Child Maltreatment

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What is This?

Classes and Consequences of Multiple Maltreatment: A Person-Centered Analysis

Sara R. Berzenski[1] and Tuppett M. Yates[1]

Abstract
While the overwhelming majority of research on the consequences of childhood maltreatment reports differential outcomes of specific maltreatment subtypes (e.g., physical abuse vs. emotional abuse) as though they are independent, maltreatment experiences often occur in combination. The present study evaluated multiple maltreatment experiences in a sample of 2,637 undergraduate students who reported on childhood maltreatment and current adjustment. The authors used latent class analysis to examine predominant patterns of multiple maltreatment experiences and investigated indices of psychosocial adjustment associated with those patterns. Results suggested that specific constellations of multiple maltreatment have qualitatively different associations with adjustment. Emotional abuse, alone or in combination with other maltreatment types, was especially salient for psychopathology (e.g., anxiety, depression), while a combination of physical and emotional abuse was most strongly associated with conduct-related problems (e.g., substance use, risky sexual behavior). These findings have both practical and empirical significance for understanding and classifying experiences of maltreatment.

Keywords
child maltreatment, child abuse, latent class analysis, emotional/psychological maltreatment, physical abuse, sexual abuse

Child maltreatment is consistently implicated in the development of maladaptive emotional and behavioral patterns (see Cicchetti & Valentino, 2006 for review). Moreover, despite a high rate of comorbidity among subtypes of maltreatment, numerous studies suggest that specific subtypes predict distinct maladaptive outcomes (Erickson, Egeland, & Pianta, 1989; Kaplan, Pelcovitz, & Labruna, 1999; Yates, Dodds, Sroufe, & Egeland, 2003). Though findings are often conveyed as if subtypes occur independently, overlapping forms of maltreatment co-occur more often than not (Claussen & Crittenden, 1991) with multiple maltreatment experiences ranging from 13.5% to 43.4% in community samples (Edwards, Holden, Felitti, & Anda, 2003; Higgins & McCabe, 2000) and 33–95% in maltreatment samples (Herrenkohl & Herrenkohl, 1981; Ney, Fung, & Wickett, 1994). Physical and emotional abuse evidence the highest rates of comorbidity, with prominent, though less consistent, overlap among other forms of abuse (Arata, Langhinrichsen-Rohling, Bowers, & O'Farrill-Swails, 2005; Corso, Edwards, Fang, & Mercy, 2008; Dong, Anda, Dube, Giles, & Felitti, 2003; see Herrenkohl & Herrenkohl, 2009 for review).

Given the extensive overlap among maltreatment experiences, efforts to identify unique outcomes of individual maltreatment subtypes are complicated and of arguable relevance. Research designs that employ participants who have only experienced one type of maltreatment (i.e., by excluding persons with multiple maltreatment exposure), though relatively infrequent, provide some statistical clarity (e.g., Shipman, Edwards, Brown, Swisher, & Jennings, 2005).

However, these participants may not be representative of the typical maltreated child. On the opposite end of the spectrum, some studies evaluate the effects of maltreatment as a unified construct and entirely ignore issues of subtypes and comorbidity (e.g., Smith & Walden, 1999), or report on subtype-specific effects without accounting for known co-occurring experiences (e.g., Bruce, Fisher, Pears, & Levine, 2009). Investigators often report the effects of one subtype of maltreatment while "controlling" for the concurrent effects of other types, either statistically (e.g., examining emotional abuse in a regression controlling for physical abuse, Berzenski & Yates, 2010), or methodologically (e.g., examining groups with multiple maltreatment that either includes physical abuse or not, Teisl & Cicchetti, 2008). While research on specific types of maltreatment can inform knowledge about developmental pathways, efforts to directly examine the experience of multiple maltreatment itself may be more valid empirically and clinically. Therefore, this study examined the phenomenology of multiple maltreatment experiences in a large group of college students. Although traditional models of cumulative risk suggest that multiple maltreatment may be more harmful than any one subtype (Masten & Wright, 1998), this study joins a small but

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growing number of investigations that identify specific *patterns* of multiple maltreatment experiences to evaluate their unique relations to adult adjustment.

Prior attempts to examine the effects of multiple maltreatment have employed varied theoretical approaches. Cumulative risk models suggest that increasing numbers of adverse childhood events (Chapman et al., 2004; Dube et al., 2003; Sameroff & Chandler, 1975) and specifically maltreatment experiences (e.g., Arata et al., 2005; Edwards et al., 2003; Finkelhor, Ormrod, & Turner, 2007; Higgins & McCabe, 1999; Masten & Wright, 1998), will be associated with heightened maladaptation as compared to any single experience. In contrast, interactive models encourage greater attention to the specific constellation of maltreatment types or features (Trickett, 1998). Consistent with a dynamic view of development, which emphasizes reciprocal influences of multiple causal factors on adjustment (e.g., Gottlieb & Halpern, 2002), interactive models hold that outcomes follow from specific relations among contributing factors, rather than the factors themselves. While a cumulative model would predict that *any* combination of maltreatment types would have a similar impact (e.g., the experience of any two subtypes of maltreatment would be equivalent), a dynamic, interactive view recognizes that, for example, physical and sexual abuse together may have a different impact on development than physical and emotional abuse, even though both involve two comorbid subtypes. Acknowledging the open and dynamic nature of human development, interactive models allow for synergistic processes wherein the total developmental effect is greater than the sum of its parts (Granic & Hollenstein, 2003). Informed by a dynamic systems framework, this study evaluated the interactive hypothesis that specific patterns of comorbid maltreatment experiences would provide more and different information than both individual and cumulative risk models of maltreatment.

