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Beyond Fear, Helplessness, and Horror: Peritraumatic Reactions Associated With Posttraumatic Stress Symptoms Among Traumatized Delinquent Youth

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This study investigated associations among peritraumatic reactions, including the triad of fear, helplessness, and horror specified in Criterion A2 of the *DSM–IV–R*, and posttraumatic stress disorder (PTSD) diagnostic status and symptom severity among a sample of 555 juvenile justice-involved adolescents (188 girls and 367 boys). Results of hierarchical and logistic regression analyses indicated that, with the exception of helplessness, peritraumatic reactions beyond the *DSM–IV–R* triad, particularly disorganized behavior and confusion, were more strongly associated with PTSD diagnosis and symptoms among these youth than were the A2 criteria. Gender differences also emerged in the pattern of results, with disorganized behavior and dissociation associated more strongly with PTSD symptom levels among girls than boys. In addition, investigation of the relations between peritraumatic reactions and the recently proposed 5-factor model of PTSD symptom clusters showed that peritraumatic disorganization was the most consistently associated with PTSD symptoms, whereas peritraumatic helplessness was uniquely associated with Numbing among boys and Dissociation among girls. These results have implications for informing the *DSM–5* as well as adding to the evidence base for deriving developmentally sensitive criteria for the diagnosis of PTSD among youth exposed to trauma.

Keywords: PTSD, symptom clusters, gender, delinquency, peritraumatic reactions

The diagnosis of posttraumatic stress disorder (PTSD) has been a topic of recent debate in light of discussions surrounding the forthcoming new edition of the *Diagnostic and Statistical Manual for Mental Disorders* (5th ed.; *DSM–5*). Much of this debate has centered on Criterion A, which is intended to serve a gate-keeping function by defining the experiences that qualify as traumatic and thus might lead to the development of PTSD (Bedard-Gilligan & Zoellner, 2008). In the *Diagnostic and Statistical Manual for Mental Disorders* (4th ed., rev.; *DSM–IV–R*; American Psychiatric Association, 2000), Criterion A1 specifies that the individual must witness or experience an event involving actual or threatened death or serious injury to the self or other. In addition, Criterion A2 requires that the experience must be accompanied by subjective peritraumatic reactions of "intense fear, helplessness, or horror." Thus, peritraumatic reactions have played a central role in the *DSM–IV–R* criteria for the PTSD diagnosis (Weathers & Keane, 2007). In contrast, the draft criteria for *DSM–5* released to date propose removing Criterion A2 from the definition entirely and replacing Criterion A1 with a restricted list of specific events, including actual or threatened death, serious injury, or sexual violation.

The empirical and theoretical bases that support these revisions include evidence that Criterion A does not contribute to the prediction of the PTSD diagnosis in general and that, in particular, there is little predictive validity of the A2 criterion requiring the peritraumatic reactions of fear, helplessness, and horror (e.g., Adler, Wright, Bliese, Eckford, & Hoge, 2008; Bernat, Ronfeldt, Calhoun, & Arias, 1998; Breslau & Kessler, 2001; Brewin, Andrews, & Rose, 2000). For example, across multiple samples, Bedard-Gilligan and Zoellner (2008) found that the endorsement of fear, helplessness, and horror predicted PTSD only at a level consistent with chance. Therefore, these studies suggest justification for adopting guidelines for the diagnosis that do not rely on the A2 criterion.

However, a competing school of thought argues that peritraumatic responses do play a central role in the development and expression of PTSD, and are more predictive of the diagnosis than are characteristics of the event itself (e.g., Brunet et al., 2001). In particular, it is argued that subjective cognitive, emotional, and physiological reactions are essential to whether or not an individual perceives a given event as traumatic and thus whether the experience is likely to become associated with posttraumatic stress (Bovin & Marx, 2011). In support of this proposition, a large body of evidence shows that peritraumatic reactions are more strongly associated with PTSD than are objective features of the event (Trickey, Sidddaway, Meiser-Stedman, Serpell, & Field, 2012). Moreover, the predictive power of peritraumatic reactions may be strengthened when the list of responses is expanded beyond the A2

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triad of fear, helplessness, and horror (Brewin et al., 2000; Ozer, Best, Lipsey, & Weiss, 2008). Notably, in the *DSM–IV–R* field trial, Kilpatrick and colleagues (1998) found that other peritraumatic reactions accounted for as much or more variance than those specified by Criterion A2, a finding recently replicated by Lancaster, Melka, and Rodriguez (2011). As Resick and Miller (2009) concluded in their review, although some studies find that fear, helplessness, and horror are associated with subsequent PTSD symptoms, these three alone are not sufficient for predicting PTSD. Among the peritraumatic reactions that have been considered in research that has diverged from the A2 triad, peritraumatic dissociation and general distress in particular have been implicated in studies of adults (Bovin & Marx, 2011) and youth (Bui et al., 2011; Dyb et al., 2008). Therefore, it is important that research concerning peritraumatic reactions include the range of responses that have been found to have significant associations with PTSD.

