



## What's in a name? A comparison of methods for classifying predominant type of maltreatment<sup>☆</sup>

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### Abstract

**Objective:** The primary aim of the study was to identify a classification scheme, for determining the predominant type of maltreatment in a child's history that best predicts differences in developmental outcomes.

**Method:** Three different predominant type classification schemes were examined in a sample of 519 children with a history of alleged maltreatment. Cases were classified into predominant maltreatment types according to three different schemes:

1. Hierarchical Type (HT)—based on a hierarchy of types that prioritizes active forms of abuse over passive abuse;
2. Severity/Frequency Type (SFT)—sorts cases into the type of maltreatment associated with the highest severity or frequency rating;
3. Expanded Hierarchical Type (EHT)—differentiates multiple maltreatment type combinations from “pure” or single sub-types.

Hierarchical regression analyses examined whether the HT, SFT, and EHT type classifications contributed to prediction of child behavior problems, trauma symptoms and adaptive functioning.

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**Results:** After controlling for demographic factors, the HT definitions predicted four outcomes, while the SFT definitions predicted three, and the EHT classifications contributed to the prediction of five child outcomes. The co-occurrence of multiple types of maltreatment was robustly related to outcomes. However, the HT and SFT classifications predicted outcomes even after accounting for the co-occurrence of multiple maltreatment subtypes.

**Conclusion:** A classification scheme that differentiates between type combinations and single maltreatment types may have the greatest predictive validity. Over and above knowing about co-occurrence of maltreatment subtypes, it is important to understand what type, or constellation of types, of maltreatment have been alleged in a child's history.

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## Introduction

There is mounting evidence suggesting that different types of maltreatment have different effects on a range of child outcomes, including emotional and social development (Cicchetti & Rizley, 1981; Crittenden, Clausen, & Sugarman, 1994; Egeland, Sroufe, & Erickson, 1983; Herrenkohl & Herrenkohl, 1981; Taussig & Litrownik, 1997a), cognitive and academic functioning (Allen & Oliver, 1982; Egeland, 1991; Eckenrode, Laird, & Doris, 1993; Wodarski, Kurtz, Gaudin, & Howing, 1990), and physiological processes (Cicchetti & Rogosch, 2001). For example, consistent with theories regarding early environmental deprivation, physical neglect is specifically associated with lower intellectual functioning (e.g., Kaufman, Jones, Stieglitz, Vitulano, & Mannarino, 1994). Relative to other maltreatment subtypes, physical abuse has been found to specifically predict levels of aggression (Kaufman & Cicchetti, 1989) and depression (Toth, Manly, & Cicchetti, 1992). These findings supporting the specificity of maltreatment effects have led researchers to argue that outcomes related to different types of maltreatment should be examined separately (Kinard, 2001; Manly, Cicchetti, & Barnett, 1994).

However, issues of specificity in maltreatment types predicting differential outcomes have not been well delineated. High levels of comorbidity of subtypes have obfuscated the determination of specific effects of maltreatment subtypes. Research in the last two decades indicates that different types of maltreatment events often co-occur (Cicchetti & Barnett, 1991; Clausen & Crittenden, 1991; Higgins & McCabe, 2000; Lewis, Mallouh, & Webb, 1989; McGee & Wolfe, 1991; Straus & Gelles, 1986), comorbid types of abuse and neglect are the norm rather than the exception (Briere & Runtz, 1990; Egeland & Sroufe, 1981; Kinard, 1994; Silverman, Reinherz, & Giaconia, 1996), and pure subtypes are a rarity (Cicchetti & Rizley, 1981). Estimates of the proportion of cases identified by Child Protective Services (CPS) involving multiple co-occurring types of maltreatment range from 46% to 90% (Barnett, Manly, & Cicchetti, 1993; McGee, Wolfe, Yuen, Wilson, & Carnachon, 1995; Russell & Trainor, 1984).

Despite these phenomenological data, research studies on child maltreatment commonly classify children's experiences into a single type of maltreatment. Some studies forego the goal of comparing maltreatment subtypes and focus instead on a single subtype, assembling samples of children who have experienced the target subtype while ignoring any co-occurring subtypes (e.g., Tebbutt, Swanston, Oates, & O'Toole, 1997; Tremblay, Hebert, & Piche, 1999). In contrast, some comparative studies use methods of classifying children into groups of predominant subtypes of maltreatment, even when children may have experienced other comorbid subtypes (e.g., Kinard, 1994; Manly et al., 1994).

The aim of the current study is to investigate the predictive utility of methods for identifying a single predominant type of maltreatment to describe children's maltreatment histories. We have examined methods that reflect classification procedures that have been used by researchers and Child Protective Service agencies in both systematic and unsystematic ways. These classification schemes have not been studied with regard to their validity or ability to predict child outcomes.

While we acknowledge that categorizing a child's maltreatment experience into a discrete category may oversimplify the complexity of the events, there are important reasons for examining the process of classification. Foremost, this investigation can help to interpret the literature emerging from these methods. Since many research studies do classify children's maltreatment experiences into a discrete type, it is important to determine whether this practice results in meaningful information. Furthermore, it will be instructive to compare and contrast the validity of different methods for establishing a predominant type. Consistent with the approach of all the articles in this special issue, we will examine whether various methods of classifying predominant maltreatment type are predictive of child psychosocial and functional outcomes. In this study, we examine the maltreatment dimension of type within a sample of children who have a history of maltreatment allegations filed with CPS. Using an all-maltreated sample allows us to move beyond comparisons of sub-types of maltreatment versus no maltreatment in an effort to examine the specific contribution of sub-type of maltreatment within a group of child victims. The focus of this paper is not to examine the effects of any given sub-type of maltreatment, *per se*. Rather, our objective is to examine the value and implications of using a variety of systems for classifying diverse maltreatment experiences into discrete predominant types.