The varied theoretical foundations on which maltreatment research developed begot similarly variable sampling and analytic approaches. In line with the cumulative approach, some studies have compared individuals who experienced two types of maltreatment to those who experienced each type in isolation (Sternberg et al., 1993). These designs may identify the effects of individual maltreatment subtypes but they do not clarify the impact of specific constellations of co-occurring subtypes. In other studies, researchers have conceived of multiple maltreatment as a hierarchy wherein one form of maltreatment is classified as "primary" (Lau et al., 2005). While some hierarchical approaches to classification consider severity and/or frequency of experiences regardless of subtype, others prioritize "active" forms of maltreatment (e.g., sexual abuse, physical abuse) over "passive" forms (e.g., neglect), without considering the specific features of the experience (Lau et al., 2005). Research that identifies dominant and subordinate types of maltreatment extends prior efforts to differentiate singly from multiply maltreated youth but does not account for the effects of specific, albeit secondary, co-occurring forms of maltreatment. Stepwise regression designs represent a middle ground that is consistent with

both an additive approach, examining incremental contributions of maltreatment types, and an interactive approach, evaluating interaction effects wherein combinations of maltreatment types explain development beyond main effects (e.g., Wolfe & McGee, 1994).

Variable-centered approaches, such as multiple regression, presume that variables operate the same way for all individuals in a largely homogenous population (Laursen & Hoff, 2006). In contrast, person-centered models reject this assumption and seek to identify variations in how variables are associated within groups of individuals. In this view, individuals are the ultimate predictors of outcomes, and variables describe individuals but do not explain development (Laursen & Hoff, 2006). Despite contributions of variable-centered approaches, the person-centered framework represents a promising avenue for assessing and generating hypotheses about the effects of co-occurring maltreatment experiences (Roesch, Villodas, & Villodas, 2010). Cluster analysis has been used to meaningfully group features within a specific subtype of maltreatment (e.g., sexual abuse) to predict differential outcomes (Trickett, Noll, Reiffman, & Putnam, 2001). It has also been used to consider both maltreatment type and severity as grouping variables (Higgins, 2004). More recently, latent class analysis (LCA), in which underlying groups of individuals with similar experiences are identified, has gained prominence (Menard, Bandeen-Roche, & Chilcoat, 2004; Shevlin & Elklit, 2008).

To date, only a handful of studies have employed LCA to identify meaningful patterns of maltreatment. For example, LCA has been used to classify features of a given maltreatment subtype, such as the severity and chronicity of sexual abuse, to predict differential outcomes (McCrae, Chapman, & Christ, 2006). Although a few studies have employed LCA to study multiple maltreatment experiences, these efforts have been constrained by small samples and/or have failed to examine the developmental outcomes associated with multiple maltreatment experiences. In one investigation, the best fitting solution identified only two latent classes, which consisted of "no maltreatment" and "multiple maltreatment" (Romano, Zoccolillo, & Paquette, 2006), while another study examined only physical and sexual abuse experiences (Nooner et al., 2010). Very few studies have used LCA to examine relations between specific patterns of multiple maltreatment and indices of adjustment (Hazen, Connelly, Roesch, Hough, & Landsverk, 2009; Pears, Kim, & Fisher, 2008). Moreover, the study by Hazen, Connelly, Roesch, Hough, and Landsverk (2009) did not reveal distinct patterns of multiple maltreatment experiences; rather, their analyses evaluated the impact of "low maltreatment," "multiple maltreatment," and one additional profile that excluded sexual abuse. The present study builds on recent advances in person-centered analytic methodology to identify qualitative differences among multiple maltreatment experiences and to evaluate their differential associations with adjustment in young adulthood.

We examined relations between patterns of child maltreatment experiences and adjustment in two domains that have been at the center of most maltreatment research (e.g.,

Ferguson & Dacey, 1997; Gross & Keller, 1992; Maughan & Cicchetti, 2002; Senn & Carey, 2010; Shin, Hong, & Hazen, 2010): psychopathology (i.e., depression, anxiety, and emotion dysregulation) and conduct problems (i.e., dating violence perpetration, substance use, and risky sexual behavior). The classification of specific adjustment indicators within the broad domains of psychopathology or conduct is consistent with extant findings indicating differential relations between each domain and specific types of maltreatment (e.g., physical abuse with conduct and emotional abuse with psychopathology; Briere & Runtz, 1990; Teisl & Cicchetti, 2008). Although some research points to more specific relations between maltreatment types and specific adjustment outcomes within each domain (e.g., sexual abuse with risky sexual behavior; Shin et al., 2010), each outcome has also been linked to other subtypes (e.g., neglect and physical abuse with risky sexual behavior; Wilson & Widom, 2008). Further, as discussed earlier, extant maltreatment research has often failed to adequately account for comorbidity across maltreatment subtypes. Research findings on multiple maltreatment are similarly variable, with most evidence pointing to greater maladjustment in the context of greater comoribidity (i.e., cumulative risk), but few studies have evaluated specificity between patterns of comorbidity and adjustment outcomes. Therefore, the current investigation explored well-established measures of adjustment in the broad domains of psychopathology and conduct to identify the incremental contributions of LCA as a person-centered, interactive approach for understanding multiple maltreatment and adjustment.

