Maltreatment Characteristics and Emotion Regulation (ER) Difficulties as Predictors of Mental Health Symptoms: Results from a Community-Recruited Sample of Female Adolescents

Jane M. Sundermann · Anne P. DePrince

Abstract Mental health outcomes vary among maltreated youth, and the factors that impact variance need further investigation. The current study examined how maltreatment characteristics (age at onset, cumulative perpetrators, and cumulative types) and difficulties with emotion regulation (ER) predicted trauma-relevant symptoms among a community-recruited sample of female adolescents with histories of exposure to violence (N=115; $M(SD)_{age}$=15.96 (1.56) years). To predict each trauma-relevant symptom (i.e. anger, anxiety, depression, dissociation, and posttraumatic stress (PTS)), a hierarchical two-step regression was conducted. For Step 1, maltreatment characteristics, taken together, predicted variance in four of five symptoms: anger, anxiety, dissociation, and posttraumatic stress (PTS). Above and beyond variance accounted for by maltreatment characteristics, age at onset predicted variance in anger, anxiety, and PTS symptoms. For Step 2, ER difficulties predicted variance in all symptoms. Findings highlight the need for further research about how maltreatment histories impact subsequent mental health. Results also suggest that ER difficulties should be increasingly considered in models of posttraumatic distress among maltreated youth.

Keywords Abuse · Adolescence · Anger · Anxiety · Dissociation · Emotion · Posttraumatic stress (PTS)

Maltreatment of children and adolescents is a major social and public health concern. An estimated 1 in 5 U.S. children are maltreated in their lifetimes (Finkelhor et al. 2009), and maltreatment is a well-documented risk factor for a variety of mental health difficulties (e.g., Briere 1996; Cook et al. 2005; Mulvihill 2005; Watts-English et al. 2006). Interestingly, victims appear to vary widely in the severity and types of mental health difficulties that they experience following exposure to maltreatment (e.g., Collishaw et al. 2007; Kaplow and Widom 2007). Thus, research has focused on uncovering the various factors that contribute to variability in mental health symptoms.

Maltreatment Characteristics as Predictors of Youth Mental Health Symptoms

Previous research demonstrates that specific characteristics of youths' maltreatment experiences (e.g., when maltreatment first occurred, how many types of maltreatment occurred) impact the severity of mental health symptoms that youth experience following maltreatment (e.g., Higgins and McCabe 2000; Kaplow and Widom 2007; Kim and Cicchetti 2010). However, a detailed analysis of that literature suggests that the evidence for relationships between specific characteristics of youths' maltreatment experiences (e.g., age at onset, cumulative perpetrators, cumulative types) and youths' mental health outcomes is still rather mixed and inconsistent.

For instance, many studies suggest that younger age at onset of maltreatment carries more risk for later mental health symptoms (e.g., Kaplow et al. 2005; Keiley et al. 2001; Repetti et al. 2002). However, still other studies suggest the opposite trend, that older age at onset carries more risk (e.g., Maccoby 1983; Sirles et al. 1989). Adding further complexity, age at onset may not necessarily predict "more" or "worse" symptoms, but simply qualitatively different symptoms. Younger age at onset may carry more risk for later internalizing problems (e.g., anxiety, depression), but older age at onset may carry more risk for later externalizing problems (e.g., substance abuse, suicidality, and criminality) (Thornberry et al. 2010).

J. M. Sundermann (✉) · A. P. DePrince
Department of Psychology, University of Denver, 2155 S. Race St., Denver, CO 80208, USA
e-mail: jane.sundermann@gmail.com

In addition to age at onset, the impact of other potentially important maltreatment characteristics (e.g., number of lifetime perpetrators and/or the number of types of maltreatment) on youths' mental health outcomes remains relatively unexplored. For the few studies that have examined the impact of cumulative perpetrators in relation to youths' mental health, the construct of cumulative perpetrators is often only roughly measured as a dichotomy: youth who report a single lifetime perpetrator versus multiple (i.e. 2 or more) lifetime perpetrators (e.g., Trickett et al. 2011). Dichotomous measures of cumulative perpetrators prohibit tests of whether each additional perpetrator, beyond two perpetrators, predicts important mental health symptoms for youth.