In cross-sectional research the need to classify type emerges in referrals where there are multiple allegations across maltreatment types. The situation is further complicated when determining the predominant type of maltreatment involves the classification of type longitudinally. Many studies of maltreatment have been cross-sectional in nature, therefore discussions of "type" are limited to one incident. The matter becomes considerably more complex when type is classified over multiple incidents of maltreatment across time. Kinard (1998) reported that the rates of types of maltreatment cases can shift considerably depending on the typing decision rules when studies are longitudinal. She noted that the probability of observing multiple types increases as greater numbers of reporting events are assayed over time. In this longitudinal study, we have employed the three systematic sets of decision rules described below for typing maltreatment over time. Therefore, we hope to offer empirical evidence regarding the predictive validity of these methods that will serve to guide other researchers.

We will contrast three ways of classifying the predominant type of maltreatment in a child's history. The first classification scheme, the Hierarchical Type (HT) was selected based on its use in the empirical literature (e.g., Kinard, 1994; Manly et al., 1994) and may reflect practices that characterize CPS processes of referral and investigation. Typically, CPS intake workers identify a single type of maltreatment associated with a referral when it is accepted for investigation. Although there are often multiple types of allegations within a report made to CPS, cases are typically sorted into one of four single types—Sexual Abuse, Physical Abuse, Neglect, or Emotional Maltreatment—with active forms of abuse viewed as paramount over passive forms. It has been presumed that when co-occurring sub-types are experienced, active forms of abuse (such as sexual abuse) are most detrimental (Levine, Doueck, Freeman, & Compaan, 1998) while neglect is less important (DePanfilis & Zuravin, 2001; Pecora, 1991). Indeed, Wells, Downing, and Fluke (1991) report that in CPS agencies where screening of maltreatment reports occurs routinely, cases of physical and sexual abuse take priority over neglect and emotional maltreatment. The HT scheme considers the occurrence of sexual abuse as primary, physical abuse is considered next in the

line of salience, followed by neglect and emotional maltreatment, respectively. For example, if sexual abuse allegations are present, this is considered the predominant type irrespective of any other sub-types alleged. While this hierarchy has been used in research to classify predominant maltreatment sub-type (Kinard, 1994; Manly et al., 1994), no theoretical or empirical justification for this scheme has been presented in the literature (Taussig & Litrownik, 1997b).

Second, we evaluated a classification typology that does not assume an a priori primacy of one type of maltreatment over the others. Instead, this classification scheme relies on severity and frequency of sub-types of maltreatment to determine the predominant type in cases where a child has experienced multiple kinds of maltreatment events. The Severity/Frequency Type (SFT) scheme relies on information about severity and frequency generated from the Maltreatment Classification System (MCS) developed by Barnett et al. (1993). The rationale for SFT classification system is derived from empirical research supporting the validity of ratings of the severity of maltreatment experiences in the prediction of child maladjustment (see review by Litrownik et al., 2005). Following patterns noted in the literature, ratings of severity take precedence over frequency in determining predominant type in the SFT scheme. In this system, comorbid sexual abuse would not be the predominant type if it is less severe and/or frequent than other sub-types of maltreatment experienced by the child.

Third, we constructed a classification scheme called the Expanded Hierarchical Type (EHT), which represents a refinement of the HT system that differentiates between single types and certain combinations of types of maltreatment. EHT delineates six types of categories: including Sexual Abuse Only, Sexual Abuse Plus Other Types of Maltreatment, Physical Abuse Only, Neglect Only, Physical Abuse and Neglect, and Emotional Maltreatment Only. This typology was designed to address the issue of multiple co-occurring forms of maltreatment being related to poor developmental outcomes.

The EHT scheme was devised because of the recognition that identifying a single predominant type of maltreatment inherently masks multiple sub-types of co-occurring maltreatment. As Taussig and Litrownik, (1997b) aptly observe, information is lost whenever children who have experienced multiple types of maltreatment are classified into discrete categories. There is growing recognition that the co-occurrence of multiple types of maltreatment in a child's victimization history is related to different physical, socio-emotional, and cognitive/academic outcomes than single types of maltreatment (Trickett & McBride-Chang, 1995). Furthermore, the number of types of maltreatment experienced by youth predicts long-term adjustment (Higgins & McCabe, 2000) and functional outcomes (Smith & Thornberry, 1995).

The EHT represents an attempt to break out certain multiple type combinations that have been found to be particularly deleterious or very common in order to contrast their effects with various single types. Thus, the EHT system distinguishes single types of maltreatment (Physical Abuse Only, Sexual Abuse Only, Emotional Maltreatment and Neglect Only) from two salient comorbid types of abuse (Sexual Abuse Plus Other Maltreatment Types, and Physical Abuse Plus Neglect). Sexual abuse combined with physical or emotional abuse has been associated with particularly high levels of long-term psychological distress (Bagley & Mallick, 2000). Examination of the distribution of types of maltreatment in our Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) data and in other studies (Kinard, 1998; National Center on Child Abuse and Neglect, 1995) indicates that certain combinations of maltreatment, such as Physical Abuse and Neglect, are very common. As such, we chose these two sub-type combinations to contrast with single maltreatment types based on specific empirical observations of their salience. However, contrasting only two sub-type combinations with single types is a limitation of the EHT framework presented herein.

Evidence regarding the importance of comorbid maltreatment sub-types raises important questions about the implications of using the classification systems described above. The divergent methods used by HT, SFT and EHT to operationalize predominant type result in different procedures for handling the occurrence of multiple types. In the HT scheme, cases with predominant type classified as emotional maltreatment would by definition only include this single type, whereas cases classified as sexual abuse could include up to four different types. Thus, the HT scheme may confound the number of types of maltreatment with the predominant type category. In contrast, the decision rules for SFT classifications are theoretically independent of the number of maltreatment sub-types. However, it is possible that SFT classifications may be empirically related to the number of sub-types. Finally, EHT represents an attempt to distinguish between single and multiple types of maltreatment. We will determine whether these type classifications contribute to prediction of child outcomes over and above the effects of co-occurring multiple types of maltreatment. Clarifying this conceptual and methodological problem is important for interpreting the findings of research studies that rely on such methods of determining a predominant type.

