Published in final edited form as:

J Trauma Stress. 2016 December ; 29(6): 491–499. doi:10.1002/jts.22147.

Examining Patterns of Exposure to Family Violence in Preschool Children: A Latent Class Approach

Damion J. Grasso¹, Amélie Petitclerc^{2,3}, David B. Henry⁴, Kimberly J. McCarthy¹, Lauren S. Wakschlag^{2,3}, and Margaret J. Briggs-Gowan¹

¹Department of Psychiatry, University of Connecticut School of Medicine, Farmington, Connecticut, USA

²Department of Medical Social Sciences, Feinberg School of Medicine, Chicago, Illinois, USA

³Institute for Policy Research, Northwestern University, Chicago, Illinois, USA

⁴Institute for Health Research and Policy, University of Illinois at Chicago, Chicago, Illinois, USA

Abstract

Young children can experience violence directly or indirectly in the home, with some children exposed to multiple forms of violence. These polyvictims often experience violence that is severe, chronic, and multifaceted. The current study used latent class analysis (LCA) to identify and examine profiles of exposure to family violence (i.e., violence directed towards the child and between caregivers) among a sample of 474 children ages 3–6 years. The data yielded 3 classes: a polyvictimized class ($n = 72$; 15.2%) with high probability of exposure to all forms of violence, a harsh parenting class ($n = 235$; 49.5%), distinguished mainly by child-directed physical discipline in the absence of more severe forms of violence, and a low-exposure class ($n = 167$; 35.2%). Classes were differentiated by contextual factors, maternal characteristics, and mother-reported and observational indicators of parenting and child functioning with most effect sizes between medium and large. These findings add to emerging evidence linking polyvictimization to impaired caregiving and adverse psychological outcomes for children and offer important insight for prevention and intervention for this vulnerable population.

Violence affects children at disturbing rates, with a portion of children experiencing multiple forms of victimization and facing cumulative risk for psychopathology and impairment that can manifest in childhood and have cascading effects across the lifespan (Finkelhor et al., 2009). These children have been described as polyvictims and have shown patterns of severe and chronic exposure to violence that extend across multiple contexts and developmental stages. The onset often presents early in life, when children are largely bound to the caregiving environment (Grasso et al., 2015). For these very young children, recent data have suggested that polyvictimization may be principally defined by violence in the home, either directed towards the child or between caregivers, and may serve as a gateway to victimization that extends beyond the caregiving environment and occurs later in childhood.

Correspondence concerning this article should be addressed to Damion J. Grasso, Department of Psychiatry, University of Connecticut School of Medicine, 65 Kane Street, West Hartford, CT 06119. Telephone: 860.523.6439. FAX: 860.523.6493. dgrasso@uchc.edu.

The authors have declared that they have no competing or potential conflicts of interest.

Most of our understanding of victimization in early childhood, however, has come from retrospective investigations of older children or adults and have been limited in scope. Studying polyvictimization within early childhood offers an important opportunity to explore co-occurring risk factors within the caregiving environment (e.g., maternal psychopathology, parenting behaviors) and explore linkages with early emergent symptoms in children towards enhancing prevention and intervention efforts.

A dose-response relationship between the number of types of childhood adversity and a host of adverse outcomes has been well-established (Finkelhor et al., 2009). Several recent studies have expanded on this cumulative risk approach to employ person-centered analytic techniques, such as latent class analysis (LCA), for identifying profiles of victimization based on which exposures probabilistically co-occur (e.g., Grasso et al., 2013; 2015). These person-centered approaches align with emerging evidence that different types of exposures can interact with and exacerbate the adverse effects of one another (Layne, Briggs, & Courtois, 2014). Thus, although cumulative risk models that rely on a total count of exposure types provide important insight, a person-centered approach may identify unique patterns of exposure that are especially detrimental to child outcomes.

Patterns of exposure characteristic of polyvictimization have been identified in studies of clinically-referred youth using person-oriented approaches. In one study, polyvictimization was identified within developmental periods based on adolescents' retrospective reports in a sample referred for trauma-specific services (Grasso et al., 2015). During the birth to 5-year period, polyvictimization was characterized by exposure linked to the caregiving environment. At later developmental periods, however, more complex patterns emerged, with increasing victimization occurring outside of the home. Another study of referred adolescents identified four polyvictimization classes differentiated by high rates of sexual trauma, physical abuse, physical assault, and community violence (Ford, Elhai, Connor, & Frueh, 2010). These studies and others have consistently linked polyvictimization classes to trauma-related impairment and other adverse outcomes.

In the only known study to apply LCA to understanding polyvictimization in young children, Hagan and colleagues (2015) used broad-based indicators of trauma exposure to identify three qualitatively distinct classes in 3- to 6-year-old children referred to a hospital-based trauma clinic: a "severe exposure" class (16% of sample) with high probability of both witnessing intimate partner violence (IPV) and child-directed violence (i.e., physical assault, verbal abuse, threat of harm); a "moderate exposure" class (23%) with no IPV exposure and moderate probability of child-directed violence and serious illness, and a "witness to violence" class (62%) with high rates of IPV exposure and low probability of child-directed violence. Children in the severe exposure class were reported to have relatively greater posttraumatic stress, internalizing, and externalizing symptoms. These findings are largely consistent with a cumulative risk framework, but also offer a more nuanced perspective regarding which exposure types probabilistically co-occur among young, clinically referred children.

