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Gee, Kevin A

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**Maltreatment Profiles of Child Welfare-Involved Children in Special Education:
Classification and Behavioral Consequences**

Kevin A. Gee, Ed.D.¹
Associate Professor
University of California, Davis
School of Education
One Shields Ave.
Davis, CA 95616
(530) 752-9334
kagee@ucdavis.edu

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¹ Corresponding author

Abstract

In this study, I investigated the maltreatment profiles of child welfare-involved children in special education and examined how those profiles influenced their internalizing and externalizing behaviors. I analyzed data on a sample of $n = 290$ children (63% male, 37% female, $M_{\text{age}} = 11$ years) from the National Survey of Child and Adolescent Well-Being II. When weighted, this sample represented over 233,000 children involved in the child welfare system and in special education. Results from latent class analyses revealed four maltreatment classes, listed by predominance: (a) supervisory neglect, (b) physical abuse, (c) other forms of maltreatment, and (d) sexual abuse. Relative to children in the sexual abuse class, children had higher teacher-reported internalizing problem behaviors if their predominate maltreatment class was either supervisory neglect or physical abuse. Understanding maltreatment and its consequences for child welfare involved children in special education can help better inform ways to promote their educational success.

Keywords: children with disabilities; maltreatment; special education, externalizing and internalizing behaviors; latent class analysis

Maltreatment Profiles of Child Welfare-Involved Children in Special Education:
Classification and Behavioral Consequences

For educators who support children in special education, knowledge of a child's disability is critical to promote their learning. However, educators often vary in their knowledge and awareness about the types of maltreatment a child has experienced in the past, in other words, their *maltreatment profiles*. Knowledge of the intersectional relationship between maltreatment profiles and disability introduces complexities into how special education and related services might need to be delivered. For instance, exposure to different combinations of maltreatment might further exacerbate a child's disabilities (Child Welfare Information Gateway and Prevent Child Abuse America, 2013; Stalker & McArthur, 2012) thereby requiring adjustments to ongoing educational supports and interventions.

Yet, though we know that maltreatment and disability often co-occur and can have a bi-directional relationship with each other (Crosse, Kay, & Ratnofsky, 1992; Leeb, Bitsko, Merrick, & Armour, 2012; Maclean et al., 2017; Sedlak et al., 2010; Sullivan & Knutson, 1998, 2000; Westcott, 1991; Westcott & Jones, 1999), we lack consistent and reliable information about the maltreatment experiences of child welfare system (CWS)-involved children eligible to receive special education services (Child Welfare Information Gateway, 2018). This lack of reliable information, particularly nationwide, stems in part from the absence of a comprehensive national reporting system, particularly one capturing both maltreatment and disability data alongside a child's special education status. Moreover, although a robust body of research documents the consequences of abuse and neglect (National Research Council, 1993; Pears, Kim, & Fisher, 2008; Petrenko, Friend, Garrido, Taussig, & Culhane, 2012), such research typically focuses only on all children broadly and rarely focuses explicitly on children with disabilities in the child welfare system.

To address these two gaps, I employed (a) latent class analysis (LCA) to develop profiles of the maltreatment experiences of CWS-involved children who were eligible to receive special education services and (b) hierarchical linear modeling (HLM) to estimate whether different maltreatment profiles relate to differences in their teacher-rated externalizing and internalizing behaviors. To carry out these two objectives, I analyzed data from the National Survey of Child and Adolescent Well-Being II (NSCAW II; U.S. Department of Health and Human Services), one of the most comprehensive surveys covering children involved with Child Protective Services (CPS) agencies across 30 states.

Methodologically, my use of LCA to develop maltreatment profiles offers a distinct advantage over approaches that simply classify children based on their most severe form of maltreatment (Rivera, Fincham, & Bray, 2018; Roesch, Villodas, & Villodas, 2010). LCA can help researchers more accurately capture the true maltreatment experiences of CWS-involved children in special education. Such experiences are often multidimensional and involve multiple, overlapping forms of maltreatment (Warmingham, Handley, Rogosch, Manly, & Cicchetti, 2019). In doing so, LCA allows researchers to classify children into several distinct groups (i.e., *profiles*) based on their experiences of multiple forms of maltreatment. LCA groups together children who look similar based on their maltreatment experiences, and at the same time, it draws clearer distinctions between children with different maltreatment experiences.

As such, LCA is often referred to as a *person-centered approach* (Lanza & Cooper, 2016) given that it focuses on establishing patterns *within* individuals (versus between) and grouping individuals who have similar within-person patterns into the same groups (Rivera et al., 2018). Prior research on children with exceptionalities has leveraged LCA to establish empirically within-person patterns on a range of characteristics. These include studies that have classified (a) the functional abilities of children with disabilities (McLaughlin, Snyder, & Algina, 2015), (b) the

bullying and victimization experiences of gifted students (Ryoo, Wang, Swearer, & Park, 2017), (c) recidivism for juvenile offenders with disabilities (Zhang, Hsu, Katsiyannis, Barrett, & Ju, 2011), and (d) errors on computational items that children with disabilities make (Bottge, Cohen, & Choi, 2018).

Overall, through my study, I offer a more nuanced picture of the maltreatment and disability nexus thereby contributing to the broader literature on the developmental welfare of maltreated children with disabilities.

Background

Child Maltreatment

Child maltreatment is a phenomenon that encompasses different forms of child abuse and neglect. According to the federal Child Abuse Prevention and Treatment Act (CAPTA), abuse and neglect includes:

Any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act, which presents an imminent risk of serious harm. (Child Abuse and Prevention Treatment Act, 2011)

Under this definition, states recognize four types of maltreatment: neglect, physical abuse, psychological maltreatment and sexual abuse (U.S. Department of Health & Human Services, 2016).

