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Abstract

Examining parent-child agreement for Acute Stress Disorder (ASD) and Post-Traumatic Stress Disorder (PTSD) in children and adolescents is essential for informing the assessment of trauma-exposed children, yet no studies have examined this relationship using appropriate statistical techniques. Parent-child agreement for these disorders was examined by structured interview in a prospective study of assault and motor vehicle accident (MVA) child survivors, assessed at 2-4 weeks and 6 months post-trauma. Children were significantly more likely to meet criteria for ASD, as well as other ASD and PTSD symptom clusters, based on their own report than on their parent's report. Parent-child agreement for ASD was poor (Cohen's $\kappa = -.04$), but fair for PTSD (Cohen's $\kappa = .21$). Agreement ranged widely for other emotional disorders (Cohen's $\kappa = -.07 - .64$), with generalised anxiety disorder found to have superior parent-child agreement (when assessed by phi coefficients) relative to ASD and PTSD. The findings support the need to directly interview children and adolescents, particularly for the early screening of posttraumatic stress, and suggest that other anxiety disorders may have a clearer presentation post-trauma.

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Introduction

Acute Stress Disorder (ASD) and Post-Traumatic Stress Disorder (PTSD) have been diagnosed in children and adolescents following a variety of single-event traumas, including sniper shootings (Pynoos et al., 1987), motor vehicle accidents (Bryant, Mayou, Wiggs, Ehlers, & Stores, 2004; Kassam-Adams & Winston, 2004; Stallard, Velleman, & Baldwin, 1998), hurricanes (La Greca, Silverman, Vernberg, & Prinstein, 1996), assaults (Meiser-Stedman, Yule, Smith, Glucksman, & Dalgleish, 2005), and ferry disasters (Yule & Williams, 1990). However, such diagnoses are based on different forms of assessment; both questionnaires and structured interviews have been used, based on child, parent, or (in medical settings) nurse report (Saxe et al., 2003; La Greca et al., 1996). While the relationship between parent and child report of child psychopathology has received attention with regard to other anxiety disorders (Choudhury, Pimentel, & Kendall, 2003; Comer & Kendall, 2004; Dibartolo, Albano, Barlow, & Heimberg, 1998; Grills & Ollendick, 2003; Foley et al., 2004; Rapee, Barrett, Dadds, & Evans, 1994) and other emotional disorders (Grills & Ollendick, 2002), in the cases of ASD and PTSD there has been scant examination of this topic.

Understanding the accuracy of parent reporting of child posttraumatic stress is important for the success of early intervention or “screen and treat” programs for trauma-exposed youth (Chemtob, Nakashima, & Hamada, 2002; Mohlen, Parzer, Resch, & Brunner, 2005; Smith et al., 2000; Stein et al., 2003). If parents or caregivers are able to recognise posttraumatic stress in their children, then parents or caregivers may be the appropriate point of assessment in the aftermath of trauma. For example, parents may be more accessible informants than their children which could make large-scale screening more efficient, both in terms of the time taken and the cost involved. Unnecessary direct assessment of children (with the possibility of causing unnecessary distress, or provoking memories of the trauma)

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could thereby be avoided. In the context of usual clinical practice, an estimate of parent-child agreement for post-traumatic stress would also be helpful for mental health professionals trying to interpret the results of multi-informant assessment or parental report when they seek help on behalf of their child.

Existing studies have demonstrated generally poor parent-child informant agreement for other anxiety disorders. In a study of children attending an anxiety disorders clinic, Rapee et al. (1994) found poor to fair parent-child agreement when assessing for separation anxiety disorder (SAD), specific phobia, and social phobia disorders (Cohen's κ coefficients ranged from .11 to .44). Similarly, Foley et al. (2004) found poor parent-child agreement for the diagnosis of SAD in a large community sample (Cohen's $\kappa = .07$), while Choudhury et al. (2003) reported poor parent-child agreement for the major anxiety disorders in clinic-referred children and adolescents (Cohen's κ coefficients ranged from .04 to .23). However, in an analysis of parent-child agreement at the symptom as well as the diagnostic level, Comer and Kendall (2004) found that agreement was more likely for certain types of symptoms. While overall, the level of parent-child agreement was not good, agreement was greater for "observable" symptoms (e.g. "There are places the child won't go because he is afraid to be away from his parents, like over a friend's house") than "unobservable" symptoms (e.g. "Child worries a lot that something bad might happen to him/her, like someone might take him/her or he/she might get lost, so that he/she couldn't see parents again"), and greater for "school-based" (e.g. "Child gets more nervous or scared than other children his/her age when answering questions in class") than "non-school-based" symptoms (e.g. "Child has bad dreams about being away from parents").

To date, few studies have examined empirically the issue of parent-child agreement for PTSD. In one of the earliest reviews of the literature surrounding children's responses to disasters, Vogel and Vernberg (1993) noted that parents under-reported emotional problems

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in the aftermath of trauma. More recently, studies have attempted to quantify the degree of agreement between parent- and child-report for child posttraumatic stress reactions.