However, a limitation of the research to date on peritraumatic reactions is that, with only a few exceptions, much of it has neglected the study of children and adolescents. Unfortunately, the experience of trauma is not rare in the lives of children (Costello, Erkanli, Fairbank, & Angold, 2002). In particular, some groups of high-risk youth, such as those involved in the juvenile justice system, evidence rates of exposure to Criterion A1 traumatic events as high as 90% and prevalence rates of PTSD as high as 50% among girls and 30% among boys (for reviews, see Kerig & Becker, 2010, 2011). Furthermore, attention to peritraumatic reactions may make a particularly helpful contribution to understanding PTSD among youth (Cohen & Scheeringa, 2009). Events that do not meet the A1 criterion for trauma among adults—for example, abandonment by a caregiver—may loom large when viewed from a child's point of view and when processed through a child's perceptual framework, and thus be interpreted as terrifying and even life-threatening (Bowlby, 1973/1998). Therefore, peritraumatic reactions may play an especially important role in determining whether a given event will be experienced as traumatizing by young people (Trickey et al., 2012). In particular, as Bowlby (1973/1998) suggested, peritraumatic distress among youth may be evoked most strongly by traumas that are interpersonal and involve intentional maltreatment by another person.

Yet another limitation of the research to date, one which also is especially relevant to the study of youth, is that PTSD is most often treated as a unidimensional construct rather than as a set of distinct symptom clusters involving such diverse reactions as reexperiencing, avoidance, and arousal. This is an issue of particular importance in the study of young people, given that children and adolescents frequently fail to meet full diagnostic criteria even when they display specific symptoms that are serious enough to disrupt functioning (Cohen & Scheeringa, 2009). In one of the few studies to investigate the ways in which peritraumatic reactions might be predictive of individual PTSD symptom clusters, Roemer, Orsillo, Borkovec, and Litz (1998) found that whereas peritraumatic reactions of helplessness were associated with the intrusive, avoidant, and arousal PTSD symptom clusters, peritraumatic horror was related only to intrusive symptoms, and fear was not significantly correlated with any of the three symptom clusters. These diverse symptom presentations may arise from different antecedents, may affect overall functioning in different ways, and may require different treatments for their amelioration (Gootzeit & Markon, 2011; Kerig, Vanderzee, Becker, & Ward, 2012). Therefore, additional research is needed to investigate the associations between peritraumatic reactions and specific PTSD symptom clusters among youth.

Further complicating this question is the fact that a multitude of studies have emerged to suggest that the factor structure of PTSD diverges from the three-part typology defined by *DSM–IV–R*. Although a number of alternative models have been proposed and tested among adults and youth, one finding that has emerged repeatedly across cultures and ages is that the avoidance cluster is comprised of two independent factors involving active avoidance versus emotional numbing (Kassam-Adams, Marsac, & Cirilli, 2010; King, Leskin, King, & Weathers, 1998; Simms, Watson, & Doebbelling, 2002). In addition, recent evidence suggests an even better-fitting 5-factor model (Armour et al., 2012; Elhai et al., 2011), recently validated among youth (e.g., Elhai, Layne, Steinberg, Briggs-King, Pynoos, 2012; Wang et al., 2011), which further divides the arousal cluster into scales associated with dysphoria and anxiety. Consideration of this newer empirically derived structural model is both timely and important given its potential impact on the revised diagnostic criteria being developed for *DSM–5*.

Finally, another question upon which research on peritraumatic reactions may help to shed light concerns gender differences in the diagnosis of PTSD. Across samples, girls and women are more likely than boys and men to meet criteria for PTSD (Tolin & Foa, 2006), but there is speculation as to whether or not these reflect true differences in prevalence versus reporting bias. For example, a well-established pattern of findings indicates that, despite higher rates of exposure to Criterion A1 traumatic events among boys and men, girls and women are more likely to endorse Criterion A2 and to obtain a PTSD diagnosis (e.g., Bedard-Gilligan & Zoellner, 2008; Breslau & Kessler, 2001; Kerig & Becker, 2011). One proposed explanation for this difference in response is that the masculine sex role stereotype may be incompatible with the acknowledgment of peritraumatic emotions implying vulnerability such as fear, helplessness, or horror (Peters, Issakidis, Slade, & Andrews, 2006; Saxe & Wolfe, 1999), particularly for adolescent boys (Kerig, Vanderzee, et al., 2012). Therefore, investigations including a wider range of possible peritraumatic reactions may better capture the subjective experience of men and boys.