According to the U.S. Department of Health and Human Services (U.S. Department of Health & Human Services, 2016), *neglect* is “the failure by the caregiver to provide needed, age-appropriate care although financially able to do so or offered financial or other means to do so” (p. 102); *physical abuse* includes “physical acts that caused or could have caused physical injury to a child.” (p. 103); *psychological (or emotional) maltreatment* includes “Acts or omissions—other

than physical abuse or sexual abuse—that caused or could have caused—conduct, cognitive, affective, or other behavioral or mental disorders” (p. 104); and *sexual abuse* is “the involvement of the child in sexual activity to provide sexual gratification or financial benefit to the perpetrator, including contacts for sexual purposes, molestation, statutory rape, prostitution, pornography, exposure, incest, or other sexually exploitative activities.” (p. 106).

Maltreatment among Children with Disabilities

Prevalence. When focusing just on studies that use regionally or nationally representative samples, three notable patterns emerge in the prevalence and heterogeneity of maltreatment among children with disabilities. Table 1 summarizes four such studies. First, neglect is the most prevalent form of maltreatment among children with disabilities affecting nearly 1 in 4 (Maclean et al., 2017; Sullivan & Knutson, 2000). Second, besides neglect, physical abuse is also highly prevalent. For instance, in a study of 35 CPS agencies with 1,834 children who had both a disability and a substantiated report of maltreatment, physical abuse was most common (35%) (Crosse et al., 1992). Further, physical abuse, in combination with other forms of maltreatment, was highly prevalent and just behind the rates of neglect (Sullivan & Knutson, 2000). Third, and finally, emotional abuse was one of the least prominent forms of maltreatment among children with disabilities, affecting about 1 in 10 (Sullivan & Knutson, 2000) and 1 in 28 children (Crosse et al., 1992). Similarly, incidence rates for emotional abuse based on the Fourth National Incidence Study of Child Abuse and Neglect were 3 in 1000 (Sedlack, 2014).

Theoretical foundations. Early models explaining the maltreatment of children with disabilities attributed the risk of abuse to children’s own behaviors and attributes such as their disability type, gender and age (Leeb et al., 2012). Later, caregiver stress or frustration models were developed which suggest that the nature of a child’s disability can place increased emotional, economic and physical demands on caregivers (Ammerman, Van Hasselt, & Hersen, 1988). As a

result, caregivers of children with disabilities may experience heightened stress and frustration. This stress can lead to diminished caregiver-child interactions and caregiver coping abilities thereby leaving children more vulnerable to maltreatment (Leeb et al., 2012).

More robust ecological models conceptualize the factors leading to the maltreatment of children with disabilities as a nested series of influences, extending beyond children and their interactions with their caregivers, to their family environments, familial social networks, and communities (Algood, Hong, Gourdine, & Williams, 2011; Leeb et al., 2012). Influential factors include parental history of abuse, neighborhood poverty and parental social networks (Algood et al., 2011). For instance, parents caring for children with disabilities may have limited social networks which constrains their access to respite care as well as social support thereby leaving their children more prone to abuse or neglect (Committee on Child Abuse and Neglect and Committee on Children with Disabilities, 2001).

Though theory helps us understand why children with disabilities experience maltreatment, it is important to acknowledge that there is a reciprocal relationship between maltreatment and disabilities: children with disabilities may experience maltreatment, and conversely, maltreatment itself can also lead to disabilities (Leeb et al., 2012). For instance, children whose mothers abused alcohol and drugs during pregnancy can experience severe developmental delays (Vig & Kaminer, 2002) and physically abused children can suffer traumatic brain injuries (Libby, Sills, Thurston, & Orton, 2003). Further, there can be wide ranging detriments to children's cognitive functioning, language as well as externalizing and internalizing behaviors in the wake of different forms of neglect (Spratt et al., 2012).

The Behavioral Consequences of Maltreatment

Because a gap exists in the research base on maltreated children with disabilities, what we know about the behavioral consequences of maltreatment comes entirely from research on

maltreated children as a whole. Theoretically, these behavioral problems due to maltreatment can be attributed to the direct distress of experiencing abuse and neglect, which triggers an intense emotional response in children (Heleniak, Jenness, Vander Stoep, McCauley, & McLaughlin, 2016). Children cope with these emotions using maladaptive strategies, such as rumination and impulsivity (Heleniak et al., 2016). Transactional perspectives also shed light on why maltreatment can lead to behavioral problems (Van Wert, Mishna, & Malti, 2016). Maltreatment, especially when experienced early in life, can disrupt child-parent interactions and attachment (Aber & Allen, 1987); consequently, as attachment theory predicts, children who experience insecure attachment are more vulnerable to externalizing disorders (Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010).

Children's behavioral responses to maltreatment can also vary based on their maltreatment types. This variability exists because different forms of maltreatment can trigger different kinds of behavioral responses. Two key studies show how particular forms of maltreatment can worsen certain behavioral responses (e.g., heightened externalizing and internalizing problem behaviors) relative to others. Petrenko et al.'s, (2012) investigation of 334 maltreated 9- to 11-year olds in out of home care showed that in contrast to children who experienced supervisory neglect, those who suffered physical abuse had higher externalizing behaviors. Also, children physically neglected had higher internalizing behaviors versus those who experienced supervisory neglect. These differential effects have also appeared in a sample of younger maltreated children as well. In a sample of 117 preschoolers, Pears et al. (2008) found that those who experienced a combination of sexual abuse, physical abuse, emotional maltreatment and neglect had the highest externalizing behavior problems versus those who experienced supervisory neglect and emotional maltreatment. On the other hand, their results showed that children experiencing a combination of supervisory

neglect and emotional maltreatment had lower internalizing behavior problems relative to all other groups.

Present Study

There are two main gaps in the literature on maltreatment and disability that I address. First, given that children with disabilities often experience multiple types of maltreatment, we need more nuanced approaches to understanding children's different maltreatment profiles. Second, although the effects of abuse and neglect on children's outcomes have been studied extensively in children in the broader population, we have limited knowledge about how CWS-involved children with disabilities fare.

