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# Maltreatment type, exposure characteristics, and mental health outcomes among clinic referred trauma-exposed youth

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## ABSTRACT

Building upon prior research documenting differential effects of psychological maltreatment, physical, and sexual abuse on youth mental health outcomes (Spinazzola et al., 2014), the present study sought to clarify the relative predictive contributions of type of maltreatment compared to salient exposure characteristics. The sample included 5058 clinic-referred youth from the Core Dataset (CDS) of the National Child Traumatic Stress Network (NCTSN) with lifetime histories of exposure to one or more of three specific types of maltreatment: *psychological maltreatment* (PM), *physical abuse* (PA), and *sexual abuse* (SA). First, we examined variations in salient trauma characteristics (age of onset, duration of exposure, number of co-occurring trauma types, and perpetrator type and number) by maltreatment group. Second, we examined whether type of maltreatment remained associated with mental health measures after adjusting for demographic variables and trauma characteristics. Profiles for youth with PM were more severe than youth who experienced either PA or SA only. Co-occurring PM and PA was associated with the most severe trauma exposure profile and with severity of PTSD symptoms, even after adjusting for demographic and trauma characteristics. Youth exposed to SA only had a distinct trauma profile and greater PTSD symptom severity after adjusting for demographic and trauma characteristic variables. Study findings hold important implications for trauma screening, assessment, and intervention, as well as for traumatic stress research methods that extend beyond abuse-specific or cumulative-risk approaches.

## 1. Introduction

Evidence continues to accumulate that psychological maltreatment (PM), defined as “thwarting of the child’s basic emotional needs,” including “needs for psychological safety and security in the environment, for acceptance and positive regard, and for age appropriate autonomy” (Barnett, Manly, & Cicchetti, 1993, p. 36) exerts potent negative effects on development and leads to a range of adverse mental health and functional outcomes (Hart, Binggeli, & Brassard, 2011). A growing body of research illustrates how PM

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comparatively “stacks up” to other forms of abuse and neglect as gauged by its sequelae (Vachon, Krueger, Rogosch, & Cicchetti, 2015). Longitudinal research examining the impact of PM, as compared to physical abuse, found the PM elements of maternal verbal abuse and emotional unresponsiveness to be equally or more detrimental to attachment, learning, and mental health (Sroufe, Egeland, Carlson, & Collins, 2005). Moreover, a number of recent studies demonstrate that PM is associated with increased risk for a variety of clinical symptoms (e.g. depression, anxiety, posttraumatic stress) even when other forms of maltreatment, such as physical and sexual abuse, are accounted for (English, Thompson, White, & Wilson, 2015; Paul & Eckenrode, 2015; Taillieu, Borwnridge, Sareen, & Afifi, 2016).

A recent study of a clinical sample of over 5000 trauma-exposed youth demonstrated that PM, compared to physical and sexual abuse, was associated with equivalent or greater severity and frequency of the majority of 30 clinical problems and risk indicators assessed. Moreover, results revealed a partially overlapping yet distinct clinical profile for psychologically versus physically or sexually abused youth. Specifically, PM was the strongest predictor of internalizing problems, an equivalent predictor of posttraumatic stress symptom severity, and a robust predictor of externalizing problems (equivalent to physical abuse and greater than sexual abuse (Spinazzola et al., 2014). The current study drew on the same clinical sample of youth to extend these findings and to explore their implications further.

Findings from the initial study by Spinazzola et al. (2014) invite further efforts to “unpack” PM to clarify its core features and identify candidate mechanisms through which it may operate and exert its effects (Layne, Briggs, & Courtois, 2014). In particular, PM tends to co-occur within a constellation of theorized risk factors (e.g., age of onset of exposure, duration of exposure, co-occurring maltreatment). Underscoring the value of exploring its distinguishing features, PM tends to have an earlier age of onset and more chronic course than other forms of abuse and neglect (McGee, Wolfe, & Wilson, 1997). These contextual features may intersect with PM and contribute to psychological distress and dysfunction (Claussen & Crittenden, 1991; Layne et al., 2009). Recent research also suggests that PM tends to co-occur with other forms of maltreatment including neglect, impaired care giving, domestic violence exposure, and physical maltreatment (Kim, Mennen, & Trickett, 2017; Pynoos et al., 2014; Trickett, Kim, & Prindle, 2011) and may intersect with these co-occurring types in complex ways. For example, PM may “enhance” the predictive effects of other forms of abuse (McGee et al., 1997), suggesting that the combination of PM with physical abuse or neglect may result in worse outcomes among youth than either risk factor in isolation.

Although the extant literature clearly suggests that PM adversely affects development, there is a continued need to clarify how, why, and for whom PM is comparatively detrimental. Historically, investigations of risk factors have measured and analyzed the impact of trauma (such as PM) using one of two approaches. These include (1) *specificity models*, which examine the impact of particular trauma types on negative outcomes; and (2) *cumulative risk models*, which look at the impact of the total “dosage” (i.e., total number of trauma types experienced over the life course) on negative outcomes (Anda et al., 2006; Finkelhor, Turner, Hamby, & Ormrod, 2011). Limitations of the specificity approach include its inherent assumption that trauma types exert independent effects, its tendency to focus on commonly-occurring trauma types (e.g. sexual and physical abuse) while ignoring potential contributions of other types (e.g. PM) that often co-occur but are infrequently measured, and a failure to account for additive, multiplicative or synergistic interactions between trauma types (Vachon et al., 2015). In contrast, the cumulative risk approach, although better accounting for the impact of multiple exposures than the specificity approach, is also limited by its treatment of trauma types as interchangeable, independent, and thus additive in their effects (Flouri, 2008).