In summary, the extant literature points to the importance of further investigating the associations between peritraumatic reactions and PTSD symptoms in general, and among traumatized youth in particular. To this end, the current study assessed a spectrum of peritraumatic reactions beyond simply fear, helplessness, and horror, and examined how each peritraumatic response was related to PTSD diagnostic status, severity, and symptom expression in a sample of high-risk youth. The specific hypotheses this study set out to test were the following: (1) that, in comparison with the *DSM–IV–R* Criterion A2 reactions of fear, helplessness, and horror, other peritraumatic reactions would be more strongly associated with the overall PTSD diagnosis among youth; (2) that peritraumatic reactions would be differentially associated with youths' meeting *DSM–IV–R* criteria for specific symptom clusters; and (3) that peritraumatic reactions would be associated with youths' symptom presentations according to Elhai and colleagues' (2011) newer empirically supported 5-factor structural model of PTSD. In addition, given that gender differences frequently

emerge in studies of PTSD among adults and youth, gender was considered as a moderator of these interrelations.

Method

Participants

Participants included 555 youth recruited from a county juvenile detention center in the midwestern United States. The sample included 188 girls and 367 boys ranging in age from 11 to 17 years ($M = 15.52$, $SD = 1.47$). Among the youth, 68.9% were White/Caucasian, 24.1% Black/African American, 2.9% Hispanic/Latino, 0.9% Native American/Alaskan Native, 2.5% multiracial, and 0.4% Asian. The majority of youth (72%) were charged with multiple offenses, which ranged from status offenses to misdemeanors and felonies.

Procedure

This study and all procedures were approved by both the Butler County Juvenile Justice Center (JJC) and the Miami University Human Subjects Institutional Review Boards. At parent visitations to the JJC, parents of eligible youth were invited to provide signed informed consent for their child's participation, and youth were invited to provide signed assent. Research assistants conducted all interviews in a private interview room within the JJC.

Measures

Trauma exposure. The *University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index for DSM–IV—Adolescent Version* (PTSD–RI; Steinberg, Brymer, Decker, & Pynoos, 2004) is a well-validated screening tool used to assess exposure to traumatic events and symptoms of PTSD among youth. The PTSD–RI has demonstrated good convergent validity, high internal consistency, and high test–retest reliability over a period of 7 days. To assess Criterion A1, the first set of questions asks youth to respond "yes" or "no" as to whether they have experienced each of a variety of traumatic events, which were endorsed by the following proportion of youth: natural disasters (20.8%), accidents (27.0%), experiencing domestic violence (25.2%), witnessing domestic violence (34.0%), experiencing community violence (64%), witnessing community violence (72.3%), seeing a dead body (21.1%), sexual abuse (18.9%), harm to a loved one (52.1%), medical trauma (29.7%), and other (19.3%). Among the youth in this sample, 86.6% reported experiencing more than one type of event. Subscales also were created summing the number of events endorsed associated with interpersonal trauma (e.g., domestic violence or sexual assault) and noninterpersonal trauma (e.g., accidents, natural disasters). The measure also asks youth to identify one event that was the "most distressing"; the average length of time elapsed since this event was 34.6 months ($SD = 37.53$, range = 0–130).

Peritraumatic reactions. The second set of questions on the PTSD–RI assesses Criterion A2 by inquiring as to whether at the time of the event identified as the "most distressing" youth experienced each of six peritraumatic reactions, including fear, helplessness, horror, disorganized behavior, confusion, and dissociation. In order to keep the measure simple, brief, and child appropriate, participants respond "yes" or "no" to each question.

PTSD symptom clusters. The third set of questions on the PTSD–RI asks youth to rate the presence of symptoms experienced in the most recent 30 days, corresponding to the *DSM–IV–R* clusters of Reexperiencing (Criterion B), Avoidance (Criterion C), and Arousal (Criterion D). Youth rate each item on a Likert-type scale from 0 (*None of the time*) to 4 (*Most of the time*), and these ratings are used to derive a total PTSD symptom score as well as scores for each of the three symptom clusters. Following Steinberg et al. (2004), a score of 3 or 4 was considered indicative of symptom presence. Youth are considered to likely meet criteria for *full PTSD* if Criterion A is met as well as the required number of symptoms for Criteria B, C, and D; *partial PTSD* is defined as an endorsement of Criterion A as well as any two PTSD clusters. In this sample, internal consistencies for the PTSD scales were $\alpha = .86$ for Reexperiencing, $\alpha = .81$ for Avoidance, $\alpha = .71$ for Arousal, and $\alpha = .89$ for Total PTSD. The measure also was rescored to correspond to the 5 factors of the Elhai et al. (2011) model, comprised of Intrusion/Reexperiencing (5 items, $\alpha = .85$), Avoidance (2 items, $\alpha = .63$), Numbing (7 items, $\alpha = .79$), Dysphoric Arousal (4 items, $\alpha = .64$), and Anxious Arousal (2 items, $\alpha = .57$).