Finally, very few studies have examined whether or not experiencing more types of maltreatment (e.g., physical abuse, sexual abuse) leads to greater mental health difficulties among victims. Given the evidence that youth who experience one type of maltreatment very frequently experience another type of maltreatment (e.g., Cohen et al. 2004; Finkelhor et al. 2007; Hamby et al. 2010), the dearth of research examining cumulative types of maltreatment as a predictor of youth mental health symptoms is quite surprising. Research suggests that multi-type (versus single type) maltreatment predicts more severe mental health symptoms among victims (e.g., DePrince et al. 2009; Finkelhor et al. 2007; Higgins and McCabe 2001; Jonson-Reid et al. 2003). However, similar to the cumulative perpetrators construct, the cumulative types construct is often measured as a dichotomy (single-type versus multi-type maltreatment), preventing examination of whether more types (beyond two types) predict additional symptoms among victims.

Emotion Regulation (ER) and Mental Health Symptoms

Beyond characteristics of maltreatment incidents themselves, individual differences in youths' skills or capacities, such as emotion regulation (ER), also contribute to risk for (or resilience to) mental health symptoms following exposure to maltreatment (e.g., Alink et al. 2009). Emotion regulation (ER) refers to the general capacity to monitor, evaluate, and modulate one's experience and expression of emotions (Gross and Thompson 2007). While several recent studies document the capacity to perform emotion regulation (ER) as a robust predictor of mental health functioning, these studies frequently examine adult and college samples (e.g., Lilly and Hong Phylice Lim 2012; Nolen-Hoeksema and Aldao 2011). Thus, research is still sorely needed to explore links between ER capacity and mental health during individuals' earlier stages of development, including childhood and adolescence.

Furthermore, among the relatively fewer studies that have examined relationships between ER capacity and important mental health outcomes among youth (versus adults), only a few studies (e.g., Perfect et al. 2011) have assessed for and tested the influence of various characteristics of youths' maltreatment histories. The lack of knowledge regarding links between youths' experiences of maltreatment, youths' relative ER capacities (or difficulties with ER), and mental health outcomes is especially surprising given research that has documented how experiences of maltreatment may significantly interfere with the psychological, behavioral, and neurophysiologic processes related to both ER and mental health symptoms common to posttraumatic distress (Beers and De Bellis 2002; Gunnar and Vasquez 2001). Given these connections, assessing ER difficulties in youth may be an important avenue to better understanding the precise nature of common symptomatology (i.e. trauma-related symptoms) amongst maltreated youth and to better informing treatment for such symptoms. While explorations of this sort have begun, few studies have examined ER difficulties in adolescence (Neumann et al. 2010; Weinberg and Klonsky 2009; Zeman et al. 2007) and even fewer studies have examined relationships between ER difficulties and mental health outcomes among a sample of high-risk adolescents.

Additionally, studies examining links between ER difficulties and mental health outcomes include several noteworthy limitations. First, measures of ER across studies tend to equate better or more adaptive ER with greater emotional control, especially expressive control of emotions (e.g., Garner and Spears 2000; Zeman and Garber 1996). However, models of ER and psychopathology among maltreated youth suggest that tight emotional control may actually be a key contributor to negative mental health outcomes (Cole et al. 1994; Shipman et al. 2000). Second, models and measures of ER have been somewhat simplistic and thus may not fully represent the multi-dimensional nature of ER. Research on ER in adults (e.g., Gratz and Roemer 2004) highlights the need for a more qualitatively rich account of ER, including different dimensions of ER difficulties like emotional unawareness or nonacceptance. Empirical studies of trauma-exposed adults (e.g., Soenke et al. 2010; Tull et al. 2007) demonstrate the particular utility of measuring specific ER difficulties versus simply "good" or "bad" overall ER.

The Current Study: Aims

The current study examined the relative contributions of multiple maltreatment characteristics (i.e., age at onset, cumulative perpetrators, and cumulative types) and difficulties with emotion regulation (ER) to mental health outcomes among a community-recruited sample of female adolescents with histories of exposure to interpersonal

violence. Two primary aims motivated the current study. First, the current study aimed to investigate how multiple maltreatment characteristics (compared to one maltreatment characteristic) influence severity of maltreated youths' mental health symptoms. Studying multiple maltreatment characteristics allowed for a unique examination of how maltreatment characteristics act collectively, or in concert, to shape risk for symptoms and how a given characteristic (e.g., age at onset), controlling for other important characteristics (e.g., cumulative perpetrators), predicts symptoms among victims. We were particularly interested in studying the influence of age at onset, cumulative perpetrators, and cumulative types as maltreatment characteristics given inconsistent findings or relatively unexplored areas of research to date.