Accordingly, two central research questions guide this study:

1. What are the maltreatment profiles of CWS-involved children who were eligible to receive special education services?
2. Among CWS-involved children identified as eligible to receive special education services, do those with different maltreatment profiles have different internalizing and externalizing behaviors?

Method

Dataset and Sample

I used restricted-use secondary data from the Department of Health and Human Service's National Survey of Child and Adolescent Well-Being II (NSCAW II). The NSCAW II is the only contemporary, nationwide longitudinal study of children who were reported to have been abused or neglected (U.S. Department of Health and Human Services, 2012). This longitudinal dataset includes three waves of data, collected between 2008 and 2012. It captures children's well-being, including their performance on a battery of standardized cognitive and behavioral assessments as well as information reported by children's caregivers, welfare caseworkers, and teachers. The

sample was drawn using a two-stage stratified design with nine primary strata that included eight states, each serving as its own strata, with the largest child welfare caseloads and one strata comprised of the remaining 38 states, including Washington DC. Due to non-participation, the final sample included 30 states in which the survey was eventually conducted.

From the overall NSCAW II sample of 5,872 children aged 0-17, I identified all the children in the dataset who were school-aged and had a teacher report of an IEP in wave 2 of the study. This yielded an analytic subsample (unweighted) of $n = 290$ children (63% male, 37% female, $M_{\text{age}} = 11$ years, age range: 5-17 years). I used this analytic sample to conduct all subsequent analyses. When weighted, this sample represents nearly 233,000 children involved in the child welfare system who were also reported to be eligible for special education services (National Data Archive on Child Abuse and Neglect, 2014). Because the NSCAW II data contained no individually identifiable information, this study was not considered human subjects research and therefore did not require Institutional Review Board review.

The NSCAW II collected data from teachers either via paper-and-pencil or online instruments whereas information from caseworkers and caregivers was collected through computer-assisted interviewing instruments. As described below, caseworkers were also interviewed in person. For wave 2 of the NSCAW II, the response rate among eligible teachers was 72.7% and the response rates for eligible caregivers and caseworkers were 85.7%, and 93.9%, respectively.

Measures

Maltreatment. Data on a child's maltreatment came from interviews with investigative caseworkers using a modified version of the Maltreatment Classification System (MCS; Barnett, Manly, & Cicchetti, 1993). The MCS has been shown to be reliable and valid when classifying maltreatment (Manly, 2005). Investigative caseworkers were asked during an in person interview at the child welfare agency to identify any maltreatment experienced by the child, based on the

child's case report. Caseworkers were presented with a list of 17 maltreatment categories from which they could select. In addition to the ten categories typically found in the MCS, seven additional categories were added to obtain more detail (Casanueva, Smith, Dolan, & Ringeisen, 2011). The 17 categories appear in Table 2.

Individualized Education Program (IEP) status. To identify the analytic sample, I relied on an item in the teacher survey asking the child's teacher whether or not the child currently had an IEP. Teachers were blinded to the child's maltreatment status and were told they were participating in a survey to gather information about the child's experiences and outcomes in school. Teachers who participated in the survey were either the child's primary teacher, language arts teacher or special education teacher who knew the child for at least 2 months. This timeframe ensured that a teacher knew the child well enough to accurately identify the child's current IEP status.

Externalizing and internalizing behaviors. Children's behavioral outcomes were based on teacher's ratings on the Teacher Report Form (TRF) derived from the Child Behavior Checklist (CBCL; Achenbach, 1991). Teachers were asked to rate, on a 3-point scale (0 [*not true*], 1 [*somewhat or sometimes true*], or 2 [*very true or often true*]) statements about the child's current behavior in the past 2 months. Externalizing standard scores ($M = 50$, $SD = 10$) were based on responses to the Delinquent Behavior and Aggressive Behaviors problem scales of the TRF. Internalizing standard scores ($M = 50$, $SD = 10$) were based on the Withdrawn, Somatic Problems and Anxious/Depressed problem scales. The TRF has been shown to have high reliability among participants in the prior version of the NSCAW ($\alpha = .90$ for externalizing behaviors; $\alpha = .91$ for internalizing behaviors; National Data Archive on Child Abuse and Neglect, 2014).

Child and caregiver control variables. When analyzing how maltreatment related to children's behavioral outcomes, I controlled for attributes of children and their caregivers. These attributes were potential confounders with maltreatment.

Primary disability. Upon answering affirmatively to whether the child currently had an IEP, the teacher was asked to identify the child's primary disability in 14 categories. In order to ensure sufficiently large groupings for model estimation purposes, these 14 categories were collapsed into seven broader categories, based on the frequency with which they occurred: (a) emotional disturbance, (b) hearing impairment, (c) intellectual disability, (d) specific learning disability, (e) speech or language impairment, (f) other health impairment, and (g) the remaining disability categories (these other categories are noted at the bottom of Table 2).

Demographics. Additional demographic variables included a child's: (a) gender, reported in two categories and coded as 1 = *male*, 0 = *female*; (b) racial and ethnic background, reported in four categories: Black non-Hispanic, Hispanic, White non-Hispanic, or another race or ethnicity; and (c) age, reported in years.

Poverty level. The caregiver's poverty level was reported in four categories based on 2010 U.S. Department of Health and Human Services poverty guidelines (e.g., for a family of 4, the poverty guideline was \$22,050): (a) < 50%, (b) 50% to <100%; (c) 100% to < 200%, and (d) > 200%. The categories were constructed based on caregivers' self-reported household size and income. Group or residential home caregivers reported the number of children in the home and their income.

Caregiving setting. A child's current caregiving setting was reported in four categories: (a) in-home with a biological or adoptive parent; (b) kin care, either formal or informal; (c) foster care; (d) group, residential or out of home care. This variable was constructed from a combination of child, caregiver and caseworker reports originally reported in seven categories in the dataset.