Stoppelbein and Greening (2000) found a strong ($r=.51$) correlation for posttraumatic stress in parentally bereaved families, using the parent- and child-report forms of the Child Post-Traumatic Stress Disorder Reaction Index (Pynoos et al., 1993). Phipps, Long, Hudson, and Rai (2005) found strong parent-child agreement in children with cancer, with parent- and child-report of PTSD symptom scores being highly correlated ($r = .46 - .69$). Shemesh et al. (2005) assessed PTSD in a sample of pediatric patients with chronic medical illnesses, conducting semi-structured interviews and self-report questionnaires with children and their parents. Parents' responses (on either the interview or the questionnaires) were not significantly associated with a "best guess" diagnosis (derived from a multiple informant procedure). Shemesh and colleagues found that parent-child disagreement was most pronounced for adolescent (12-19 year old) participants. Schreier, Ladakakos, Morabito, Chapman, and Knudson (2005) found that in the case of children admitted to hospital following mild to moderate injury, parents initially under-reported PTSD symptoms in their children but that parent and child reports converged over time. Dyb, Holen, Braenne, Indredavik, and Aarseth (2003) found poor parent-child agreement for posttraumatic stress within a small sample of children involved in a traffic accident, with parents under-reporting PTSD symptoms relative to their children.

These contradictory findings can be attributed to a number of factors: the very different types of trauma involved (ranging from more ongoing or lengthy situations, such as chronic medical problems, to one-off incidents such as MVAs); the use of different measures (e.g. questionnaire measures versus structured interviews); varying periods between the trauma and the PTSD assessment; and the use of different techniques to assess parent-child agreement. Of note is the lack of any published studies (to our knowledge) that have

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examined child-parent agreement for ASD in children, and any studies reporting Cohen's κ coefficients for parent-child agreement for a diagnosis of PTSD (Cohen's κ coefficients being considered a superior measure of parent-child agreement than correlation statistics as they take into account the amount of agreement produced by chance). Furthermore, there is a general dearth of studies examining parent-child agreement for PTSD following single-event traumas, such as MVAs. While there are problems associated with focusing on Cohen's κ as an index of parent-child agreement, and on a dichotomous measure of post-traumatic stress (i.e., a diagnosis of PTSD, as compared to continuous measures of post-traumatic stress; Comer & Kendall, 2004), κ coefficients are a widely used tool for investigating parent-child agreement for other anxiety disorders (see above), and therefore allow comparison with the existing anxiety disorders literature.

In view of these gaps in the literature, we attempted to measure the degree of agreement between parents and children in a prospective study of 10-16 year olds exposed to a single-event trauma, using κ coefficients to measure agreement for interview-based diagnoses of ASD and PTSD. Given the above findings regarding other child anxiety disorders, we predicted that parent-child agreement for ASD and PTSD would be poor. Following the findings of Comer and Kendall (2004), we also predicted that there would be differential levels of agreement across the various symptom clusters of ASD and PTSD. In particular, we predicted that the avoidance and hyperarousal symptom clusters would show greater parent-child agreement relative to the reexperiencing and (in the case of ASD) dissociation clusters, which comprise more "unobservable" symptoms. These data would be useful in informing screening measures for child PTSD (e.g., parent-report screening measures might need to be focused on certain symptoms), particularly in the acute phase, as well as in helping to identify what components of the ASD and PTSD diagnoses account for overall levels of parent-child (dis)agreement. Following the findings of Schreier et al. (2005)

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we also predicted that PTSD would have superior parent-child agreement to ASD (i.e. that parent-child agreement would converge over time).

In order to provide some comparison with the levels of child-parent agreement for ASD and PTSD in the present sample, other forms of psychopathology (including other anxiety disorders and depression) were also assessed with both child and parent interview. In terms of prevalence, other emotional disorders have been shown to occur at elevated levels in children exposed to trauma who develop PTSD (Bolton, O’Ryan, Udwin, Boyle, & Yule, 2000; Goenjian et al., 1995; McCloskey & Walker, 2000; Mirza, Bhadrinath, Goodyer, & Gilmour, 1998; Thabet, Abed, & Vostanis, 2004). However, the extent to which parents are able to accurately assess broader anxiety reactions in their children in the immediate aftermath of trauma has yet to be investigated. This information is important for understanding the overall clinical picture following trauma. Comer and Kendall’s (2004) findings suggest that parent-child agreement would be higher for disorders that would be more easily noticed by parents. We therefore hypothesised that separation anxiety disorder, which comprises more easily observable behavioural symptoms relative to ASD/PTSD (where many significant symptoms are “unobservable”; e.g., the reexperiencing cluster), would elicit better parent-child agreement than either ASD or PTSD.

Method

Participants

Children and adolescents aged 10-16 years who attended an Emergency Department (ED) in South London, UK, following either an assault or an MVA were invited to participate in this study. Children were excluded from participating if they had: existing brain disease or severe learning disability; a social services investigation of family underway; the inability to speak English; or exposure to a sexual assault (as the primary investigator was male and no female interviewer was available). Assaults and MVAs were selected as inclusion criteria for

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this study as they were relatively common causes of presentation at this inner-city ED, where a traumatic stressor could be clearly identified and defined. The exclusion of children where there was an ongoing social services investigation was to ensure that the presenting incident was a single event and not one episode of an ongoing experience of abuse or neglect. Most assault victims had been the victims of robbery or violence at school.

Of the 343 children and adolescents who met the inclusion criteria for this study, 119 (34.7%) were not contactable due to inaccurate or incomplete records at the ED, 116 (33.8%) did not wish to participate, and two (0.6%) were immediately referred for treatment for the effects of prior trauma. One-hundred and six children and adolescents (30.9%) agreed to participate in the study, of whom 93 (87.7%) completed the initial assessment (the remaining 13 children only completed self-report questionnaires pertaining to other aspects of their posttraumatic response). This low response rate is typical for this area, where social disadvantage and the associated obstacles for participating in research (e.g. lack of telephone, shift work, etc) are widespread, but is a figure comparable with other prospective studies of child MVA survivors (Stallard et al., 1998; Stallard, Salter, & Velleman, 2004; McDermott & Cvitanovich, 2000).