Table 1
Intercorrelations Among Study Variables, Reported Separately by Gender

Variable	1	2	3	4	5	6	7	8	9
1. Fear	—	.24**[b]	.10[b]	.05[b]	.22**[b]	.22**[b]	.08[a]	.11[a]	−.023[a]
2. Helplessness	*.31***[b]	—	.19**[b]	.14[b]	.18*[b]	.13[b]	.22**[a]	.22**[a]	.11[a]
3. Horror	*.21***[b]	*.16***[b]	—	−.07[b]	.10[b]	.14[b]	.18*[a]	.23**[a]	.01[a]
4. Disorganized behavior	*.17***[b]	*.06*[b]	*.01*[b]	—	.08[b]	.018[b]	.24**[a]	.21**[a]	.05[a]
5. Confusion	*.36***[b]	*.20***[b]	*.08*[b]	*.14***[b]	—	.20**[b]	.16*[a]	.24**[a]	.02[a]
6. Dissociation	*.31***[b]	*.12**[b]	*.12**[b]	*.05*[b]	*.33***[b]	—	.23**[a]	.23**[a]	.11[a]
7. Total trauma exposure	*.09*	*.14***	*.13**	*.20***	*.19***	*.14***	—	.78**	.51**
8. Interpersonal trauma	*.04*	*.23***	*.17***	*.13***	*.11**	*.08*	*.72***	—	.43**
9. Noninterpersonal trauma	*.12**	*.08*	*.02*	*.08*	*.13**	*.12**	*.49***	*.17***	—

Note. Correlations for girls are displayed above the diagonal, and correlations for boys are displayed in italics below the diagonal. Means and standard deviations for girls and boys are displayed on separate rows.
[a] Point-biserial correlations. [b] Phi correlations. All other correlations shown are Pearson product–moment correlations.
* $p < .05$. ** $p < .01$.

Results

Gender Differences in Youths' Responses

As the intercorrelations displayed in Table 1 indicate, peritraumatic reactions generally were less strongly associated with noninterpersonal trauma exposure for girls than for boys, although a comparison of the size of the correlations using Fisher's *r*-to-*z* transformation indicated that the only significant difference was for dissociation, which was more strongly associated with interpersonal trauma among girls than boys ($z = 1.79$, $p = .037$).

Results for *t* tests of differences between boys and girls are displayed in Table 2. Whereas boys and girls were equally likely to report a Criterion A1 stressor, girls were more likely than boys to also meet Criterion A2 by endorsing fear, helplessness, or horror. In addition, girls were significantly more likely than boys to endorse each of the peritraumatic reactions assessed, as well as to meet criteria B, C, D, and full PTSD diagnostic criteria. Therefore, as previous research suggests, gender should be considered as a potential moderator of the results.

Associations Among Peritraumatic Reactions and PTSD Symptom Severity Scores

A series of hierarchical multiple regression analyses were conducted separately for boys and girls, the results of which are displayed in Table 3. Ethnicity and age initially were entered on the first step for all analyses but were not significant for any of the equations and therefore were excluded from the final models for the sake of parsimony. For boys but not girls, meeting Criterion A1 accounted for a significant proportion (3.8% vs. 2.1%, respectively) of variance in PTSD symptoms. When fear, helplessness, and horror were added on the second step of the equation, none of the independent variables was significant for girls, but all were for boys. In total, the *DSM–IV–R* Criterion A2 peritraumatic reactions of fear, helplessness, and horror explained 8.4% of the variance in PTSD symptoms for boys but only 1.8% of the variance for girls. The inclusion of the additional reactions of disorganized behavior, confusion, and dissociation on the third step explained an additional 12.3% of the variance for girls and 5.2% for boys, increasing the total variance explained by the model to 17.3% for girls and 17.5% for boys. Notably, for girls, A1, disorganized behavior, confusion, and dissociation were the only peritraumatic reactions associated with PTSD symptoms, whereas for boys, helplessness, horror, disorganized behavior, and confusion were associated with PTSD.

Associations Among Peritraumatic Reactions and PTSD Diagnostic Criteria

A series of four logistic regression models were conducted to investigate whether individual peritraumatic reactions were associated with youth meeting *DSM–IV–R* Criteria B, C, and D as well as criteria for the PTSD diagnosis. Again, for each model, age and ethnicity were entered on the first step but were not significant. The results are displayed in Table 4 and, as the odds ratios show, youth who endorsed the peritraumatic reactions of helplessness, disorganized behavior, and confusion were more than one and a half times more likely to meet PTSD criteria than were youth who did not endorse these reactions. The model was significant, $\chi^2(7) = 74.31$, $p < .001$, $-2LL = 676.002$, Nagelkerke $R^2 = .170$, and a nonsignificant Hosmer and Lemeshow test indicated a good fit to the data, $\chi^2(8) = 11.14$, $p = .194$. Next, models for each of the PTSD symptom clusters were examined separately. On the basis of a Bonferroni-adjusted alpha level of .0125, helplessness and disorganized behavior were associated with whether youth met *DSM–IV–R* criteria for the cluster of Reexperiencing. This model also was significant, $\chi^2(7) = 64.49$, $p < .001$, $-2LL = 691.03$, Nagelkerke $R^2 = .15$, with a nonsignificant Hosmer and Lemeshow test, $\chi^2(8) = 9.30$, $p = .318$. In turn, disorganized behavior and confusion were associated with meeting diagnostic criteria for the Avoidance cluster, with a significant model, $\chi^2(7) = 41.2$, $p < .001$, $-2LL = 667.79$, Nagelkerke $R^2 = .10$, and nonsignificant Hosmer and Lemeshow test, $\chi^2(8) = 4.70$, $p = .789$. Finally, helplessness and disorganized behavior were associated with Arousal, with a nonsignificant Hosmer and Lemeshow, $\chi^2(8) =$