In summary, the current study will compare the predictive validity of classification schemes for determining the predominant type of maltreatment experienced by a child. We will contrast a system based on assumptions about sub-type primacy (HT), with a system based on a severity/frequency decision rule (SFT), with a scheme designed to differentiate single types of maltreatment from specific combinations of maltreatment types (EHT). Analyses will be employed to determine how each classification scheme is able to predict later child behavior problems, traumatic symptoms, and adaptive functioning. The primary purpose of this study is to: (a) investigate similarities and differences in the ability of different methods of classifying maltreatment type in accounting for these outcomes and (b) to determine if one method of classifying type of maltreatment is “better” than other methods based on their ability to predict differences in these developmental outcomes. In addition, we will determine whether the apparent predictive validity of these predominant type classifications is actually attributable to the effects of multiple types of maltreatment embedded within the classification systems.

## Method

### *Sample*

Data for the analyses were drawn from children and their primary caregivers participating in the LONGSCAN. LONGSCAN is a prospective longitudinal study of the antecedents and consequences of child abuse and neglect. The sample for the present study includes all LONGSCAN children who (1) have completed interviews around the time of the child’s 4th and 8th year of life (hereafter referred to as Visits 4 and 8, respectively); (2) have a reported allegation of maltreatment occurring between birth and their Visit 8 interview; and (3) have had a review of their CPS record through the date of their Visit 8 interview. Based on these criteria, the final sample for our study includes 519 children (49.1% male) and their primary maternal caregiver. (For a summary of the steps taken in generating the final sample for these analyses please see Figure 1 in the introduction to the special issue [English, Bangdiwala, & Runyan, 2005].) This larger sample of high-risk children all of whom had maltreatment allegations allowed us to move beyond comparisons of maltreated and non-maltreated children in an effort to examine the specific contribution of classifying sub-type of maltreatment within a group of child victims.

Demographic characteristics for participating children and their families are provided in Table 1. At the time of the Visit 8 interview children were approximately 8 years of age. The majority of the children

Table 1  
Sample characteristics ( $N = 519$ )

	%	$N$	Mean ( $SD$ )	Median
Child gender				
Male	49.1	255		
Female	50.9	264		
Child racial status				
Majority status	31.8	165		
Minority status	68.2	354		
Child age (years)			8.2 (.39)	8.1
Caregiver marital status				
Married	33.3	173		
Single/never married	37.0	192		
Separated	9.6	50		
Divorced	18.1	94		
Widowed	1.9	10		
Caregiver education (years)			11.8 (2.3)	12.0
Family income (US\$) <sup>a</sup>				\$15–19.9K
Family geographic location (“site”)				
East (EA)	12.7	66		
South (SO)	10.2	53		
Southwest (SW)	38.0	197		
Northwest (NW)	39.1	203		

<sup>a</sup> Because the range for the upper category of income was truncated, it is not appropriate to report mean and standard deviation for this variable.

were of minority ethnic status (i.e., Black, Hispanic, Mixed Race, Asian, and American Indian). The range of educational attainment of the participating primary maternal caregivers was broad: On average caregivers had approximately 12 years of education, and 30.4% of the caregivers had some post-high school education. Participating families had a median income of between \$15,000 and \$19,999 and a modal income range of \$10,000 to \$14,999. Approximately 77% of the families live on the west coast of the United States while the remaining portion of the sample live on the east coast. (The four geographic locations, or “Sites,” are referred to as East (EA), South (SO), Southwest (SW), and Northwest (NW) for the remainder of this paper.)

### Procedures

Data on the dependent variables were collected during separate, in-depth, face-to-face interviews with the primary maternal caregiver and the child at both the Visit 4 and Visit 8 interviews.

### Measures

**Dependent variables.** Child Developmental Outcomes. In order to assess child developmental outcomes, 10 dependent variables derived from three standardized instruments were used in the analyses. These

outcomes included: total behavior problems, Internalizing Behavior Problems, Externalizing Behavior Problems, Anxiety, Depression, Post-traumatic Stress, Dissociation, Anger, Daily Living Skills, and Socialization Skills, all measured at the Visit 8 interview. Each instrument was selected to tap into a different aspect of child behavioral and psychosocial functioning. All three instruments were standardized using large normative samples and demonstrate adequate validity and internal consistency reliability.

*Child Behavior Checklist (CBCL) (Achenbach, 1991).* The CBCL was used to assess a variety of behavioral problems. Primary caregivers reported on the frequency of 113 child behaviors during the prior 6 months using a 3-point Likert-type scale (0 = not true; 1 = somewhat or sometimes true; 2 = very or often true). Analyses utilized *T* scores on the Total Problems, Externalizing, and Internalizing broadband scales. Higher scores on the broadband scales indicate more problematic behavior.

*Vineland Scales of Adaptive Behavior Scales, Screener (Sparrow, Balla, & Cicchetti, 1984).* Child functioning was assessed using standard scores from the Daily Living and Socialization scales of the Vineland Screener according to primary caregiver report. The Vineland Screener is a 30-item measure, adapted from the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984). The Screener was designed to assess the personal and social sufficiency of individuals from birth to 18 years of age for research purposes. Primary caregivers responded to items related to everyday activities in which children commonly engage. Items are scored on a 3-point scale (0 to 2) indicating increasing mastery of the activity in question. Higher scores on the Vineland Screener reflect better functioning.

*Trauma Symptom Checklist for Children—Alternate Version (Briere, 1996).* Childhood trauma symptoms were assessed through child self-report using the Trauma Symptom Checklist for Children-Alternate Version (TSCC-A). The TSCC-A includes five subscales: Anxiety, Depression, Post-traumatic Stress, Dissociation, and Anger. This version does not include the 10 items, which comprise the Sexual Concerns subscale. Children responded, using a 4-point Likert scale (0 = Never; 1 = Sometimes; 2 = Lots of times; and 3 = Almost all of the time), to 44 items related to experiences they may have had. *T* scores for each of the subscales were used in our analyses. (A total score for the TSCC-A cannot be computed.) Higher scores reflect greater symptomatology, and *T* scores  $\geq 65$  are considered clinically significant.