Second, the current study aimed to expand upon previous research demonstrating robust links between youths' ER difficulties and mental health symptom severity by investigating how differences in youths' ER difficulties might predict additional variance in mental health symptom severity above the variance already captured by differences in youths' maltreatment histories. Within that aim, we sought to address previous limitations within the literature regarding links between ER difficulties and psychopathology by attempting to measure ER difficulties as a more multi-dimensional construct, including an assessment of adolescents' difficulties with awareness, understanding, and acceptance of emotions.

To test hypotheses related to our two principle aims, a two-step hierarchical regression was conducted for the prediction of each of the following mental health symptoms among maltreated youth: anger, anxiety, depression, dissociation, and PTS. These mental health symptoms were chosen as outcomes of particular interest within the current study given evidence that those symptoms are especially prevalent among youth with fairly chronic maltreatment and complex trauma histories (e.g., Cook et al. 2005). The current study hypotheses were as follows: First, we expected that maltreatment characteristics, taken together as a group, would predict a significant proportion of variance in each mental health symptom considered. Second, we expected that each maltreatment characteristic (i.e. age at onset, cumulative perpetrators, and cumulative types) would alone predict a unique proportion of variance in all mental health symptoms. Given our review of the literature, we made directional predictions for these particular hypotheses, expecting that younger age at onset and greater cumulative perpetrators and types would relate to more severe mental health symptoms. Finally, we expected that youths' difficulties with emotion regulation (ER) would predict a significant proportion of the variance in all mental health symptoms, such that greater ER difficulties would predict more severe symptoms. We

expected that adolescents' difficulties with ER would predict variance in adolescents' mental health symptoms even greater than the variance already accounted for by the maltreatment characteristics, age at onset, cumulative perpetrators, and cumulative types.

Methods

Participants & Procedure

Female adolescents (N=115), ages 12–19, were recruited in an urban center in the Rocky Mountain region as part of a larger study examining teen dating violence. All procedures were approved by the Institutional Review Board (IRB) of the university conducting the study. Researchers contacted caseworkers in agencies that serve child welfare youth (e.g., Department of Human Services) and asked them to refer female adolescents with histories of exposure to violence. Interested adolescents and/or their legal guardians then contacted researchers to set up a 2–3 h interview that would take place in a university setting and would be conducted solely with the adolescent. Researchers obtained written consent from all adolescents' legal guardians prior to the interview. Interviewers were graduate students who were trained in adherence to ethical practices and IRB guidelines surrounding interviewing of youth about potentially traumatic events and mental health symptomatology.

Upon adolescents' arrival to the research offices, interviewers gave them their own assent/consent information verbally and in writing while emphasizing that they could skip any question and discontinue at any time and still receive full compensation. To further ensure participants' understanding of the assent/consent information, interviewers also administered a quiz to assess their understanding and to answer any remaining questions. Following assent/consent procedures, interviews commenced with the verbal administration of questions. Participants could respond verbally to the interviewer or point to response options on a visual scale. At interview completion, participants were thanked, debriefed, and given $40 for their participation plus $10 to offset transportation costs.

Participating adolescents reported a mean age of 15.96 years (SD=1.56). Participants identified with the following ethnic and racial groups: 37 % Hispanic/Latina; 33 % White; 31 % Black/African-American; 28 % "Other"; 6 % Native American/American Indian/Alaska Native, 1 % Asian/Asian-American, and approximately 6 % declined to answer. Participants chose between the following labels to describe their family backgrounds in terms of socioeconomic status: 32 % identified as Working Class, 45 % identified as Middle Class, 12 % as Upper Middle Class, 1.8 % as Upper Class, and 9.6 % as "Don't Remember"/"Don't Know".

Measures

Maltreatment Characteristics Age at onset, cumulative per-petrators, and cumulative types were assessed with a semi-structured clinical interview, the Traumatic Events Screening Inventory for Children (TESI-C) (Ford et al. 2002). The TESI-C assesses exposure to potentially traumatic events for youth from 6 to 18 years of age and demonstrates good parent–child agreement and internal consistency in past studies (Ford et al. 2000; Ribbe 1996). The interview started with screening questions regarding the presence or absence of five commonly recognized types of maltreatment: emotional/psychological abuse, neglect, physical abuse, sexual abuse, and witnessing domestic violence (WDV). Upon an adolescent's endorse-ment of any screening question, the interviewer then asked about specific characteristics of the incidents.