Emerging evidence (Kisiel, Fehrenbach, Torgersen et al., 2014; Pynoos et al., 2014; Spinazzola et al., 2014) suggests that neither the specificity nor the cumulative risk approach adequately captures the impact of child trauma. In particular, both approaches fail to measure and delineate: (1) how particular types of trauma exposure co-occur in clusters that can lead to additive or synergistic effects; (2) developmental timing of exposures and subsequent efforts at adjustment; and (3) the reverberating effects and varying causal pathways of different types of exposure across levels of the ecology (individual, family, broader community, etc.). Recent studies demonstrate that among high risk populations, such as children in the child welfare system or those seeking treatment for traumatic sequelae, trauma types tend to co-occur in coherent and recognizable clusters (Kisiel, Fehrenbach, Torgersen et al., 2014; Pynoos et al., 2014).

An examination of constellations of trauma exposure among over 14,000 clinic-referred youth revealed that both age of onset (developmental timing) and overall duration of trauma vary by trauma type. For example, impaired caregiving, neglect, exposure to domestic violence, and PM have their initial onset early in the life course (before age 5 years) and have a relatively long duration (4 years or more). A principal components analysis demonstrated that these four trauma types also tend to co-occur in clusters with physical abuse, whereas other types of trauma formed separate co-occurring clusters. These included acute forms of trauma (serious injury, accident, traumatic loss, natural disaster, and medical trauma), broader contextual traumas (community and school violence, war, terrorism, political violence), and different forms of assault (sexual abuse, sexual assault, and physical assault; Pynoos et al., 2014). Moreover, recent work demonstrates that exposure to particular combinations of trauma, such as physical *and* psychological maltreatment, or interpersonal *and* non-interpersonal forms of trauma, are linked to the greatest degree of dysfunction in youth when compared to the impact of physical or sexual abuse alone (Kisiel, Fehrenbach, Torgersen et al., 2014; Spinazzola et al., 2014).

In sum, evidence suggests that the nature, potency, and sequelae of childhood PM may be influenced by a complex set of exposure parameters or characteristics. These include: the specific type(s) of maltreatment/trauma experienced; the developmental timing of specific types of exposure (Manly, Kim, Rogosh, & Cicchetti, 2001); the particular combinations in which different types of trauma co-occur (Kisiel, Fehrenbach, Torgersen et al., 2014; McGee et al., 1997; Spinazzola et al., 2014), and the cumulative impact thereof (Anda et al., 2006; Felitti & Anda, 2009). Parsing out the effects of childhood PM is complicated by findings that PM rarely occurs in isolation, but rather tends to co-occur in constellations with other trauma types (Layne et al., 2014; Pynoos et al., 2014; Spinazzola et al., 2014) thereby making it difficult to isolate the independent influence of PM on specific outcomes. The high degree of overlap

with other trauma also calls into question the rationale and utility of efforts to isolate independent effects rather than undertaking the study of focal risk factors within a broader ecological context (Layne et al., 2010). Therefore, it may be more informative to examine why various child maltreatment types tend to co-occur in specific constellations (Pynoos et al., 2014), intersect in potentially complex ways, and exert their cumulative influences on development and later mental health outcomes in additive or synergistic configurations (Layne et al., 2009).

Given the above, and building on prior findings (Spinazzola et al., 2014), we examined two exploratory questions with the aim of accounting for both trauma specificity and cumulative risk in evaluating the impact of PM on mental health outcomes among youth in six mutually exclusive maltreatment groups (described below). First, do exposure characteristics (age of onset, total duration of exposure, number of co-occurring types of trauma, and perpetrator type and number) vary by maltreatment group? Second, are exposure characteristics and group status associated with differences in mental health measures when examined simultaneously?

## 2. Methods

### 2.1. Participants

Data were analyzed from the Core Data Set (CDS) of the National Child Traumatic Stress Network (NCTSN; Briggs et al., 2012; Pynoos et al., 2008). A clinical quality improvement initiative, the CDS is a large, diverse database of clinic-referred children and adolescents collected across the U.S. The CDS contains information regarding demographics, family characteristics, service use, trauma exposure, treatments received, clinical functioning, and standardized assessments of emotional/behavioral problems as collected between 2004 and 2010 on 14,088 children from 56 participating NCTSN centers. We examined the study questions using a subsample of youth ( $N = 5057$ ; 43.5% boys; mean age = 10.8 years, age range = 0–20.9 years) with reported exposure to one or more of the following three types of maltreatment: *psychological maltreatment* (PM); *sexual abuse* (SA); and *physical abuse* (PA). These youth were categorized into six mutually exclusive groups based upon their respective exposures to one or a combination of two trauma types. These consisted of: (1) a *PM only* group ( $n = 1339$ ); (2) an *SA only* group ( $n = 1084$ ); (3) a *PA only* group ( $n = 825$ ); (4) an *SA + PA* group ( $n = 250$ ); (5) a *PM + SA* group ( $n = 313$ ); and (6) a *PM + PA* group ( $n = 1246$ ). Since we have learned from Spinazzola et al. (2014) that the youth with all three types of maltreatment (PA + SA + PM) had the worst clinical outcomes compared to these six subgroups, the primary focus of this study was to compare and contrast the trauma characteristic profiles across PA, SA and PM without the PA + SA + PM group.

### 2.2. Procedure

The NCTSN was the first to establish a web-based data collection tool (*InForm*) for collecting data from trauma-exposed youth, their caregivers, and other collateral sources. Study data were provided by NCTSN community-based treatment service and treatment development centers over a 6-year period. Study procedures complied with all federal regulations for human subject protection and were approved by the Institutional Review Board (IRB) of Duke University Health System and the respective IRBs of each participating center.

### 2.3. Measures

Information was obtained from multiple sources, including children, caregivers, and other collaterals for all measures used in this study. All measures utilized for this study were from the baseline interview (i.e. at enrollment).

#### 2.3.1. Demographic variables

Demographic variables included sex, age, and race/ethnicity (White [non-Hispanic], African American [non-Hispanic], Hispanic, other).