Household size. The number of children in the caregiver's household.

Caregiver mental health. To capture the mental health of a caregiver, I used standardized scores for mental health on the Short-Form Health Survey (SF-12; Ware Jr., Kosinski, & Keller, 1996). Internal consistency was .79. Prior research has linked maternal mental health, including depression to the behavioral outcomes of children with disabilities (Hauser-Cram & Woodman, 2016).

Marital status. I included caregivers' self-reported marital status in two categories, coded as 1 = *married*, or 0 = *not married* (separated, divorced, widowed, or never been married).

Descriptive Statistics

Table 2 reports weighted descriptive statistics for each variable. Physical maltreatment was most prevalent, followed by supervisory neglect, and then sexual maltreatment. The most common disability was a specific learning disability (SLD), which mirrors the proportion of children with SLD (35%) in the overall population of children with disabilities (McFarland et al., 2018). Roughly 15% had an emotional disturbance, nearly three times the rate in the general population of children. Finally, equal proportions had either an intellectual disability or a speech or language impairment. In contrast to the general population of children with disabilities, there were slightly more children in the sample with intellectual disabilities (11% versus 7% in the general population), and the rate was about half for children with a speech or language impairment (11% versus 21% in the general population).

Other notable demographics show that the sample included a higher proportion of boys than girls, which is expected given gender differentials in special education placement (Wehmeyer & Schwartz, 2001). In terms of racial and ethnic representation, over half the sample was white and about a quarter of children were Hispanic. Finally, a majority of children were cared for by a

biological or adoptive parent and a majority lived with caregivers who had incomes at or below 200% of the federal poverty level.

Data Analysis

Latent class analysis (LCA). I used LCA to classify children based on caseworker reports of their maltreatment experiences. I fit a series of LCA models in Mplus 7 (Muthén & Muthén, 2012) yielding solutions that had from one to five maltreatment classes. The preferred number of classes was based on a solution that had (a) the lowest information criteria (Akaike Information Criterion [AIC]; Bayesian Information Criterion [BIC] and Sample-size Adjusted BIC [SABIC]); (b) classification quality (known as *entropy*) whose values were closer to 1; (c) mean class assignment probabilities $> .80$; and (d) conditional response probabilities within each class that were closer to 0 or 1 thereby facilitating the interpretability of each class (Geiser, 2012). Finally, I used an adjusted Lo-Mendell-Rubin test (LMRT) to compare the fit of a model with k (e.g. 4) versus $k - 1$ (e.g., 3) classes. Though a bootstrapped likelihood ratio test is more accurate (Nylund, Asparouhov, & Muthén, 2007), this test was not available when estimating model with survey design information. The LMRT with a p value less than .05 indicated that the solution with k classes was preferred over the solution with $k - 1$ classes. Code files for this study's LCA analyses are available from the author upon request.

Hierarchical linear modeling (HLM). After I identified the number of latent maltreatment classes using LCA, I entered these classes as predictors of behavioral outcomes in a two-level HLM model. HLM was appropriate given the structure of the NSCAW II data, in which children (Level 1) were clustered within welfare agency (Level 2). A composite specification of the two-level model for the i th child in the j th agency was as follows:

$$Y_{ij} = \gamma_{00} + \sum_{q=1}^Q \gamma_{q0} x_{qij} + \sum_{k=0}^K \phi_{k0} z_{kij} + u_{0j} + \varepsilon_{ij} \quad (1)$$

where Y_{ij} is the behavioral outcome of interest, x_{qij} represents a set of indicator variables representing the maltreatment latent classes (with one omitted) and z_{kij} represents a set of controls. u_{0j} is the random effect for agency and ε_{ij} is the individual level error term. Finally, γ_{q0} , the estimates of interest, capture how each maltreatment latent class—relative to the reference maltreatment class—relates to children’s behavioral outcome, net of controls. To adjust for differential probability of selection into the sample as well as noncoverage and nonresponse, I incorporated child and agency level weights when fitting the model to data. Standard errors were clustered by welfare agency. I fitted models separately for each behavioral outcome using Stata 15.1 (StataCorp, 2017). Code files for this study’s HLM analyses are available from the author upon request.

After fitting each model, I conducted a series of general linear hypothesis (GLH) tests. The first tested the null hypothesis that the coefficient estimates on each maltreatment class were equivalent, net of controls. This test answered whether the maltreatment classes were jointly related to each behavioral outcome. I also tested the null hypothesis that two different coefficient estimates on the classes was zero. These tests helped answer whether any two different maltreatment classes had distinct relationships to children’s behavioral outcomes.

Multiple hypothesis testing. Given an inflated Type I error rate due to multiple hypothesis testing, I adopted a more stringent alpha level of .004 to test the null. Thus, when the p value was less than .004, I rejected the null and the result was considered statistically significant.

Missing data. Rates of missingness were highest for maltreatment category ($n = 39$ or 13% of the sample), followed by disability category ($n = 23$; 8%) and then poverty category ($n = 20$; 7%). The measures of internalizing and externalizing behaviors were missing three and two observations, respectively. Caregiver mental health had two missing observations and marital

status was missing in 10 of the cases. Finally, gender, race-ethnicity, age, care setting and household size were not missing. A total of 51 (18%) children were missing either disability or maltreatment type.

To understand if missingness depended on key observables (gender, race-ethnicity and age), I regressed the fully observed variable (e.g., age) on a set of indicators (coded as missing = 1; 0 otherwise) for three variables missing more than 10 cases: maltreatment, poverty or disability. Based on the results (available from the author upon request), there were no significant differences at a Bonferroni adjusted significance level of $\alpha = .001$. Thus, I assumed that the missingness was not systematically related to these observed characteristics and that data were missing completely at random.