*Independent variable: maltreatment type*

*Modified Maltreatment Classification System (Barnett et al., 1993; English et al., 2005).* Because CPS often codes only a single type of maltreatment even when children have had multiple experiences, it was necessary to go back to the original CPS narrative to determine extent of our participants' maltreatment experiences. The MCS developed by Barnett et al. (1993) allows a trained reviewer to recode the CPS case narrative based on specific criteria developed by the authors. Using the MCS a child's CPS narrative can be coded to reflect the variety of experiences that child has. In other words, unlike CPS, the MCS allows for the coding of multiple types of maltreatment with associated codes for severity and substantiation.

LONGSCAN modified the MCS (Modified Maltreatment Classification System [MMCS]) to expand and clarify the original coding system, as well as to better describe the maltreatment experiences of our sample (English et al., 2005). Each child's CPS record is reviewed biannually. LONGSCAN developed an abstraction protocol to code each allegation and investigation summary found in the CPS record. Coders are trained in this common protocol at the LONGSCAN Coordinating Center. Coders use the MMCS

to code the sub-type, severity, and identified perpetrator of each maltreatment allegation. Lead coders from each LONGSCAN site are systematically trained and achieve a rate of 90% congruence with the gold standard trainers at the NW site and Coordinating Center. Although we have data on allegations for siblings, these data are not reflected in the current study. If the participant child was not named as a victim in the CPS report, the allegation was not coded for that child.

*Predominant type of maltreatment.* The HT, SFT, and EHT schema, described in the introduction to this study, were used to operationalize predominant type of maltreatment for the children in our sample. All type variables were based on maltreatment allegations filed with local CPS agencies and were coded according to the MMCS. The schema is defined below:

1. Hierarchical Type:

Single allegation types are classified based on the type specified in the allegation.

Multiple types are classified as follows:

Sexual Abuse = Any Sexual Abuse (can include any other type)

Physical Abuse = No Sexual Abuse, Any Physical Abuse (can include Neglect)

Neglect = No Sexual/Physical Abuse, Any Failure to Provide or Lack of Supervision or Moral/Legal Maltreatment (can include Emotional Maltreatment)

Emotional Maltreatment = Emotional Maltreatment Only (no co-occurring types)

2. Severity/Frequency Type: (For the SFT classification scheme, further decision rules were employed to summarize multiple referrals accrued over time. Interested parties can receive further information about this longitudinal SFT definition from the corresponding author.)

Single allegation types are classified based on the type specified in the allegation.

The SFT categories include: Physical Abuse, Sexual Abuse, Neglect (including Failure to Provide, Lack of Supervision, and Moral/Legal Maltreatment), and Emotional Maltreatment.

If there is more than one type of allegation, type is established by the highest severity (as coded by the MMCS)

If there are multiple types of equal severity, type is established by the highest frequency (as coded by the MMCS)

If there are multiple types of equal severity and frequency, type is established using the HT system.

3. Expanded Hierarchical Type:

Sexual Abuse Only (can include Emotional Maltreatment)

Sexual Abuse + Other (including any other type, i.e., Physical Abuse, Neglect, or Moral/Legal Maltreatment, can include Emotional Maltreatment)

Physical Abuse Only (can include Emotional Maltreatment)

Neglect Only (any Failure to Provide or Lack of Supervision or Moral/Legal Maltreatment, can include Emotional Maltreatment)

Physical Abuse + Neglect (no Sexual Abuse but can include Emotional Maltreatment)

Emotional Maltreatment Only (no other types can co-occur)

*Control variables*

Five variables were used as control variables: child gender, child ethnicity (“minority status” vs. “majority status”), child’s age (at the time of the Visit 8 interview), family income, and site.

## Analyses

Ten hierarchical regression analyses (one for each outcome variable) were run for each predominant maltreatment type classification scheme (HT, SFT, EHT). Within each classification scheme, the neglect (or neglect alone) sub-type was always the reference group. Control variables and independent variables were entered in blocks as follows:

- Block 1: demographic controls (gender, ethnicity, age)
- Block 2: predominant maltreatment type (as determined by each type schema)
- Block 3: income
- Block 4: site

In order to determine whether the predominant type of maltreatment contributed to the prediction of developmental outcomes over and above the experience of multiple types of maltreatment, an additional block was entered with a dichotomous variable to indicate whether or not a child had experienced multiple types of maltreatment. These follow-up hierarchical regression analyses were run for each dependent variable using each of the three maltreatment classification schemes. The blocks were entered as follows:

- Block 1: demographic controls
- Block 2: multiple type dichotomous variable
- Block 3: predominant maltreatment type
- Block 4: income
- Block 5: site

## Results

### Preliminary analyses

We examined frequencies of predominant type classifications according to the HT and SFT classification schemes. As shown in Table 2, [Comment 1] using the HT scheme classified 44% of cases within the predominant type of Neglect, 20.2% as Sexual Abuse, and 34.3% as Physical Abuse. In contrast, SFT

Table 2  
HT and SFT classifications and proportion of predominant types involving multiples

Predominant type	Sexual Abuse	Physical Abuse	Neglect	Emotional Maltreatment	Significance tests
Hierarchical Type ( <i>n</i> = 519)					
<i>n</i> (%)	105 (20.2%)	178 (34.3%)	230 (44.3%)	6 (1.2%)	$\chi^2 = 365.27^{***}$
% multiple	91.4	78.7	36.5	0	
Mean # types	2.96	2.36	1.37	1.00	
Severity/Frequency Type ( <i>n</i> = 519)					
<i>n</i> (%)	38 (7.3%)	65 (12.5%)	410 (79.0%)	6 (1.2%)	$\chi^2 = 20.40^{***}$
% multiple	76.3	41.5	43.9	0	
Mean # types	2.5	1.94	2.01	1.00	

classified 79% of the cases as Neglect and with fewer classified as Sexual Abuse (7.3%) and Physical Abuse (12.5%). Both schema classified only 1.2% of the cases as pure Emotional Maltreatment.