In 90 cases (84.9%), both the child and a parent/family member completed the initial structured interview. At the 6-month follow up, 64 (68.8%) of the 93 children and adolescents who completed the initial interview were re-interviewed. Of the 90 cases where both child and parent/family member completed the initial interview, there were 51 (56.7%) cases where both child and parent/family member were re-interviewed at 6-month follow up. Reasons for participating families failing to complete the follow up assessment were that the family was no longer contactable, the family was no longer willing to take part in the study, or the child had commenced treatment. In order to check whether the relatively large number of participants not completing the study affected the representativeness of the cohort at the 6-

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month assessment, comparisons were made between participants who left the study after the main assessment and participants who remained in the study at the 6-month assessment. Chi-square analyses revealed no differences in the frequency with which ASD was endorsed (by either child- or parent-report) or the type of traumatic event experienced, while a t-test revealed that participants who remained in the study at the 6-month assessment had lower triage scores (i.e. more serious injuries) as a result of the trauma than participants who stopped participating in the study ($t[84.69]=2.44, p=.018$).

The mean age of child participants in the study was 13.8 years ($SD=1.9$ years). The sample comprised 32 (35.6%) girls and 58 (64.4%) boys, where 50 (55.6%) had been assaulted, and 40 (44.4%) had been involved in an MVA. In 85 (94.4%) cases the child's mother was interviewed, in 3 (3.3%) cases the child's father was interviewed, in 1 (1.1%) case the child's older sibling was interviewed, and in 1 (1.1%) case the child's grandmother was interviewed. In 8 (8.9%) cases, the child's parent was also involved in the assault or MVA.

Thirteen participants (14.4%) had a fracture as a result of the incident they were involved in, and 13 (14.4%) were admitted to hospital. All participants received a triage rating when first seen by a nurse at the ED (i.e. a nurse rating of how urgently treatment was required upon attendance at the ED, where a lower score indicates greater urgency). Five (5.6%) participants arrived at the ED by ambulance and did not receive a nurse triage rating, 7 (7.8%) received a triage category of "1" (i.e. immediate treatment required), 15 (16.7%) received a triage category of "3", 62 (68.9%) received a triage category of "4" (i.e. treatment not required immediately), while no data were available for 1 participant. Of the 50 children and adolescents exposed to assaults, 24 (48.0%) knew their assailant and 16 (32.0%) were attacked by an assailant with a weapon. Of the 40 children and adolescents who had been exposed to MVAs, 4 (10.0%) had been knocked off their bicycles by motor vehicles, 1

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(2.5%) had fallen from their bicycle by accident, 7 (17.5%) had been passengers in motor vehicles, 1 (2.5%) had been riding a motorbike, 1 (2.5%) had been a passenger on a motorbike, and 26 (65.0%) had been pedestrians.

Participants did not differ from non-participants in terms of sex, the type of trauma experienced, or triage category, but they were significantly younger than non-participants (mean age = 14.8, SD = 1.9; $t=3.54$, $df=340$, $p<.001$). With regard to differences between the assault- and MVA-exposed participants, a t-test revealed that MVA survivors had significantly more serious nurse triage ratings relative to the assault victims ($t[66.66] = 2.39$, $p<.02$, adjusted for heterogeneity of variance).

Procedure

Ethical permission to conduct the study was granted by the Research Ethics Committee of the lead author's home institution, and the hospital from where families were recruited ([Author's Home Department] REC No. 058/01; King's College Hospital REC No. 01-186). The families of children meeting criteria for entry into the study were contacted by letter a few days after their child's attendance at the ED, detailing what participating in the study would involve. A telephone call inviting the family to participate in the study was then made several days after delivery of the letter.

If the family (i.e. child and parent or caregiver) gave their informed consent to participate in the study, they completed an initial assessment at 2-4 weeks post-trauma, and a follow up assessment at 6 months post-trauma. Each assessment involved both parent and child completing a structured interview assessing ASD or PTSD (depending on whether the assessment was conducted at two to four weeks or 6 months) in the child, as well as other emotional disorders.

Measures

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The Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Versions (ADIS-C/P) is a semi-structured interview schedule devised by Silverman et al. (1996) for the assessment of anxiety disorders in children and adolescents, based on the diagnostic criteria laid out in the DSM-IV. Interviews are conducted separately with both parent and child. Diagnoses are derived using both child and parent responses.

Silverman et al. (2001) noted that the ADIS-C/P has been used in a number of childhood anxiety clinical trials (e.g. Hayward et al., 2000; Spence, Donovan, & Brechman-Toussaint, 2000). In assessing the test-retest reliability of the ADIS-C/P, Silverman et al. (2001) conducted the interview with 62 children aged 7-16 years, referred to a specialist childhood anxiety disorders clinic. SAD, social phobia, specific phobia, generalized anxiety disorder (GAD), attention-deficit/hyperactivity disorder and oppositional defiant disorder (ODD) were found to have good to excellent test-retest reliability (using kappa coefficients; Cohen, 1960). Despite the lack of data regarding the test-retest reliability of the ADIS-C/P for the assessment of PTSD, it was considered to be the most appropriate interview measure of PTSD available. This was due to its prominence in childhood anxiety disorders research, the ability of the schedule to be used effectively to assess a variety of disorders, the inclusion of an appropriate measure to assess the interference associated with each possible disorder, and the use of the DSM-IV in devising the schedule.