The current study aimed to contribute to the limited literature on polyvictimization in young children and extend the Hagan et al. (2015) study in several ways. First, we attempted to

replicate these patterns in a high-risk sample of 3- to 6-year-old children drawn from a larger community-based study. Hagan et al. (2015) found unique risk patterns distinguished by witnessing violence versus being a direct victim of violence. In this vein, we hoped to further unpack polyvictimization to gain insight into how different dimensions of violence – including both violence directed towards the child and between caregivers - independently or together, confer risk for psychopathology. Given research suggesting that early childhood polyvictimization is largely defined by exposures within the caregiving environment, we focused more narrowly on family-specific types of violence. This allowed us to include more discrete indicators of family-specific violence, including those that may not cross the threshold of IPV or child maltreatment, per se, but that may nonetheless be associated with maladaptive outcomes for children. For example, corporal punishment has been linked with anxiety, emotion dysregulation, and aggression in young children (Chang, Schwartz, Dodge, & McBride-Chang, 2003; Lansford et al., 2014). Also, patterns of marital discord beyond what might normally be expected in a healthy relationship have been associated with adjustment and behavioral problems in older children (Cummings, Iannotti, & Zahn-Waxler, 1985). By taking this approach, we hoped to detect patterns that might otherwise be obscured using only broad-based indicators (e.g., physical abuse). For simplicity's sake, we refer to all aggression towards the child or between caregivers as psychological or physical violence.

Second, we examined an expanded set of potentially co-occurring familial risk factors to examine whether polyvictimization in young children links to a larger dysfunctional family and social environment that includes family stressors and caregiver trauma exposure and psychopathology. This more comprehensive approach provided an opportunity to elucidate the larger context of young children's victimization and associated risk factors.

Finally, like many child studies, our investigation still depended largely on maternal-report of caregiver and child functioning; however, we augmented these measures with independent ratings of children's functioning from validated observational paradigms designed to elicit anxiety and disruptive behavior in young children in the context of an intensive study examining violence exposure and developmental risk.

Thus, the current study was designed to delve more deeply into young children's exposure to family violence in a non-referred sample to (a) establish whether unique patterns of victimization could be identified based on the co-occurrence of different types of violence towards the child and between caregivers (b) elucidate a larger context of associated risk factors and their consequences towards providing information to help to define the scope and targets of prevention and intervention efforts for this vulnerable population.

Method

Participants and Procedure

Participants were a subsample of the Multidimensional Assessment of Preschoolers (MAPS) Study cohort ($N = 1,857$) of 3- to 6-year-old children recruited from pediatric primary care clinics in the Chicago area (Wakschlag et al., 2014). The subsample ($n = 746$) was randomly selected from the full MAPS cohort Eligibility criteria required that the respondent was the

child's biological mother and English speaking and excluded children with significant developmental delays. The subsample selection process included oversampling for child disruptive behavior (scores $\geq 80^{\text{th}}$ percentile on the Multidimensional Assessment of Preschool Disruptive Behavior; Wakschlag et al., 2014) and past year IPV reported on a 4-item screener. The subsample included 497 (67%) eligible families, similar to the full sample on child age, sex, poverty, and ethnicity. Consistent with the sampling plan, the subsample had elevated rates relative to the pediatric sample of disruptive behavior (42% versus 21%) and IPV (22% versus 13%). A sociodemographically comparable analytic sample of 474 remained after excluding 23 families missing violence exposure data. Children were 50% female, racially/ethnically diverse (47.7% African American, 29.3% Hispanic, 21.5% Caucasian, 1.5% other) and had a mean age of 4.77 years $\pm$ 0.91. Approximately two-thirds (64.7%) of mothers were living with a partner.

Most families attended two 3-hour lab visits. Mothers were compensated for participation and transportation. Study protocols were approved by institutional review boards from Northwestern University and the University of Connecticut. Mothers provided informed consent. Mandated procedures for reporting suspected abuse, neglect and imminent harm were followed.

Measures

The Revised Conflict Tactics Scale (CTS-2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) measured the presence and chronicity (i.e., 0 = *Never*, 1 = *Once*, 2 = *Twice*, 4 = *3–5 Times*, 8 = *6–10 Times*, 15 = *11–20 Times*, 25 = *Greater Than 20 Times*) of the caregiver's own acts of psychological aggression and physical assault toward her partner and vice versa (e.g., "I beat my partner up" and "my partner beat me up") in the past year. Since the primary focus of analyses was on children's overall exposure, composite variables reflecting the presence of psychological aggression or physical assault, irrespective of perpetrator, were created. Dichotomous scores (i.e., occurred at least once) were used in the LCA. Chronicity scores, however, were used in separate analyses. Following guidelines, chronicity scores were calculated as sums of item frequency ratings in each scale; for each item the maximum response reported for mother or partner behavior was used.

The Conflict Tactics Scales Parent-Child version (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998) was used to assess child-directed psychological aggression (5 items) and physical assault (8 items) by the mother or her partner in the past year. Very severe/typically rare items from the physical assault scale were omitted in the study because of anticipated low base-rates and concern that they might compromise the reliability of mothers' reporting. Scoring followed the same method as described above for the CTS-2 to yield dichotomous and chronicity scores (i.e., 0 = *Never*, 1 = *Once*, 2 = *Twice*, 4 = *3–5 Times*, 8 = *6–10 Times*, 15 = *11–20 Times*, 25 = *Greater Than 20 Times*). Items were described as psychological, mild/moderate physical, or severe physical (see Supplemental Table S4 note).

Past year stressful life events relevant to families with young children were assessed with a 30-item checklist that included items from the Life Events Inventory (LES; Cochrane &

Robertson, 1973) and Schedule of Recent Life Experiences (Holmes & Rahe, 1967). Violent events were excluded. Analyses used the total number of events.

The 28-item Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) was used to measure maternal experience of childhood physical abuse, sexual abuse, emotional abuse, and physical neglect during childhood and adolescence. Items were rated on a Likert scale (1 = *Never True*, 2 = *Rarely True*, 3 = *Sometimes True*, 4 = *Often True*, 5 = *Very Often True*). The total CTQ score was used in analyses ($\alpha = .94$).

