The Association between Dimensions of Maltreatment and Academic Outcomes for Youth in

Foster Care

By

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Abstract

Childhood maltreatment is often associated with youth's ability to function in school. Youth with a history of maltreatment tend to receive lower grades and scores on tests of academic achievement, as well as demonstrate more negative behaviors in school, as compared to non-maltreated youth (Romano, Babchishin, Marquis, & Frechette, 2015). However, there are many inconsistencies in previous studies examining the association between maltreatment and academic outcomes in youth. One potential reason for mixed findings within the literature could be a result of how maltreatment is measured and operationalized. The current study examined if the methods used to define and describe maltreatment contribute to the association between maltreatment and academic functioning in youth. Youth in foster care (N=490, M_{age}= 13.13[3.09]) were recruited and information on their maltreatment history and academic functioning was obtained from official agencies, school records, and self-reported measures. Results suggested that frequency maltreatment was more predictive of academic behavior, as compared to type and severity. No dimensions were associated with grades and significant findings were only observed for models using self-report data. However, maltreatment as a whole does appear to negatively relate to school behavior, which was found for both self-report and case file measurement models. The findings suggest a need for research on academic functioning to take a comprehensive approach when measuring and defining maltreatment, as well as explore what other factors influence school performance and behavior.

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Childhood maltreatment is associated with an extensive and diverse range of negative

outcomes (Lansford et al., 2002), affecting cognitive, language, and emotion regulatory abilities

(Rouse & Fantuzzo, 2009). Given maltreatment's impact on a variety of functional areas

underlying academic performance, it is not surprising that maltreated youth tend to be at greater

risk for negative academic outcomes as compared to non-maltreated youth (for review see

Romano, Babchishin, Marquis, & Frechette, 2015; Stone, 2007; Trout, Hagaman, Casey, Reid, &

Epstein, 2008). Maltreated youth tend to receive lower grades and achievement test scores, as

compared to youth with no history of maltreatment (Eckenrode, Laird, & Doris, 1993). For

example, Crozier and Barth (2005) examined math and reading ability in a national sample of

school-aged children with histories of maltreatment and reported that approximately one third

performed below their non-maltreated peers in these areas of academic ability. Not only do youth

with experiences of maltreatment typically receive lower grades, but they are also more likely

than those without maltreatment to fail or repeat a grade (Eckenrode et al., 1993).

Research also suggests that maltreatment is related to classroom behaviors that can limit

youths' academic functioning. Youth exposed to maltreatment tend to miss more school days,

engage less in classroom activities, and receive more school suspensions, as compared to non-

maltreated youth (Kendall-Tackett & Eckenrode, 1996; Lansford et al., 2002; Reyome, 1994).

Furthermore, the effects of maltreatment on academic achievement can extend into adulthood, as

maltreated youth are less likely to attend college or other post-secondary educational systems

compared to non-maltreated youth (Vinnerljung, Dolan, & Hjern, 2010).

Not only could maltreatment be a catalyst for negative academic problems, but these types of experiences may also exacerbate existing difficulties in other areas of functioning. Academic problems and maltreatment are associated with high school dropout, which in turn predicts numerous negative outcomes, such as an increased use of public assistance (Kelly, 2000), substance abuse (Townsend, Flisher, & King, 2007), and mental health problems in adulthood (Liem, Lustig, & Dillon, 2010). Berlin, Vinnerljung, and Hjern (2011) followed a group of foster care youth leaving care to examine potential risk factors of negative outcomes. Poor grades during childhood was the strongest risk factor for a multitude of negative outcomes, including high rates of suicide, welfare dependency, criminal behavior, as well as substance abuse problems.

However, there are mixed findings when examining the association between maltreatment and academic functioning, making it unclear as to what degree maltreatment contributes to academic difficulties in maltreated youth (Perfect, Turley, Carlson, Yohanna, & Saint Gilles, 2016; Romano et al., 2015; Trout et al., 2008). For example, multiple studies have reported that maltreated youth tend to perform similarly on academic achievement tests when compared to non-maltreated, matched peers (e.g., Briscoe-Smith & Hinshaw, 2006), whereas other studies report that almost half or more than half of the study's sample demonstrated behavioral or academic achievement difficulties (e.g., Attar-Schwartz, 2009; Leiter & Johnsen, 1997).