Drawing on a large sample of college students, we evaluated maltreatment patterns across several specific subsamples to obtain the most informative and parsimonious constellations of maltreatment patterns. Given the limitations of prior attempts to identify classes of multiple maltreatment based on community and maltreated samples, we sought to examine the utility of identifying classes of maltreatment experiences specifically among individuals who had been multiply maltreated. First, we identified latent classes within the total sample, which included both participants who had and had not experienced maltreatment. We expected to arrive at a two-class solution: maltreated or not maltreated. Second, we identified classes among maltreated participants, and expected to find four classes, each identified by one of the four specific maltreatment types examined here (i.e., physical abuse, sexual abuse, domestic violence exposure, and emotional abuse). Third, we conducted a final LCA to examine patterns within the *multiply* maltreated subsample of participants. We anticipated that removing nonmaltreated and singly maltreated participants from the analysis would enable LCA to reveal the most informative and relevant patterns of multiple maltreatment. Given that this is the first investigation to evaluate specific patterns of multiple maltreatment within a purely multiply maltreated sample, this final analysis was primarily exploratory with respect to expected profile compositions. However, based on prior research demonstrating disproportionate rates of comorbidity, we expected that physical and emotional abuse would cluster together in at least one class (Corso et al., 2008; Herrenkohl & Herrenkohl, 2009).

In addition to identifying meaningful subgroups of individuals, we sought to evaluate relations between identified classes and adult adjustment indicators. Again, because the specific makeup of the classes was undetermined, we did not have specific hypotheses about these relations. However, we did expect that there would be differential relations between multiple maltreatment classes and indicators of psychopathology as compared to conduct problems given prior evidence that emotional abuse may be more strongly related to psychopathology, while physical abuse is more strongly associated with conduct problems (e.g., Briere & Runtz, 1990). In addition, while we expected that multiple maltreatment would be associated with worse adjustment than single maltreatment, based on evidence from cumulative models (Edwards et al., 2003; Finkelhor, Ormrod, & Turner, 2007), we also hypothesized that specific combinations of maltreatment experiences would be uniquely related to adjustment beyond these additive effects (i.e., that any two forms of comorbid maltreatment would *not* be equivalent). Finally, we conducted an exploratory evaluation of gender differences in the obtained relations, given our interest in individual differences, and the well-established contribution of gender to adjustment in the wake of maltreatment. Although maltreatment in females has been associated more with internal distress outcomes, while males have been connected more with outcomes such as domestic violence perpetration (Kaplan et al., 1999; Wolfe, Scott, Wekerle, & Pittman, 2001), we expected that associations might also vary by specific experience.

Method

Participants

The sample of 2,637 undergraduate students ($M_{age} = 19.10$ years, $SD = 1.50$) was predominantly female (64%), and racially diverse, with 46.3% of respondents identifying as Asian, 28.3% as Hispanic, 16.4% as White, 5.9% as Black, and 3.1% as multiracial/other. The majority (76.5%) grew up in two parent households, while the rest lived with single parents, relatives, or foster/adoptive parents. In terms of parental education, 81.6% of the sample had caregivers with high school degrees, and 31.6% had at least one parent with a 4-year college degree or higher.

Procedure

Introductory psychology students completed various psychological studies or supplementary lectures in exchange for course credit. The sample was recruited over a period of 2 years and completed a 2-hr computerized survey in small, supervised groups of up to 14 students at a time. Participants sat in private cubicles under the supervision of a trained research assistant. Students were informed that the purpose of the study was to examine experiences in childhood and adaptation in adulthood, and that their responses were anonymous. Responses were password protected, encrypted by a survey management

company, and identified by code number. Students were required to stay for the entire session to minimize incentive to rush. Procedures were approved by the Human Research Review Board of the University.

Measures

Maltreatment. The Childhood Maltreatment Interview Schedule (Briere, 1992) was used to assess the frequency of maltreatment experienced prior to age 17 in the domains of emotional abuse, physical abuse, sexual abuse, and exposure to domestic violence. This measure has demonstrated effectiveness at discriminating among long-term outcomes of various maltreatment subtypes (Briere & Runtz, 1990). *Physical abuse* was defined as a caregiver doing something to the child on purpose (e.g., hitting, punching, cutting, or pushing the child) that made her or him bleed, gave her or him bruises or scratches, or broke bones or teeth, and was assessed with a single dichotomous item (i.e., before you were 17, did this ever happen? $n = 350$, 13.3%). Although responses were probed for the frequency and severity of physical abuse, only the dichotomous yes/no response was used in these analyses. *Sexual abuse* was defined as anyone ever kissing the child in a sexual way, touching her or his body in a sexual way, or making the child touch sexual parts. For these analyses, sexual abuse was indicated by a single dichotomous yes/no item ($n = 434$, 16.5%). *Domestic violence exposure* was defined as the participant having seen or heard one parent hit or beat up the other parent, and was also indicated by a single dichotomous item ($n = 526$, 19.9%). *Emotional abuse* was assessed with 14 items that captured how often the individual was yelled at, insulted, criticized, and humiliated by each caregiver during a typical childhood year. Each item was rated on a 7-point scale from never (*0*) to more than 20 times (*7*) yielding two scores reflecting frequency of emotional maltreatment by mother (7 items, $\alpha = .91$) and frequency of emotional maltreatment by father (7 items, $\alpha = .91$). Emotional maltreatment scores were averaged across parents ($r = .664$, $p < .001$), if both were rated, to create a total emotional abuse frequency variable. To create a dichotomous variable, the top 15% of emotional abuse scores were coded as "emotional abuse present" ($n = 392$, 14.9%) and all other participants were coded as absent. The 15% cutoff point was determined to coincide with the prevalence of emotional abuse in other community samples noted in the literature (which range from 10.6%, Dong et al., 2003, to over 40%, Menard et al., 2004), as well as to fall in line with the prevalence of other types of maltreatment reported in our sample (as noted above, these ranged from 13.3% to 19.9%). Although college students are presumed to be more advantaged than a community sample, descriptive analyses indicated these participants endorsed comparable maltreatment experiences to other community populations (Chapman et al., 2004; Herrenkohl & Herrenkohl, 2009). For example, 43.4% of respondents endorsing sexual abuse reported the abuse included force and/or penetration, and 5.7% of those endorsing physical abuse indicated that they required medical services, both of which are comparable to other community samples.