We also conducted Chi-square analyses to examine the proportions of predominant types that involved multiple sub-types of maltreatment in both the HT and SFT systems. Predominant Type according to the HT scheme was significantly associated with proportion of multiple types ( $\chi^2 = 365.27$ ,  $p < .001$ ), such that 91.4% of Sexual Abuse cases, 78.7% of Physical Abuse cases, 36.5% of Neglect cases and 0% of Emotional Maltreatment cases (by definition) involved multiple forms of maltreatment. These findings reflect how the HT scheme defines predominant type with respect to the occurrence of multiple types. The majority of Sexual and Physical Abuse cases involved multiple forms of maltreatment since these sub-types are designated first in the hierarchy regardless of comorbidity. Neglect cases, as third in the hierarchy, contained far fewer cases involving multiple types. As would be expected within the HT system, Emotional Maltreatment emerged as a “pure” sub-type with none of the cases involving multiple forms of maltreatment.

SFT predominant type classifications were also associated with differences in proportion involving multiple maltreatment types ( $\chi^2 = 20.40$ ,  $p < .001$ ). Again, the majority (76.3%) of Sexual Abuse cases involve other forms of maltreatment. However, the number of Physical Abuse cases involving multiple types dropped sharply (from 78.7% to 41.5%) while the number of Neglect cases involving multiple types increased (from 36.5% to 43.9%). It is interesting to note that even in a typing schema that does not rely on an a priori hierarchy that gives priority to active forms of abuse, none of the Emotional Maltreatment cases involved multiple forms of maltreatment.

The association between the HT and SFT predominant type classifications and the co-occurrence of multiple types of maltreatment supports the need to examine EHT as a third classification scheme which differentiates selected maltreatment type combinations from “pure” or single types.

### *Regression models*

In terms of the control variables, Minority/Majority status was associated with CBCL Internalizing scores such that ethnic minority children were rated as having fewer problems than were Caucasian children ( $B = -2.14$ ,  $p < .05$ ). Child's gender was related to Vineland Daily Living Skills ( $B = 5.65$ ,  $p < .01$ ) and Socialization ( $B = 4.28$ ,  $p < .01$ ) Scales, and TSCC Dissociation ( $B = -2.79$ ,  $p < .05$ ). Controlling for all other covariates, girls on average had higher adaptive functioning scores and fewer self-reported dissociation symptoms. Age was related to Vineland Socialization scores ( $B = -5.05$ ,  $p < .05$ ), such that younger children received higher adaptive functioning scores. Family income was associated with scores on the TSCC Anger scale ( $B = .43$ ,  $p < .05$ ), children from families with higher income levels reported more anger symptoms. Site effects were also noted in the analyses, relative to children in the NW sample, children from the SW site had lower CBCL Internalizing scores ( $B = -2.65$ ,  $p < .05$ ), children from the SO site had lower CBCL Externalizing scores ( $B = -4.36$ ,  $p < .05$ ), and children from the EA site had higher Vineland Socialization scores ( $B = 7.30$ ,  $p < .01$ ).

### *Hierarchical Type classification scheme and child outcomes*

Selected results of the first set of hierarchical regression models examining the HT classification system are summarized in Table 3. We have presented regression models in which the type classification variables emerged as significant predictors in the final model. The final models for CBCL Internalizing

Table 3  
Hierarchical Type classification scheme predicting child outcomes

Outcome variable	Overall final model $F$	Final model total adjusted $R^2$	Significant type variables <sup>a</sup>	Unstandardized $B$	Standard Error $B$
CBCL Total Problems	2.14*	.022	Sex Abuse	2.84*	1.42
TSCC	1.92*	.016	Sex Abuse	3.80*	1.72
Post-traumatic Stress			Physical Abuse	3.12*	1.43
TSCC Anger	1.76 <sup>+</sup>	.015	Sex Abuse	4.06**	1.54

<sup>a</sup> Reference group is Neglect predominant type.

<sup>+</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

Problems, Vineland Daily Living Skills, and Vineland Socialization were significant but the coefficients associated with the HT variables did not reach statistical significance. The final models predicting CBCL Total Problems ( $F = 2.14$ ,  $p < .05$ ) and TSCC Post-traumatic Stress ( $F = 1.92$ ,  $p < .05$ ) were significant and involved HT variables as significant predictors of these outcomes. Controlling for the effects of age, gender, minority status, income and site, Sexual Abuse as predominant type was associated with greater symptomatology than Neglect as predominant type as indicated by CBCL Total Problems ( $B = 2.84$ ,  $p < .05$ ) and TSCC Post-traumatic Stress ( $B = 3.80$ ,  $p < .05$ ). In the case of Post-traumatic Stress, Physical Abuse predominant type was also related to higher symptom endorsement than the Neglect predominant type ( $B = 3.12$ ,  $p < .05$ ). In addition, while the overall model was marginally significant in predicting TSCC Anger ( $F = 1.755$ ,  $p < .07$ ), results indicated that Sexual Abuse predominant type was associated with greater Anger symptoms compared to the Neglect type ( $B = 4.06$ ,  $p < .01$ ).

