marshall, G. N., Elliott, M. N., et al. (2001). A national survey of stress reactions after the September 11, 2001, terrorist attacks. *New England Journal of Medicine*, *345*, 1507–1512.
- Silver, R. C., Holman, E. A., McIntosh, D. N., Poulin, M., & Gil-Rivas, V. (2002). Nationwide longitudinal study of psychological responses to September 11. *JAMA—Journal of the American Medical Association*, *288*, 1235–1244.
- Smith, T. W., Rasinski, K. A., & Toce, M. (2001). *America Rebounds: A National Study of Public Response to the September 11 Terrorist Attacks*. Chicago, IL: National Opinion Research Centre.
- 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.
- Terr, L. C., Bloch, D. A., Michel, B. A., Shi, H., Reinhardt, J. A., & Metayer, S. (1999). Children’s symptoms in the wake of Challenger: A field study of distant-traumatic effects and an outline of related conditions. *American Journal of Psychiatry*, *156*, 1536–1544.
- 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.
- Vogel, J. M., & Vernberg, E. M. (1993). Part 1: Children’s psychological responses to disasters. *Journal of Clinical Child Psychology*, *22*, 464–484.

1 Weertman, A., & Arntz, A. (2007). Effectiveness of treatment of childhood memories in cognitive therapy for
3 personality disorders: A controlled study contrasting methods focusing on the present and methods focusing
on childhood memories. *Behaviour Research and Therapy*, 45, 2133–2143.

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