#### 2.3.2. Child behavior checklist: (CBCL; Achenbach & Rescorla, 2004)

Two developmentally appropriate versions of this measure for ages 1 ½–5 and 6–18 years were used in the present study. This widely used measure is completed by a parent or caregiver who knows the child well. Respondents rate approximately 113 items on a 3-point scale ranging from 0 (not true) to 2 (often true). The CBCL yields scores on two broad band scales (Internalizing and Externalizing Behavior Problems), as well as empirically-based syndrome scales reflecting a range of emotional and behavioral problems. The CBCL has sound psychometric properties across diverse samples of youth. Alpha coefficients for the current sample were 0.93 for Internalizing and 0.94 for Externalizing Behavior Problems.

*UCLA PTSD Reaction Index (PTSD-RI; Steinberg, Brymer, Decker, & Pynoos, 2004)* assesses traumatic stress reactions in children and youth, ages 7 years and older, consistent with DSM-IV-TR diagnostic criteria for PTSD, including criterion B (re-experiencing), criterion C (avoidance/numbing), and criterion D (arousal) symptoms. Symptom frequency during the past month is rated on a 5-point scale ranging from 0 (*none of the time*) to 4 (*most of the time*). Twenty items directly assess PTSD symptoms, whereas two additional items (*fear of recurrence, trauma-related guilt*) assess associated features. Scoring algorithms permit tabulation of the PTSD total scale, and B, C, and D symptom subscale scores. Previous studies have identified a cutoff total score of  $\geq 38$  (range 0–64) to denote the clinical range. The PTSD-RI has demonstrated robust psychometric properties in prior CDS studies (Elhai et al., 2013; Steinberg, Brymer, Kim, Briggs, & Ippen, 2013). Cronbach's alpha for the total score in the current study was 0.94.

The *Trauma History Profile (THP)*, derived from the NCTSN Core Data Set General Trauma and Trauma Detail Forms, collects information from multiple informants regarding history of exposure to a range of trauma events. The THP assesses exposure to 20 different types of trauma. These include *interpersonal* (psychological, sexual and physical maltreatment, neglect, impaired caregiving, domestic violence exposure) and *non-interpersonal* (natural disaster, accidents, medical trauma, exposure to war/terrorism) trauma, as well as, contextual information including age in years during which each type of exposure occurred and other trauma-specific details (e.g., perpetrator, setting, weapon use, injuries, etc.). Sexual abuse was defined as “actual or attempted sexual molestation, exploitation, or coercion by a caregiver”. Physical abuse was defined as “actual or attempted infliction of physical pain or bodily injury by a caregiver”. Psychological maltreatment was defined as “emotional abuse, verbal abuse, excessive demands, and / or emotional neglect”. For a full list of definitions of each trauma type captured by the THP please see Greeson et al. (2014) and the National Child Abuse and Neglect Data System (NCANDS) glossary (U.S. Dept. of Health and Human Services, 2000). Exposure to one or more types of trauma *within* a given year were scored as “1,” else “0,” for that type and year.

### 2.3.3. Exposure characteristics

Trauma exposure characteristics, conceptualized as parameters that assist in defining the nature, developmental timing, and socio-environmental context of the event, were derived from the THP. These included: (1) *lifetime proportion of exposure* (hereafter referred to as “proportion”) computed as the proportion of years of life during which exposure occurred for PM, PA, and SA specifically (i.e., total number of years in which an individual was exposed, divided by age at baseline); (2) *age of onset* - earliest age at which a particular trauma type occurred; (3) *number of co-occurring traumas* - total number of trauma types the individual reported being exposed to over the course of their lifetime (range = 0–17 trauma types) - this variable did not include the trauma types of interest (PM, PA and SA) in the total count; (4) *perpetrator type*, categorized as a dichotomous variable (parent vs. non-parent) based on the child’s relationship to the perpetrator, and (5) *multiple perpetrators* - categorized as a dichotomous variable (trauma perpetrated by one versus two or more individuals).

## 2.4. Data analysis

We conducted all analyses using SAS Version 9.4 for Windows. First, to evaluate whether pre-selected trauma characteristics including age of onset, duration, co-occurrence of other trauma types, and perpetrator of maltreatment differed across study groups, we used Cochran-Mantel-Haenszel (CMH) tests and random-effects models for categorical and continuous variables, respectively. These methods accounted for correlations among youth nested within study sites.

Second, we employed linear mixed-effects regression models to assess (via model contrast) whether the trauma characteristics were associated with mental health measures, and whether group status remained significantly associated with mental health measures after adjusting for both demographic and trauma characteristics. Covariates included in all the regression models were group status, demographic (i.e. sex, age at enrollment, and race), and trauma characteristic (i.e. age of onset, proportion, multiple perpetrator, co-occurring trauma, and age of onset of co-occurring trauma). The PM-only group has the largest sample size and thus served as the reference group for all comparisons. Models also included site-level random intercepts that accounted for correlations among youth nested within study sites.

## 3. Results

### 3.1. Question 1: do exposure characteristics (age of onset, total duration of exposure, number of co-occurring types of trauma, and perpetrator type and number) vary by maltreatment group?

Demographic and trauma characteristics are presented in Table 1.

#### 3.1.1. Perpetrator

We found that perpetrator type and number varied across groups. Fig. 1 shows that youth experiencing sexual abuse appeared to be more likely to report multiple perpetrators. Youth with a history of sexual abuse had increased odds of reporting multiple perpetrators compared to youth who did not experience sexual abuse (OR = 1.40, 95% CI: 1.18–1.66;  $p < .0001$ ). The most commonly identified perpetrator in all study groups was a parent (range: 58%–78%), with the exception of the SA-only group ( $p < .0001$ ), which reported parent (20%), other adult relative (21%), and unrelated adults (21%) as the most common perpetrator types. A portion of the sample was missing perpetrator information (see Fig. 1).

#### 3.1.2. Age of onset

We found significant group differences with respect to age of onset of first trauma. Mean age of onset ranged from 3.76 years (PM + PA group) to 6.69 years (SA only group), with the PM + PA group experiencing a significantly earlier age at first exposure (See Table 1). The overall pattern indicated that youth who experienced PM—either in isolation or in combination with another form of maltreatment—experienced an earlier average age of onset than youth who did not experience PM (SA, PA, PA + SA groups; with vs. without PM: 4.63 vs. 5.89 years, respectively;  $p < .0001$ ).