The ADIS-C/P examines all anxiety disorders and includes screens for some affective and behavioural disorders in children. Due to the constraints of time (and the limited usefulness which would be derived from examining infrequent psychopathology) many disorders were not examined. PTSD/ASD, SAD, social phobia, specific phobia, panic disorder (PD), agoraphobia, GAD, obsessive compulsive disorder (OCD), and major depressive disorder (MDD) were investigated in the present study. The ADIS-C/P is designed such that each diagnosis can be potentially screened out after one or two key questions. For

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the above diagnoses, questioning was therefore curtailed if the screening questions were not endorsed. However, in the case of the PTSD/ASD diagnoses *all* questions were asked of each child or parent, regardless of their answers, so that each ASD and PTSD symptom cluster (as defined by the DSM-IV) was assessed (i.e. exposure to trauma, re-experiencing, avoidance, hyperarousal, impairment of functioning, and in the case of ASD, dissociation).

When the present study was designed, we were not aware of any studies published that had examined the prevalence of ASD in children and adolescents, as it is defined by the DSM-IV, and using a standardised interview with the child. Interview items assessing the dissociation items of ASD, to be included in the interview schedules for both parent and child at the initial (2-4 week) interview, were developed. This development was guided by the DSM-IV criteria for ASD, ASD interview schedules developed for use with adults (Bryant, Harvey, Dang, & Sackville, 1998; Bryant & Harvey, 2000), existing work on child dissociation (Putnam, Helmers, & Trickett, 1993), and the experience of staff at the firstauthor's home department.

The DSM-IV lists five possible dissociative symptoms, of which three are required for an individual to meet the dissociation criterion for ASD. Each dissociation symptom was assessed in our interview schedule using two or three items, and each item was asked twice; once relating to the child or adolescent's experience during the trauma, and a second time relating to his or her experience since the trauma. Thus, four or six items were included in the interview schedule to assess each dissociation symptom. These items are available from the first author.

The internal reliability of the ASD diagnostic items was found to be high (Cronbach's $\alpha = 0.85$). Tape recordings of 11, 2-4 week interviews and 10, 6-month interviews were assessed by another clinician so as to assess the inter-rater reliability of the ASD and PTSD diagnoses. The clinician (XX) had seven years' experience of assessing and treating

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traumatic stress reactions in children and adolescents, and was blind to the principal investigator's diagnosis in each case. There was unanimous agreement between raters for both the ASD diagnosis at initial interview (Cohen's $\kappa = 1.00$) and the PTSD diagnosis at 6 month follow-up ($\kappa = 1.00$).

Data Analysis

In order to allow comparison with other studies, we decided to use Cohen's κ inter-rater reliability statistic as an index of the degree of agreement between child and parent report of ASD, PTSD, and the other disorders investigated. In addition, phi (ϕ) coefficients (a measure of the association between dichotomous variables) were calculated so as to allow comparison of agreement between children and parents for ASD and PTSD diagnostic criteria and other diagnoses, as in Comer and Kendall (2004). Where we made specific predictions, we used an alpha value of .05. In those instances where more exploratory analyses were performed, a Bonferroni correction for multiple comparisons was performed. Since we made a further 31 comparisons, the correction suggested an alpha value of .0016.

Results

Parent and child report of ASD and PTSD criteria and diagnoses

The numbers of children and parents reporting individual ASD and PTSD criteria, as well as ASD and PTSD diagnoses, are presented in Table 1. Chi-square analyses revealed that children were more likely than their parents to report meeting the dissociation criterion of ASD ($\chi^2 > 20$, $df = 1$, $p < .0001$), the reexperiencing criterion of ASD ($\chi^2 = 15.07$, $df = 1$, $p < .0002$), and a diagnosis of ASD ($\chi^2 = 13.05$, $df = 1$, $p < .0003$), while the difference for the hyperarousal criterion of PTSD was non-significant at our corrected alpha value ($\chi^2 = 4.92$, $df = 1$, $p = .03$). Inter-rater reliabilities for the individual ASD criteria were poor to fair, with Cohen's κ ranging from .08 - .26, while the ASD diagnosis itself had an inter-rater reliability of $\kappa = -.04$. At the 6-month assessment for PTSD, inter-rater reliabilities for the individual

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criteria seemed to improve, ranging from .22 - .44; importantly, the κ coefficient for the PTSD *diagnosis* was .21, a value considered by Landis and Koch (1977) to be fair.

We were concerned that the poor parent-child report for ASD may have been related to the inclusion of the dissociation symptoms cluster in this disorder, which was especially underreported by parents. However, when a “diagnosis” of “early PTSD” was derived at the first assessment point (i.e. PTSD without the duration criterion and without the dissociation cluster), parents were still less likely to report that their child met criteria for this “diagnosis” than the children themselves (14.8% versus 27.3% for child-report), and parent-child agreement remained poor (Cohen’s $\kappa = .16$). A further concern was that the slight convergence in parent-child agreement over time may have been the result of a significant number of participants dropping out of the study by the 6-month assessment. In order to verify that this change in agreement was not related in some way to this high attrition rate, Cohen’s κ for ASD was calculated for just the 51 participants who completed both the initial and 6-month assessments. This coefficient was $-.07$, suggesting that the improvement in parent-child agreement between ASD and PTSD was not an artifact due to participant attrition.