One explanation for these discrepant findings may be due to differences in methodology. For one, operationalization techniques tend to vary greatly across studies, which often operationalize abuse by type only (i.e., physical, neglect) and exclude other dimensions of maltreatment (e.g., severity or frequency; Flynn, Ghazal, Legault, Vandermeulen, & Petrick,

2004). Abuse exposure and its impact on adjustment may be far more complicated than just the type of abuse experienced. Child maltreatment can encompass many different kinds of experiences that vary greatly in their nature and these differences may put youth at greater risk for poor academic functioning. Initial findings from studies examining maltreatment dimensions (e.g., frequency, severity) provide some support that the ways in which maltreatment is measured and operationalized may contribute to the understanding of how maltreatment influences academic functioning in youth (Kinard, 2001; Romano et al., 2015). However, many of these studies have examined different dimensions independently, such as testing the role of frequency only and not severity, for example. Another common methodological difference is the source of maltreatment information. Research approaches are inconsistent in that some studies on the relation between maltreatment and school functioning include self-report of abuse (Daignault & Hébert, 2009) and others rely on case file data (Fantuzzo, Perlman, & Dobbins, 2011). Although evidence from the general maltreatment literature provides initial support that outcomes may be dependent on source of information (Brown, Cohen, Johnson, & Salzinger, 1998; Huffhines et al., 2016), there is no established evidence yet to date on how information extracted from different sources may influence the association between maltreatment and academic functioning. Research is needed that can reconcile a clear picture of how maltreatment and academic functioning are associated by examining the methods used to define and describe maltreatment.

The current study had multiple goals. One, advance the field by assessing the nature of the maltreatment-academic relation when the maltreatment information is based on self-report versus case file data. Two, expand the knowledge base by comparing different operationalization techniques of abuse to determine how various aspects of exposure may play a role in the maltreatment-academic functioning relation. Specifically, the study tested if maltreatment

characteristics (type, severity, and frequency) predicted academic functioning independently and collectively.

Maltreatment measurement and academic functioning

The two most common sources for information on youth maltreatment exposure history are self-report and data from official state social service or foster care records (Fallon et al., 2010; Finkelhor, Ormrod, Turner, & Hamby, 2005). Self-report techniques include the administration of questionnaires (e.g., Juvenile Victimization Questionnaire; Hamby, Finkelhor, Ormrod, & Turner, 2004), as well as face-to-face or phone interviews (e.g., Lansford et al., 2002). Self-report measurement techniques may provide researchers with a more complete maltreatment history, as compared to case files, because many acts of abuse occur in private, and the youth may be the only possible reporter (outside of the perpetrator) that has knowledge of their experience (Fallon et al., 2010; Macmillan, Jamieson, & Walsh, 2003). However, the accuracy of self-report methods is often questioned because of potential biases. For example, youth may inaccurately recall information, or decline to disclose certain information due to social desirability influences or worry of stigmatization (Greenhoot, 2011; Macmillan et al., 2003). Moreover, youth may not always be aware of their exposure to certain types of maltreatment (i.e., neglect when the child was an infant; Gilbert et al., 2009).

Another method commonly used is the extraction of maltreatment information from state and federal agency case files. This typically involves the use of a coding system (e.g., Modified Maltreatment Classification System [MMCS]; English et al., 2005a) where trained personnel review case file reports, narrative descriptions made by caseworkers, to organize and operationalize a child's maltreatment exposure. Coding case files is believed to be a more reliable measure of maltreatment histories, as compared to self-report, because case files are

thought to be a more objective approach of documenting maltreatment (Shaffer, Huston, & Egeland, 2008). However, official records are also subject to potential report and investigation biases, which could lead to inaccurate estimates of a child's maltreatment history (Brown et al., 1998). For example, many suggest that child maltreatment is often a result of poverty, which may result in potential class bias and overrepresentation of children from low socioeconomic status (Jonson-Reid, Drake, & Kohl, 2009). Moreover, only a small number of maltreatment cases are ever identified by official agencies (Sedlak & Broadhurst, 1996), making case file reports limited to what is known and moreover, what can be substantiated. The true prevalence rates of youth who experience maltreatment is estimated to be two or three times higher than what is identified in case files by official agencies (Hussey, Chang, & Kotch, 2006). For example, the U.S. Department of Health & Human Services (2016) reported that approximately 1% of children experienced maltreatment (i.e., substantiated investigations), which is in contrast to national, community samples that report an approximate prevalence of 25% based on self-report (Finkelhor, Turner, Shattuck, & Hamby, 2013).

Given the differences in data collection methods and potential biases implicit in both methods, inconsistencies between self-report and official records are common (Brown et al., 1998; Huffhines et al., 2016). For example, Cho and Jackson (2016) reported concordance between case file and self-reported abuse ranged from approximately 20% to 60% depending on maltreatment type. Accounting for the source of information that is used to describe maltreatment experiences may help to resolve disparities in the maltreatment and academic literature. For example, in the literature on psychopathology and child maltreatment, Cohen, Brown, and Smailes (2001) found that self-reported maltreatment was associated with lower

levels of psychopathology (e.g., depression, anxiety), as compared to those with maltreatment experiences indicated by official records.

Furthermore, there is also evidence to suggest that differences in outcomes between report types may also be specific to certain types of maltreatment. For youth who had experienced physical and sexual abuse, differences in psychosocial adjustment (as measured by externalizing and internalizing problems) were found between groups of youth who had reported only experiencing abuse according to self-report data, youth where abuse was only reported in their case file, and youth where there was abuse reported in both case file and self-report sources (Cho & Jackson, 2016). No research to date has examined how report type may contribute to differences in the association between maltreatment and academic outcomes. Given previous findings when examining report type and psychopathology, the current study attempted to provide a better understanding of how maltreatment information source, either from self-report or case file, differentially predicted academic outcomes. Moreover, the current study sought to investigate if potential differences in case file and self-report data was present for several dimensions of maltreatment (type, frequency, and severity), as opposed to just whether or not maltreatment was reported.