#### 3.1.3. Lifetime proportion of exposure

Proportion of exposure also varied by group, ranging from a low of .19 for the SA-only group, to a high of .54 for the PM + PA

**Table 1**  
Demographic and Trauma History Characteristics.

	SA Only	PA Only	PM Only	SA + PA	PM + SA	PM + PA
Group n <sup>a</sup>	1084	825	1339	250	313	1246
<b>Demographic Characteristics</b>						
Male <sup>1,***</sup>	263 (24.3)	451 (54.7)	651 (48.7)	86 (34.4)	69 (22.0)	681 (54.7)
<b>Race<sup>1</sup></b>						
White/Caucasian	338 (31.2)	221 (26.8)	584 (43.6)	91 (36.4)	132 (42.2)	501 (40.2)
Black/AA	282 (26.0)	265 (32.1)	205 (15.3)	70 (28.0)	51 (16.3)	209 (16.8)
Hispanic/Latino	346 (31.9)	218 (26.4)	413 (30.8)	63 (25.2)	101 (32.3)	390 (31.3)
Other	58 (5.4)	54 (6.6)	111 (8.3)	11 (4.4)	21 (6.7)	110 (8.8)
Unknown/Missing	60 (5.5)	67 (8.1)	26 (1.9)	15 (6.0)	8 (2.6)	36 (2.9)
<b>Age at Enrollment<sup>2,***</sup></b>						
Mean (SD)	10.1 (4.18)	10.6 (4.21)	10.6 (4.39)	11.1 (4.11)	12.0 (3.94)	11.2 (4.27)
<b>Trauma History Characteristics</b>						
<b># Youth with age of onset data for trauma type captured by subgroup</b>	952 (87.8)	692 (83.9)	1211 (90.4)	212 (84.8)	293 (93.6)	1165 (93.5)
Age Onset <sup>2,***</sup>	6.69 (3.46)	5.87 (4.07)	4.68 (4.79)	5.24 (3.90)	4.98 (4.21)	3.76 (3.99)
Mean (SD)						
Proportion <sup>2,***</sup>	0.19 (0.14)	0.25 (0.23)	0.47 (0.33)	0.33 (0.23)	0.43 (0.29)	0.54 (0.30)
Mean (SD)						
<b># Youth with any Co-Occurring Traumas</b>	1054 (97.2)	821 (99.4)	1339	248 (99.2)	312 (99.7)	1244 (99.8)
<b># Co-occurring Traumas</b>						
Mean (SD) <sup>2,***</sup>	1.31 (1.47)	2.27 (1.72)	3.22 (1.78)	2.40 (1.86)	2.94 (1.94)	3.54 (1.95)
Onset of Co-Occurring Traumas, Mean (SD) <sup>2,***</sup>	4.46 (4.35)	3.99 (4.21)	3.03 (3.98)	3.23 (3.81)	3.65 (4.41)	2.48 (3.68)

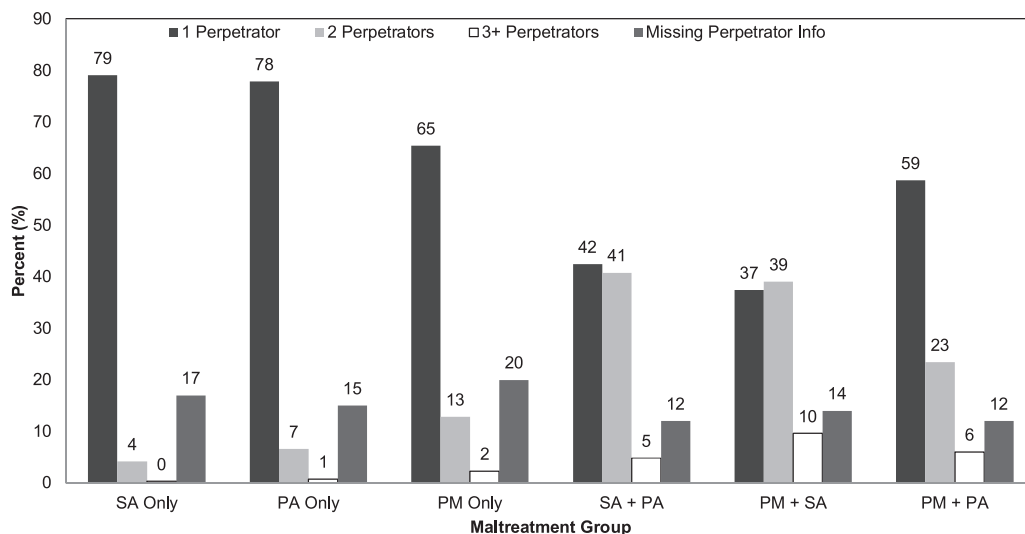
Notes: SA = Sexual Abuse, PA = Physical Abuse, PM = Psychological Maltreatment. Proportion was calculated as number of years of exposure divided by the age at intake, which is rounded to the next integer. Co-occurring traumas did not include sexual abuse, physical abuse and psychological maltreatment, but included the remaining 17 trauma types captured by the Trauma History Profile (THP).

<sup>1</sup> Cochran–Mantel–Haenszel (CMH) test was used.

<sup>2</sup> Random effects model was used.

\*\*\*  $p < .0001$ .

<sup>a</sup> Groups are mutually exclusive drawn from the CDS, reporting at least one of the three trauma types of interest (PA, SA and/or PM).



**Fig. 1.** Number of Perpetrators by Maltreatment Group.

Note: SA = Sexual Abuse, PA = Physical Abuse, PM = Psychological Maltreatment.

group which had a significantly greater proportion of exposure ( $p < .0001$ , See Table 1). A similar pattern emerged in relation to age of onset, in that youth who experienced PM only, SA + PM or PA + PM had significantly higher proportions of exposure than youth who experienced SA only, PA only, or SA + PA (with vs. without PM: 0.47 vs. 0.27;  $p < .0001$ ).