All TESI-C interviews were audio-recorded and tran-scribed. A primary rater then examined each TESI-C tran-scription to determine age at onset of maltreatment, cumula-tive perpetrators of maltreatment, and cumulative types of maltreatment. Within a TESI-C codebook, the primary rater defined age at onset as the earliest age at which a participant endorsed having experienced any type of maltreatment. Cu-mulative perpetrators was defined as the number of unique perpetrators of maltreatment across the participant's life. Thus, if a participant indicated that her biological father both phys-ically and sexually abused her, her biological father was considered only one (versus two) perpetrator. Finally, cumu-lative types of maltreatment was simply defined as the sum of types of maltreatment endorsed by the participant within the TESI-C. The TESI-C within the current study included five types of maltreatment: emotional/psychological maltreatment, neglect, physical abuse, sexual abuse, and witnessing domes-tic violence. A second rater independently coded a randomly selected subset (10 %) of transcripts. Inter-rater reliability statistics, intraclass coefficients, demonstrated excellent agreement across the two raters for all characteristics used within the current analyses (ICCs>.80).

ER Difficulties Adolescents' ER difficulties were assessed with the 36- item Difficulties in Emotion Regulation Scale (DERS) (Gratz and Roemer 2004). For each item, adolescents rated how often they experienced (1 = Almost never to 5 = Almost always) difficulties with ER. The DERS yields a total score as well as six subscale scores: 1) Nonacceptance of emotional responses (called Nonacceptance), 2) Difficulties engaging in goal directed behavior (Goals), 3) Impulse control difficulties (Impulse), 4) Lack of emotional awareness (Awareness), 5) Limited access to emotion regulation strate-gies (Strategies), and 6) Lack of emotional clarity (Clarity). The DERS displays good test-retest reliability and internal consistency, and adequate construct and predictive validity (Gratz and Roemer 2004; Gratz et al. 2006; Tull et al. 2007).

In the current sample, Cronbach's alphas for the six DERS subscales ranged from .82 to .92. Cronbach's alpha for the full DERS scale was .94.

Symptoms Five mental health symptoms, chosen as charac-teristic of complex posttraumatic distress (i.e. anger, anxiety, depression, dissociation, and posttraumatic stress), were assessed with the Trauma Symptom Checklist for Children (TSCC) (Briere 1996) and the Beck Depression Inventory – Second Version (BDI-II) (Beck et al. 1996). For the TSCC, adolescents rated how often they experienced (0 = Never to 3 = Almost all the time) four distinct symptoms: anger, anxiety, dissociation, and posttraumatic stress (PTS) symptoms. The TSCC has demonstrated good reliability and validity across a diversity of populations including children who identify as lower income and racial/ ethnic minority group members (Ohan et al. 2002). For the BDI-II, adolescents rated their experience of 21 depressive symptoms (0 = Low severity to 3 = High severity) in the 2 weeks immediately prior to the assessment. The BDI-II has demonstrated good reliability and validity across a variety of samples (Beck et al. 1996; Grothe et al. 2005). In the current sample, measures of internal consistency for the BDI-II (α_{BDI}=.82), TSCC ($\alpha_{TSCCtotal}$=.96), and TSCC subscales ($\alpha_{TSCCsubscales}$=.86–.91) were excellent.

Results

Descriptive Statistics

All variables were examined for violations of statistical assumptions underlying the analyses, and no violations were notable. Regarding characteristics of participants' maltreatment histories, participants reported a mean of 2.71 (SD=1.31) types of maltreatment out of five possible types of maltreatment coded from the TESI-C. Forty-two percent of participants reported emotional/psychological abuse, 43 % reported neglect, 48 % reported physical abuse, 57 % reported sexual abuse, and 76 % reported witnessing domestic violence (WDV). Of participants for whom Age at Onset could be calculated (n=113), partici-pant responses ranged from 0 years to 17 years (M(SD)= 5.89 (4.40)). Of participants for whom Cumulative Perpe-trators could be calculated (n =109), responses ranged from 1 perpetrator to 10 perpetrators (M(SD)=3.02 (1.91)). Descriptive statistics for all variables related to ER difficulties (as measured by the DERS) and mental health symptoms (as measured by the TSCC and BDI-II) are displayed in Table 1. Pearson zero-order correlations between all variables are displayed in Table 2.