The short-forms of the Patient-Reported Outcomes Measurement Information System (PROMIS; Cella et al., 2007) were used to assess maternal depression (8-item; $\alpha = .94$) and anxiety (7-item; $\alpha = .90$) symptoms in the past week. Items were rated on a frequency scale (1 = *Never*, 2 = *Rarely*, 3 = *Sometimes*, 4 = *Often*, 5 = *Always*).

Maternal PTSD symptoms were assessed with the PTSD Checklist civilian version in the absence of Criterion A assessment (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993). Mothers rated how much they have been bothered by that problem in the past month (0 = *Not at All*, 1 = *A Little Bit*, 2 = *Moderately*, 3 = *Quite a Bit*, 4 = *Extremely*). A total PTSD symptom score was calculated as the sum of all 17 items ($\alpha = .92$).

Symptom scores were obtained from mothers' reports in the Preschool-Age Psychiatric Assessment (PAPA; Egger & Angold, 2004), a DSM-IV-TR-based semistructured diagnostic interview administered by trained research assistants. An expert clinical psychologist monitored reliability of administration and coding for 20% of interviews (*ICCs* ranged from 0.85 to 0.98). Using diagnostic criterion symptom counts, an internalizing score was calculated as the sum of depression and anxiety symptoms ($\alpha = .78$) and an externalizing score as the sum of symptoms from the attention-deficit hyperactivity, oppositional defiant, and conduct disorder domains ($\alpha = .84$). Traumatic stress was assessed via maternal reports on the Trauma Symptom Checklist for Young Children (TSCYC; Briere et al., 2001). Items were rated on a frequency scale (0 = *Never*, 1 = *Sometimes*, 2 = *Lots of Times*, 3 = *Almost All of the Time*). Total symptoms were calculated as the sum of raw subscale scores and converted to a T-score, following manual guidelines ($\alpha = 0.92$).

Children and mothers were observed during the Anxiety Dimensional Observation System (ANX-DOS; Mian, Carter, Pine, Wakschlag, & Briggs-Gowan, 2015), an observational paradigm that that uses specific presses (e.g., remote-controlled spider, separation from parent) to elicit clinically-salient behaviors. The ANX-DOS utilizes global coding from normal to atypical (0 = *no evidence*, 1 = *mild/normative*, 2 = *of concern*, 3 = *atypical*) to capture fear behaviors, physical avoidance, exaggerated startle, clinging/proximity-seeking to mother, and separation distress. Interrater agreement for a randomly selected 20% of the sample was monitored in an ongoing fashion throughout the coding process. Inter-rater agreement, indexed by the *ICCs* ranged from .71 to .84. Please see Mian et al., 2016 for full details.

Behavior also was assessed in the Disruptive Behavior Dimensional Observation System (DB-DOS), an observational paradigm designed to elicit preschool disruptive behavior (Wakschlag et al., 2008). In parent and examiner contexts, children participate in a variety of

tasks designed to elicit frustration and/or disappointment (e.g., compliance tasks, difficult puzzle). In the examiner context, the examiner responds to the child's disruptive behavior or negative affect starting with minimal support and progressing up a hierarchy of supportive responses as necessary, providing information about the level of support needed by the child to modulate behavior or affect. Behavioral codes (0 = *normative variation*, 1 = *normative misbehavior*, 2 = *of concern*, 3 = *clearly atypical*) capture two domains: Problems in Anger Modulation (e.g., rapidity of escalation, difficulty recovering), and Behavioral Regulation (e.g., behavioral inflexibility, defiance) are rated with the same coding anchors as the ANX-DOS. Internal consistency ($\alpha = .87$ to $.92$) and inter-rater agreement, indexed by the average *intraclass correlation coefficient (ICC)*, was $.91$.

The Parent-Clinical Observation Schedule (P-COS, Hill, Maskowitz, Danis, & Wakshlag, 2009), a coding system applied to the parent context of the DB-DOS, yields three domain scores: Problematic Discipline (e.g., harshness, emotional misattunement; $ICC = .47$); Responsive Involvement (e.g., parental engagement, scaffolding; $ICC = .81$); and Constructive Discipline (e.g., reinforcement; $ICC = .55$).

Data Analysis

Exploratory LCA using Mplus software (Version 7.1) was used to identify classes based on dichotomous indicators from the CTS-2 and CTSPC. Rare items ($< 2\%$) were combined into one variable (i.e., 6 CTS-2 and 2 CTSPC items; see Supplemental Tables S1 and S2) resulting in 15 CTS-2 and 12 CTSPC indicators. Variables were entered into the LCA beginning with one class and adding classes incrementally until a unique solution could not be determined with maximum likelihood methods. Fit indices were examined. The Bayesian Information Criteria (*BIC*) is interpreted such that the lowest value is considered the best fit (Schwartz, 1978). The Lo–Mendell–Rubin (LMR) adjusted likelihood ratio test (Lo, Mendell, & Rubin, 2001) provides comparisons between models, such that nonsignificant values indicate the model with one additional class is not a statistically improved fit over the current model. Entropy values were also used to evaluate the quality of classes and range from 0 to 1 with values closer to 1 representing better separation of classes (Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993). Results from the LCA were further examined to determine whether the model could be refined by addressing items with low conditional response probabilities (CRPs), which reflect the probability that a member of a specific class will endorse an item. For dealing with missing data, Mplus applies maximum likelihood estimation to determine class solutions using the maximum information available. Missing data points on class indicators never exceeded 4 on any of the 6 indicators with missing data and these were assumed to be missing at random.