#### Severity/Frequency Type classification scheme and child outcomes

The pertinent findings of regression models examining the SFT classification scheme are presented in Table 4. The final models for Vineland Daily Living Skills and Vineland Socialization were significant but the SFT variables did not contribute to prediction of these outcomes. The SFT typology significantly contributed to the prediction of only one child outcome, Internalizing Behavior Problems ( $F = 2.37$ ,  $p < .01$ ). The predominant type of Physical Abuse was related to lower levels of Internalizing problems compared to Neglect type ( $B = -4.07$ ,  $p < .01$ ). In addition, the final model predicting CBCL Total Problems

Table 4  
Severity/Frequency Type classification scheme predicting child outcomes

Outcome variable	Overall final model $F$	Final model total Adj. $R^2$	Significant type variables <sup>a</sup>	Unstandardized $B$	Standard Error $B$
CBCL Internalizing Problems	2.37*	.029	Physical Abuse	-4.07**	1.53
CBCL Total Problems	1.60 <sup>+</sup>	.013	Physical Abuse	-3.80*	1.59

<sup>a</sup> Reference group is Neglect predominant type.

<sup>+</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

approached significance ( $F = 1.60, p < .10$ ), and again the Physical Abuse type was associated with fewer problems than was the Neglect type ( $B = -3.80, p < .05$ ).

#### *Hierarchical Type and Severity/Frequency Type schemes with multiple type variable*

As indicated by our preliminary analyses, the predominant types derived from both the HT and SFT systems were confounded with the existence of multiple co-occurring types. Therefore, we sought to determine whether the effects associated with these predominant type classifications were due only to the presence of multiple types in certain groups. As such, we conducted analyses identical to those just described but included a block containing the indicator of multiple types of maltreatment inserted into the second step of the models before entering the predominant type classifications. Prior to entry of the predominant type classifications, the multiple types variable entered in the second block contributed significantly to the prediction of CBCL Total ( $B = 3.12, p < .01$ ), Internalizing ( $B = 2.17, p < .05$ ), and Externalizing scales ( $B = 2.94, p < .05$ ), Vineland Socialization ( $B = -2.87, p < .05$ ), TSCC Anger ( $B = 2.18, p < .05$ ), Depression ( $B = 3.10, p < .05$ ), and Post-traumatic Stress ( $B = 3.29, p < .01$ ). In each case, having multiple types of documented maltreatment experiences was robustly related to poorer child developmental outcomes.

Table 5 displays the results when using the HT classification scheme to predict child outcomes after accounting for variance contributed by the multiple types variable. After accounting for sociodemographic controls and the occurrence of multiple types, the HT predominant type variables remained significant as predictors of 3 of the 10 child outcomes, including CBCL Total Problems, Internalizing Problems and TSCC Anger. Predominant type of Physical Abuse was associated with fewer Internalizing symptoms than the predominant type of Neglect ( $B = -4.36, p < .05$ ). Predominant type of Sexual Abuse was related to greater Anger symptoms on the TSCC compared to Neglect ( $B = 5.41, p < .05$ ). Moreover, the results of the model indicate that the entry of the HT variables in Block 3, rendered the multiple variables non-significant in predicting child reported Anger on the TSCC. In this way, the evidence suggests that the effect of the multiple types variable was fully accounted for by the effects of the HT typology variables (cf. Baron & Kenny, 1986).

Table 5  
Hierarchical Type classifications and multiple types predicting child outcomes

Outcome variable	Overall final model $F$	Final model total Adj. $R^2$	Significant type variables <sup>a</sup>	Unstandardized $B$	Standard Error $B$
CBCL Total Problems	2.12*	.024	Multiple	5.10**	1.84
			Physical Abuse	-3.52 <sup>+</sup>	1.81
CBCL Internalizing Problems	2.57**	.033	Multiple	4.56*	1.77
			Physical Abuse	-4.36*	1.74
TSCC Anger	1.64 <sup>+</sup>	.015	Multiple	n.s.	-
			Sexual Abuse	5.41*	2.37

<sup>a</sup> Reference group is Neglect predominant type.

<sup>+</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

Table 6  
Severity/Frequency Type classifications and multiple types predicting child outcomes

Outcome variable	Overall final model $F$	Final model total Adj. $R^2$	Significant type variables <sup>a</sup>	Unstandardized $B$	Standard Error $B$
CBCL Total Problems	2.15*	.027	Multiple	3.06**	1.09
			Physical Abuse	−3.97*	1.58
CBCL Internalizing Problems	2.40**	.033	Multiple	n.s	–
			Physical Abuse	−4.16*	1.53

<sup>a</sup> Reference group is Neglect predominant type.

\*  $p < .05$ .

\*\*  $p < .01$ .

Similarly, the results summarized in Table 6 indicate that after taking into account the existence of multiple maltreatment types, the SFT predominant types were still associated with CBCL Internalizing and Total Problems scores. In both cases, the predominant type of Physical Abuse was related to lower problem scores compared to the predominant type of Neglect ( $B = -4.16$ ,  $p < .01$ , and  $B = 3.97$ ,  $p < .05$ ). In the model predicting CBCL Internalizing scores, the entry of the SFT variables in the third block rendered the multiple types variable from the second block no longer significant. Again this is some indication that the effect of the multiple types variable was fully explained by the SFT typology.

In summary, the multiple types variable was robustly related to greater symptomatology endorsed on the CBCL and TSCC. However, in some cases, the predominant type classification schemes further contributed to the prediction of child outcomes. In other words, the presence of multiple types of maltreatment did not always explain the effects of the predominant type classifications. In two instances, it appeared that the predominant type classifications mediated the effect of the multiple types variable.