Table 1 Descriptive statistics for ER difficulties and mental health symptoms

Variable name	Measure	M	SD	Range
ER difficulties	DERS[a]			
Overall ER difficulty	–	2.41	0.72	1.06–4.36
Nonacceptance	–	1.94	0.97	1.00–5.00
Goals	–	2.95	0.96	1.00–5.00
Impulse	–	2.31	1.09	1.00–5.00
Aware	–	2.88	0.99	1.00–5.00
Strategies	–	2.22	0.79	1.00–4.63
Clarity	–	2.31	0.91	1.00–5.00
Mental health symptoms				
Anger	TSCC[b]	0.95	0.68	0.00–3.00
Anxiety	TSCC	0.99	0.70	0.00–3.00
Depression	BDI-II[c]	0.91	0.42	0.10–2.29
Dissociation	TSCC	0.91	0.65	0.00–2.70
Posttraumatic Stress (PTS)	TSCC	1.21	0.67	0.00–2.78

[a] $N=114$ for all DERS variables; a score for one participant was missing due to an interviewer error

[b] $N=112$ for all TSCC variables. Three participants did not complete the TSCC due to time constraints in administration

[c] $N=114$ for the BDI-II variable. A score for one participant was missing due to an administration error

Inferential Statistics

Anger Results of all hierarchical regressions are displayed in Table 3. Step 1 of the anger symptom severity model was statistically significant ($p<.05$). Maltreatment characteristics, taken together, predicted approximately 10 % of the total variance in Anger (F (3, 102)=3.56, $p<.05$; $R^2=.10$). Age at Onset predicted a unique proportion of the variance in Anger ($\beta=-.23$, $p<.05$). When ER Difficulties were added as Step 2 of the model predicting Anger, the model was also statistically significant (F (4, 101)=24.00, $p<.001$; $R^2=.49$), as was the change in R^2 ($\Delta R^2=.39$, $p<.001$). Age at Onset and ER Difficulties each predicted a unique proportion of the variance in Anger and in the hypothesized negative and positive directions, respectively (Age at Onset: $\beta=-.17$, $p<.05$; ER Difficulties: $\beta=.64$, $p<.001$).

Anxiety Step 1 of the anxiety symptom severity model was statistically significant ($p<.01$). Maltreatment characteristics predicted approximately 13 % of the total variance in Anxiety (F (3, 102)=4.92, $p<.01$; $R^2=.13$). Age at Onset predicted a unique proportion of the variance in Anxiety ($\beta=-.25$, $p<.05$). When ER Difficulties was added as Step 2, the model was also significant (F (4, 101)=18.40, $R^2=.42$; $p<.001$), as was the change in R^2 ($\Delta R^2=.30$, $p<.001$.). Age at Onset and ER Difficulties each predicted a unique proportion of the variance in Anxiety and in the hypothesized negative and positive directions, respectively (Age at Onset: $\beta=-.20$, $p<.05$; ER Difficulties $\beta=.55$, $p<.001$).

Depression Step 1 of the depression symptom severity model was not significant; maltreatment characteristics, taken together, did not predict a significant proportion of the total variance in Depression (F (3, 103)=0.78, $p>.05$; $R^2=.02$). When ER Difficulties was added as Step 2, the model was statistically significant (F (4, 102)=24.29, $R^2=.49$; $p<.001$), as was the change in R^2 ($\Delta R^2=.47$, $p<.001$.). ER Difficulties predicted a unique proportion of the variance in Depression and in the hypothesized, positive direction ($\beta=.69$, $p<.001$).

Dissociation Step 1 of the dissociation symptom severity model was significant ($p>.05$); maltreatment characteristics predicted approximately 10 % of the total variance in Dissociation (F (3, 102)=3.97, $p<.05$; $R^2=.10$). When ER Difficulties was added as Step 2, the model was also significant (F (4, 101)= 15.14, $p<.001$; $R^2=.38$), as was the change in R^2 ($\Delta R^2=.27$, $p<.001$). ER Difficulties predicted a unique proportion of the

Table 2 Pearson correlation coefficients for all predictor and outcome variables

	Anger	Anxiety	Depression	Dissociation	PTS	Age onset	Perpetrators	Types
ER difficulty	.66***	.59***	.68***	.57***	.48***	−.14	.11	.14
Anger	–	.74***	.60***	.63***	.62***	−.27**	.22*	.17
Anxiety		–	.61***	.79***	.79***	−.32**	.23*	.25**
Depression			–	.55***	.51***	−.03	.14	.03
Dissociation				–	.73***	−.24*	.24*	.28**
PTS					–	−.31**	.15	.30**
Age Onset						–	−.31**	−.45***
Perpetrators							–	.53***
Types								–