To examine associations between classes and distal variables we used the Lanza, Tan, and Bray (2013) 3-step approach: (a) the LCA is estimated without covariates or distal outcomes; (b) highest probability of class membership is used to assign classes; (c) associations between class membership and distal outcomes are estimated with an adjustment based on classification uncertainty. This method performs well when class separation is sufficient (i.e., entropy $> .06$; Asparouhov & Muthén, 2014). Because complete data on all measures was unattainable, class comparisons were restricted to data from

participants with complete scores on those measures, as indicated in tables. The comparison with the least number of participants used a subsample of 336 (70.9% of the sample). The modal number of participants across comparisons was 473 (99.8% of the sample) and the median was 383 (80.8%).

Results

Frequencies for individual CTS-2 and CTSPC items are provided in Supplementary Tables S1 and S2. Overall, 91.6% ($n = 434$) of children were exposed to at least one form of child-directed psychological violence (e.g., swore/cursed, threatening to spank), 72.2% ($n = 342$) to any mild-moderate physical violence (e.g., spanking with bare hand, slapped on hand/arm/leg), and 28.1% ($n = 133$) to more severe forms of physical violence (e.g., hit on bottom with belt, hit with fist or kicked hard). Also, 73.0% ($n = 346$) and 31.6% ($n = 150$) were exposed to partner psychological and physical violence, respectively.

The initial LCA included 15 partner- and 12 child-directed indicators. Fit statistics (see Supplementary Table S3) supported a 3-class over a 2-class solution, and although the LMR adjusted likelihood ratio test was statistically significant for the 4-class over the 3-class solution ($p = .043$), greater entropy and a smaller BIC, a parsimonious indicator of fit (Collins & Lanza, 2010, favored the 3-class solution. Thus, a 3-class solution was selected.

CRPs for each indicator were examined for characterizing classes according to their patterns of exposure. Identified classes included a polyvictimized class (15.2%) with high probability of exposure to the full range of indicators, a harsh parenting class (48.9%) with high probability of exposure to psychological violence towards the child and between caregivers and punitive physical discipline (e.g., “spanking”), and a low exposure class (35.9%) with low probability of exposure to all indicators except “shouted or yelled” at partner and “shouted” at child.

All except 5 indicators differentiated classes as indicated by CRP differences exceeding 0.34. Because nonassociated items may influence the class solution, a refined model omitted one CTSPC item with a high base-rate (89.2%, “shouted, yelled, or screamed at your child”) and combined four CTSPC items with low base-rates (8%): slapped on the face/head/ears; shook; hit with a fist/kicked hard; and hit on other part of the body besides bottom with a hard object. In the refined model, all indicators differentiated classes as evidenced by CRP differences greater than 0.34. The revised model exhibited good fit, $LL = -3908$, $BIC = 8253.46$, $LMR p < .05$, had comparable entropy (.832) to the initial 3-class model, and demonstrated superior fit compared to a 4-class model (i.e., $LL = -3833.40$, $BIC = 8252.11$, $LMR p > .05$, entropy = .789).

Figure 1 provides detailed estimates of exposure to each indicator for each class in the revised model. Patterns mirrored the initial 3-class solution, with a polyvictimized (15.2%), harsh parenting (49.5%), and low exposure (35.2%) class. All of the polyvictimized class and most of the harsh parenting class (97.0%) experienced at least one form of psychological violence between caregivers compared to 67.9% in the low-exposure class. All of the polyvictimized class also had experienced at least one type of physical violence

between caregivers compared to 42.7% in the harsh parenting and 5% in the low exposure classes. Most of the children in the polyvictimized (98.6%), harsh parenting (98.7%), and low exposure (78.4%) classes experienced at least one type of direct psychological violence. Most of the polyvictimized (89.9%) and harsh parenting (91.2%) classes were exposed to mild-moderate physical violence (e.g., spanking) towards the child compared to 37.7% in the low exposure class. Finally, whereas more than half of the polyvictimized class (68.1%) had experienced at least one type of severe physical violence directed towards the child, far fewer in the harsh parenting (34.5%) and low exposure (2.4%) classes had experienced any form of severe physical violence. In Supplemental Table S4, CTS-2 and CTSPC chronicity scores are compared across the classes, further validating the LCA solution, with classes differing significantly on all violence types.

Class comparisons are presented in Table 1. With the exception of poverty status, which was more common in the polyvictimized class relative to the other two classes, the classes did not differ in terms of demographic factors. Past year stressful life events followed a linear pattern with the greatest number of events in the polyvictimized class, followed by the harsh parenting and low exposure classes.

Maternal childhood maltreatment and symptoms of depression, anxiety, PTSD and antisocial behavior followed a linear pattern, with significantly higher scores in the polyvictimized class, followed by the harsh parenting and low exposure classes; many effect sizes were moderate to large especially between the polyvictimized and low exposure classes. For observed parenting, the poly-victimized class had significantly lower scores on maternal responsive involvement and constructive discipline relative to the other classes, which did not significantly differ. Observed problematic discipline did not differentiate classes.

Child externalizing symptoms followed a linear pattern, with significantly higher scores in the polyvictimized class, followed by the harsh parenting and low exposure classes. For PTSD symptoms, both the polyvictimized and harsh parenting classes had significantly higher symptoms than the low exposure class. Internalizing symptoms were significantly higher in the harsh parenting class relative to the low exposure class.

There were no significant class differences for most types of observed anxiety. However, both the polyvictimized and harsh parenting classes had significantly greater scores on observed startle behavior relative to the low exposure class. Also, the polyvictimized class had significantly lower scores on separation distress compared to the harsh parenting and low exposure classes.