Table 2
Gender Differences in Youth Responses on the PTSD—Reaction Index

Index item	Girls *M* (*SD*)	Boys *M* (*SD*)	*t*(*df*)	*p*
Total trauma exposure	5.40 (3.56)	4.31 (2.64)	$t(295.478) = 3.71$	.000
Interpersonal trauma	2.55 (1.53)	2.10 (1.25)	$t(317.39) = 3.457$	.001
Noninterpersonal trauma[a]	.87 (.85)	.80 (.83)	$t(553) = 1.03$	.306
Criterion A1 met	95.2 (.19)	92.9 (.25)	$t(474.756) = 1.601$	.003
Criterion A2 also met	98.3 (.13)	94.7 (.22)	$t(516.189) = 2.332$	.000
Criterion B met[a]	57.4 (.50)	40.0 (.49)	$t(556) = 3.957$	.000
Criterion C met	43.1 (.50)	30.5 (.46)	$t(352.562) = 2.888$	.000
Criterion D met	67.0 (.47)	49.5 (.50)	$t(396.736) = 4.073$	.000
Criteria for PTSD met	25.5 (.44)	16.4 (.37)	$t(331.178) = 2.491$	.000
Fear	73.9 (.44)	60.2 (.49)	$t(514.542) = 3.342$	.001
Helplessness	79.7 (.40)	65.6 (.48)	$t(432.847) = 3.655$	.000
Horror	45.5 (.50)	29.4 (.46)	$t(346.18) = 3.676$	.000
Disorganized behavior	48.4 (.50)	33.9 (.47)	$t(354.334) = 3.274$	.001
Confusion	81.9 (.39)	62.0 (.49)	$t(459.525) = 5.247$	.000
Dissociation	58.0 (.50)	48.2 (.50)	$t(381.426) = 2.188$	.029

Note. Bonferroni-corrected alpha indicates that $p < .0038$ is significant. All variables are coded 0 = no and 1 = yes, and therefore the mean also reflects percentage endorsing. PTSD = posttraumatic stress disorder.
[a] Equal variances assumed.

Table 3
Results of Hierarchical Multiple Regressions for the Associations Between Peritraumatic Reactions and PTSD Symptom Severity

	Girls					Boys				
Reaction	*F*(*df*)	R^2	B (*SE*)	*t*	*p*	*F*(*df*)	R^2	B (*SE*)	*t*	*p*
Step 1	$F(2, 180) = 2.53$	.027			.082	$F(2, 360) = 7.11^{***}$	.038			.001
Criterion A1			10.57 (5.38)	1.97	.051			10.76 (2.86)	3.768^{***}	.008
Step 2	$F(5, 177) = 1.70$	.046			.138	$F(5, 357) = 9.97^{***}$	.123			.000
Criterion A1			9.42 (5.52)	1.71	.09			7.50 (2.81)	2.67^{**}	
Fear			1.05 (2.43)	.43	.667			3.64 (1.48)	2.46^{*}	.014
Helplessness			3.41 (2.68)	1.27	.204			5.34 (1.50)	3.57^{***}	.000
Horror			1.83 (2.12)	.87	.388			3.37 (1.54)	2.19^{*}	.029
Step 3	$F(8, 174) = 4.55^{***}$	.173			.000	$F(8, 354) = 9.36^{***}$	.175			.000
Criterion A1			11.69 (5.20)	2.25^{*}	.026			4.85 (2.79)	1.73	.084
Fear			−.72 (2.33)	−.31	.757			1.43 (1.54)	.92	.356
Helplessness			1.40 (2.55)	.55	.585			5.05 (1.46)	3.46^{***}	.001
Horror			1.87 (2.02)	.93	.356			3.71 (1.50)	2.46^{*}	.014
Disorganized			7.50 (1.96)	3.82^{***}	.000			4.25 (1.42)	2.98^{**}	.003
Confusion			5.52 (2.58)	2.14^{*}	.034			4.88 (1.51)	3.22^{***}	.001
Dissociation			4.51 (2.04)	2.21^{*}	.028			.97 (1.43)	68	.499

Note. PTSD = posttraumatic stress disorder.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

3.03, $p = .932$, and a significant model, $\chi^2(7) = 37.71$, $p < .001$, −2LL = 713.32, Nagelkerke $R^2 = .09$. The logistic regression models were also examined for potential moderation by gender by including interactions between gender and each peritraumatic reaction. With the Bonferroni adjustment applied reducing the alpha level to .0125, none of the moderation effects was significant.