$^\dagger p<.10$, $*p<.05$, $**p<.01$, $***p<.001$

Table 3 Results of all hierarchical regressions

Anger	R^2	ΔR^2		β	b	SE(b)
Step 1	.10*	–	Age at onset	−.23*	−.04	.02
			Perpetrators	.16	.06	.04
			Types	−.02	−.01	.06
Step 2	.49***	.39***	Age at onset	−.17*	−.03	.01
			Perpetrators	.14	.05	.03
			Types	−.07	−.04	.05
			ER Difficulties	.64***	.60	.07
Anxiety	R^2	ΔR^2		β	b	SE(b)
Step 1	.13**	–	Age at onset	−.25*	−.04	.02
			Perpetrators	.12	.04	.04
			Types	.08	.04	.06
Step 2	.42***	.30***	Age at onset	−.20*	−.03	.01
			Perpetrators	.10	.04	.03
			Types	.03	.02	.05
			ER difficulties	.55***	.54	.08
Depression	R^2	ΔR^2		β	b	SE(b)
Step 1	.02	–	Age at onset	.00	.00	.01
			Perpetrators	.17	.04	.03
			Types	−.06	−.02	.04
Step 2	.49***	.47***	Age at onset	.06	.01	.01
			Perpetrators	.15	.03	.02
			Types	−.11	−.04	.03
			ER difficulties	.69***	.41	.04
Dissociation	R^2	ΔR^2		β	b	SE(b)
Step 1	.10*	–	Age at onset	−.14	−.02	.02
			Perpetrators	.11	.04	.04
			Types	.16	.08	.06
Step 2	.38***	.27***	Age at onset	−.09	−.01	.01
			Perpetrators	.09	.03	.03
			Types	.12	.06	.05
			ER Difficulties	.53***	.48	.07
PTS	R^2	ΔR^2		β	b	SE(b)
Step 1	.13**	–	Age at Onset	−.22*	−.03	.02
			Perpetrators	−.04	−.01	.04
			Types	.22	.12	.06
Step 2	.31***	.18***	Age at Onset	−.18	−.03	.01
			Perpetrators	−.05	−.02	.03
			Types	.19	.10	.05
			ER Difficulties	.43***	.41	.08

***p<.001; **p<.01; *p<.05

variance in Dissociation and in the hypothesized, positive direction (β=.53, p<.001).

PTS Step 1 of the PTS symptom severity model was significant (p>.05); maltreatment characteristics predicted approximately 13 % of the total variance in PTS (F (3, 102)=5.09, p<.01; R^2=.13). Age at Onset predicted a unique proportion of the variance in PTS and in the hypothesized, negative direction (β=−.22, p<.05). When ER Difficulties was added as Step 2, the model was also significant (F (4, 101)=11.39, p<.001; R^2=.31), as was the change in R^2 (ΔR^2=.18, p<.001). ER Difficulties predicted a unique proportion of the variance in PTS and in the hypothesized, positive direction (β=.43, p<.001).

Discussion

The current study is the first (of which we are aware) to examine the contributions of multiple maltreatment characteristics (e.g., age at onset) to trauma-relevant mental health symptoms, but while also considering the impact that youths' perceived difficulties with emotion regulation (ER) may have on those same mental health symptoms. Results of the current study extend knowledge of the relationships between individuals' perceived ER difficulties and mental health outcomes to, first, a younger sample of individuals than are typically studied (i.e. adolescents versus college students or adults). Results also extend knowledge of the links between ER difficulties and mental health symptoms to a non-treatment-seeking (i.e. community-recruited) sample of individuals. Finally, and perhaps most importantly in relation to our overall goals with the current study, results extend knowledge of the relationships between ER difficulties and mental health outcomes to a sample of individuals who report fairly chronic and complex maltreatment and trauma histories. Because each adolescent from this sample reported maltreatment, the current study was able to more specifically examine how differences in individuals' maltreatment histories (i.e. age at onset, perpetrators, and types) impacted severity of important posttraumatic mental health symptomatology.