#### *Expanded Hierarchical Type classification scheme and child outcomes*

Selected results of the regression models examining the EHT classification system are summarized in Table 7. The final models predicting CBCL Total Problems ( $F = 2.14$ ,  $p < .05$ ), Internalizing Problems ( $F = 2.41$ ,  $p < .05$ ) were significant and the final models for CBCL Externalizing Problems ( $F = 1.68$ ,  $p < .07$ ), TSCC Post-traumatic Stress ( $F = 1.62$ ,  $p < .09$ ), and TSCC Anger ( $F = 1.82$ ,  $p < .07$ ) approached significance and involved EHT variables as significant predictors of these outcomes. Controlling for the effects of age, gender, minority status, income and site, the predominant type of Sexual Abuse Plus Other Maltreatment Types was associated with greater symptomatology than the predominant type of Neglect as indicated by CBCL Total Problems ( $B = 2.84$ ,  $p < .05$ ), Externalizing Problems ( $B = 3.53$ ,  $p < .05$ ), TSCC Anger ( $B = 3.77$ ,  $p < .05$ ), and TSCC Post-traumatic Stress ( $B = 4.02$ ,  $p < .05$ ). In addition, results indicated that Physical Abuse Plus Neglect type was associated with greater TSCC Post-traumatic Stress symptoms compared to the Neglect type ( $B = 3.29$ ,  $p < .05$ ). In the case of Internalizing problems, Physical Abuse Only predominant type was related to lower symptom endorsement than the predominant type Neglect ( $B = -4.95$ ,  $p < .01$ ).

Table 7  
Expanded Hierarchical Type classification scheme predicting child outcomes

Outcome variable	Overall final model $F$	Final model total Adj. $R^2$	Significant type variables <sup>a</sup>	Unstandardized $B$	Standard Error $B$
CBCL Total Problems	1.94*	.022	Sex Abuse Plus Physical Only	2.84* −3.52 <sup>+</sup>	1.42 1.96
CBCL Internalizing Problems	2.41**	.033	Physical Only	−4.95**	1.88
CBCL Externalizing Problems	1.68 <sup>+</sup>	.016	Sex Abuse Plus	3.53*	1.46
TSCC	1.61 <sup>+</sup>	.015	Sex Abuse Plus	4.02*	1.79
Post-traumatic Stress			Physical Abuse + Neglect	3.29*	1.56
TSCC Anger	1.82 <sup>+</sup>	.015	Sex Abuse Plus	3.77*	1.60

<sup>a</sup> Reference group is Neglect predominant type.

<sup>+</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

In summary, our analyses suggest that the HT and SFT classification schemes contributed to the prediction of child developmental outcomes, with HT system performing somewhat better than the SFT system. Further our results suggest there is some increased predictive validity of the predominant type classifications over and above just having information about whether there were multiple co-occurring maltreatment sub-types in a child's history. Finally by using the EHT system, we noted a pattern in the salient combination and single maltreatment types that contributing to prediction of child outcomes across the models. The predominant types of Sexual Abuse Plus Other Maltreatment Types and Physical Abuse Plus Neglect predicted poorer outcomes than the Neglect type, while the Physical Abuse Only type was associated with fewer symptoms than observed in the among children in the Neglect type group.

## Discussion

We examined three methods of classifying a predominant type of maltreatment and evaluated their predictive validity in terms of explaining child developmental outcomes. These three typologies were chosen for different purposes. The HT method was examined because of its ecological validity in resemblance to typical CPS practices. The SFT classification scheme was predicated on the theoretical assumption that certain dimensions of maltreatment events (including severity and frequency) can be used to characterize a predominant type among multiple co-occurring types. The EHT represents a refinement of the HT offering more differentiation of pure types from certain type combinations.

Our initial analyses suggested that there may be some value in using such classification schemes to identify the predominant type of maltreatment experienced by a child to predict behavioral and functional outcomes. We found that this classification conveys information about child outcomes over and above knowing whether a child had multiple types of maltreatment victimization. Both the HT and SFT systems demonstrated some ability to predict child functioning outcomes in the domain of behavioral problems and trauma symptoms. Our follow-up analyses suggested that in some cases, the explanatory power of these

three typologies was sustained when the occurrence of multiple types of maltreatment in the child's history was taken into account. For these reasons, there may be some utility in classifying a single predominant type of maltreatment because the effects of the predominant type classification were not always explained by the variable indicating multiple co-occurring sub-types. Furthermore, there were some instances when the relationship between the predominant type classification and the child outcome appeared to account for the relationships observed between the occurrence of multiple types of maltreatment and child outcomes.

Next, we found that the EHT scheme may provide greater discriminative validity than the HT classification scheme since the more differentiated EHT categories were significantly associated with 5 versus 3 (as in the HT classification) child developmental outcomes. There was value in distinguishing certain combined and single maltreatment types using the EHT system, with certain predominant type classifications related to poorer child outcomes. Children classified as having had Sexual Abuse Plus Other Maltreatment Types and Physical Abuse Plus Neglect tended to fare worse than children classified in the Neglect type group. On the other hand, children with Physical Abuse Only type of maltreatment displayed fewer symptoms than children in the Neglect type group. However, the interpretation of these results must be tempered by the fact that the variance explained by the predominant type schemes was very limited, typically explaining only 1% to 2% of the variance in the outcomes. This limited explanation of outcomes was somewhat surprising but may be related to two methodological issues. First, we relied on CPS reports of maltreatment, which may at times be quite distal to the actual maltreatment experiences of the youth under study (see limitations discussed below). Second, all the children under study had maltreatment reports filed with CPS and thus were likely victimized in one form or another. In most studies, the inclusion of a control group of non-maltreated youth provides greater variance in child outcomes to be explained by maltreatment dimensions.

The results from the current investigation may be important in interpreting the results of previous studies that have demonstrated differences in outcomes based on predominant type. It is likely these studies may have confounded predominant type categories with the number of types of maltreatment experienced. Indeed, our results indicate that the experience of multiple types of maltreatment appears to be a robust factor in predicting child outcomes. This is consistent with previous studies citing more severe child maladjustment associated with a history of multiple versus single types of maltreatment (Eckenrode et al., 1993; Trickett & McBride-Chang, 1995). Yet, characterizing a predominant type may still offer some promise in distinguishing specific effects of sub-types of maltreatment.