Associations Among Peritraumatic Reactions and the 5-Factor Model of PTSD Clusters

The associations of peritraumatic reactions with the symptom clusters derived from Elhai and colleagues' (2011) 5-factor model also was examined using multiple regression analyses with a Bonferroni-adjusted alpha level of .01. Ethnicity and age initially were included on the first step but were not significant for any model. Results for Intrusion showed helplessness (B = 1.72, *SE* = .46, $t = 3.789$, $p < .001$), horror (B = 1.29, *SE* = .43, $t = 3.02$, $p = .003$), disorganized behavior (B = 2.39, *SE* = .41, $t = 5.82$, $p < .001$), and confusion (B = 2.03, *SE* = .46, $t = 4.41$, $p < .001$), were associated but not fear (B = .80, *SE* = .46, $t = 1.75$, $p = .080$), nor dissociation (B = .98, *SE* = .42, $t = 2.34$, $p = .02$); $F(7, 539) = 21.06$, $p < .001$. In turn, for Avoidance, helplessness (B = .85, *SE* = .25, $t = 3.48$, $p = .001$), disorganized behavior (B = .95, *SE* = .22, $t = 4.26$, $p < .001$), and confusion (B = 1.05, *SE* = .25, $t = 4.19$, $p < .001$) were associated, but not fear (B = −.043, *SE* = .25, $t = -.17$, $p = .87$), horror (B = .56, *SE* = .23, $t = 2.41$, $p = .016$), nor dissociation (B = .51, *SE* = .23, $t = 2.24$, $p = .026$), $F(7, 539) = 12.98$, $p < .001$. For Dysphoric Arousal, helplessness (B = .97, *SE* = .37, $t = 2.61$, $p = .009$); disorganized behavior (B = 1.07, *SE* = .34, $t = 3.18$, $p = .002$); and confusion (B = 1.02, *SE* = .38, $t = 2.71$, $p = .007$) emerged as significant, but not fear (B = .02, *SE* = .37, $t = .04$, $p = .969$), horror (B = .64, *SE* = .35, $t = 1.83$, $p = .068$), nor dissociation (B = .35, *SE* = .34, $t = 1.01$, $p = .314$), $F(7, 539 = 6.27$, $p < .001$). In turn, horror was associated with Anxious Arousal (B = .79, *SE* = .20, $t = 3.97$, $p < .001$), whereas this was not the case for fear (B = .30, *SE* = .21, $t = 1.38$, $p = .169$), helplessness (B = .45, *SE* = .21, $t = 2.10$, $p = .036$), disorganized behavior (B = .41, *SE* = .19, $t = 2.12$, $p = .034$), nor confusion (B = .48, *SE* = .22, $t = 2.25$, $p = .025$). None of these relations was moderated by gender.

A different pattern emerged for analyses regarding Numbing, for which disorganized behavior (B = 1.75, *SE* = .55, $t = 3.17$, $p = .002$); and confusion, (B = 1.89, *SE* = .62, $t = 3.07$, $p = .002$), emerged as significant; $F(7, 539) = 7.23$, $p < .001$, whereas fear, helplessness, horror, and dissociation did not (B = .35, *SE* = .61, $t = .57$, $p = .569$; B = 1.29, *SE* = .61, $t = 2.13$, $p = .034$; B = .95, *SE* = .57, $t = 1.66$, $p = .098$; and B = .96, *SE* = .56, $t = 1.68$, $p = .094$, respectively). Additionally, for Numbing, when interaction terms between each peritraumatic reaction and gender were entered in a third step, significant moderational effects emerged for helplessness (B = 3.67, *SE* = 1.36, $t = 2.69$, $p = .007$), and dissociation (B = −3.26, *SE* = 1.61, $t = -3.12$, $p = .002$). Further examination of the results indicated that boys who endorsed peritraumatic helplessness and girls who endorsed dissociation scored higher than their peers on the Numbing factor.

Discussion

The findings of the present study are consistent with a growing body of research indicating that the *DSM–IV–R* triad of fear, helplessness, and horror is insufficient for delimiting the reactions to traumatic events that are associated with posttraumatic stress (Resick & Miller, 2009). As the hierarchical regressions presented here demonstrated, the Criterion A2 peritraumatic reactions accounted for a small amount of variance in PTSD symptoms, particularly for girls. Additional variance in PTSD symptom severity was accounted for by the addition of disorganized behavior and confusion for all youth, and of dissociation for girls. In turn, logistic regressions indicated that helplessness was the only A2 criterion that was associated with whether youth met criteria for a diagnosis of PTSD. The odds ratios showed that youth who endorsed helplessness were two times more likely to meet criteria for PTSD than did those who did not report experiencing this reaction,

Table 4
Results of Logistic Regressions for Associations Among Peritraumatic Reactions and DSM–IV–R Criteria