Psychopathology. The Symptom Checklist-90-Revised (Derogatis, 1983) was used to assess participants' overall level of anxiety and depression symptoms. Items were rated on a 5-point scale representing how much each symptom bothered or distressed the participant during the preceding week from not at all (*1*) to extremely (*5*). *Depressive symptoms* reflected the total score across 13 items ($\alpha = .98$; e.g., feeling blue, feeling no interest in things). *Anxiety symptoms* reflected the total score across 10 items ($\alpha = .98$; e.g., nervousness or shakiness inside). *Emotion dysregulation* was assessed with the Difficulties in Emotion Regulation scale (DERS; Gratz & Roemer, 2004), which consists of 36 items (e.g., when I'm upset, I feel out of control) that are rated on a 5-point scale from *almost never or 0–10% of the time* (1) to *almost always or 91–100% of the time* (5). The DERS shows strong internal consistency in college student populations and good construct validity (Sloan & Kring, 2007). The total sum of emotion regulation difficulties was used in these analyses ($\alpha = .85$).

Conduct problems. Conduct problems were assessed using the Conflict Tactics scale (CTS, Straus, 1979) to assess dating violence perpetration and a modified version of the Adolescent Health Survey (AHS; Blum, Resnick, & Bergeisen, 1989) to assess substance use and risky sexual behavior. The CTS consists of 29 descriptions of *partner violence perpetration* (e.g., I twisted my partner's arm or hair, I insulted or swore at my partner) rated on a 7-point scale from *never* (0) to *more than 21 times* (6). The AHS was used to assess total *substance use* in the past year (i.e., alcohol and drugs) and *risky sexual behavior*. Substance use reflected the sum of participants' reported frequency of alcohol and drug use in the past year from *never* to 5 *or more times a week* across 13 different substances. Risky sexual behavior was indicated by a composite of (a) sexual activity before age 17 (14.1%), (b) infrequent or absent birth control use (15.9%), (c) two or more prior sexual partners (22.6%), (d) exchanging sex for money or goods (.7%), (e) being diagnosed with a sexually transmitted disease (2.7%), and (f) ever being or getting someone pregnant (3.4%).

Results

Data Analysis Plan

LCA models were fit for three samples, including (a) the complete student sample, (b) students who endorsed any type of maltreatment, and (c) students who endorsed more than one type of maltreatment. Rates of subtypes of maltreatment in the three samples are displayed in Table 1. LCA models identified groups of individuals who reported similar patterns of maltreatment experiences. LCA models were fit across these distinct samples to evaluate our hypothesis that LCA in a multiply maltreated sample, rather than broader student or maltreated samples, would yield the most meaningful multiple maltreatment identification. The final class solution was validated by examining associations between identified maltreatment classes and

Table 1. Descriptive Breakdown of Child Maltreatment in Each Sample

	Domestic Violence Exposure	Physical Abuse	Sexual Abuse	Emotional Abuse
Total sample (N = 2,637)				
% Endorsed	19.9	13.3	16.5	14.9
% Female	72.6	70.7	86.1	67.5
Maltreated sample (N = 1,129)				
% Endorsed	46.6	31.0	38.4	34.7
% Female	72.2	70.0	85.9	66.6
Multiply maltreated sample (N = 431)				
% Endorsed	68.0	58.0	49.9	57.1
% Female	78.5	74.8	87.9	72.4

Table 2. Fit Statistics for Potential LCA Models

	AIC	BIC	LMRT, p value	Entropy
Total sample				
2 class	**8973.487**	**9026.384**	**<.001**	**0.494**
3 class	8978.210	9060.493	.686	0.650
4 class	8986.259	9097.930	.187	0.726
5 class	8996.186	9137.243	.846	0.523
Maltreated sample				
2 class	5736.526	5781.787	<.001	0.760
3 class	5578.104	5648.511	<.001	0.744
4 class	**5396.615**	**5492.168**	**<.001**	**1.000**
5 class	5395.188	5515.887	1.000	0.799
Multiply maltreated sample				
2 class	2250.844	2287.44	<.001	1.000
3 class	2162.584	2219.51	<.001	1.000
4 class	**2100.477**	**2177.73**	**<.001**	**0.945**
5 class	2081.063	2178.65	<.001	0.844

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; LCA = latent class analysis.
Rows highlighted in bold were selected as the best-fitting models for each sample.

adjustment indicators in the domains of psychopathology and conduct to evaluate whether certain patterns of child maltreatment are differentially related to adjustment indicators in adulthood. Finally, we evaluated gender differences in the observed relations.