Finally, classes differed in observed disruptive behavior. Children in the harsh parenting class displayed greater problems in anger modulation with the parent relative to both the polyvictimized and low exposure classes. Children in both the polyvictimized and harsh parenting classes displayed more problems in behavioral regulation with the examiner than children in the low exposure class. No other class differences were observed.

Discussion

These findings highlight distinct patterns of young children's exposure to family violence directed towards the child and between caregivers in a diverse community-based sample. Three classes of children were identified: polyvictimized (15.2%), harsh parenting (49.5%), and low exposure (35.2%). Similar to the clinically-referred Hagan et al. (2015) sample, a small, but not unsubstantial, portion of children showed patterns of polyvictimization, characterized by exposure to multiple indicators of psychological and physical violence towards the child and between caregivers. This pattern reflects the high overlap observed between IPV and harsh or abusive parenting (Edelson, 1999; Grasso et al., 2015), which may be due in part to "spillover" of violent behaviors from partner conflict to parent-child interactions (Levendosky & Graham-Bermann, 2001). A second class was likely to have experienced harsh parenting (e.g., spanking) but unlikely to have experienced physical forms of violence between caregivers. Finally, a low exposure class showed some evidence of psychological violence but almost no evidence of physical violence. These classes differed not only in their overall patterns of exposure, but in their chronicity of exposure, with stepwise increases in chronicity of violence directed towards the child and between caregivers from the low to high exposure classes.

Unlike in older samples (Grasso et al., 2013), the three classes varied little in demographic characteristics, despite having very distinct patterns of exposure. An exception was poverty, which was significantly more common in the polyvictimized class relative to the other two classes. This is consistent with research identifying poverty as a risk factor for IPV (Cunradi, Caetano, & Schafer, 2002), and one that may serve to maintain the cycle of partner violence due to the cumulative stress it imparts on both victims and perpetrators (Goodman, Smyth, Borges, & Singer, 2009). Relatedly, the polyvictimized class had a greater number of recent stressful life events than the other classes and these can be critically disruptive to a family system with linkages to degree of family conflict, maternal depression, reduced quality of parent-child interactions, and child behavior problems (Coohey, 2004; Pianta & Egeland, 1994).

A constellation of maternal risk factors further differentiated classes. Maternal history of childhood adversity and trauma followed a stepwise pattern from the low to high exposure classes, consistent with the inter-generational transmission of violence, whereby caregivers' exposure to childhood adversity is associated with impaired caregiving and similar experiences in offspring (De Bellis, 2012). Maternal depression, anxiety, and PTSD symptoms also followed a linear pattern, consistent with a larger literature linking symptom severity with impaired caregiving and child impairment (Ashman, Dawson, & Panagiotides, 2008; Goodman et al., 2011). Moreover, mothers of polyvictims displayed relatively lower responsive involvement and constructive discipline in an observational paradigm. Thus, these polyvictims were *less* likely to experience positive caregiving behaviors that could serve to buffer the effects of the broader contextual risks also linked with polyvictimization. This aligns with studies of older children (Murray, Bair-Merritt, Roche, & Cheng, 2012) and underscores the value of interventions that take a more comprehensive approach to addressing the needs of violence-exposed children by incorporating multiple aspects of

family functioning into the treatment plan, including parental psychopathology and parenting competencies.

Child externalizing symptoms followed a linear pattern from the low exposure to polyvictimized classes. These findings reflect the strong link between children's exposure to IPV and disruptive behavior (Evans, Davies, & Dilillo, 2008), which some studies suggest may be mediated by harsh parenting (Grasso et al., 2015). Our harsh parenting class findings also highlight risk associated with harsh physical discipline, which was underlined in a recent meta-analysis providing evidence for an adverse effect of spanking on child outcomes, above and beyond physical abuse (Gershoff & Grogan-Kaylor, 2016). Our findings suggest adverse effects of harsh parenting even in the absence of physical partner violence.

Corroborating evidence comes from observational findings that when examined in a laboratory paradigm, children in the polyvictimized and harsh parenting classes exhibited poorer behavioral regulation with an unfamiliar examiner than children in the low exposure class. Interestingly, in the parent context, children in the harsh parenting class exhibited greater problems in anger modulation than the low exposure and polyvictimized classes, despite maternal reports indicating greater disruptive behavior in polyvictims. This may reflect differences in children's response to harsh parenting when in more violent family environments. For example, children faced with the threat of IPV or physical maltreatment may learn to dampen their expression of anger. An interesting finding that may also speak to the unique parent-child dynamic in more violent family contexts is the attenuated separation distress observed in polyvictims relative to children in the harsh parenting and low exposure classes when briefly separated from their mother in the laboratory. As some separation distress is normative in young children, this may suggest differences in the quality of mother-child relationships in these family environments (e.g., Stronach et al., 2011).

Interestingly, the polyvictimized class did not have greater internalizing symptoms than the other classes; however, children in the harsh parenting class had greater symptoms than those in the low exposure class. Although unexpected, it does not disagree with the mixed literature on children's exposure to IPV and internalizing symptoms (Vu, Jouriles, McDonald, & Rosenfield, 2016), and may also reflect that externalizing symptoms are more noticeable and reportable by parents than internalizing symptoms. Also, PTSD symptoms did not differentiate the polyvictimized and harsh parenting classes, but both had higher symptoms than the low exposure class. Linkages between children's exposure to IPV and PTSD are strong, with the rate of PTSD as high as 45% in one IPV-exposed preschool sample (Koolick et al., 2016) and risk of developing PTSD associated with more severe and chronic IPV (Levendosky, Bogat, & Martinez-Torteya, 2013). Greater differentiation in PTSD symptoms between the polyvictimized and harsh parenting classes might emerge over the course of development and/or with ongoing exposures. An observational finding that appears to complement these patterns is the more pronounced startle behavior, a criterion symptom of PTSD, observed in the polyvictimized and harsh parenting classes compared to the low exposure class.