Reaction	B (*SE*)	Wald's χ^2	*df*	Odds ratio	*p*
Criterion B: Reexperiencing					
Fear	.27 (.21)	.82	1	1. 31	.196
Helplessness	.68 (.21)	10.30	1	1.98	.001
Horror	.30 (.20)	2.29	1	1.34	.130
Disorganized behavior	.86 (.19)	21.18	1	2.37	.000
Confusion	.49 (.21)	5.34	1	1.64	.021
Dissociation	.17 (.19)	.82	1	1.19	.367
Criterion C: Avoidance					
Fear	.16 (.22)	.55	1	1.18	.458
Helplessness	.34 (.22)	2.31	1	1.40	.129
Horror	.28 (.20)	1.97	1	1.32	.160
Disorganized behavior	.62 (.19)	10.87	1	1.87	.001
Confusion	.61 (.23)	7.03	1	1.83	.008
Dissociation	.32 (.20)	2.59	1	1.37	.108
Criterion D: Arousal					
Fear	.18 (.20)	.80	1	1.20	.371
Helplessness	.54 (.20)	7.27	1	1.72	.007
Horror	.41 (.19)	4.38	1	1.50	.036
Disorganized behavior	.58 (.19)	9.68	1	1.79	.002
Confusion	.18 (.21)	.72	1	1.19	.395
Dissociation	.23 (.19)	1.45	1	1.26	.229
PTSD diagnosis (full or partial)					
Fear	.22 (.21)	1.10	1	1.25	.295
Helplessness	.74 (.23)	11.59	1	2.10	.001
Horror	.34 (.20)	3.33	1	1.43	.068
Disorganized behavior	.91 (.19)	23.04	1	2.48	.000
Confusion	.60 (.22)	7.48	1	1.82	.006
Dissociation	.25 (.19)	1.69	1	1.29	.194

Note. Bonferroni correction indicates $p < .0125$ as the lower bound for significance. *DSM–IV–R* = *Diagnostic and Statistical Manual of Mental Disorder* (4th ed., rev.). PTSD = posttraumatic stress disorder.

whereas youth who endorsed confusion were almost twice as likely as others to meet diagnostic criteria. In turn, youth who endorsed disorganized behavior were over two times more likely than their peers to meet criteria for PTSD. The fact that disorganized behavior was the reaction most reliably associated with the PTSD diagnosis is of interest, given that this is the one developmentally specific peritraumatic reaction listed in the *DSM–IV–R*. Although suggested as a possible proxy for distress among young children in the *DSM–IV–R*, disorganized behavior also may effectively index the impact of events experienced by adolescents during a traumatic encounter. Taken together, these results suggest that, at least for delinquent youth, peritraumatic reactions associated with a sense of loss of control, personal agency, and self-regulation are more strongly associated with PTSD than is fear itself.

Analyses conducted to assess whether peritraumatic reactions were associated with youths' meeting diagnostic criteria for each of the three *DSM–IV–R* symptom clusters showed that, again, helplessness was the only A2 criterion that contributed to these models, whereas disorganized behavior emerged as even more strongly associated, significantly increasingly the odds that youth would meet criteria for all three *DSM–IV–R* symptom clusters. Moreover, in addition to investigating the relations between peritraumatic reactions and the *DSM–IV–R* criteria for the PTSD diagnosis, this study aimed to advance our understanding and inform the *DSM–5* by including the recently empirically supported Elhai et al. (2011) 5-factor typology of PTSD symptoms. In contrast to the largely null results in analyses focusing on the *DSM–IV–R* clusters, the A2 criteria were associated with scores on four of the five Elhai et al. PTSD symptom dimensions, including all but Numbing; however, disorganized behavior once again emerged in these analyses as even more consistently associated with PTSD symptoms. Furthermore, Numbing was the only cluster that seemed to be uniquely associated with a subset of peritraumatic reactions, which differed according to gender: For boys, peritraumatic helplessness was associated with Numbing, whereas for girls, dissociation during the traumatic event was associated with current reports of Numbing. The finding that girls who engaged in peritraumatic dissociation were more likely to demonstrate symptoms of posttraumatic numbing suggests that the use of coping strategies that involve withdrawal of awareness during traumatic events might become overgeneralized and continue to interfere with girls' capacity to tolerate and express their emotions long after the event has passed. This result also is of particular interest in the study of juvenile justice–involved youth, given that posttraumatic emotional numbing has been theorized to comprise an underlying mechanism by which exposure to trauma contributes to delinquency (Allwood, Bell, &, Horan, 2011; Kerig, Bennett, et al., 2012; Lansford et al., 2006).