Identification of Latent Class Solutions

LCA models were fit using Mplus Version 3.12 (Muthén & Muthén, 1998-2006) to evaluate possible two- to five-class models. The Akaike information criterion (AIC, Akaike, 1974), Bayesian information criterion (BIC, Schwarz, 1978), Lo–Mendell–Rubin Adjusted Likelihood Ratio Test (LMRT, Lo, Mendell, & Rubin, 2001), and entropy (Ramaswamy, Desarbo, Reibstein, & Robinson, 1993) are presented for each of these models by sample in Table 2. The best fitting models for each sample were selected based on the smallest AIC and BIC, which assess model fit with varying degrees of consideration for parsimony, and the largest entropy, which reflects the percentage of participants who were correctly classified by the

model. In addition, the LMRT statistic evaluated whether the model fit the available data significantly better than a more parsimonious model with one fewer class. Overall, the BIC is considered to be the most reliable measure of model fit (Nylund, Asparouhov, & Muthen, 2007).

LCA-total sample. A two-class solution for the total sample was selected as the best fitting model (Table 2). While the LMRT statistic suggested that a two-class model was better than a one-class model (not tested), each solution above the two-class model evidenced increasing AIC and BIC values, and nonsignificant LMRT values. Entropy was poor for all models, however, indicating that none of these models was particularly successful in classifying the majority of the sample. Item response probabilities (Table 3) revealed that Class 1 consisted of low probabilities of any maltreatment, while Class 2 consisted of higher, closer to chance, probabilities of each type of maltreatment. Thus, these classes were labeled "no maltreatment" and "maltreatment."

LCA-maltreated sample. A four-class model was selected in the LCA for the maltreated subsample (Table 2). The AIC and BIC values increased or remained the same in the five-class model and the LMRT statistic was not significant. In addition to the AIC and BIC indices, the entropy value of 1.00 for the four-class model indicated that 100% of the participants were correctly classified by the four-class solution. The item response probabilities (Table 3) indicated that the classes corresponded to individual maltreatment subtypes. Each class consisted of a 100% chance of endorsing a given type of maltreatment, and low (but relatively equal) probabilities of any of the other types. Thus, each class was labeled for the dominant type of maltreatment: physical abuse, emotional abuse, domestic violence exposure, and sexual abuse.

LCA-multiple maltreated sample. Fit statistics also suggested a four-class solution in the multiply maltreated subsample (see Table 2). Although AIC values continued to decrease as the number of classes increased, this criterion can be driven to lower values as the number of classes becomes high, particularly in large samples (Bozdogan, 1987). In addition, the most substantial drop in the AIC value occurred between the three- and four-class models. Although the LMRT statistic suggested that the five-class model was a significant improvement over the four-class model, this gain was much smaller than that between the three- and four-class models. Most importantly, the four-class solution had the lowest BIC value, which is the most reliable index, and should be weighted accordingly (Nylund et al., 2007). Overall, the fit indices and parsimony pointed to the four-class model as the best solution for the multiply maltreated sample.

The item response probabilities (see Table 3) revealed that Class 1 was characterized by domestic violence exposure and physical abuse, with a negligible chance of reporting concurrent emotional abuse, and no chance of reporting sexual abuse. This class was identified as "Violent Home" in which physical

Table 3. Item Response Probabilities and Probability of Expected Class Membership

	Domestic Violence Exposure	Physical Abuse	Sexual Abuse	Emotional Abuse
Total sample				
Class 1 (No maltreatment: 79.9%)	.09	.02	.11	.05
Class 2 (Maltreatment: 20.1%)	.46	.41	.30	.38
Maltreated sample				
Class 1 (Physical abuse: 31.0%)	.42	1.00	.26	.36
Class 2 (Emotional abuse: 16.0%)	.00	.00	.19	1.00
Class 3 (Domestic violence: 33.6%)	1.00	.00	.24	.23
Class 4 (Sexual abuse: 19.4%)	.00	.00	1.00	.00
Multiply maltreated sample				
Class 1 (Violent home: 16.5%)	1.00	1.00	.00	.06
Class 2 (Hostile home: 13.2%)	1.00	.15	.00	1.00
Class 3 (Harsh parenting: 20.4%)	.28	1.00	.00	1.00
Class 4 (Sexual abuse: 49.9%)	.61	.42	1.00	.47