Operationalization of maltreatment dimensions

Maltreatment research in general has shown that the impact of abuse on youth functioning might better be explained when the nature of the experience is captured beyond just the presence of maltreatment. Most commonly, experiences of maltreatment are defined and measured by type (i.e., physical abuse, sexual abuse, emotional abuse, and neglect), severity (e.g., the event could have caused minor to serious physical harm), and frequency (e.g., getting

physically punished by a parent three times or once, or failing to provide food almost never to almost always).

Maltreatment type. The majority of research on academic outcomes and maltreatment have examined the differences between maltreatment type in relation to academic outcomes, such as grades and classroom behavior (Romano et al. 2015; Stone, 2007). Overall, studies report that children exposed to neglect, as opposed to other types of abuse such as physical or sexual abuse, tend to demonstrate lower grades, academic achievement scores, and more school behavioral problems (Eckenrode et al., 1993; Hildyard & Wolfe, 2002; Kurtz, Guadin, Wodarski, & Howing, 1993).

Despite some consistency, some findings are mixed. For example, Crozier and Barth (2005) examined academic achievement in relation to maltreatment subtype (physical and sexual abuse, and neglect) and found no differences between maltreatment type and math and reading achievement scores. In contrast, Eckenrode et al. (1993) categorized youth by maltreatment type and reported that neglected and physically abused youth had significantly lower grades than sexually abused youth. In addition, findings regarding academic behavior are inconsistent. Anthonysamy and Zimmer-Gembeck (2007) compared teacher ratings of aggression and prosocial behavior between students with no prior history of maltreatment and youth with experiences of both physical abuse and neglect. The authors found that maltreated students tended to demonstrate more aggression and less prosocial behavior, as compared to the non-maltreated students. However, Kurtz et al. (1993) found that only youth with previous abuse, but not neglect, were reported by their teachers as having significantly more problem behaviors, as compared to non-maltreated youth. One reason why there are discrepancies in findings for grades and school behavior may be the result of inconsistent and limited maltreatment

operationalization techniques. Cozier and Barth (2005) categorized youth into maltreatment subtype based on reports from case workers, whereas Eckenrode et al. (1993) categorized youth into either neglect or physical abuse based case file data. Thus, differences in the techniques used to measure maltreatment could have influenced whether or not differences were observed between maltreatment subtypes.

Maltreatment severity. Severity has been defined as the measure of assumed or reported impact on a child, and physical harm or potential for physical harm (Litrownik et al., 2005). For example, a severe incident of physical abuse might include multiple injuries or head injuries, whereas a mild form of physical abuse would include a push or shove with no serious injury (Sprang, Clark, & Bass, 2005). Severity can be measured using a subjective approach, such as having caseworkers, parents, or youth themselves rate the impact of a maltreatment experience without any formal definitions (e.g., Crittenden, Claussen, & Sugarman, 1994). Severity can also be measured objectively using scales or coding techniques. These methods are based on consensus of expert option or in relation to actual or potential for physical harm (English et al., 2005a).

Within the maltreatment literature at large, as well as the academic literature specifically, severity is not as widely studied or included in maltreatment measurement, as is maltreatment type (English, Bangdiwala, & Runyan, 2005c). For those studies that have included measures of maltreatment severity, the findings are mixed, which may reflect differences in how severity is operationalized. For example, Coohey, Renner, Hua, Zhang, and Whitney (2011) found no association between math and reading scores and maltreatment severity when using a dichotomous "severe" or "not severe" categorization of maltreatment experiences in their analysis. This rating was developed from CPS investigators' subjective perception of harm.

When examining the effect of maltreatment dimensions and academic outcomes, Kinard (2001) characterized the severity of maltreatment experiences using the MCS for each subtype by taking the highest severity rating for a single event. In this study, the author found no association between physical abuse, sexual abuse, or neglect severity and math and reading achievement scores.

In contrast, others authors have reported a significant association between maltreatment severity and academic functioning. For example, Daignault and Hébert (2008) reported that the severity of sexual abuse experiences contributed to academic achievement scores in a sample of sexually abused girls. Leiter and Johnsen (1997) reported that severity of maltreatment was significantly associated with increased risk of school absences and high school dropout. However, frequency of maltreatment, more specifically number of events, duration, and age of onset, was used as proxy for severity. More frequent or a greater number of maltreatment events does not necessarily translate into greater severity or seriousness of experiences. For example, a child may experience a series of minor hits from their parent most days of the week, but another child may experience one incident of physical abuse that leaves them permanently disabled.