Phi statistics (designated ϕ in Table 1) between parent and child reports revealed significant agreement for the ASD reexperiencing, avoidance, and impairment of functioning criteria, and for the avoidance and hyperarousal criteria of PTSD. Fisher’s transformation was used to allow comparison between the coefficients of correlation for ASD and PTSD criteria over time, and between the various criteria. The only significant difference observed was for the hyperarousal criterion, where parent-child agreement improved between ASD and PTSD ($z = 1.77, p < .039$, one-tailed), though the difference for ASD and PTSD diagnoses was approaching significance ($z = 1.56, p = .059$).

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In the case of between-criteria comparisons, we tested whether parent-child agreement as indexed by ϕ coefficients was greater for the avoidance and hyperarousal criteria than for the dissociation and reexperiencing criteria. No significant differences were observed for the initial ASD assessment, while at the follow-up PTSD assessment there were no statistically significant differences except for an approaching significance difference for hyperarousal over reexperiencing ($z = 1.41, p = .079$, one-tailed).

---TABLE ONE ABOUT HERE---

Parent and child report for ASD and PTSD by type of trauma

It was of interest whether the prevalence of ASD and PTSD and the amount of agreement between parents and children for these diagnoses might differ according to the type of trauma experienced. Chi-square analyses revealed no differences in the prevalence of ASD or PTSD between assaults and MVAs (on the basis of either parent or child report). Examination of the inter-rater reliability coefficients for the assault and MVA sub-samples revealed that Cohen's κ was similar for ASD (-.04 and -.05 respectively), but more seemingly different for PTSD (.41 and -.10, respectively). Phi coefficients were consistent with this pattern, with similar phi coefficients for the assault and MVA sub-samples for ASD (-.07 and -.07, respectively), but diverging for PTSD at the 6-month assessment (.43 and -.10, respectively). Fisher's transformation found that the difference in phi coefficients for PTSD was approaching significance, based on our corrected alpha value of .0016 ($z=1.88, p=.03$). This possible divergence between assault and MVA survivors needs to be treated with caution, however, given the low numbers of each group at the 6-month assessment ($n=25$ and $n=26$, respectively) and the low prevalence of PTSD in each group.

Correlation between ASD and PTSD for children and parents

While we examined in greater detail elsewhere the ability of child-reported ASD to predict later child-reported PTSD (Meiser-Stedman et al., 2005), we thought it pertinent to

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compare the ability of ASD to predict later PTSD by informant. In each case we predicted that informants' report of ASD would predict PTSD. Child-reported ASD was found to significantly correlate with later child-reported PTSD ($\phi = .33$, $n = 64$, $p < .008$), while parent-reported ASD was unrelated to later parent-reported PTSD ($\phi = .24$, $n = 51$, $p = .09$). Notably for screening purposes, it was found that parent-reported ASD failed to correlate with later child-reported PTSD ($\phi = -.07$, $n = 60$, $p > .1$).

Parent and child report of other psychopathology

Rates of parent- and child-reported psychopathology (other than ASD and PTSD) at each time point are presented in Table 2. Children were more likely than their parents to report meeting criteria for a diagnosis of specific phobia ($\chi^2 = 7.81$, $df = 1$, $p < .006$) at the initial assessment, though when corrected for multiple comparisons this finding was only approaching significance. At the follow up assessment, there were no differences between child- and parent-report for other disorder, based on our corrected alpha value.

Parent-child agreement, as measured by Cohen's κ , for disorders not specific to trauma ranged from $-.04$ - $.55$ at the initial assessment, and from $-.07$ - $.64$ at the follow up assessment. Phi coefficients for parent- and child-reported psychopathology were only significant for specific phobia and GAD at the initial assessment, and for SAD and GAD at the follow up assessment.

---TABLE TWO ABOUT HERE---

Comparisons between ASD/PTSD and other psychopathology

In order to compare the size of parent-child agreement between ASD and PTSD and other psychopathology, Fisher's transformation of phi coefficients and z-scores were used. Since several anxiety disorders were not endorsed by either children or their parents, it was not possible to calculate ϕ coefficients for these disorders and thereby make comparisons with ASD and PTSD. At the initial assessment, GAD ($z = 2.71$, $p < .007$) was found to have a

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greater parent-child agreement relative to ASD, while no difference was observed for specific phobia, panic disorder, agoraphobia, or MDD (though the difference for specific phobia was approaching significance). At the follow up assessment, ϕ coefficients for specific phobia and SAD were not significantly different to the coefficient for PTSD, while GAD had superior parent-child agreement to PTSD ($z = 2.86, p < .004$).

Discussion

This study described the prevalence of child- and parent-reported ASD, PTSD, and other emotional disorders, and the degree of agreement between children and parents, in a sample of trauma-exposed children and adolescents. To our knowledge this is the first study to report parent-child agreement for ASD, and one of the first to report parent-child agreement for PTSD following single-event trauma. Parent-child agreement for ASD was poor, in line with our predictions and with existing studies of other anxiety disorders and PTSD (Dyb et al., 2003; Shemesh et al., 2005). By the time of the PTSD interview at the follow up assessment, parent-child agreement as assessed by Cohen's κ had improved to a "fair" level (Landis & Koch, 1977), though this does not reach the widely cited cut-off of .60 as an acceptable level of agreement (Mannuzza et al., 1989). The phi coefficient for parent-child agreement did not significantly improve between the ASD and PTSD assessments, though the change in scores did approach significance. Only the hyperarousal criterion showed significant improvement in parent-child agreement over time (i.e. between the ASD and the PTSD assessments) when measured by phi coefficients. While child-reported ASD did predict later child-reported PTSD, parent-reported ASD failed to predict later parent-reported PTSD, suggesting that parental report of ASD and/or PTSD were not a reliable measure of distress in the child. Parent-reported ASD failed to predict later child-reported PTSD, suggesting parent-only screening in the aftermath of trauma would be less than optimal. The poor agreement for ASD and PTSD was also evident in the individual diagnostic criteria,