Results

Maltreatment Classes

LCA results indicated that four maltreatment classes best described the data. I selected the four class solution for its parsimony, interpretability and because it had the lowest goodness of fit statistics (AIC and SABIC as well as the LMRT statistic) in contrast to the one-, two-, three- or five- class solutions (Table 3). Classification quality for the four class solution also was high at .9.

Table 4 displays the conditional probabilities, derived from the LCA analyses, that a child within these four latent maltreatment classes had a caseworker who responded *yes* when asked if the child experienced that specific maltreatment type. Based on these probabilities, I labeled and interpreted the classes as children who predominately experienced (a) supervisory neglect; (b) physical abuse; (c) other forms of maltreatment other than neglect, sexual or physical abuse; or (d) sexual abuse.

Of the four classes, the supervisory neglect class was the most common with nearly 1 out of every 2 children in the sample in this class. In general, this class describes children who were not

adequately supervised, such that their safety was in jeopardy (Barnett et al., 1993). For example, this class includes children who were left alone for periods at a time while exposed to varying degrees of danger. Children in this class also had probabilities of also experiencing physical neglect (23%). In contrast to supervisory neglect, physical neglect means that the child's needs, such as food, clothing, shelter, and health care, were not adequately met. The second most common class was physical abuse, applicable to 1 in 4 children. These children also had probabilities (approximately 10%) of being physically neglected, physically abused or sexually abused. The third most common class, involving 14% of children, mostly experienced other forms of maltreatment (e.g., educational maltreatment). Finally, 12% were classified as predominately experiencing sexual abuse.

How Maltreatment Classes Related to Children's Behaviors

Table 5 displays results from two-level HLM models for each behavioral outcome. Given that the "other forms of maltreatment" class was ambiguous, I present results for three classes (neglect, sexual abuse and physical abuse). A GLH test of the joint significance showed that these maltreatment classes, as a whole, did not significantly relate to children's externalizing behavior problem scores at a Bonferroni adjusted significance level of .004, $\chi^2(3) = 10.74, p < .01$. However, the maltreatment classes, as a whole, significantly predicted their internalizing behavior scores, $\chi^2(3) = 18.99, p < .001$.

Pairwise tests summarized in Table 6 show that children who were in the physically abused class had higher internalizing behaviors versus those in the sexual abused class ($\gamma = 6.9; p < .004$), an effect size (ES) of about 0.70 *SD*. Similarly, children who were in the supervisory neglect class had higher internalizing behaviors versus those in the sexually abused class ($\gamma = 3.5; p = .004$), an ES of approximately 0.35 *SD*. Results of pairwise tests between each maltreatment

class showed no significant difference in externalizing behaviors scores between each maltreatment class.

Discussion

In this study, I determined the maltreatment profiles of a sample of CWS-involved children receiving special education, and assessed how those profiles related to their behavioral outcomes. I found that the two most prevalent maltreatment classes were characterized by children who primarily experienced supervisory neglect and physical abuse. Other maltreatment classes were less common, including sexual abuse. My findings are consistent with the findings of three studies summarized in Table 1: Sullivan and Knutson (2000), Sedlak et al., (2010) and Maclean et al. (2017). The consistency is noteworthy given that my sample included a narrower age range of school-aged children (5-17 year olds) and came from different geographic locations relative to the samples in the aforementioned studies.

The reason why supervisory neglect emerged as the most prominent maltreatment profile may be linked to challenges that caregivers may face in supporting children with disabilities. As Ammerman et al. (2000) noted, children with disabilities can face a heightened risk for neglect given the specialized needs (e.g., medical) and responsibilities associated with caring for children with certain disabilities. Consequently, there may be more opportunities for parents and caregivers to overlook those needs, especially if parents have limited resources to care for their children.

However, what this study also shows and adds to the current knowledge base is that the predominate form of neglect was supervisory neglect. In classifying maltreatment types, prior studies involving children with disabilities have not distinguished between physical and supervisory neglect. This distinction between these subtypes of neglect can be important. As Knutson et al. (2004) found in a sample of children in first and fifth grades, although both supervisory and physical neglect predict children's anti-social behaviors, they can also have

distinct effects. For example, supervisory neglect not only can lead to physical neglect, but it is more salient in mediating a family's social disadvantage on older rather than younger children's anti-social behaviors.

I also found that approximately 1 in 4 CWS-involved children with disabilities were classified as predominantly experiencing physical abuse. This is consistent with findings from Maclean et al., (2017) who found that about 24% of children in their sample experienced an allegation of physical abuse. Finally, in contrast to the rates of sexual abuse reported in Crosse et al. (1992) and Maclean et al. (2007) (19% and 22% respectively), sexual abuse was the least prominent maltreatment class, relevant to about 1 in 10 children in this study. Although sexual abuse was not as prevalent, understanding how it manifests among children with disabilities is still important to highlight. Some children with disabilities require close physical care and contact which can make them more vulnerable to potential abusers (Wilczynski, Connolly, Dubard, Henderson, & McIntosh, 2015). Also, children with disabilities may have challenges in distinguishing between appropriate versus inappropriate physical contact (Hibbard, Desch, & Committee on Child Abuse and Neglect, 2007).

Regarding the association between maltreatment classes and behavioral outcomes, CWS-involved children with disabilities who were primarily physically abused or experienced supervisory neglect had higher internalizing behavior scores relative to children who were classified as primarily experiencing sexual abuse. The internalizing behaviors of children with disabilities, especially those with intellectual disabilities, has already been shown to be higher than those of their peers without disabilities (Hauser-Cram & Woodman, 2016). Accordingly, physical abuse or supervisory neglect could further exacerbate their internalizing problems. When considered in the context of the broader research on maltreated children, these findings contrast with those of Petrenko et al., (2012) who found that children who were physically neglected also

had higher internalizing behaviors, but only relative to children who experienced supervisory neglect.