In related research, Jackson, Gabrielli, Fleming, Tunno, and Makanui (2014) examined the association between behavioral problems and overall maltreatment dimensions of severity and frequency. The results indicated that regardless of type of abuse, when type, severity, and frequency are accounted for in the same model, the severity of abuse, as opposed to frequency, contributed to the presence of externalizing behaviors (e.g., aggression, conduct problems) and adaptive skills. However, it is unclear whether severity, as opposed to frequency, may contribute to school behavior, as Jackson et al. (2014) used parent rating of behavior and there are often discrepancies in parent and teacher rated behavior (Aitken, Martinussen, & Tannock, 2017;

Rescorla et al., 2014). Given the discrepancies in severity measurement and mixed findings both within academic related research and the literature overall, more research is needed to fully clarify the relation between maltreatment severity and academic functioning.

   Maltreatment frequency. Frequency, another maltreatment dimension, is most often measured by counting the number of maltreatment events a child has experienced. To take into account temporal aspects of maltreatment, the rate of maltreatment occurrence has also been defined as the duration or chronicity of maltreatment events (i.e., the amount of time in-between the first and most recent event of maltreatment), or how long a case file has been open (English et al., 2005b; Manly, Cicchetti, & Barnett, 1994).

   Within the academic literature specifically, there is limited research on how frequency of maltreatment experiences, using any of the potential techniques described above, may contribute to academic functioning. Kinard (2001) examined the influence of maltreatment frequency of physical and sexual abused and neglect and reported that only physical abuse frequency was associated reading ability, such that more incidents of physical abuse were associated with lower reading achievement scores. Researchers have consistently hypothesized that frequency of maltreatment may be a significant contributor to the development of academic functioning in youth. For example, after finding no differences for the effect of maltreatment subtype on academic achievement, Petrenko, Friend, Garrido, Taussig, and Culhane (2012) suggested that chronicity or frequency of maltreatment might have a greater impact on academic functioning, as compared to type and severity of maltreatment. This was because the authors were only able to obtain maltreatment history during a two year window, which limited information on youth's complete maltreatment history. It may be the case that the longer maltreatment occurs, the greater chance there is for maltreatment to disrupt the normal development of a child's cognitive

functioning, thus resulting in greater academic deficits. The current study was able to expand on previous research by including maltreatment frequency directly to examine if how many times and how often maltreatment occurred contributed to academic functioning.

Other maltreatment operationalization issues. In addition to issues with measuring and incorporating maltreatment dimensions in research on academic outcomes, no research to date has examined maltreatment dimensions together using a method that incorporates the influence of each type and each dimension simultaneously on academic outcomes. Kinard (2001) examined maltreatment type, severity, and frequency and their association with academic functioning in youth and reported that certain dimensions of maltreatment were predictive of academic functioning, specifically reading and math competence. However, Kinard (2001) did not include emotional maltreatment, and examined each type (and its corresponding dimension) of maltreatment in independent analyses.

Examining different dimensions of maltreatment together may help explain differences in research findings within the academic literature. Findings from large national samples suggest that most children do not experience a single abuse type, and that polyvictimization or the experience of multiple types of abuse is common (Turner, Finkelhor, & Ormrod, 2010). For example, Turner et al. (2010) reported that 66% of their sample experienced more than one type of victimization and 30% experienced five or more types. Ignoring polyvictimization in samples of youth exposed to maltreatment means ignoring the considerable overlap that exists between the different types and characteristics of maltreatment. For example, Gabrielli, Jackson, and Brown (2016) reported on the correlations between different dimensions of maltreatment and found moderate and strong correlations between severity and frequency for each subtype of maltreatment. Additionally, there may also be strong associations between different types of

maltreatment. For example, Hodgodon (2009) found that many of the severity and frequency interaction scores calculated for each type of maltreatment were significantly correlated.

The strong association between each type and dimension of maltreatment can make it difficult to determine which characteristic (e.g., type or severity) of the maltreatment event(s) or which event(s) contributes to the outcome examined. In the maltreatment literature at large, findings suggest that each dimension may differently affect the outcome being examined. For example, neglect has largely been found to be associated with greater deficits in academic ability, as compared to other maltreatment types (Romano et al., 2015). It has been hypothesized that neglected children are at-risk for cognitive delays, which in turn negatively affect cognitive and emotional regulatory functioning associated with academic success (Hildyard & Wolfe, 2002). However, neglect is often a chronic experience, as opposed to other forms of maltreatment such as physical or sexual abuse, which are largely incident limited. What may actually account for findings on neglect could be the frequency of the maltreatment, not just the type of experience.

Examining only each maltreatment type and its corresponding characteristics in isolation, as is common in the academic literature, may produce inaccurate results. Although Kinard (2001) provided important first step in the study of maltreatment dimensions and academic functioning, limitations of this study and findings from the general maltreatment literature make it difficult to formulate conclusions about the relation between maltreatment and academics. Taken together, initial findings from the academic literature and findings from the general maltreatment literature point to the need to simultaneously examine all maltreatment variables together when examining the effects of maltreatment on academic functioning.