The current findings should be interpreted in light of several limitations. First, as is often the case with clinical work and research with young children, this study relied heavily on maternal reports, raising the issue of shared method variance, which may have contributed to some of the associations observed. Relatedly, mothers' own histories of adversity may have influenced their reports, making them more or less attuned to the presence of symptoms in their young children. It is worth noting, however, that mothers' reports of children's symptoms on the PAPA extend beyond simple parent-report since the presence of symptoms is determined by interviewer judgments about the severity of problems reported. Second, despite high rates of violence behaviors reported by mothers, some mothers may have under-reported certain behaviors due to concerns about adverse consequences of disclosure (e.g., mandated reporting). Third, many of the comparisons across classes on distal variables had missing data; however, no comparison had fewer than 70% of the sample and 65.5% had greater than 80% of the sample. Fourth, examining patterns of violence exposure in a sample enriched for IPV and child disruptive behavior offers benefits and limitations. Although oversampling for IPV may have helped to secure greater variability needed to detect patterns of exposure associated with more serious indicators of IPV in this community-based sample, further research will be needed to establish whether observed patterns generalize to families from the general population. Finally, longitudinal data will be essential to establish whether and how these classes predict outcomes for children and families over the course of development.

Using a person-centered analytic approach, this study yielded information that moves towards unpacking and better understanding the heterogeneity of exposure patterns and their associated risk factors and consequences. Study findings (a) broadly replicate patterns identified in a clinically-referred sample of children of the same age group (i.e., Hagan et al., 2015), (b) are consistent with studies of polyvictimization conducted in older samples of children and adults, and (c) extend this work by linking polyvictimization to a larger dysfunctional family and social environment that includes family stressors and caregiver trauma exposure and psychopathology. Understanding polyvictimization and co-occurring risk factors within early childhood and their relation to emerging psychopathology will help to interrupt risk trajectories and enhance prevention and intervention efforts for this vulnerable population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This manuscript was developed (in part) under grant numbers U01MH090301 and R01MH082830 from the National Institute of Mental Health. Dr. David Henry passed away during the final stages of preparation of this manuscript and so his authorship will be posthumous.

References

- Ashman SB, Dawson G, Panagiotides H. Trajectories of maternal depression over 7 years: Relations with child psychophysiology and behavior and role of contextual risks. *Development and Psychopathology*. 2008; 20:55–77. [PubMed: 18211728]

- Asparouhov T, Muthén B. Auxiliary variables in mixture modeling: Three-step approaches using M plus. *Structural Equation Modeling: A Multidisciplinary Journal*. 2014; 21:329–341.
- Bernstein, D.; Fink, L. *Childhood Trauma Questionnaire: A retrospective self-report manual*. San Antonio, TX: The Psychological Corporation; 1998.
- Briere J, Johnson K, Bissada A, Damon L, Crouch JG, Gil E. The Trauma Symptom Checklist for Young Children (TSCYC): Reliability and association with abuse exposure in a multi-site study. *Child Abuse and Neglect*. 2001; 25:1001–1014. [PubMed: 11601594]
- Briggs-Gowan MJ, Carter AS, Ford J. Parsing the effects of violence exposure in early childhood: Modeling developmental pathways. *Journal of Pediatric Psychology*. 2012; 37(1):11–22. [PubMed: 21903730]
- Cella D, Yount S, Rothrock N, Gershon R, Cook K, Reeve B, Rose M. The Patient-Reported Outcomes Measurement Information System (PROMIS): Progress of an NIH roadmap cooperative group during its first two years. *Medical Care*. 2007; 45:S3–S11.
- Chang L, Schwartz D, Dodge KA, McBride-Chang C. Harsh parenting in relation to child emotion regulation and aggression. *Journal of Family Psychology*. 2003; 17:598–606. [PubMed: 14640808]
- Cochrane R, Robertson A. The life events inventory: A measure of the relative severity of psychosocial stressors. *Journal of Psychosomatic Research*. 1973; 17:135–139. [PubMed: 4741684]
- Collins, LM.; Lanza, ST. *Latent class and latent transition analysis: With applications in the social, behavioral, and health sciences*. Hoboken, NJ: Wiley; 2010.
- Coohey C. Battered mothers who physically abuse their children. *Journal of Interpersonal Violence*. 2004; 19:943–952. [PubMed: 15231031]
- Cummings M, Iannotti RJ, Zahn-Waxler C. Influence of conflict between adults on the emotions and aggression of young children. *Developmental Psychology*. 1985; 21(3):495–507.
- Cunradi CB, Caetano R, Schafer J. Socioeconomic predictors of intimate partner violence among white, black, and Hispanic couples in the United States. *Journal of Family Violence*. 2002; 17:377–389.
- De Bellis, MD. The Intergenerational transmission of family violence. In: Widom, CS., editor. *Trauma, Psychopathology, and Violence: Causes, Correlates, Or Consequences?*. American Psychiatric Press, Inc.; 2012. p. 79–108.
- Edelson JL. The overlap between child maltreatment and woman battering. *Violence Against Women*. 1999; 5:134–154.
- Egger HL, Angold A. The Preschool Age Psychiatric Assessment (PAPA): A structured parent interview for diagnosing psychiatric disorders in preschool children. *Handbook of infant, toddler, and preschool mental health assessment*. 2004:223–243.
- Evans S, Davies C, Dilillo D. Exposure to domestic violence: A meta-analysis of child and adolescent outcomes. *Aggression and Violent Behavior*. 2008; 13:131–140.
- Finkelhor D, Ormrod RK, Turner HA. Lifetime assessment of poly-victimization in a national sample of children and youth. *Child Abuse & Neglect*. 2009; 33:403–411. [PubMed: 19589596]
- Ford JD, Elhai JD, Connor DF, Frueh BC. Poly-victimization and risk of posttraumatic, depressive, and substance use disorders and involvement in delinquency in a national sample of adolescents. *Journal of Adolescent Health*. 2010; 46(6):545–552. [PubMed: 20472211]
- Gershoff ET, Grogan-Kaylor A. Spanking and child outcomes: Old controversies and new meta-analyses. *Journal of Family Psychology*. 2016 Advance online publication.
- Goodman LA, Smyth KF, Borges AM, Singer R. When crises collide: How intimate partner violence and poverty intersect to shape women's mental health and coping? *Trauma, Violence, & Abuse*. 2009; 10:306–329.
- Goodman SH, Rouse MH, Connell AM, Broth MR, Hall CM, Heyward D. Maternal depression and child psychopathology: A meta-analytic review. *Clinical child and family psychology review*. 2011; 14:1–27. [PubMed: 21052833]
- Grasso D, Henry D, Kestler J, Nieto R, Wakschlag LS, Briggs-Gowan M. Harsh parenting as a potential mediator of the association between intimate partner violence and child disruptive behavior in families with young children. *Journal of Interpersonal Violence*. 2015 Advance online publication.