In terms of practice, knowledge of how distinct maltreatment profiles of CWS-involved children with disabilities resulted in more serious effects underscores the importance of tailoring types of intervention based on their maltreatment profiles (English et al., 2005). For instance, both caseworkers and teachers may need to augment behavioral supports and interventions for children whose maltreatment profiles show predominate patterns of either physical abuse or supervisory neglect. Further, information about maltreatment profiles and their distinct behavioral effects can help guide decision making about the personalized supports that can be integrated into support plans.

As for limitations of this study, these results provide correlational rather than causal evidence between certain maltreatment classes and children's behavioral outcomes. Further, given a bi-directional relationship between maltreatment and disability, it is difficult to disentangle whether abuse preceded the disability. Teasing out whether maltreatment preceded the disability diagnosis or vice versa is an unresolved issue that is endemic to the broader field of research on maltreatment and disability. Also, due to limitations in the data, these results do not account for the severity or chronicity of maltreatment. Future studies should incorporate measures of severity and chronicity as both have been shown to interact to influence the functioning of maltreated children (Manly, Cicchetti, & Barnett, 1994). Finally, these results are specific to this study's analytic sample of CWS-involved children eligible for special education services and are not generalizable to children with disabilities as a whole.

More broadly, this work has implications that lie at the intersection of the education and child welfare systems. For special education teachers and IEP team members, including school psychologists, understanding maltreatment and its consequences can better inform the types of

supports that children need to learn and can further contextualize challenges that may hinder progress in response to interventions. One emergent approach includes trauma-informed IEPs which can help re-envision goals and services specified in an IEP (Rossen, 2018). This can include, for example, identifying and building behavioral skills—such as relationship-building, self-regulation and social-emotional skills—important to children who have experienced trauma. Knowledge of children’s maltreatment profiles can also be instrumental in formulating broader safety objectives within their IEPs. Promoting communication and self-advocacy skills for children disabilities with a history of maltreatment can help them remain safe from further abuse and neglect (Johnson, 2015).

Finally, there are implications for future research. From an ecological perspective, children with disabilities develop within a nested system of influences, but rarely does maltreatment appear in more general studies on their developmental welfare. Not only does this gap in the knowledge base hinder our ability to plan for and invest in appropriate services on a larger scale, but it prevents deeper examination of why disabilities and maltreatment co-occur and how both concurrently influence outcomes. Methodologically, using statistical modeling techniques like structural equation modeling can help illuminate the socioecological determinants (e.g., poverty) of different maltreatment profiles and highlight key mechanisms that underlie the reciprocal relationship between profiles of maltreatment and disabilities. Accordingly, the developmental literature on children with disabilities would benefit from more rigorous and robust studies that address maltreatment head-on. Without attention to the intersectionality between maltreatment and disabilities, we may be overlooking critical ways in which maltreatment shapes the well-being of children with disabilities.

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Table 1

Studies of Maltreatment Rates Among Children with Disabilities Based on Regionally or Nationally Representative Samples

Study	Maltreatment Rates (high to low)	Sample	Sites	Sample Year	Age Range	Source and Reporting of Disability Information	Source and Reporting of Maltreatment Information
Crosse, Kaye, & Ratnofsky (1992) A Report on the Maltreatment of Children with Disabilities	Physical abuse (35%); Inadequate supervision (22%); Sexual abuse (22%); Physical neglect (21%); Medical neglect (19%)	$n = 1,834$ children with a substantiated report of maltreatment ^a .	35 Child Protective Services (CPS) agencies in the US	1991	0-17	Reported by CPS caseworker who identified the most serious form of disability a child had that was suspected or known by the caseworker.	Reported by CPS caseworker who reported up to three types of substantiated maltreatment.
Sullivan & Knutson (2000) Maltreatment and Disabilities: A Population-based Epidemiological Study	Neglect (24%); Physical abuse, Neglect, and Emotional abuse (15%); Physical abuse, Neglect (11%); Emotional abuse, Neglect (11%)	Approximately $n = 40,000$ children, of whom $n = 1,012$ with substantiated cases of maltreated and a disability.	Public and Archdiocese schools in Omaha, Nebraska	1994-5 School Year	0-21	From Omaha Public School (OPS) records. Reporting based on Nebraska Department of Education rules and verified by a multidisciplinary team.	Maltreatment reports come from records maintained by social service and foster care agencies as well as local police and sheriff offices.
Sedlak, Mettenburg, Basena, Petta, McPherson, Greene, & Li (2010) Fourth National Incidence Study of Child Abuse and Neglect	Incidence rates (per 1000) for children with at least one confirmed disability: Neglect (17.4); Abuse (7.8)	Based on "countable" children (i.e., child met specific study criteria, including standards set of severity of harm). $n = 6,950$ children were fully coded for their maltreatment ^b .	122 counties across the US	2005-2006	0-18	Reported by CPS and Sentinels (professionals in the community who have regular contact with children). Reported in 13 main categories.	Maltreatment type was derived from CPS records and coded by a team of trained coders.

(NIS-4): Report
to Congress

Maclean, Sims, Bower, Leonard, Stanley, & O'Donnell (2017)	Neglect (25%); Physical abuse (24%); Sexual abuse (19%); Emotional abuse (3.5%) (note: based on maltreatment allegations)	Of the children in the sample ($n =$ 524,534) about 4.6% had had an allegation of maltreatment ($n =$ 24,016). Of those allegations, about 26% were children with disabilities (n $= 6,211$). ($n =$ 3,352) allegations were substantiated.	Western Australia (all children born in between 1990-2010)	Children born between 1990- 2010	Birth to an unspecified age. Source of data on children with intellectual disabilities (ID) included children aged 5 to 17.	From four administrative data sources. Reporting based on a broad definition by the researchers: "any limitation of impairment that may affect everyday activities" (p. 2).	Maltreatment data are from the Department for Child Protection and Family Support (DCPF) and focus on allegations of maltreatment.
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Note. ^a Substantiated maltreatment means that under applicable state policies and laws, sufficient evidence existed for CPS to verify that a child was maltreated.