Current study

To better understand the association between maltreatment and academic outcomes in youth, the current study examined how report type (self-report, case file) of maltreatment and dimensions of maltreatment (type, severity, and frequency) were related to academic outcomes (grades and classroom behavior). Furthermore, the current study used maltreatment experiences from a large sample of youth in foster care and validated methods for measuring the different components of maltreatment experiences.

Because of the relatively few studies that have examined dimensions of maltreatment in relation to academic functioning, as well as the comparison between self-report and case file data, the hypotheses in the current study were largely exploratory, but based on trends in the available empirical evidence. It was hypothesized that 1) severity for each type of maltreatment (physical, sexual, emotional, and neglect) would be significantly negatively related to math and reading grades, and 2) severity of maltreatment would be significantly positively associated with school problems and negatively associated with adaptive skills in school for all maltreatment types. Because neglect has most commonly been associated with negative school functioning in youth (Romano et al., 2015), it was also hypothesized that 3) frequency of neglect would have a stronger negative association with math and reading grades and adaptive skills and positive association school problems, as compared to the other types of maltreatment frequency. The current study also explored potential differences between these associations using both self-report and case file maltreatment experiences. Given the relation between performance in school and intelligence (as measured by IQ; e.g., Tiet et al., 1998), placement changes (as measured by number of foster care homes; e.g., Ryan & Testa, 2005), and age (as measured in years; e.g., Schoedl et al., 2010), these variables were included in the models as covariates.

Methods

Participants

The current study included 490 youth participants ages eight to eighteen in foster care (M_{age}= 13.3, SD = 3.1), their primary adult caretaker, and their teacher. Youth participants were mostly male (52.1%) and most participants identified as African American (50.6%), followed by Caucasian (33.6%), Multiracial (9.3%), and Hispanic/Latino (4.3%). Additionally, 61.7% of youth participants lived in a traditional foster home and the remaining participants lived in a residential facility. The majority of primary caregivers were the child's foster mother or father (51.5%), followed by staff at residential facilities (28.1%), biological relatives (12.7%), and other (7.8%). Participants were recruited as part of the Studying Pathways to Adjustment and Resilience in Kids (SPARK) project. SPARK is a federally funded longitudinal research project focused on investigating factors that contribute to resiliency for youth in foster care. So that youth participants could reliably complete the study measures, youth were excluded from the project if they had a composite IQ score below 70, reported having psychotic symptoms on the BASC-2, a diagnosis of Autism Spectrum Disorder, or were non-native English speakers. Additionally, participants were required to have been in foster care for at least 30 days prior to data collection at time point one. Participants were surveyed at three time points, three months apart, but only data from time point one was included in the current study. Youth and their primary caregivers were compensated at each time point for taking part in the study. Teachers were asked, via an online survey, to provide information about the child's academic functioning and progress at each data collection time point and received compensation at each time point for participating.

Measures

Self-report maltreatment. The current study determined type, frequency and severity scores of on maltreatment via youth self-report measure of maltreatment, which includes questions derived from the MMCS (English et al., 2005a). The original Maltreatment Classification System (MCS; Barnett, Manly, & Cicchetti, 1993) allowed for coding of maltreatment records obtained from the Department of Family Services for each child. The MMCS expanded on the MCS by adding codes for severity and frequency of each maltreatment subtype. A modified version of this system was created and administered as a self-report questionnaire to measure experiences of maltreatment. This consisted of reformatting the codes for abuse subtypes and the severity of each subtype into age appropriate questions that ask about youth's lifetime experiences. This method has been reported to provide the highest levels of fidelity for recording maltreatment experiences (English et al., 2005a).

The MMCS provides information about the type, frequency, and severity of maltreatment experiences across the lifetime. Youth participants in the study were asked a total of 19 physical abuse items (e.g., "In your lifetime, about how often did someone kick or punch you?"), 12 sexual abuse items (e.g., "In your lifetime, about how often has someone forced you to look at their sexual parts?"), 15 emotional abuse items (e.g., "In your lifetime, about how often has anyone ever made you feel like they didn't care whether you were safe or healthy?"), and 22 neglect items (e.g., In your lifetime, how often did your parent(s) make sure you always went to school?"). To determine frequency of maltreatment, youth were asked to rate the how often a given event occurred on a scale from 1 (*never*) to 5 (*almost always*). Frequency of each subtype of maltreatment were calculated by summing together the frequency scores for the endorsed maltreatment items endorsed. Frequency scores were treated as a continuous variable and could range from 1 to 340. For example, if a child reported two neglect experiences as *almost always*

(*5*) and a physical abuse experience *sometimes* (*2*), the child would receive a neglect frequency score of 10 and a physical abuse frequency score of 2. This type of frequency measure may provide the best indicator of maltreatment frequency as it utilizes a continuity approach and definition, as opposed to simple count of events (English et al., 2005b). A frequency score for physical abuse, sexual abuse, emotional abuse, and neglect were used in the analyses.