- Grasso DJ, Dierkhising CB, Branson CE, Ford JD, Lee R. Developmental patterns of adverse childhood experiences and current symptoms and impairment in youth referred for trauma-specific services. *Journal of Abnormal Child Psychology*. 2015 Advance online publication.
- Grasso DJ, Saunders BE, Williams LM, Hanson R, Smith DW, Fitzgerald MM. Patterns of multiple victimization among maltreated children in Navy families. *Journal of Traumatic Stress*. 2013; 26:597–604. [PubMed: 24114860]
- Hagan MJ, Sulik MJ, Lieberman AF. Traumatic life events and psychopathology in a high risk, ethnically diverse sample of young children: A person-centered approach. *Journal of Abnormal Child Psychology*. 2015 Advance online publication.
- Hill C, Maskowitz K, Danis B, Wakschlag LS. Validation of a clinically sensitive, observational coding system for parenting behaviors: The Parenting Clinical Observation Schedule (P-COS). *Parenting: Science and Practice*. 2009; 8:153–185.
- Holmes TH, Rahe RH. The social readjustment rating scale. *Journal of Psychosomatic Research*. 1967; 11:213–218. [PubMed: 6059863]
- Koolick J, Galano M, Grogan-Kaylor A, Clark H, Montalvo-Liendo N, Graham-Bermann S. PTSD symptoms in young children exposed to intimate partner violence in four ethno-racial groups. *Journal of Child & Adolescent Trauma*. 2016 Advance online publication.
- Lansford JE, Sharma C, Malone PS, Woodlief D, Dodge KA, Oburu P, Tapanya S. Corporal punishment, maternal warmth, and child adjustment: A longitudinal study in eight countries. *Journal of Clinical Child & Adolescent Psychology*. 2014; 43:670–685. [PubMed: 24885184]
- Lanza ST, Tan X, Bray BC. Latent class analysis with distal outcomes: A flexible model-based approach. *Structural Equation Modeling: A Multidisciplinary Journal*. 2013; 20:1–26. [PubMed: 25419096]
- Layne CM, Briggs EC, Courtois CA. Introduction to the special section: Using the Trauma History Profile to unpack risk factor caravans and their consequences. *Psychological Trauma: Theory, Research, Practice, and Policy*. 2014; 6:S1–S8.
- Levendosky AA, Bogat GA, Martinez-Torteya C. PTSD symptoms in young children exposed to intimate partner violence. *Violence Against Women*. 2013; 19:187–201. [PubMed: 23420836]
- Levendosky AA, Graham-Bermann SA. Parenting in battered women: The effects of domestic violence on women and their children. *Journal of Family Violence*. 2001; 16:171–192.
- Lo Y, Mendell NR, Rubin DB. Testing the number of components in a normal mixture. *Biometrika*. 2001; 88:767–778.
- Mian ND, Carter AS, Pine DS, Wakschlag LS, Briggs-Gowan MJ. Development of a novel observational measure for anxiety in young children: The Anxiety Dimensional Observation Scale. *Journal of Child Psychology and Psychiatry*. 2015; 56:1017–1025. [PubMed: 25773515]
- Murray KW, Bair-Merritt MH, Roche K, Cheng TL. The impact of intimate partner violence on mothers' parenting practices for urban, low-income adolescents. *Journal of Family Violence*. 2012; 27:573–583.
- Pianta RC, Egeland B. Relation between depressive symptoms and stressful life events in a sample of disadvantaged mothers. *Journal of Consulting and Clinical Psychology*. 1994; 62:1229. [PubMed: 7860821]
- Ramaswamy V, DeSarbo WS, Reibstein DJ, Robinson WT. An empirical pooling approach for estimating marketing mix elasticities with PIMS data. *Marketing Science*. 1993; 12:103–124. doi: 10.1287.
- Schwartz G. Estimating the dimension of a model. *Annals of Statistics*. 1978; 6:461–464.
- Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The Revised Conflict Tactics Scales (CTS2): Development and Preliminary Psychometric Data. *Journal of Family Issues*. 1996; 17:283–316.
- Straus MA, Hamby SL, Finkelhor D, Moore DW, Runyan D. Identification of child maltreatment with the Parent-Child Conflict Tactics Scales: Development and psychometric data for a national sample of American parents. *Child Abuse & Neglect*. 1998; 22(4):249–270. [PubMed: 9589178]
- Stronach EP, Toth SL, Rogosch F, Oshri A, Manly JT, Cicchetti D. Child maltreatment, attachment security, and internal representations of mother and mother-child relationships. *Child Maltreatment*. 2011; 16:137–145. [PubMed: 21339198]