^b Full coding refers to the "full evaluative coding" of a child's maltreatment type. Only children in the study sample that met specific inclusion criteria (described on pages A-17 and A-18 of Sedlack et al. [2010]) could have their maltreatment type reliably coded by a team of trained coders.

Table 2

Weighted Descriptive Statistics for a Sample of CWS-Involved Children with Disabilities (n = 290)

	Proportion or Mean	95% CI	Missing observations (n)
Behavioral outcomes			
Internalizing behaviors (standard scores)	56.24	[53.95,58.53]	2
Externalizing behaviors (standard scores)	57.94	[56.14,59.73]	3
Maltreatment type or reason for investigation^a			
			39
Physical abuse	0.37	[0.29,0.46]	
Sexual abuse	0.15	[0.09,0.20]	
Emotional maltreatment	0.09	[0.03,0.14]	
Physical neglect (failure to provide)	0.13	[0.08,0.18]	
Supervisory neglect (lack of supervision)	0.34	[0.25,0.42]	
Abandonment	0.00	[0.00,0.00]	
Moral/legal maltreatment	0.00	[0.00,0.00]	
Educational maltreatment	0.02	[0.00,0.03]	
Exploitation	0.00	[0.00,0.01]	
Other	0.15	[0.09,0.20]	
Prematurity or low birth weight	0.00	[0.00,0.00]	
Substance exposure (e.g., born with drugs in system)	0.01	[0.00,0.03]	
Domestic violence	0.05	[0.01,0.09]	
Substance-abusing parent	0.06	[0.01,0.11]	
Voluntary relinquishment	0.00	[0.00,0.00]	
Children in Need of Services (CHINS)	0.01	[0.01,0.03]	
Investigation only way to get services	0.00	[0.00,0.00]	
Primary disability category			
			23
Emotional disturbance	0.15	[0.10,0.21]	
Intellectual disability	0.11	[0.06,0.16]	
Other categories ^b	0.19	[0.12,0.27]	
Other health impairment	0.09	[0.03,0.14]	
Specific learning disability	0.34	[0.25,0.44]	
Speech or language impairment	0.11	[0.06,0.17]	
Controls (child)			
Male	0.63	[0.54,0.73]	0
Race/ethnicity			
			0
Black non-Hispanic	0.17	[0.09,0.26]	
White non-Hispanic	0.53	[0.41,0.66]	

Hispanic	0.24	[0.13,0.35]	
Another race/ethnicity	0.05	[0.02,0.09]	
Age (in years)	11.07	[10.45,11.68]	0
Controls (caregiver)			
Caregiving setting			0
In-home (biological or adoptive)	0.86	[0.79,0.93]	
Kin care (formal or informal)	0.10	[0.04,0.16]	
Foster care	0.02	[0.01,0.03]	
Group, residential or out-of-home	0.02	[0.00,0.04]	
Federal poverty level in 2010 ^c			20
<50%	0.21	[0.14,0.28]	
50% to <100%	0.39	[0.31,0.47]	
100% to 200%	0.33	[0.24,0.41]	
> 200%	0.07	[0.03,0.12]	
Number of children in household	2.58	[2.35,2.80]	0
Mental health score	48.44	[46.78,50.10]	2
Married	0.29	[0.21,0.37]	10

Note. ^aWhen reporting maltreatment, caseworkers were asked about additional categories that focused on reasons for a maltreatment investigation. These categories included: Prematurity or Low Birth Weight, Substance Exposure, Domestic Violence, Substance-abusing Parent, Voluntary Relinquishment, Children in Need of Services, and Investigation Only Way to Get Services.” (Casanueva et al., 2012, p. 22). “Investigation Only Way to Get Services” means that an investigation was necessary for child to receive services. “Children in Need of Services (CHINS)” may refer to a child under 18 who has experienced maltreatment and currently not receiving services.

^bOther categories include: deafness, orthopedic impairments, autism, traumatic brain injury, visual impairments, multiple disabilities, developmental disability, ADHD, speech impairment.

^cFor a family for 4, the poverty guideline was \$22,050.

Table 3

Goodness of Fit Statistics for One- Through Five-Class Solutions

Number of classes	AIC	BIC	SABIC	LMRT	<i>p</i> value	Entropy
1	1981.93	2031.29	1986.91	n/a	n/a	n/a
2	1942.67	2044.91	1952.97	68.44	.00	.86
3	1919.92	2075.04	1935.56	52.12	.06	.90
4	1910.06	2118.06	1931.02	46.90	.03	.90
5	1915.21	2176.09	1941.51	25.50	.16	.80

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SABIC = Sample-size Adjusted BIC; LMRT = Lo-Mendell-Rubin test.

Table 4

Four Latent Class Solution Describing Maltreatment Classes for CWS-Involved Children with Disabilities

Maltreatment types	Latent Classes			
	Supervisory neglect	Physical abuse	Other forms of maltreatment	Sexual abuse
Physical abuse	16%	100%	0%	10%
Sexual abuse	13%	0%	0%	100%
Emotional maltreatment	14%	9%	8%	11%
Physical neglect (failure to provide)	23%	2%	3%	10%
Supervisory neglect	65%	7%	11%	0%
Abandonment	2%	0%	0%	0%
Educational maltreatment	7%	0%	0%	0%
Exploitation	1%	0%	0%	3%
Other	0%	1%	100%	14%
Substance exposure	2%	0%	2%	0%
Domestic violence	13%	1%	11%	0%
Substance abusing parent	13%	3%	0%	0%
Voluntary relinquishment	1%	0%	0%	0%
Children in need of services (CHINS)	1%	0%	3%	0%
Sample size (<i>n</i>)	124 (49%)	61 (24%)	36 (14%)	30 (12%)

Note. Percentages in the table are the conditional probabilities that a child within this latent class had a caseworker who responded “yes” when asked if the child experienced that specific maltreatment type.