All maltreatment items were rated for severity a priori on a scale from 1 (*least severe* or *mild*) to 3 (*most severe* or *severe*) using the MMCS coding system, defined by potential or actual physical harm from the event, and expert opinion (which included consultation from investigators from other large scale longitudinal maltreatment studies). Severity ratings on the MMCS have been previously established as a reliable indicator of maltreatment severity (Litrownik et al., 2005). On the self-report measure, the severity rating ranged from 1 to 3, which was used to consolidate severity ratings from the original MCS and create a common severity metric for all types of maltreatment. Endorsed events were weighted depending on the severity ranking on the event. Events considered *least severe* or *mild* received a weight of 1, *moderate* a weight of 2, and *most severe* or *severe* a weight of 3. A severity score for each maltreatment subtype was calculated by taking the sum of all severity scores and diving by the number of events endorsed. Severity scores were treated as a continuous variable and could range from 1 to 3. For example, if a child has 2 *severe* events of sexual abuse and 2 *mild* and 1 *moderate* event of physical abuse, that child would receive a sexual abuse severity score of 3, and a physical abuse severity score of 1.33. A separate severity score for physical abuse, sexual abuse, emotional abuse, and neglect was included in the analyses.

Case file maltreatment. Information on maltreatment history was obtained from youths' case files provided by the Division of Social Services (DSS). Case files were coded using the

MMCS. The MMCS is used to extract detailed information from the case files for research purposes to classify characteristics of the maltreatment reports (English, Marshall, Coghlan, Brummel, & Orme, 2002). Information on maltreatment events were coded based on reporter narratives for both substantiated and unsubstantiated reports. Coding of the case files was conducted by two trained coders, who were required to reach adequate levels of reliability (80% or kappa equivalent).

Each event from the reports was coded for maltreatment type (e.g., physical abuse, sexual abuse, emotional abuse, and neglect), severity, and frequency. Type of maltreatment was determined by matching up the description of the event with the definition of each type provided by the MMCS. Moreover, the description of the event provided in the report was used to rate the severity of the each event within the type. Severity of physical abuse ranged from 0 to 4, emotional abuse and neglect ranged from 0 to 5, and sexual abuse ranged from 0 to 6. Frequency for each maltreatment type was calculated by summing together the number of reports for each maltreatment type for each child.

Academic functioning/progress. Participants' class grades were obtained from their academic record (i.e., grade cards) and the grades of the students from the semester during their first time point were used in the current study. School administrators provided participants' grade reports at the end of each year the participant was involved in the study. The current study included English and math course grades as a measure of academic functioning given that overall grades or grade point averages are not typically computed for youth not in high school. Examples of math classes across age groups include courses such as algebra, geometry, and statistics. Examples of English classes include courses such as communication arts, reading, and writing.

To improve generalizability and adequate comparison between participants from different schools in the current study, letter grades from grade card reports were converted into a continuous scale of 1 (letter grade of *F,* or not meeting expectations) to 5 (letter grade of *A*, or exceeds expectations). This type of conversion has been successfully used in previous studies examining youth's academic functioning (e.g., Schwartz, Gorman, Nakamoto, & Toblin, 2005). Due to an inability to adequately create a reasonable comparison scale, children's grades from honors and special education classes were excluded from data analysis (*N*=7). If youth were enrolled in multiple classes of the same subject at the time of data collection (e.g., communication arts and writing, both considered English classes), an average grade was calculated for that subject for the child.

School behavior. Youth's behavior at school was obtained through the teacher rating scale of the Behavior Assessment System for Children, Second Edition (BASC-2-TRF; Reynolds & Kamphaus, 2004). Youth participants' teachers completed the BASC-2-TRF as part of an online survey sent to them during each time point of data collection. The BASC-2-TRF consists of 160 items for youth ages 8 to 12 and 150 items for youth ages 12 to 18, and takes approximately 10 to 15 minutes to complete. Behaviors are rated on a four-point scale of frequency from 0 (*Never*) to 3 (*Almost Always*).

The BASC-2-TRF provides scores for each subscale reported as continuous *T*-scores and percentiles that are based on data from normed national samples (Reynolds & Kamphaus, 2004). *T*-scores above 70 for the subscale of school problems is considered to be clinically significant, *T*-scores between 60 and 69 are considered to be in the at-risk range, and *T*-scores below 59 are considered to be in the normal range. The school problems and adaptive skills composite *T*-scores of the BASC-2-TRF were included in the analyses. The school problems composite score

consists of attention and learning problems subscales, and the adaptive skills composite score consists of adaptability, social skills, leadership, study skills, and functional communication subscales, as reported by the teachers while the child is in a school setting. The school problems score provides a proxy of various functional skills, school problems and internalizing and externalizing symptoms demonstrated at school. Additionally, high scores on the school problems subscale indicates potential deficits in academic achievement (Kamphaus & VanDeventer, 2007).