### 3.1.4. Co-occurring trauma

Examination of patterns of co-occurring trauma (both number and type) revealed that all six groups experienced additional co-

**Table 2**  
Rates of Co-occurring Trauma by Maltreatment Group.

	SA	PA	PM	SA + PA	PM + SA	PM + PA	<i>p</i> <sup>a</sup>
Group N	1084	825	1339	250	313	1246	
<b>Co-Occurring Trauma Type</b>	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Impaired Caregiver	194 (17.9)	244 (29.6)	761 (56.8)	83 (33.2)	148 (47.3)	774 (62.1)	< .0001
Domestic Violence	265 (24.5)	382 (46.3)	801 (59.8)	123 (49.2)	172 (54.9)	893 (71.7)	< .0001
Neglect	133 (12.3)	218 (26.4)	498 (37.2)	86 (34.4)	107 (34.2)	634 (50.9)	< .0001
Traumatic Loss	284 (26.2)	344 (41.7)	766 (57.2)	98 (39.2)	135 (43.1)	675 (54.2)	< .0001

Note: SA = Sexual Abuse, PA = Physical Abuse, PM = Psychological Maltreatment; Co-occurring trauma types represent the four most commonly reported trauma types reported on the Trauma History Profile (THP).

<sup>a</sup> Cochran–Mantel–Haenszel (CMH) tests were used.

occurring trauma, ranging from an average of 1.31 co-occurring types for the SA only group to an average of 3.54 co-occurring types for the PM + PA group (see Table 1). Further, age of first exposure to co-occurring trauma types varied across groups; youth in the PM + PA group reported experiencing their first co-occurring trauma between one and two years earlier, on average, than those in the SA only, PA only or PM + SA groups ( $p < .001$ , See Table 1).

Moreover, the specific type of co-occurring trauma varied across groups, with trauma types representing child maltreatment (i.e. exposure to domestic violence, impaired caregiving, and neglect) emerging as the most commonly reported types of co-occurring trauma (see Table 2). For youth with exposure to PM (PM only, PM + PA, and PM + SA groups), the most commonly co-occurring trauma types were domestic violence (55%–72%), impaired caregiver (47%–62%), and neglect (34%–51%). More than 62% of the PM + PA group experienced impaired caregiver, domestic violence, and over 50% reported neglect. Approximately 40% of youth with exposure to PA with or without SA also endorsed traumatic loss/separation and domestic violence. Youth in the SA only group had relatively lower rates of exposure than the other five groups to co-occurring trauma, ranging from 12% for neglect to 26% for traumatic loss/separation.

**Table 3**  
Summary of Mixed-Effects Regressions for Total PTSD Symptoms and CBCL Externalizing and Internalizing Problems.

	PTSD RI (N = 2571)		CBCL Externalizing (N = 2849)		CBCL Internalizing (N = 2849)	
	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>	Estimate (SE)	<i>p</i>
<b>Study Group</b>		0.07		0.56		0.11
PM Only	REF		REF		REF	
SA Only	2.51 (0.98)	0.0106	0.68 (0.75)	0.37	0.86 (0.73)	0.24
PA Only	1.58 (0.95)	0.10	1.32 (0.72)	0.07	−0.73 (0.70)	0.30
SA & PA	1.87 (1.41)	0.18	0.98 (1.08)	0.36	−0.01 (1.04)	0.99
SA & PM	1.99 (1.21)	0.10	0.21 (0.92)	0.82	0.72 (0.88)	0.42
PA & PM	2.00 (0.76)	0.0088	0.63 (0.55)	0.26	1.01 (0.53)	0.06
<b>Covariates</b>						
Age (Year) <sup>a</sup>	−0.29 (0.11)	0.0065	0.18 (0.06)	0.0042	0.22 (0.06)	0.0003
Male <sup>a</sup>	−4.20 (0.61)	< .0001	1.60 (0.45)	0.0003	0.17 (0.43)	0.70
Race/Ethnicity <sup>a</sup>		0.77		0.0053		0.08
White	REF		REF		REF	
Black	−0.38 (0.88)	0.67	−0.87 (0.64)	0.17	−1.71 (0.62)	0.0059
Hispanic	0.18 (0.86)	0.83	−2.38 (0.64)	0.0002	−0.73 (0.64)	0.25
Other	0.90 (1.19)	0.45	−1.42 (0.87)	0.10	−1.12 (0.84)	0.18
Unknown/Missing	−1.47 (1.72)	0.40	−0.31 (1.33)	0.82	−1.28 (1.29)	0.32
# Co-Occurring Trauma <sup>a</sup>	0.89 (0.17)	< .0001	0.54 (0.14)	0.0001	0.35 (0.14)	0.0111
# Perpetrators <sup>a</sup>		0.14		0.0026		0.47
2 or more	REF		REF		REF	
1	−1.47 (0.75)	0.0517	−1.88 (0.55)	0.0006	−0.35 (0.53)	0.50
Unknown/Missing	−0.77 (1.30)	0.55	−1.89 (0.93)	0.0417	−1.11 (0.91)	0.22
Proportion <sup>a</sup>	4.43 (1.46)	0.0024	−2.80 (1.01)	0.0057	−0.18 (0.98)	0.86
Age of Onset <sup>a</sup>						
Maltreatment Trauma	0.24 (0.10)	0.0189	−0.25 (0.08)	0.0030	0.05 (0.08)	0.52
Co-Occurring Trauma	0.05 (0.08)	0.56	−0.11 (0.07)	0.13	−0.09 (0.07)	0.16

Note: PA = Physical Abuse, SA = Sexual Abuse, PM = Psychological Maltreatment.

<sup>a</sup> Indicates variables entered as covariates. A subsample of youth were entered into the regression models: 3935 youth met the age criteria for PTSD-RI, 635 had missing PTSD-RI data; 5044 youth met age criteria for CBCL, 1337 had missing CBCL data; 10% of the sample was missing data on trauma characteristics (i.e. proportion, age of onset or number of co-occurring trauma types).