- Tottenham N. The importance of early experiences for neuro-affective development. *Current Topics in Behavioral Neuroscience*. 2014; 16:109–129.
- Vu NL, Jouriles EN, McDonald R, Rosenfield D. Children's exposure to intimate partner violence: A meta-analysis of longitudinal associations with child adjustment problems. *Clinical Psychology Review*. 2016 Advance online publication.
- Wakschlag L, Briggs-Gowan M, Hill C, Danis B, Leventhal B, Keenan K, Carter A. Observational assessment of preschool disruptive behavior, Part II: Validity of the Disruptive Behavior Diagnostic Observation Schedule (DB-DOS). *Journal of the American Academy of Child Adolescent Psychiatry*. 2008; 47:632–641. [PubMed: 18434925]
- Weathers FW, Litz BT, Herman DS, Huska JA, Keane TM. The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility. 1993

Figure 1.

Conditional response probabilities of exposure to each type of child-directed violence for the polyvictimized, harsh parenting, and low-exposure classes.

Table 1
Comparisons of Classes on Context, Maternal and Child Characteristics, and Problematic Behavior

Variable	n	Class 1		Class 2		Class 3		Wald's χ^2	Cohen's d				
		M%	SE	M%	SE	M%	SE		1-2	1-3	2-3		
Child													
Age	473	4.81	0.13	4.77	0.07	4.73	0.08	0.53	.04	.07	.04		
Sex	473	40.4	6.5	55.3	3.7	46.7	4.3	4.11	.27	.11	.15		
Minority status	473	89.8	6.5	79.6	3.1	72.2	3.8	5.95	.20	.35	.15		
Poverty status	474	64.6	6.8	45.2	3.9	40.9	4.8	8.27 [*]	.33 ^a	.39 ^a	.35		
Number of moves	404	0.71	0.27	0.47	0.08	0.38	0.07	1.98	.16	.23	.08		
Stressful life events	473	0.14	0.02	0.09	0.01	0.06	0.01	30.52 ^{***}	.32 ^a	.56 ^a	.21 ^a		
Maternal characteristics													
Educ < high school	466	29.3	6.0	22.1	3.1	25.7	3.9	1.14	.15	.07	.07		
Unemployed	472	59.2	6.5	43.7	3.7	52.3	4.4	4.23	.28	.12	.15		
Child Trauma	415	49.64	2.81	42.33	1.24	35.67	1.10	30.28 ^{***}	.36 ^a	.80 ^a	.39 ^a		
Depression	399	15.36	0.98	12.77	0.41	10.68	0.35	28.67 ^{***}	.38 ^a	.79 ^a	.43 ^a		
Anxiety	399	15.86	0.80	13.75	0.38	12.00	0.41	21.79 ^{***}	.35 ^a	.67 ^a	.31 ^a		
Antisocial	474	2.64	0.20	1.78	0.10	0.74	0.07	128.17 ^{***}	.55 ^a	1.59 ^a	.80 ^a		
PTSD	473	33.22	1.67	26.53	0.63	21.57	0.43	76.51 ^{***}	.62 ^a	1.30 ^a	.61 ^a		
Responsive involvement	378	11.61	0.47	13.01	0.25	12.87	0.31	7.21 [*]	.36 ^a	.32 ^a	.04		
Constructive discipline	378	9.53	0.21	10.08	0.09	10.08	0.11	6.15 [*]	.37 ^a	.36 ^a	.00		
Problematic discipline	381	0.82	0.16	0.50	0.07	0.41	0.08	5.45	.28	.36	.09		
Child symptoms													
Total PTSD	336	59.92	2.88	59.12	1.25	52.72	0.97	18.83 ^{**}	.04	.43 ^a	.38 ^a		
Internalizing	373	7.73	0.82	8.92	0.49	6.43	0.46	13.64 ^{**}	.16	.21	.36 ^a		
Externalizing	385	9.93	0.90	7.98	0.42	6.03	0.46	17.62 ^{***}	.29 ^a	.60 ^a	.31 ^a		
Fear arousal	375	1.77	0.12	1.68	0.07	1.65	0.08	0.69	.09	.12	.03		
Physical avoidance	375	1.84	0.13	1.84	0.07	1.70	0.09	1.78	.00	.12	.13		
Proximity seeking	375	0.89	0.12	0.78	0.07	0.96	0.08	2.95	.10	.07	.17		

Variable	n	Class 1		Class 2		Class 3		Cohen's <i>d</i>			
		M%	SE	M%	SE	M%	SE	1 – 2	1 – 3	2 – 3	
Exaggerated startle	375	1.27	0.15	1.20	0.08	0.84	0.09	.06	.36 ^a	.30 ^a	
Separation distress	375	0.09	0.04	0.42	0.05	0.38	0.06	.48 ^a	.43 ^a	.05	
Behavioral – parent	381	4.48	0.50	6.20	0.32	5.64	0.38	.36	.25	.11	
Anger – parent	381	3.83	0.54	4.88	0.32	4.07	0.37	.22 ^a	.05	.17 ^a	
Behavioral – examiner	381	1.97	0.40	1.86	0.21	1.10	0.19	.03	.32 ^a	.26 ^a	
Anger – examiner	381	1.97	0.40	1.86	0.21	1.10	0.19	.03	.32	.26	

Note. Class 1 = polyvictimized; Class 2 = harsh parenting; Class 3 = low exposure, PTSD = posttraumatic stress disorder.

^aSignificant pairwise comparison after Bonferroni correction.

* $p < .05$.

** $p < .01$.

*** $p < .001$.