Maltreatment Characteristics and Mental Health Symptoms

We were able to recruit a sample of high-risk youth from the community who reported fairly complex and pervasive maltreatment experiences across their lives. As already indicated in the reported results, participants reported that they first experienced maltreatment, on average, around five and a half years of age, that they had been maltreated by an average of three perpetrators, and that they had experienced on average 2–3 different types of maltreatment across their lifespan. Consistent with study hypotheses, variability in the maltreatment characteristics of age at onset, cumulative perpetrators, and cumulative types, taken together, predicted a significant proportion of variance in four of five mental health symptoms: anger, anxiety, dissociation, and PTS. These results thus largely support the argument and empirical evidence (e.g., Kaplow and Widom 2007; Thornberry et al. 2010) that differences in maltreatment histories do indeed play a role in subsequent mental health outcomes. Contrary to our hypotheses, maltreatment characteristics, taken together, did not predict variance in one of the five symptoms that were considered in the current study: depression. Given few studies that have examined different types of posttraumatic mental health symptomatology in relation to the specific group of maltreatment characteristics that the current study measured and examined, we recommend future attempts at replicating this finding and

further investigating potential reasons for depression being the outcome of exception within the current study analyses.

Age at Onset and Mental Health Symptoms Consistent with hypotheses and previous studies by Kaplow et al. (2005) and Keiley et al. (2001), age at onset significantly predicted anger, anxiety, and PTS symptom severity. Because age of onset predicted symptoms above and beyond the effects of other maltreatment characteristics (cumulative perpetrators and types), our results suggest age at onset as more than just a proxy for more chronic maltreatment. Contrary to our hypotheses, age at onset did not predict unique variance in two symptoms: depression and dissociation. Since we know of few studies that have explicitly examined the relationship between age at onset of maltreatment and diverse mental health symptomatology among high-risk samples of adolescents, we recommend further investigation and replication of the current study results in similar community-recruited samples of youth.

Cumulative Perpetrators and Mental Health Symptoms Results did not support our hypothesis that cumulative perpetrators would predict unique variance in the severity of mental health symptoms. We know of no studies to date that have specifically measured cumulative perpetrators in this more continuous way and then related the construct to these trauma-relevant mental health outcomes among maltreated youth. Cumulative perpetrators, as measured within the current study as a lifetime sum of perpetrators, may fail to capture important nuances of the victim-perpetrator relationship that are more predictive of mental health outcomes. For example, Betrayal Trauma Theory (Freyd 1996) suggests that the intimacy or closeness of a perpetrator to a victim is important for victim outcomes.

Cumulative Types and Mental Health Symptoms Results did not support our hypothesis that cumulative types of maltreatment would predict unique variance in symptom severity. These null findings may reflect past researchers' concerns (e.g., Cicchetti et al. 2010; Saunders 2003) about the validity of parsing maltreatment experiences into discrete types or categories. For instance, some researchers (e.g., Brassard et al. 1993; Higgins 2004) have pointed out that emotional or psychological abuse, frequently defined as a repeated pattern of adult behavior that tells a child that they are worthless or unloved, inherently underlies all types of child maltreatment. It is also possible that children's subjective appraisals of the cumulative and pervasive nature of their own maltreatment experiences are more important to their mental health outcomes than a more objective measure or tally of their maltreatment experiences like the variable used within the current study, Cumulative Types. Future research may want to consider, in addition to using tallies of children's maltreatment

experiences, actually asking children about how pervasive or cumulative they perceive their experiences of maltreatment to be. As suggested by Finkelhor et al. (2007), children who view their maltreatment experiences as more of a broad life condition rather than a series of events that occurred to them may be more likely to experience more negative and severe mental health outcomes.

ER Difficulties and Mental Health Symptoms

Results indicated that adolescents' perceived ER difficulties were quite a robust predictor of their mental health symptoms. By demonstrating such robust links between adolescents' perceived ER difficulties and a host of mental health symptoms, the current study results are largely consistent with both theoretical frameworks (e.g. Linehan 1993) and empirical evidence from studies that demonstrate strong, positive links between ER difficulties and fairly broadband psychopathology (e.g., Alink et al. 2009; Gratz et al. 2006; Tull et al. 2007). One particularly exciting finding from the current study is that the relationship between perceived ER difficulties and mental health symptoms remained very strong even after accounting for the variance in symptoms explained by maltreatment characteristics.

We encourage further research on the links between more specific types of ER difficulties (e.g., lack of awareness, difficulties with impulse control when upset), overall (or more global) ER difficulties, and mental health symptoms among maltreated youth. Exploratory data analyses run as part of the current study suggested that specific types of ER difficulties (e.g., difficulties with impulse control when upset) predict mental health symptoms in much the same way as overall ER difficulties predict mental health symptoms. Research should continue to examine the utility of measuring multiple dimensions of ER difficulties and to test whether differential relationships may exist between specific dimensions of ER difficulties and mental health symptoms compared to a broader, overall measure.