### 3.2. Question two: are exposure characteristics and group status associated with mental health symptoms when examined simultaneously?

Table 3 summarizes the results from the mixed-effects regression model for externalizing and internalizing problems and PTSD symptoms among a subsample youth with available data on the CBCL and PTSD-RI. A total of 3935 youth met the age criteria for the PTSD-RI and of those, 635 (16% of the sample) had missing data. A total of 5044 youth met age criteria for the CBCL and of those, 1337 (27% of the sample) had missing data. Among those with non-missing assessments, about 10% were missing trauma characteristics, and less than 1% were missing number of co-occurring trauma types. We conducted the site-level random-effects regression analyses to further understand whether the key trauma characteristics (e.g. proportion, age of onset, and number of co-occurring trauma types) differed between youth who did versus did not miss PTSD-RI or CBCL assessments, adjusting for age of enrollment and study group. Results from these analyses indicated that there were no significant differences in the key trauma characteristics between groups, with the exception of the finding that youth with missing PTSD-RI assessments had a greater number of co-occurring trauma on average than youth who were not missing the PTSD-RI ( $M = 2.76$ ,  $SD = 1.88$  versus  $M = 2.80$ ,  $SD = 2.04$  respectively). While this finding was statistically significant, this difference does not appear to be clinically meaningful.

#### 3.2.1. PTSD symptoms

Adjusted analysis showed that higher PTSD total scores were associated with: (1) younger age at enrollment ( $p = .007$ ), (2) female gender ( $p < .0001$ ), (3) greater number of co-occurring traumas ( $p < .0001$ ), (4) greater lifespan proportion of exposure ( $p = .004$ ), and (5) older age at first exposure to maltreatment trauma ( $p = .019$ ).

#### 3.2.2. Externalizing problems

Higher CBCL externalizing scores were significantly associated with: (1) older age at enrollment ( $p = .004$ ), (2) male gender ( $p = .0003$ ), (3) White race (vs. Hispanic,  $p = .0002$ ), (4) greater number of co-occurring traumas ( $p = .0001$ ), (5) victimization by multiple perpetrators (vs. single perpetrator,  $p = .0006$ ), (6) lower proportion of lifespan exposure ( $p = .006$ ), and (7) first exposure to maltreatment at younger age ( $p = .003$ ).

#### 3.2.3. Internalizing problems

Higher CBCL Internalizing scores were significantly associated with the following characteristics: (1) older age at enrollment ( $p = .0003$ ), (2) White race (vs. Black,  $p = .006$ ), and (3) greater number of co-occurring traumas ( $p = .011$ ).

When adjusting for both demographic and trauma characteristics in the regression models, group status remained significantly associated with youth mental health measures in some cases but not others. Significantly greater PTSD total scores for youth in the SA only ( $p = .011$ ) and PM + PA ( $p = .009$ ) groups versus those in the PM only were still observed. However, group status was not associated with CBCL Externalizing and Internalizing Behavior Problems after accounting for demographic and trauma characteristics.

## 4. Discussion

This exploratory study sought to extend findings from prior research comparing the impact of psychological maltreatment (PM) to that of physical abuse (PA) and sexual abuse (SA; Spinazzola et al., 2014) by investigating how and why PM may exert an equivalent effect on youth mental health outcomes. We were interested in exploring whether the effect of PM was attributable to PM *per se* (operationally defined by PM group membership), or alternatively, to a constellation of parameters surrounding PM characterized by earlier age of onset, longer duration of exposure or a greater number of co-occurring trauma exposures. We did so by exploring two primary study questions: (1) *Do exposure characteristics (age of onset, proportion of exposure, number of co-occurring types of trauma, and perpetrator type and number) vary by maltreatment group?* And (2) *are exposure characteristics and group status associated with mental health symptoms when examined simultaneously?* Our findings supported the conclusions of the Spinazzola et al. study in some instances, and pointed to new directions for further investigation in others.

### 4.1. Study question one

We found partial evidence for group-specific “profiles” of trauma characteristics. In particular, we observed *both* specificity within groups, as well as general patterns across groups. Our main finding was a pattern of trauma characteristics common to PM exposure, observed in the PM (alone) as well as SA + PM and PA + PM groups. Namely, youth who experienced PM had a more severe and chronic course of maltreatment as reflected by an earlier age of onset, greater lifespan proportion of exposure and exposure to more co-occurring trauma types than youth who experienced sexual or physical abuse without PM. In addition, youth exposed to PM, either alone or in combination with SA or PA, had higher rates of exposure to domestic violence, impaired caregiving, and neglect. Of particular interest was the finding that the trauma characteristic profile observed among youth who experience *the combination* of psychological and physical maltreatment (PM + PA) signaled an especially deleterious risk factor profile. These youth had the most severe and pronounced trauma characteristic profile of all the groups – the youngest age of onset (under 4 years of age on average), greatest proportion of years exposed (over 50% of the child’s lifespan on average), and highest average number of co-occurring trauma types (3.54 additional types).

These findings suggest that PM in particular is likely to occur within an early caretaking environment characterized by chaotic, unpredictable, and/or non-responsive caregiver behaviors (i.e. impaired caregiving, domestic violence, neglect) that may go

undetected by providers and broader caretaking systems, leading to longer durations of exposure. The adverse effects of the disorganized contexts in which PM often occurs are exacerbated both by the inherently insidious nature of PM (Spinazzola et al., 2014) and by confusion and disagreement about how to define, assess, or determine when PM has reached the threshold of maltreatment (Trickett, Mennen, Kim, & Sang, 2009).