Table 5

Hierarchical Linear Modeling (HLM) Results Describing the Effect of Maltreatment Classes on the Externalizing and Internalizing Behaviors of CWS-Involved Children with Disabilities.

	Externalizing behavior		Internalizing behavior	
Maltreatment class (ref: Neglect)				
Other forms of maltreatment	-1.23	(1.60)	2.45	(2.87)
Sexual abuse	-2.12	(1.50)	-3.55**	(1.22)
Physical abuse	4.04*	(1.86)	3.31	(1.81)
Controls (child)				
Disability type (ref: Other)				
Emotional disturbance	-0.68	(2.51)	11.70***	(1.93)
Intellectual disability	-2.29	(2.25)	0.63	(1.84)
Specific learning disability	-6.22*	(2.52)	-2.00	(2.32)
Speech or language impairment	-4.13	(2.34)	-2.83	(1.69)
Other health impairment	-0.37	(2.82)	13.28***	(2.15)
Female	5.86***	(1.21)	2.05	(1.29)
Race/ethnicity (ref: Black Non-Hispanic)				
White Non-Hispanic	-7.54***	(1.82)	-0.89	(1.72)
Hispanic	-2.47	(1.45)	-1.25	(1.35)
Race/ethnicity other than Black, White or Hispanic	-5.96*	(2.40)	0.31	(2.30)
Age (in years)	0.25	(0.25)	-0.37	(0.23)
Substantiated case	2.18	(2.28)	3.37	(1.73)
Controls (caregiver)				
Caregiving setting (ref: In Home)				
Kin Care: Formal & Informal	0.86	(1.81)	-0.97	(1.33)
Foster Care	-0.51	(2.75)	3.38	(2.51)
Group, Residential, or Out of Home care	-2.13	(3.68)	9.11***	(2.63)
Federal poverty level (ref: < 50%)				
50% - <100%	3.49	(1.82)	-0.89	(1.94)
100%-200%	2.11	(2.50)	1.92	(1.98)
>200%	2.29	(2.14)	11.68***	(1.88)
Number of children in household	0.83*	(0.41)	1.29**	(0.48)
Mental health score	0.04	(0.06)	-0.13*	(0.05)

Married	1.05	(0.86)	-0.22	(0.79)
Constant	48.10 ^{***}	(3.93)	57.38 ^{***}	(3.61)
var(u_{0j})	34.67 ^{***}	(7.77)	81.50 ^{***}	(13.57)
var(ε_{ij})	24.53 ^{***}	(3.99)	24.23 ^{***}	(4.26)
Observations (unweighted)	204		204	

Note. Based on a 2-level (child nested within welfare agency) hierarchical linear model (HLM). Model fit using data only on the analytic subsample of children ($n = 290$) without missing data. Models incorporate survey weights at the child and agency levels. Clustered standard errors in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6

Differences in Internalizing and Externalizing Behaviors Between Pairs of Maltreatment Classes

Pairwise Contrasts	Difference in internalizing behaviors	SE	95% CI	p value
Neglect vs. Sexual abuse	3.55	1.22	[1.15, 5.95]	0.004
Neglect vs. Physical abuse	-3.31	1.81	[-6.85, 0.23]	0.067
Sexual vs. Physical abuse	-6.86	1.80	[-10.39, -3.32]	0.000

Pairwise Contrasts	Difference in externalizing behaviors	SE	95% CI	p value
Neglect vs. Sexual abuse	2.12	1.50	[-0.83, 5.07]	0.160
Neglect vs. Physical abuse	-4.04	1.86	[-7.69, -0.39]	0.030
Sexual vs. Physical abuse	-6.15	2.35	[-10.75, -1.55]	0.009

Note. SE = standard error. CI = confidence interval. Results were considered statistically significant based on a Bonferroni adjusted significance level of $\alpha = .004$.

Supplemental Table A1.

	Missing on Disability Status	95% CI	Missing on Maltreatment Status	95% CI	Missing on Poverty Status	95% CI
Race/ethnicity						
Black non-Hispanic	-0.17**	[-0.26,-0.07]	0.07	[-0.17,0.30]	-0.14*	[-0.25,-0.03]
White non-Hispanic	-0.16	[-0.44,0.13]	-0.04	[-0.35,0.28]	-0.07	[-0.47,0.32]
Hispanic	0.12	[-0.18,0.41]	0.01	[-0.26,0.29]	0.11	[-0.31,0.53]
Other	0.21	[-0.05,0.46]	-0.04*	[-0.09,-0.00]	0.11	[-0.10,0.31]
Age (in years)	-0.40	[-1.73,0.93]	-0.80	[-2.63,1.02]	2.35	[-0.17,4.87]
Male	0.04	[-0.28,0.35]	-0.15	[-0.33,0.04]	-0.19	[-0.43,0.04]
Caregiving setting						
In-home (biological or adoptive)	-0.01	[-0.24,0.23]	-0.04	[-0.15,0.07]	0.09	[-0.19,0.36]
Kin care (formal or informal)	0.04	[-0.19,0.27]	-0.01	[-0.03,0.01]	0.01	[-0.03,0.05]
Foster care	-0.01	[-0.03,0.02]	-0.02	[-0.04,0.01]	0.24	[-0.03,0.52]
Group, residential or out-of-home	-0.03*	[-0.05,-0.00]	0.07	[-0.17,0.30]	-0.14*	[-0.25,-0.03]

* $p < 0.05$, ** $p < 0.01$

Note: Estimates based on regressions of each variable listed in column one on indicator variables for missingness on disability, maltreatment and poverty statuses (where missingness was coded as *missing* = 1, 0 = *not missing*). All models incorporate survey weights. Linearized standard errors in parentheses.