Limitations

Results of the current study should be interpreted in light of several limitations. First, participants were female adolescents who had come to the attention of the child welfare system. Thus, how the observed relationships between maltreatment characteristics, ER difficulties, and trauma-relevant mental health symptoms generalize to males, other stages of development (e.g., early childhood, later adulthood), and youth outside of the child welfare system remains an empirical question that should be addressed in future studies. One implication of having an all-female sample was that the rate of sexual abuse (57 % of the current sample) was much higher than is typically seen in mixed gender samples. Thus, while

our study offers a unique opportunity to study a sample that is higher in sexual abuse histories, future research should also continue to study the relationships between maltreatment characteristics, ER difficulties, and mental health outcomes among mixed gender samples of maltreated youth.

A second limitation is our exclusive reliance on self-report measures. Due to shared method variance, results may overestimate relationships between variables. To address that concern, future research should strive for a more multi-method approach, especially when the constructs of interest demonstrate fairly high overlap, such as ER difficulties and mental health symptoms within the current study. A third limitation of the current study is the cross-sectional design, a design that prohibits us from making inferences about causal relationships between the variables. While we recognize the preliminary nature of these results, we also see the results as an important extension of knowledge about maltreatment, ER difficulties, and mental health to a younger, more low-income, and more racially/ethnically heterogeneous group of individuals than past studies have reported. Results from the current study point to the need for future studies, especially those studies using prospective and longitudinal methodologies, to better elucidate potentially causal relationships between these variables. Finally, caution in interpreting the current study results should be exercised given that multiple statistical tests were used, increasing risk for Type I error. Because the work represented in the current study falls within a relatively new and unexplored area of research, statistical corrections for multiple tests (e.g., Bonferonni corrections) were not conducted given the risk of then increasing Type II error. We strongly encourage replication of the current study results in future research.

Implications

Previous studies relating maltreatment or ER difficulties to mental health symptoms have often focused on college students or adults (e.g., Lilly and Hong Phylice Lim 2012; Tull et al. 2007) or adults receiving clinical treatment (e.g., Gratz et al. 2006). The current results have important implications for the assessment and treatment of mental health symptoms among maltreated youth, especially youth with complex trauma histories. Many participants within the current study endorsed having experienced more than one type of trauma, more than one perpetrator, and fairly ongoing experiences of trauma with early-onset. Youth with more chronic and complex histories of maltreatment, though at high risk for mental health difficulties, are still quite understudied. Our results are thus important in extending previous findings regarding maltreatment, ER, and mental health to an often understudied and underserved population of individuals, who have often experienced complex trauma: female adolescents within the child welfare system. Future research should continue to examine risk and resilience factors among youth with complex trauma to better predict, and then offer intervention for, later mental health difficulties.

Previous studies linking maltreatment characteristics or ER difficulties to mental health outcomes also frequently focus on psychiatric diagnoses as outcomes of interest (e.g., Generalized Anxiety Disorder, Major Depressive Disorder, Posttraumatic Stress Disorder (PTSD)). While such mental health outcomes are clearly important, results of the current study importantly extend such findings by showing that both maltreatment characteristics and ER difficulties are also able to predict mental health symptoms along a broader continuum than is represented by discrete diagnostic categories.

Given that this study is the first (again, of which we are aware) to examine multiple maltreatment characteristics and ER difficulties as predictors of mental health symptoms among a sample of maltreated youth, we strongly recommend that other researchers attempt to replicate these results especially through the use of longitudinal and prospective assessment when possible. Continuing to build empirical evidence in support of which factors (e.g., maltreatment characteristics, ER difficulties, etc.) best predict trauma-relevant mental health symptoms among maltreated youth is of critical importance to informing the decisions of mental health care policy makers and community providers. Developing the evidence for the most important risk and resilience factors for youth following experiences of maltreatment (including maltreatment characteristics and individual capacities or skills like ER) may help to create a more efficient and effective system by which important figures in youths' lives (e.g., school personnel, clinical providers) can identify at-risk youth. Given the often scarce resources for mental health within schools and youth-frequented community organizations, empirical evidence can help adult figures and professionals determine factors that may be most important to initially assess for (i.e. factors that are the *most* predictive of negative sequelae), as opposed to attempting assessments of a broad array of less-relevant or non-empirically-supported factors.

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