The pernicious connections between *failure to properly define*, *failure to accurately detect*, and *failure to appropriately intervene* in cases involving PM is illustrated by contrasting government statistics purporting to track PM. In particular, reports that PM occurs relatively rarely (7.6% of official reports) are contradicted by other reports in which PM was identified on a “secondary” level (i.e., subsequently reported during an investigation triggered by allegations of another form of maltreatment). These “secondary” reports identify psychological abuse and neglect as present among 36% and 52% of reports, respectively—representing over 1.1 million children nationwide (Sedlak et al., 2010). Similarly, a study examining child protective service case records revealed that although 50% of maltreated children had experienced PM, this was officially noted in only 9% of the cases (Trickett et al., 2009). Unlike other forms of child maltreatment such as sexual and physical abuse, PM does not leave overt physical manifestations in its wake, making the line between what constitutes maltreatment versus “poor parenting” much more subjective and difficult to determine (Wolfe & McIsaac, 2011). Collectively these observations highlight a need for a universal definition of PM as well as screening and assessment tools that can be utilized by providers in order to guide decision making about when to intervene.

Further adding to the inherent complexity and challenges of accurate detection, the high rate of co-occurrence of impaired caregiving and physical neglect with PM likely reflects a broader array of family-level risk factors, such as parenting stress or mental illness. Consistent with the notion of a *risk factor caravan* (defined as co-occurring risk factors that accumulate in number, accrue in their cumulative effects, often mediate or moderate one another’s effects, and “cascade” forward across development (Layne et al., 2014)), this broader constellation of risks is in turn associated with “cascading” subsequent risks. These risks consist of continued trauma, including disrupted placements (James, 2004), child maltreatment (Crouch & Behl, 2001; Rodriguez & Green, 1997), and negative child psychological and behavioral outcomes. Family level risk factors tend to co-occur with childhood trauma - for example, depressed mothers with few social supports are at greater risk to engage in hostile or neglectful parenting (Lyons-Ruth, Connel, & Grunebaum, 1990; Maughan, Cicchetti, Toth, & Rogosch, 2007). These findings are consistent with developmental epidemiology research findings (Pynoos et al., 2014) that trauma types involving child maltreatment tend to co-occur in conceptually coherent clusters (e.g., neglect, psychological maltreatment, impaired caregiving, domestic violence, physical abuse). The constellation of risk factors with which PM tends to co-occur are theorized to accumulate and cascade forward in ways that increase the risk for—and vulnerability to—subsequent exposures, leading to ongoing stress, adversity and developmental disruption that places youth on a life trajectory characterized by dysfunction and distress over time (Layne et al., 2014). These observations underscore the continued importance of clear definitions, early identification, and ultimately, effective intervention for populations at risk for PM, as the presence of PM serve as a marker of risk for exposure (whether prior, concurrent, or subsequent) to a broader “syndrome” of ongoing attachment trauma characterized by a constellation of co-occurring risk factors that involve maltreatment at the hands of caregiving figures and the resulting complex posttraumatic response.

In contrast to the findings for youth with a history of PM, youth who experienced SA in the absence of PA or PM displayed a distinct trauma characteristic profile suggestive of trauma occurring outside of the family context. These youth were more likely to have experienced abuse by a perpetrator who was a non-parent, greater odds of experiencing abuse at the hands of multiple perpetrators, had an *older* age of onset of trauma exposure, experienced a *lesser* proportion of exposure of abuse, and were *less likely* to have experienced other co-occurring traumas. Thus, it appears that for SA-only youth, the traumatic exposure was qualitatively distinct, in that they were more likely than youth in the PA-only, PM-only, PM + SA, and PM + SA groups to experience an acute form of trauma perpetrated by a non-parent and therefore potentially occurring outside the family. Although not tested for statistical significance, when looking at the demographic variables of this group descriptively it is interesting that youth in the SA-only group also had an average younger age at enrollment into trauma-informed services, suggesting that sexual abuse which is perpetrated by a non-parent may trigger faster environmental intervention. It is also possible that youth who experience sexual abuse in the absence of other forms of child maltreatment may have more intact attachment relationships, supporting their ability to disclose and garner a protective response from adults.

#### 4.2. Study question two

Our examination of links between trauma characteristics, maltreatment group status and clinical outcomes covered two inter-related components. Although analysis of posttraumatic stress and internalizing/externalizing problems was on a subsample of youth, we wanted to know whether trauma characteristics and maltreatment group were associated with the clinical outcomes of interest when examined simultaneously. Number of co-occurring trauma types emerged as the most consistently related to mental health and behavioral problems, demonstrating associations with severity of PTSD, internalizing, and externalizing symptoms. This finding is consistent with findings from the Adverse Childhood Experiences (ACE) study (Felitti & Anda, 2009) and the work of Finkelhor and colleagues (Finkelhor, Ormrod, & Turner, 2007, 2011) which reported a dose-response relation between the number of different types of trauma exposures and negative physical and mental health outcomes later in life. Recent research has also highlighted that risk for maladjustment grows as diversity, frequency, and severity of maltreatment exposure increases (Vachon et al., 2015). Our study thus replicates these findings in a clinic-referred population.

Interestingly, the associations between age at first trauma exposure (younger versus older) and proportion of lifespan trauma exposure (longer versus shorter) and clinical outcomes, varied depending upon the outcome of interest. For PTSD, older age of onset but greater proportion of lifespan trauma exposure was associated with more severe symptoms. However, for externalizing problems,



the pattern was the opposite – younger age of onset but lesser proportion of exposure was associated with more severe symptoms. For internalizing problems, neither age of onset nor proportion of exposure were predictive of symptoms severity. It is also notable that among the subgroups of interest, the vast majority experienced some other form of trauma that preceded (i.e. had an earlier age of onset) the trauma types under examination.

Taken together, these findings suggest that a blanket approach of “more trauma is worse for kids” should not be the only method utilized for understanding, identifying, and helping traumatized youth. In addition to evaluating cumulative trauma exposure, attending to the *developmental timing* of exposure, as well as differential relations between types of exposure and specific outcomes (Capretto, 2017; Layne et al., 2010) to trauma may prove especially informative in predicting clinical presentations. These findings are consistent with recent work demonstrating that child maltreatment may exert negative impact on development due to occurrence within sensitive exposure periods (Cowell, Cicchetti, Rogosch, & Toth, 2015; Khan et al., 2015; Pechtel, Lyons-Ruth, Anderson, & Teicher, 2014).