Table 4. Young Adult Outcomes by Maltreatment Experience

	Depression		Anxiety		Difficulties in Emotion Regulation		Domestic Violence Perpetration		Risky Sexual Behavior		Substance Use	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
1. Domestic Violence	21.65[4,6,7,8]	9.26	14.24[4,6,7,8]	5.61	84.92[4,7,8]	21.82	30.44	9.32	.74[3,7,8]	1.02	16.44[7]	3.24
2. Physical Abuse	21.15[4,6,7,8]	7.99	13.96[4,6,7,8]	5.79	85.30[4,7]	21.61	30.46	8.08	1.08	1.08	16.75[7]	5.03
3. Sexual Abuse	24.20	10.61	15.33[8]	6.83	85.65[4,7,8]	21.75	33.01	11.22	1.15[1]	1.30	16.22[7]	3.52
4. Emotional Abuse	27.20[1,2]	11.35	17.84[1,2]	8.44	95.50[1,2,3]	19.98	35.51	17.55	.78[7,8]	.98	17.45[7]	5.43
5. Violent Home	22.81	11.08	15.52	8.18	86.48	21.52	35.12	12.55	1.04	1.26	17.68	4.72
6. Hostile Home	27.02[1,2]	12.31	18.09[1,2]	9.25	90.38	22.84	32.37	13.22	.65	1.08	16.59[7]	3.85
7. Harsh Parenting	27.39[1,2]	11.58	17.74[1,2]	9.00	95.73[1,2,3]	24.39	37.52	15.33	1.35[1]	1.41	19.60[1,2,3,4,6]	5.60
8. Sexual Abuse (Mult.)	27.02[1,2]	11.63	17.79[1,2]	8.26	92.99[1,3]	25.76	35.48	14.57	1.25[1,4]	1.22	17.74	5.24
Total sample	21.95	9.54	14.59	6.48	83.61	22.15	31.69	11.87	1.16	1.07	16.70	4.43
F	7.77***		6.84***		6.07***		2.48*		4.67***		5.28***	

Note. Superscripts indicate Bonferonni adjusted post hoc differences $p < .05$ between types of maltreatment experiences (i.e., rows) on each adjustment indicator.

violence occurs between parents and between parent and child. Class 2 was characterized by emotional abuse and domestic violence exposure, with a small chance of reporting physical abuse, and no chance of reporting sexual abuse. This class was identified as "Hostile Home" in which the parent is negative and rejecting toward the child while exposing the child to conflict between the parents, both of which are emotionally, but not physically, damaging experiences. Class 3 was characterized by emotional abuse and physical abuse, with a smaller likelihood of reporting domestic violence exposure, and no chance of sexual abuse. This class was identified as "Harsh Parenting," reflecting physical and verbal abuse directed to the child in the relative absence of violence between the parents. Class 4 was characterized by a 100% probability of sexual abuse and close to chance percentages of emotional abuse, domestic violence exposure, and physical abuse. This group was identified as the "Sexual Abuse" class because it contained every person whose multiple maltreatment included sexual abuse and was not particularly characterized by a combination with any one other form of maltreatment.

Validation of Multiple Maltreatment Classes

Exploratory analyses evaluated profiles of psychosocial adjustment in the domains of psychopathology (i.e., depression, anxiety, and emotion regulation) and conduct (i.e., dating violence, substance use, and risky sexual behavior) for each of the four multiple maltreatment classes and within each of the individual maltreatment subtypes. These analyses evaluated both cumulative models positing stronger associations with maladjustment as a function of multiple- versus single-type maltreatment and interactive models wherein specific constellations of maltreatment types may be associated with different outcomes in a nonlinear fashion.

Table 4 displays the results of univariate analyses of variances and associated Bonferroni-adjusted post hoc tests for each adjustment indicator, evaluating differences between maltreatment classifications. Participants who had experienced emotional abuse, or any pattern of multiple maltreatment that included emotional abuse (i.e., Harsh Parenting or Hostile Home), reported significantly higher rates of psychopathology
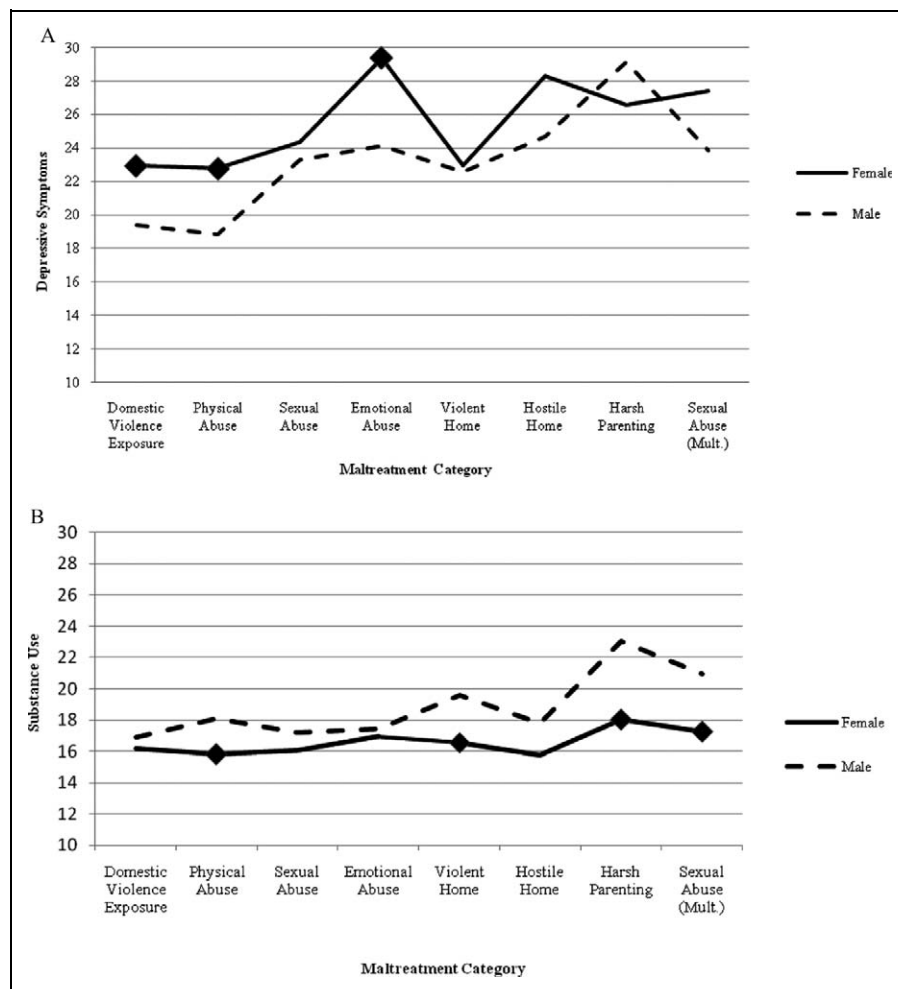
Figure 1. (A) Depressive symptoms by maltreatment experience, split by gender. (B) Substance use by maltreatment experience, split by gender. ◆ Indicates significant gender differences within that maltreatment classification ($p < .05$).