In addition, this study investigated whether specific traumatic events were associated with particular peritraumatic reactions. There was a general trend for youth to endorse more peritraumatic reactions of all sorts in the face of interpersonal rather than noninterpersonal traumas. However, there also were gender differences in these patterns of results such that, whereas dissociation was more often reported by girls in the context of interpersonal traumas, for boys, dissociation and confusion were more often reported in the context of noninterpersonal events. The differential reactivity of girls to interpersonal traumas has emerged in previous studies of adolescents (Kerig & Becker, 2011; Kerig, Ward, Vanderzee, & Arnzen Moeddel, 2009), and may reflect the relational orientation promoted by feminine sex role socialization (Zahn-Waxler, Crick, Shirtcliff, & Woods, 2006). Furthermore, however, a number of studies indicate that the interpersonal traumas to which detained girls have been subjected are differentially likely to involve perpetration by family members and romantic partners (Kerig & Becker, 2011). According to betrayal trauma theory (Freyd, 1996), youth who experience maltreatment in the context of a close relationship may engage in dissociation so as to ward off distressing feelings that might threaten their attachment to the abuser (De Prince, Chu, & Pineda, 2011; Kerig, Bennett, et al., 2012).

Lastly, consistent with previous research involving participants across the entire developmental spectrum, girls in this sample were not more likely than boys to report having experienced a Criterion A1 event and yet were more likely than boys to endorse the A2 criteria of fear, helplessness, and horror, as well as each of the other criteria for the PTSD diagnosis. These data also showed that girls were significantly more likely than boys to endorse each of the additional peritraumatic reactions included on the PTSD–RI, and so this gender difference in response style was not specific to the A2 triad. Future research to shed additional light on these

gender differences in the association between peritraumatic reactions and PTSD might benefit from the inclusion of an expanded list of potential responses beyond those included on the PTSD–RI. For example, in their study of adults exposed to a wide array of traumas, Lancaster and colleagues (2011) found that peritraumatic guilt was a unique predictor of PTSD symptoms among men, whereas disgust and sadness uniquely predicted PTSD among women. In this light, it also is possible that the list of peritraumatic reactions included in the PTSD–RI might not be sufficiently developmentally sensitive to the kinds of reactions that are most indicative of trauma among adolescent boys. For example, our clinical observations suggest that, for detained boys, the most traumatizing experiences might be those associated with potentially gender-related peritraumatic reactions such as humiliation, emasculation, and a loss of pride. In addition, beyond helplessness per se, the delinquent boys in our sample seem to be particularly preoccupied with self-recrimination for perceived failure to "act like a man" and to control events that in fact were uncontrollable.

Consequently, although the PTSD–RI is the most well-validated and widely used measure for assessing PTSD among youth, the restricted range of peritraumatic reactions included on the measure represents one of several limitations of the present study that should be addressed in future research. A further limitation of the PTSD–RI is that, in order to keep the measure simple, brief, and child-appropriate, all peritraumatic reactions are assessed via a single item rated categorically as present or absent. More statistical power for detecting effects associated with youth reports of peritraumatic reactions would be attained through the use of continuous rating measures, such as the recently published downward extensions for youth of scales assessing peritraumatic distress and dissociation (Bui et al., 2011). Another limitation of the present study is that the sample includes only youth offenders; thus these findings may not generalize to other populations of adolescents. An additional significant limitation is that all data were gathered cross-sectionally, and the reports of peritraumatic reactions were retrospective. Although the data involved a sequential timeline in that the traumatic events had all occurred prior to youth reports of their current PTSD symptoms, prospective data are needed in order to establish whether peritraumatic reactions during stressful events are predictive of the development of PTSD.

In conclusion, the results of the present study of high-risk adolescents confirms findings reported in adult samples that the *DSM–IV–R* A2 criteria of fear, helplessness, and horror do not fully capture the range of peritraumatic reactions that are associated with increased risk for PTSD. In fact, the observation that PTSD is associated with a range of responses beyond fear, helplessness, and horror has played a role in the proposal that *DSM–5* move the diagnosis out of the anxiety spectrum altogether and into a new stress disorder category (Resick & Miller, 2009). Importantly, the present study extends these findings to a sample of youth, who have been neglected in much of the research on peritraumatic reactions. The developers of *DSM–5* are only just beginning to consider how the diagnostic criteria might need to be tailored to consider developmental factors, and this research adds to the evidence base that can help to inform those decisions. In this light, of particular note is the finding that disorganized behavior —one of the few developmentally specific PTSD criteria in the current diagnostic manual—was one of the peritraumatic reactions most consistently associated with PTSD among youth. Therefore, these results suggest the importance of continuing to develop developmentally sensitive and empirically based indices of PTSD in young people.

The results of the present study also may help to inform the *DSM–5* by suggesting, consistent with a growing body of theory and research, that removing considerations of peritraumatic responses entirely from the diagnostic criteria might be ill advised (Bovin & Marx, 2011). Particularly for youth, subjective appraisals are central to determining whether a given event is considered to be traumatic and thus whether it is likely to cause posttraumatic stress. As Bowlby (1973/1998) asserted,

> Perhaps the most fundamental lesson to be learnt by anyone who wishes to understand the situations that other people fear is that forecasts of future dangers are as often as not strictly individual . . .. The difficulty in using reality as a criterion lies, not in there being no reality, but in our imperfect capacity to comprehend it. That a child has an imperfect capacity to comprehend what is or may be truly dangerous is usually taken for granted. That the capacity of an adult is greater often by only a small margin tends to be forgotten. (pp. 186–190)

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