Although in most instances maltreatment group was not associated with mental health outcomes when trauma characteristics were accounted for, one notable exception was found for youth in the PA + PM group, as the association between group status and PTSD symptom severity remained significant. This suggests that while trauma characteristics were associated with mental health symptoms among these youth, there is also something specific about exposure to the combination of psychological and physical maltreatment that garners additional risk. This finding is in line with research indicating that the presence of PM may exacerbate the impact of exposure to other forms of trauma (McGee et al., 1997).

A history of sexual abuse, in the absence of PA and PM, also remained associated with PTSD symptoms after trauma characteristics were adjusted for. This finding replicates prior research demonstrating that child sexual abuse remains predictive of negative outcomes even when controlling for a wide range of co-occurring risk factors (Fergusson, Boden, & Horwood, 2008) or when comparing it's contribution to that of other types of trauma (Kisiel, Fehrenbach, Liang et al., 2014). This suggests that exposure to sexual abuse presents a particularly potent risk factor for PTSD and is a critical feature to attend to in directing intervention efforts.

When looking at impact of child maltreatment more broadly (i.e. considering the impact of physical, sexual and psychological maltreatment alone or in combination) both trauma characteristics (operationally defined by selected trauma exposure parameters) and maltreatment classification (defined by trauma type-based group membership) proved to be important contributors to outcomes. Findings from this study suggest that the ways in which childhood maltreatment exerts its effect are highly complex and that the developmental timing, duration or chronicity, trauma type, cumulative exposure, and perpetrator relationship to the child intersect in complex ways (Layne et al., 2009). Some characteristics may be more important contributors than others, depending on the type of clinical outcome under consideration, but ultimately attempting to parse out the individual impact of these factors may prove to be of limited utility. In particular, in the case of youth who were exposed to PM, it appears that the early environment was characterized by exposure to stressors that may be considered reflections of “attachment trauma” – i.e. physical neglect, impaired caregiving, and domestic violence – that co-occur, commence early in life, persist for longer periods across development, and predict more generalized deficits in functioning. Considering the confluence of these factors collectively may be most informative for both research and clinical efforts.

Study findings highlight the need to broaden the scope of screening efforts beyond dichotomous classifications of exposed or not exposed to a particular type of trauma, but also to assess for the developmental timing, chronicity, and perpetrator of maltreatment, as these factors all prove important in determining risk for later mental health and behavioral difficulties among youth seeking treatment. Comprehensive trauma assessment measures such as those used for the Trauma History Profile (THP) offer the flexibility to evaluate and account for such factors in treatment planning for trauma-exposed youth.

## 5. Study strengths and limitations

Strengths of this study include: (1) use of a large database of treatment seeking, trauma impacted youth that provides a wealth of information about the nature and impact of a range of trauma exposure types; and (2) examination of trauma characteristic profiles among a large, demographically diverse group of youth. Study limitations include: (1) For the same reasons that the findings from this study are particularly informative for trauma-exposed, treatment seeking populations (i.e. that the CDS consists of quality improvement data collected from a treatment seeking sample), the sample is not nationally representative, thereby limiting generalizability to treatment seeking community populations. (2) Data used in this study were cross sectional, which precludes analysis of transactional processes such as mediation and moderation that could be examined with longitudinal data. (3) Analysis of clinical outcome measures was on a subsample of youth, limiting our ability to compare the findings of this study to the previous study (Spinazzola et al., 2014). And (4) while we examined patterns of co-occurrence between the various trauma types under study, we did not utilize component groupings or underlying factors as predictors of the outcomes of interest. In regards to the findings for internalizing and externalizing problems, because the CBCL relies on caregiver report and in the majority of instances the primary caregiver was the identified perpetrator of abuse or maltreatment in this sample, it is possible that symptoms in these domains were under-reported. However, it is difficult to determine the extent of this confound, as some youth in the sample had been adopted or placed in foster or kinship care subsequent to reported abuse or maltreatment resulting in a non-offending caregiver reporting on youth symptoms at the time of measure completion.

## 6. Directions for future research

Accumulating evidence (Grasso et al., 2013; Kisiel, Fehrenbach, Torgersen et al., 2014; Layne et al., 2014, 2010; Pynoos et al.,

2014; Trickett et al., 2011) suggests that cumulative risk and specificity approaches for examining the impact of risk factors are not adequate to capture the inherent complexity of child maltreatment and trauma and the multiplicative or synergistic impact thereof. Youth are often exposed to a multitude of risk factors across levels of the ecology (individual, family, and broader context; Flouri, 2008), and during different developmental periods, some of which may moderate the impact of trauma and/or exert independent effects (Belsky & Pasco Fearon, 2002). Future research can examine the transactional interplay between trauma types and trauma characteristics on mental health symptoms and appreciate the many different ways in which even small numbers of factors can intersect to influence outcomes (Layne et al., 2009).

Exposure to particular types of trauma during specific critical developmental periods may be especially problematic and operate through disruptions in salient developmental tasks, such as the capacity for attachment, self-regulation, and cognitive controls. Both child-intrinsic and child-extrinsic factors may moderate or mediate these effects, leading to complex adaptations to traumatic environments that are expressed through a variety of DSM diagnoses or behavioral problems (Briere & Spinazzola, 2005). The knowledge base will be best informed by longitudinal methodologies that facilitate analysis of various trajectories of risk and resilience (Layne et al., 2009) and the impact of underlying causal mechanisms on these pathways (Layne et al., 2014). In addition, a balanced, strength-based approach calls more broadly for study of the complex ecologies (termed *caravan passageways*) that differentially give rise to *risk factor caravans* on one hand, and resilience-promoting *resource caravans* on the other (Layne et al., 2014). Ultimately, it will be critical to the next generation of advancement in detection and treatment of childhood trauma that we develop, validate and disseminate assessment tools that identify victims of all forms of child and adolescent maltreatment, from the more overt to the most insidious.

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