The BASC-2-TRF has demonstrated satisfactory test–retest reliability and interrater reliability with alphas greater than 0.68. Additionally, the BASC-2-TRF has shown internal reliability with alphas ranging from 0.89 to 0.95 (Reynolds & Kamphaus, 2004). The BASC-2-TRF demonstrated adequate internal reliability for both the school problems (Cronbach's α child= .64, adolescent= .86) and adaptive skills (Cronbach's α child= .79, adolescent= .92) composite scores in the current study. The BASC-2-TRF is a superior measure of classroom behavior because it uses a multidimensional approach, as opposed to a categorical approach, allowing for a continuous measure of severity instead of whether or not a participant has school issues or functional school behaviors (Kamphaus & Van Deventer, 2007).

Demographics. Child's ethnicity was obtained through a demographic questionnaire administered to youth participants' primary caretaker.

Covariates

Intelligence. To estimate intelligence, participants completed the Kaufman Brief Intelligence Test, Second Edition (KBIT-2; Kaufman & Kaufman, 2004). The KBIT-2 is an individualized and brief intelligence test for individuals ages 4 to 90. There are a total of 154 items, and the test takes approximately 15 to 30 minutes to complete. Although brief, the KBIT-2

has been shown to be a reliable and valid estimate measure of intelligence (Bain & Jaspers, 2010; Kaufman & Kaufman, 2004). The KBIT-2 produces strong validity coefficient and highly correlated with full length IQ tests, such as the Wechsler Intelligence Scales for Children, Fourth Edition ($r > .76$; Bain & Jaspers, 2010). Reliability estimates from the KBIT-2 are adequate with alpha coefficient above 0.80 for composite and sub-scale scores, as well as split half reliability coefficients greater than 0.78 (Kaufman & Kaufman, 2004).

Previous research has demonstrated the importance of IQ for academic functioning, such that youth with higher IQ tend receive better school grades and stay in school longer (Brody, 1997; Tiet et al., 1998). Furthermore, there is also a potential protective quality in the relation between maltreatment and IQ. For example, following maltreatment, youth with a higher IQ tend to demonstrate fewer psychological symptoms, such as post-traumatic stress disorder (De Bellis, Hooper, Spratt, & Woolley, 2009). Given IQ's relation with performance in school, youth's verbal (VIQ) and nonverbal IQ (NVIQ) scores were included in the analyses as covariates.

Placement changes. Number of previous placement changes was obtained from a placement database provided by the Children's Division. A sum score of placement changes was calculated using this information and included in the model as a covariate. Foster care youth often experience placement instability (Rubin, O'Reilly, Luan, & Localio, 2007). A high frequency in placement changes has been linked with increases in general behavioral and psychological problems (Moore, McDonald, & Cronbaugh-Auld, 2016), as well specific negative school behavior problems, such as delinquent behaviors (Ryan & Testa, 2005). Additionally, placement instability tends to be associated with English and math skills, such that increases in number of placement changes predicts more delays in academic skills such as reading and math (Zima, Bussing, Yang, Belin, & Forness, 2000).

Age. Child's age was calculated by measuring the time in between the data collection session and the child's date of birth, as reported by the primary caregiver of the child on the demographics measure. Age was included in the hypothesized model to control for any potential age related differences that may contribute to the association between maltreatment and academic functioning given the wide age range of the current sample. For example, this includes age related differences between school age youth and adolescents in type of school structure (e.g., grade school compared to high school) and potential differences the type of maltreatment youth are exposed to (e.g., emotional maltreatment is more common among adolescents; Finkelhor et al., 2005).

Procedures

All methods and procedures used in the current study were approved by the Institutional Review Board at the University of Kanas and the state's Department of Social Services Review Board prior to data collection. All participants in the current study were recruited from a large Midwestern county. The Children's Division (CD) provided the SPARK research team with a list of eligible participants in the county. Participants were recruited using multiple methods, including directly mailing and calling eligible foster families, placing advertisements in newsletters and list-serves, and referrals. This type of recruitment method allowed for a representative sample of the population being studied because research members attempted to make contact with all eligible participants.

Participants interested in the study were contacted by the SPARK research team either in person or by phone. A screener of eligibility was completed, and if the study criteria was met, a member of the research team then scheduled a time to complete data collection. Since youth were in foster care and their legal guardian was the State of Missouri, consent for youth to

participate was obtained from the Division of Social Services (DSS) and the Chief Judge of the Circuit Court for the county from which the youth were recruited. Youth also provided assent before taking part in study activities, which was read aloud by a trained graduate student. Caregivers and teachers also provided consent for participation.

Data collection procedures at each time point during the SPARK project took approximately three hours and were completed by trained graduate level clinical child psychology students. Data collection occurred at convenient and quiet community locations (e.g., library, residential facility) that were easily accessible for participants in the study. After describing the study methods and procedures and obtaining consent and assent, youth completed study measures using an audio-computer assisted self-interview (ACASI) program on a laptop computer. This type of data collection method provided both a visual and audio description via headphones of each question and possible question response to the participants. The ACASI system allowed for participant confidentially and accommodated for participants who may have had difficulty reading. Furthermore, the ACASI system used a set of alerts and follow up questions if participants indicated they do not know or do not want to answer a question to ensure thorough data collection completion. All study measures were included in the ACASI system for both the caregiver and the youth participant. Regular breaks and snacks were provided for the participants during completion of the questionnaire battery on the ACASI to ensure participants could remain attentive during data collection. Following completion of the ACASI program section, a graduate student administered the KBIT-2 in a face-to-face interview with the child participant.