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with no κ coefficients reaching the widely accepted cut-off of .60. Chi-square analyses suggested that this was a reflection of parents under-reporting symptoms in their children, or their children over-reporting symptoms, at least for certain symptom clusters and for the ASD diagnosis.

The generally poor parent-children agreement observed for ASD and PTSD in this study is similar to findings for other anxiety disorders (Choudhury, et al. 2003; Comer & Kendall, 2004; Dibartolo, et al., 1998; Foley et al., 2004; Grills & Ollendick, 2003; Rapee, et al., 1994). With regard to other studies of parent-child agreement for PTSD, our findings may help to bring some clarity to the existing contradictory findings. While studies of post-traumatic stress reactions in children with more chronic or ongoing stressors, such as bereavement (Stoppelbein & Greening, 2000), cancer (Phipps et al. 2005) and chronic medical illnesses (Shemesh et al., 2005), have found generally good parent-child agreement, parent-child agreement has been less good in the case of one-off threats, such as natural disasters (Vogel & Vernberg, 1993), MVAs (Dyb et al., 2003), or mild to moderate physical injury (Schreier et al., 2005). Our findings, based on a group of children who were exposed to single-event traumas, add to this latter group of studies. As with Vogel and Vernberg's (1993) review, our findings suggested that parents were under-reporting ASD and PTSD in their children relative to their children's report (or that children were over-reporting ASD and PTSD). The slight improvement by the time of the PTSD assessment support Schreier et al.'s (2005) observation that parent-child agreement improved over time. For events that continue to have obvious life-long implications, parents are apparently more able (or more willing) to recognise distress in their child. Clearly stressors such as bereavement and chronic illness may present more opportunities for parents to notice distress in their children and discuss how they are coping, e.g. medical procedures, changes in routines, anniversaries, etc. In the case of single-event trauma, however (particularly where any injuries sustained are slight),

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parents may be more able to forget what happened or are given fewer situations where they are presented with their child's distress. Parents may also simply be less aware as to the psychological damage that can be caused by single events such as MVAs. Given the comparatively short history of investigating events such as MVAs in children and the lack of any significant public health campaign concerning these issues, this is not surprising.

The slight convergence in agreement between the ASD and PTSD assessments over time might be attributed to a number of factors. First, the two diagnoses, while obviously both based on posttraumatic stress symptoms, nevertheless have different criterion thresholds, with fewer symptoms being required to meet the ASD criteria of reexperiencing and hyperarousal. It is unlikely, given our examination of an "early PTSD" diagnosis, that the improvement in parent-child agreement was related to the presence of the dissociation criterion in the ASD diagnosis. Second, families may have been more disrupted in the immediate aftermath of the child's accident or assault, preventing good communication. Third, parents may have the view that some initial reactions are "normal", and so under-report "symptoms" in their children.

Contrary to our predictions, there was little evidence of avoidance and hyperarousal criteria having greater parent-child agreement relative to the dissociation and reexperiencing criteria. Comparison of ϕ coefficients suggested that hyperarousal had superior parent-child agreement to reexperiencing at the follow up assessment. The lack of any difference at the initial assessment may have been the result of a "floor" effect, where agreement was poor for all criteria. While we assumed parents may not have been able to observe many reexperiencing symptoms, parents also may have lacked the opportunities to observe avoidance symptoms; the recruited sample was relatively mature, and probably undertook many activities without their parents' supervision, e.g. travelling to school.

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The contrast with Comer and Kendall's (2004) findings may have been the result of considering criteria rather than individual symptoms; to take the reexperiencing criterion as an example, one might expect the symptom "recurrent and intrusive distressing recollections of the event" to be more difficult for a parent to recognise than "physiological reactivity on exposure to internal or external cues" (American Psychiatric Association, 1994). The main implication of this failure to observe any between-criteria differences for parent-child agreement is that we have not been able to pinpoint any specific aspects of the ASD and PTSD diagnoses that give rise to their poor parent-child agreement.

Comorbid disorders were found to have quite widely varying degrees of parent-child agreement, with Cohen's κ coefficients ranging from $-.04$ - $.38$ at the initial assessment (relative to $-.04$ for ASD), and from $.07$ - $.64$ at follow up (relative to $.21$ for PTSD). The generally poor parent-children agreement observed in this trauma-exposed population broadly matches existing findings for clinic-referred samples (e.g. Choudhury et al., 2003; Rapee et al., 1994). Only GAD was found to have superior parent-child agreement (when comparing phi coefficients), relative to ASD and PTSD. While the differences in phi coefficients were not significant between ASD or PTSD and other disorders, specific phobia (at the initial assessment) and SAD did nevertheless have significant phi coefficients (unlike either ASD or PTSD). This provides partial support for our hypothesis that parent-child agreement would be greater for more observable disorders, in particular SAD. Together with the findings for GAD, this suggests that ASD and PTSD have a less clear presentation when assessed by multiple informants, relative to other anxiety disorders.