than any other single or multiple maltreatment group that did not include emotional abuse. This pattern was consistent across each of the psychopathology indicators. These findings do not support traditional cumulative models but rather point to the disproportionately salient association between emotional abuse and psychopathology, as well as meaningful variation across classes of multiple maltreatment.

In contrast to the consistent pattern across psychopathology outcomes, there was no consistent pattern of effects across the singly- or multiply-maltreated groups with respect to conduct outcomes. However, the Harsh Parenting group, characterized by physical abuse and emotional abuse, consistently had the highest rates of conduct problems, particularly substance use. These data also support an interactive model, as this class was more strongly related to conduct problems than other classes with different combinations of two maltreatment subtypes.

Finally, exploratory analyses by gender indicated that females followed the same pattern as the full sample across psychopathology outcomes, while males followed a different pattern (Figure 1A). While emotional abuse remained most salient for females, even above some multiple maltreatment

experiences, males followed a more traditional cumulative pattern. Specifically, males who reported single types of maltreatment displayed lower and comparable levels of psychopathology than did males who endorsed multiple maltreatment. As with the total sample, there were no clear patterns by gender across the conduct domains (Figure 1B), However, as in the total sample, Harsh Parenting (i.e., physical and emotional abuse) was related to conduct problems, particularly among males. Notably, these gender differences did not consist of uniform differences in outcomes across maltreatment classifications but rather varied by group. Females in the domestic violence, physical abuse, and emotional abuse groups displayed more depressive symptoms than males ($p < .05$) but in the other groups depressive symptoms were comparable between females and males (i.e., this was not just an overall gender difference where females uniformly reported more symptoms than males but rather a case of certain maltreatment effects being more salient for females). For substance abuse, males endorsed higher rates than females but only in the physical abuse, Violent Home, Harsh Parenting, and Sexual Abuse groups ($p < .05$).

Discussion

The present study identified meaningful patterns of multiple maltreatment experiences and evaluated their specific associations with adult adjustment, yielding important implications for future investigations and clinical applications. LCA models were evaluated in a large sample of college students with variable maltreatment exposure, in a subsample of maltreated students, and in a final subsample of multiply maltreated students. Multiple maltreatment emerged as a significant concern in this sample (16.3% multiply maltreated), particularly among those who reported some form/forms of childhood maltreatment (38.2% multiply maltreated). Consistent with prior work, the analysis of the first two samples revealed dominant groups defined by the presence versus absence of maltreatment in the total sample (Romano et al., 2006) and the presence of single maltreatment types in the maltreated sample (Nooner et al., 2010).

As hypothesized, the LCA of the multiply maltreated subsample provided the most informative patterns of multiple maltreatment experiences. Because the majority of participants in each of the total and maltreated samples did not experience multiple maltreatment, the solutions that classified these individuals provided the best, most parsimonious fit for the data, and left no room to differentially classify multiply maltreated participants. Instead, by evaluating these patterns within a subsample of students with multiple maltreatment exposure, this investigation yielded an empirically and practically relevant model of multiple maltreatment.

The LCA in the multiply maltreated sample suggested a four-class solution (Violent Home, Hostile Home, Harsh Parenting, and Sexual Abuse). Follow-up analyses examined differential relations between maltreatment, either singly or in combination, and adjustment in adulthood. As hypothesized, maltreatment classifications were differentially related to adjustment outcomes, such that among participants who had experienced two types of maltreatment, outcomes remained variable. This result illustrates the value of an interactive model, wherein the *specific* combination of maltreatment types is incrementally informative, over a cumulative model in which any two types of maltreatment would be similarly related to increased pathology. For example, Harsh Parenting was related more strongly to difficulties in emotion regulation than Hostile Home and Violent Home, even though each class was characterized by two types of maltreatment. The particular value of the person-centered approach in complementing this interactive framework is its ability to identify these classifications in an exploratory way, enabling us to examine only meaningful and parsimonious combinations of experiences.

Specifically, emotional abuse in isolation was more strongly associated with psychopathology than any other single maltreatment type and was comparable in strength to both the Harsh Parenting and Hostile Home multiple maltreatment classifications (both of which are characterized in part by emotional abuse). These findings point to the primacy of emotional abuse, in some cases above and beyond multiple maltreatment, for understanding psychopathological adjustment. Ample research suggests that emotional abuse is the most prevalent and deleterious form of maltreatment (Briere & Runtz, 1990; Gross & Keller, 1992; Hart, Binggeli, & Brassard, 1997). In addition, the domestic violence literature has demonstrated that emotional abuse of partners may be as deleterious or more than physical abuse of partners (Coker, Smith, Bethea, King, & McKeown, 2000). Our findings are consistent with growing evidence that emotional maltreatment is a uniquely pernicious form of abuse (Dodge Reyome, 2010; Wright, 2007; Yates & Wekerle, 2009), and that it may exacerbate the expected effects of other maltreatment types (Hart, et al., 1997; McGee, Wolfe, & Wilson, 1990).