It may be important to account for the breadth and pervasiveness of types of maltreatment as well as trying to characterize children's diverse victimization experiences into a predominant type profile. For example, the number of types of maltreatment may be one indicator of breadth and pervasiveness of the victimization experience that contributes to prediction of developmental outcomes above and beyond knowing the predominant type. Furthermore, it appears that different ways of classifying predominant type of maltreatment yield varying levels of predictive validity. Our analyses suggest that systems that group children into types of active and passive maltreatment in a hierarchical manner may actually provide some predictive utility. The HT scheme gave primacy to sexual abuse, then physical abuse followed by neglect and then emotional maltreatment. Sorting children into maltreatment types using this scheme did contribute to prediction of some child outcomes, lending perhaps some credence to prevailing patterns of closer scrutiny of these "active" forms of maltreatment by CPS workers (Wells et al., 1991). Furthermore, systems that differentiate between single types versus combined types provide more detailed categories and may provide finer discrimination regarding long-term outcomes. However, examination of our results does not support the notion that active forms of maltreatment are consistently associated with

poorer outcomes than maltreatment resulting from acts of omission (Neglect). Predominant Sexual Abuse coupled with Other Forms of Maltreatment was typically related to more symptoms of psychological distress compared to predominant Neglect. However, the predominant type of Physical Abuse without Neglect was related to lower levels of symptoms compared to the predominant type of Neglect. On the other hand, the combined type of Physical Abuse plus Neglect was in some cases related to more distress than Neglect Alone.

It is important to note a major limitation of this initial exploratory study on methods for classifying predominant type of maltreatment. The current study relied on case records as the single source of information about the actual types and severity of maltreatment that the child may have experienced. CPS workers may focus on specific information about certain types of maltreatment and may not garner or record details about other types of maltreatment. For instance, workers may be more likely to document incidents of active forms of abuse, such as physical and sexual abuse, while devoting less attention to neglect or emotional maltreatment. Our type classification schemes are then better characterized as groupings of report types rather than reified as actual constellations of maltreatment experiences. A second limitation is related to sampling, the current study did not draw a random sample of children with maltreatment allegations. As described in the Introduction to the special section, the various study sites included special populations (e.g., children with a history of out-of-home placement, children with moderate to high risk for re-victimization determined by CPS risk assessment, children meeting criteria for “failure to thrive”). As such, these children may not be representative of the general population of children with CPS maltreatment allegations. For example, the rate of sexual abuse victimization in this sample of 8-year-olds was 20%, which is exceptionally high. It is possible then that our results may be skewed and generalizable only to higher risk maltreated populations. A third limitation of the study involved the regression analyses. We selected neglect as the reference type category in all models predicting child developmental outcomes. It is possible that contrasting other type categories (e.g., Physical Abuse vs. Sexual Abuse) would have yielded additional significant results. However, these additional contrasts were not included as a part of this study, as we did not want to further inflate experiment-wise error rates.

Notwithstanding these limitations, our results suggest that there is value in further exploring the predictive power of examining specific combinations and profiles of maltreatment reports. Indeed other investigators have similarly identified specific combinations of types of maltreatment as extremely detrimental to child adaptation. For example, Bagley and Mallick (2000) report that when Physical Abuse or Emotional Abuse is coupled with Sexual Abuse, the symptoms of emotional disorder associated with Sexual Abuse are exacerbated. Similarly, McGee, Wolfe, and Wilson (1997) report that the co-occurrence of perceived psychological maltreatment enhanced the predictive validity of other maltreatment types experienced by youth. These findings highlighted the particularly potentiating effects of co-occurring emotional maltreatment, an issue addressed in a separate paper in the current issue. It was not within the scope of the current study to examine all possible interactions between types of maltreatment. We examined classification typologies that, for better or worse, folded many youngsters with a history of Emotional Maltreatment into other predominant type groups. However, our findings as well as those of other investigations (cf. Trickett & McBride-Chang, 1995) underscore the importance of considering multiple types of maltreatment simultaneously in combination, rather than one at a time. It may be important for future research to move beyond coding the presence or absence of specific types of maltreatment to a more thorough examination of the conditions associated with specific clusters of co-occurring maltreatment sub-types. The apparent “synergistic” and “interactive” nature of diverse maltreatment experiences deserves further exploration and explication.

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## Résumé

**Objectif:** Le but primitif de l'étude a été d'identifier un schéma de classification, pour la détermination du type prédominant de maltraitance dans l'histoire d'un enfant, qui prédise au mieux les différences dans les évolutions ultérieures.

**Méthode:** Trois différents plans de classification par type prédominant ont été examinés dans un échantillon de 519 enfants avec une histoire de maltraitance supposée. Les cas ont été classés dans des types de maltraitance prédominante selon trois plans différents:

1. Le Type Hiérarchique (TH) basé sur une hiérarchie qui donne priorité aux formes actives plutôt qu'aux formes passives d'agression;
2. Le Type Gravité/Fréquence (TGF) qui met en évidence les cas où le type de maltraitance est lié au taux le plus élevé de gravité ou de fréquence;
3. Le Type Hiérarchique étendu (THE) qui différencie les combinaisons multiples de maltraitance depuis les sous-types "purs" et les simples. Des analyses de régression hiérarchique ont cherché si les classifications TH, TGF et THE contribuaient à la prédiction de problèmes comportementaux infantiles, de symptômes traumatiques, et à un fonctionnement adaptatif.

**Résultats:** Après contrôle des facteurs démographiques, les définitions TH faisaient prévoir quatre évolutions, les TGF trois, et les classifications THE amenaient à prévoir cinq types d'évolution infantile. La co-survenue de multiples sortes de maltraitance était fortement reliée à des évolutions. Cependant, les classifications TH et TGF auguraient de certaines évolutions même après explication de la co-survenue de multiples sous-types de maltraitance.

**Conclusions:** Un schéma de classification qui différencie des combinaisons et des mauvais traitements isolés peut avoir la plus grande validité prédictive. Au delà de la connaissance de la co-survenue de sous-types de maltraitance, il est important de comprendre quel type, ou constellation de types de maltraitance ont été déclarés dans l'histoire d'un enfant.

## Resumen

Spanish-language abstract not available at time of publication.