These differences may simply be the result of other disorders having been present for some time before the trauma, and so more easily recognised by parents. It is possible that children are less able to talk about traumatic stress reactions with their parents, relative to other fears or worries. For example, many families may be used to discussing worries, which

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would enable communication about GAD symptoms. One implication of the Comer and Kendall (2004) finding may be that ASD or PTSD comprise symptoms that are more difficult to observe than other disorders. Alternatively, as Yule, Perrin, and Smith (1999) suggest, children may hide their distress from their parents because they don't want to upset them, while parents may prefer to deny that their child is experiencing any serious distress in response to a trauma. Parents may have more over-optimistic beliefs about the ability of children to cope in the aftermath of trauma, while there may be greater recognition of more general anxiety problems.

The approaching-significance difference in parent-child agreement for PTSD between assaults and MVAs is likely to be a statistical artifact, as noted above, but may also suggest that the type of trauma a child experiences is related to the extent to which the disorder is detectable in children. While the inclusion and exclusion criteria for this study were selected to ensure that the events children experienced were distinguishable, single-event traumas that met the traumatic stressor criterion of the DSM-IV, there are still differences between the different traumatic experiences. Assaults by their nature were more likely to last for minutes and involved intentional violence or injury, while the MVAs were generally over in a few seconds and more commonly accidental. Parents may be more willing to acknowledge that assaults are more likely to cause psychological disturbance than MVAs.

These findings have two main implications for the assessment of children and adolescents exposed to single-event trauma. First, the poor agreement between child and parents for the ASD diagnosis at the initial assessment suggests that early screening for posttraumatic stress in trauma-exposed children and adolescents requires the assessment of children themselves. Parents were much less likely to give responses supporting a diagnosis of ASD in their children. While it may be preferable to interview parents about their child's response to a trauma (i.e. for fear of upsetting their children), this approach may result in

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children being incorrectly identified as not suffering significant psychiatric morbidity. Parent report may become more accurate as a way of ascertaining child posttraumatic stress several months after the trauma, yet the need to obtain child report as well as parent report would remain.

Second, the results of this study suggest that ASD and PTSD may not have as clear a presentation as other anxiety disorders. While disorders other than ASD and PTSD have been documented in child and adolescent trauma survivors before (Bolton, et al., 2000; Goenjian et al., 1995; Mirza, et al., 1998; McCloskey & Walker, 2000; Thabet, et al., 2004), this study has been the first to investigate child-parent agreement for these other problems in this specific population. The data revealed that parents' and children's responses to an interview assessing for ASD or PTSD were less likely to agree than for certain other anxiety disorders, which themselves generally have poor parent-child agreement (Grills & Ollendick, 2002). As we were not able to identify conclusively differences in parent-child agreement between the various symptom clusters of ASD and PTSD, it is unclear why these disorders may have poor parent-child agreement relative to other conditions. These findings suggest that clinicians need to be aware that while other emotional responses may be a presenting concern, ASD or PTSD may be a harder to detect response in the aftermath of trauma. Furthermore, parent report is useful for the assessment of anxiety disorders other than ASD/PTSD (particularly GAD) in the aftermath of trauma.

This study is limited by the low participation rate and poor retention of participants at the 6-month assessment. This obviously reduces the power of many of the analyses performed here, and to some extent makes comparison between the initial and follow-up assessments more difficult. In particular, the small sample size meant that there were relatively few cases where a child experienced a disorder other than ASD/PTSD, making it impossible to conduct some analyses. The high attrition rate for this study meant that

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participants who persisted in the study at the 6-month assessment had more severe injuries, but were not more likely to have ASD, relative to the participants who did not complete the 6-month assessment. A further limitation concerns the recruitment of participants exposed to single-event, small-scale trauma (i.e. not mass disasters or war). In the vast majority (91.1%) of cases parents were not exposed to the same trauma as their children, making it difficult to investigate whether being involved in the same trauma together with a parent has any relation on the extent of parent-child agreement for ASD or PTSD. Smith et al. (2001), when assessing the impact of war trauma on a community of children and their mothers, found that higher levels of maternal distress predicted their report of their child's behavioural difficulties. Future research is need to investigate whether parental mental health impacts on their reporting of their children's distress, particularly following trauma where parents have not been involved in the same trauma as their children.

Unlike many existing studies of parent-child agreement for other anxiety disorders, this study did not involve a clinic-referred sample, but rather a naturalistic sample of trauma-exposed children. While the findings of this study may be appropriate when considering trauma-exposed youth, it may not allow appropriate comparison with other clinic-based studies of parent-child agreement. Further, analyses of parent-child agreement are required for larger child and adolescent samples exposed to other forms of trauma, as well as for other forms of report (e.g. self-report questionnaires).