Follow-up analyses indicated that emotional abuse was especially salient for females, with males showing a more typical additive pattern in which multiple maltreatment corresponded to greater maladjustment. Research finds childhood emotional abuse is related to increased feelings of shame in adulthood (Feiring, 2005; Hoglund & Nicholas, 1995) and that schemas of shame and self-sacrifice mediate relations between emotional abuse and psychopathology (Wright, Crawford, & Del Castillo, 2009). Given that girls may be more vulnerable to shame-based emotions in the wake of child maltreatment (Alessandri & Lewis, 1996), these findings suggest that the specific impact of emotional abuse on one's sense of self-worth may be one mechanism by which it influences psychopathological adjustment among females.

Emotional abuse did not display the same robust effects for conduct outcomes. For both sexes, Harsh Parenting was most salient, suggesting that different forms of child-directed maltreatment (i.e., physical abuse and emotional abuse) may be associated with conduct disruptions in adulthood in a cumulative fashion but that they also represent a distinct experience from other types of multiple maltreatment. For males, physical abuse alone or in combination with other maltreatment types was particularly salient for conduct problems (e.g., substance use). It may be that an especially robust association between child physical abuse and conduct problems (Kaplan et al., 1999) competed for dominance with emotional abuse, such that the combination of both (i.e., Harsh Parenting) was most strongly related to conduct problems.

These findings further our understanding of multiple maltreatment experiences and speak to the utility of person-centered and the interactive frameworks. However, these findings should be interpreted in consideration of their limitations. First, while large and diverse, the present sample of undergraduate psychology students may not be representative of nonstudent populations. However, the utility and appropriateness of student populations for research is well established (Greenberg, 1987), and, as noted previously, the phenomenology of maltreatment in this sample was comparable to that observed in broader community samples (Chapman et al., 2004; Herrenkohl & Herrenkohl, 2009). Second, self-report methods for assessing maltreatment are uniquely limited by their retrospective nature. However, our use of dichotomous indicators is supported by research suggesting that retrospective reports of

adverse experiences in childhood are valid to the extent that detailed information is not needed (Hardt & Rutter, 2004), and that they are reliable over time (Dube, Williamson, Thompson, Felitti, & Anda, 2004). Relatedly, the measurement of emotional abuse on a multi-item scale (converted to a dichotomous cut point) may have contributed to the differential strength of relations between emotional abuse and some aspects of adjustment. However, the fact that this was not uniform across all outcome measures, nor across both genders, suggests that this was not a substantial consideration. Additionally, the obtained rates of emotional abuse were comparable to other types of maltreatment and to other studies reported in the literature (Dong et al., 2003; Menard et al., 2004). Third, this study was limited by the omission of participant reports of neglect. While the four maltreatment subtypes evaluated here provide substantial information about childhood maltreatment experiences and young adult adjustment, information about child neglect was excluded due to the complexities inherent in assessing neglect (Stowman & Donohue, 2005) and our concern that retrospective reports on acts of omission may be less reliable and valid than those on acts of commission. Given that the inclusion of neglect may have resulted in the emergence of qualitatively different classes of multiple maltreatment, we echo recent calls for increased attention to neglect in future research (Hildyard & Wolfe, 2002). Finally, what constitutes a strength in terms of the validity of our maltreatment reports is also a limitation in that these analyses did not include specific information about the nature of participants' maltreatment experiences in terms of severity, frequency, timing, or other features that have emerged as important in other studies (Ethier, Lemelin, & Lacharite, 2004; Manly, Kim, Rogosch, & Cicchetti, 2001; Trickett et al., 2001).

Despite these limitations, the present study revealed meaningfully distinct latent classes of multiple maltreatment and unique relations to adjustment. In accordance with the interactive perspective, it may be empirically and clinically profitable to embrace and understand these unique and qualitatively distinct patterns, rather than to simply acknowledge the experience of multiple types of adversity, or to assign participants to groups based on potentially arbitrary hierarchical valuations of experience. The current study begins to answer recent calls for systematic and empirically justified resources to tailor treatments to individual contexts and needs (e.g., Yates, Burt, & Troy, 2011). Clarifying the unique experience of maltreatment can direct applied interventions to the particular developmental histories and needs of clients. For example, clinicians have long appreciated the comorbidity between domestic violence and child physical abuse. However, the present findings point to the potential severity of the equally prominent overlap between child-directed emotional abuse and child physical abuse (i.e., Harsh Parenting). While not detracting from the importance of probing for physical abuse in families presenting with domestic abuse (and vice versa), these data highlight the importance of attending to the emotional climate of the parent–child relationship in families presenting with child physical abuse. Given the overwhelming salience of emotional

abuse in observed relations with maladjustment, our findings justify increased attention to parent support services aimed at communicative processes, complementing extant approaches targeting disciplinary practices. Qualified by the need for replication of the observed patterns and their relations to adjustment, these findings have important significance for further applications of person-centered techniques to empirical and clinical efforts to understand qualitatively distinct patterns of developmental experience.

Declaration of Conflicting Interests

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