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Table 1. Agreement between child and parent report of ASD and PTSD criteria by assessment point

Criterion/Diagnosis	2-4 week interview (ASD)					6-month interview (PTSD)				
	Child report	Parent report	Cases			Child report	Parent report	Cases		
			Cohen's κ	correct	φ			Cohen's κ	correct	φ
			(n=84) ^a	(n=84)	(n=84)			(n=51)	(n=51)	(n=51)
Exposure to trauma	69/95 (72.6%)	66/86 (76.7%)	.08	64.7%	.08	-	-	-	-	-
Dissociation	50/93 (53.8%)	8/83 (9.6%)	.08	52.3%	.14	-	-	-	-	-
Reexperiencing	64/95 (67.4%)	35/90 (38.9%)	.17	52.2%	.32**	32/68 (47.1%)	19/54 (35.2%)	.22	61.5%	.21
Avoidance	64/95 (67.4%)	52/90 (57.8%)	.20	62.2%	.21*	23/68 (33.8%)	13/54 (24.1%)	.38	75.0%	.35*
Hyperarousal	76/95 (80.0%)	62/90 (68.9%)	.18	67.8%	.18	35/68 (51.5%)	17/54 (31.5%)	.45	73.1%	.46**
Impairment of functioning	37/95 (38.9%)	34/90 (37.8%)	.26	65.6%	.26*	18/68 (26.5%)	10/54 (18.5%)	.22	71.2%	.18
Diagnosis	18/93 (19.4%)	2/86 (2.3%)	-.04	81.0%	-.07	8/67 (11.9%)	7/54 (13.0%)	.21	82.4%	.21

ASD = Acute Stress Disorder; PTSD = Posttraumatic Stress Disorder. ^aThe discrepancy between this n value and n values presented in the

Method section is the result of the omission of Dissociation data for several parents.

* = p<.05, ** = p<.01

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Table 2. Agreement between child and parent report of other psychopathology by assessment point

Diagnosis	2-4 week interview					6-month interview				
	Child report	Parent report	Cohen's κ	Cases		Child report	Parent report	Cohen's κ	Cases	
				correct	ϕ				correct	ϕ
Separation Anxiety Disorder	4/85 (4.7%)	4/76 (5.3%)	-.04	92.9%	-.04	1/57 (1.8%)	5/43 (11.6%)	.00	92.1%	.38*
Social Phobia	2/86 (2.3%)	0/76 (0.0%)	.00	97.1%	^a	2/57 (3.5%)	0/43 (0.0%)	.00	97.4%	^a
Specific Phobia	11/85 (12.9%)	1/76 (1.3%)	.24	87.1%	.24*	5/57 (8.8%)	3/43 (7.0%)	-.07	86.8%	-.07
Panic Disorder	1/84 (1.2%)	2/76 (2.6%)	-.01	97.1%	-.01	0/57 (0.0%)	1/43 (2.3%)	^b	100.0%	^a
Agoraphobia without PD	2/84 (2.4%)	1/76 (1.3%)	-.01	97.1%	-.01	1/57 (1.8%)	0/43 (0.0%)	.00	97.4%	^a
Agoraphobia with PD	0/84 (0.0%)	1/76 (1.3%)	.00	98.6%	^a	0/57 (0.0%)	0/43 (0.0%)	^b	100.0%	^a
GAD	6/84 (7.1%)	4/76 (5.3%)	.55	95.7%	.39**	5/57 (8.8%)	6/43 (14.0%)	.64	94.7%	.69***
OCD	1/84 (1.2%)	0/76 (0.0%)	.00	98.6%	^a	0/57 (0.0%)	0/43 (0.0%)	^b	100.0%	^b
Major Depressive Disorder	7/85 (8.2%)	5/76 (6.6%)	.14	88.6%	.14	5/57 (8.8%)	0/43 (0.0%)	.00	92.1%	^b

PD = Panic Disorder; GAD = Generalised Anxiety Disorder; OCD = Obsessive-Compulsive Disorder.

^a These correlation analyses could not be performed as one of the variables was constant. ^b These analyses could not be performed due to insufficient cases. * = $p < .05$, ** = $p < .01$, *** = $p < .001$

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22nd February 2006

Dear Professor Lochman,

Re: Manuscript #JACP149R1

Thank you for accepting this manuscript for publication in the Journal of Abnormal Child Psychology, pending the receipt of a manuscript with additional revisions.

We have amended the manuscript in the following ways:

Editor's comments:

1. We have removed Table 3 and the accompanying text in the Introduction, Results and Discussion sections pertaining to the elevated psychopathology in the ASD and PTSD participants.

Reviewer 1's comments:

1. We have reduced the number of analyses performed by omitting Table 3 and the comparisons concerning disorders comorbid with ASD or PTSD, as outlined above. Following Reviewer 1's suggestion we have performed a Bonferroni correction for exploratory analyses, and amended the Results sections accordingly (see pp.13, 15-16). These changes have not significantly altered our findings, so no amendments to the Discussion section were necessitated.

Reviewer 2's comments:

1. We recognise that a larger sample size would have allowed for a better examination of the issues concerning parent-child agreement for other emotional disorders following single-event trauma. In order to increase the power of the analyses performed (mainly by reducing the likelihood of a type II error), we have removed Table 3 and the analyses concerning disorders comorbid with ASD/PTSD. We do think it is important to report our significant findings concerning parent-child agreement for GAD relative to the parent-child agreement for ASD/PTSD (as represented in Table 2), which has implications for clinical practice. We have, however, drawn attention to the low sample size issue (and the resultant difficulties with conducting parent-child agreement analyses for other disorders) in the Discussion section (p.22).

We hope these amendments are appropriate. Once again, we are very grateful for your comments and those of the reviewers, which have been a great help as we have sought to improve this manuscript.

Yours sincerely,

Dr Richard Meiser-Stedman
Prof. William Yule
Dr Patrick Smith
Dr Ed Glucksman
Dr Tim Dalgleish

PARENT AND CHILD REPORT OF POSTTRAUMATIC PSYCHOPATHOLOGY

Parent and child report of posttraumatic psychopathology in a prospective study of children
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