Upon completion of data collection at each time point, a graduate research assistant completed a comprehensive debriefing session with the child and the caretaker to 1) assess for

current abuse or suicidal ideation, identified by the ACASI system, and 2) check for changes in

mood as a result of taking part in the study. Recent findings have shown that asking youth about

sensitive information, such as maltreatment and victimization history, does not appear to be

significantly distressing (Finkelhor, Vanderminden, Turner, Hamby, & Shattuck, 2014). Youth

and their caregivers also received follow-up phone calls within 48 hours to assess potential

changes in mood or problems that may have occurred as a result of taking part in the study.

Following data collection completion, participants were compensated for their time.

During data collection, children and their caregivers were asked to provide the name and

contact information of their teacher and the school each child attends. If youth had multiple

teachers, they were asked to provide the contact information of a current teacher that they

believed knew them best. Teachers were then contacted via email and asked to complete a set of

online questionnaires about the youth participant in the study. School administrators also

provided the SPARK research team with youths' grade report card. After each data collection

time point, teachers were compensated for their time.

Data analysis

Means, standard deviations, and ranges were calculated for the continuous variables of

interest included in the current study analyses (see Table 1). Additionally, bivariate correlations

were calculated between the all of the continuous variables of interest (see Table 2). Multivariate

outliers were identified and removed by using values obtained from Mahalanobis' distance using

a chi-squared distribution (p < .001; Tabachnick & Fidell, 2013).

Missing data was managed using full information maximum likelihood (FIML) under the

assumption of data missing completely at random. FIML allows for the calculation of unbiased

parameter and standard error estimates by using a likelihood function calculated for each

participant based on associations between non-missing variables (Kline, 2015; Raykov, 2005). Total missing data was 17.8%. A power analysis was performed to test for the minimum sample size needed to obtain an adequately fitting model with sufficient power. Using a null root-mean-square residual error of approximation (RMSEA) value of .05 and alternative value of .08 at an alpha level of .05, and desired power of 80% (MacCallum et al. 1996), the sample size needed to adequately test the proposed models with 62 degrees of freedom was 183.

To test the hypotheses for the effect of maltreatment characteristics on academic functioning, the current study used structural equation modeling (SEM) using a maximum likelihood estimator with robust standard errors (MLR) in R software (R Core Team, 2014). MLR estimation was used to calculate robust standard errors and parameter estimates that account for multivariate non-normality in the distribution of the variables included in the models. The first tested model included frequency and severity of maltreatment regressed on math grades, reading grades, adaptive skills, and school problems (Figure 1). This model tested the association between each individual characteristics of maltreatment and academic outcomes, which included severity and frequency for each subtype of maltreatment: physical abuse, sexual abuse, emotional abuse, and neglect. All maltreatment variables were permitted to correlate and all endogenous variables were allowed to correlate with each other.

Maltreatment measurement model. Next, a one-factor maltreatment model based on severity and frequency for all maltreatment types was used to predict school behavior and grades. This type of measurement model has been successfully used and supported in previous studies with data from the SPARK Project (Gabrielli, Jackson, Tunno, & Hambrick, 2017). To account for shared error variance for each maltreatment type, the severity and frequency variables for each type were correlated and the variance of the latent maltreatment variable was

fixed to 1.0 in the hypothesized model. Additionally, all endogenous variables were allowed to correlate with each other. Modifications indices were examined following testing of the original hypothesized model.

For both types of models (i.e., one model with each dimension (type, severity, frequency) of maltreatment as separate indicators, and the maltreatment measurement model combining all maltreatment indicators), a model was estimated based on self-report and case file maltreatment experiences. Thus, a total of four models were estimated. To evaluate model fit, the following global fit indices were evaluated: the chi-squared test statistic, the RMSEA, the standardized root mean square residual (SRMR), the comparative fit index (CFI), and the Tucker-Lewis Index (TLI). Cutoffs indicating good model fit will include values less than .05 for the RMSEA (Browne & Cudeck, 1993) and .08 for the SRMR (Hu & Bentler, 1999), as well as values greater than .95 for both the CFI and TLI (Hu & Bentler, 1999).

Results

A total of 490 participants were included in the current analyses following the removal of six participants that were identified as outliers using Mahalanobis' distance. The means, standard deviation, and ranges for all continuous variables included in the current study are presented in Table 1, and the bivariate correlations between the maltreatment dimensions are presented in Table 2.

According to self-reported maltreatment, the most prevalent type of abuse was neglect (99.39%), followed by emotional abuse (90.62%), physical abuse (86.93%), and sexual abuse (41.63%). The most prevalent maltreatment type provided though case file report was neglect (61.02%), and then physical abuse (51.63%), emotional abuse (40.00%), and lastly sexual abuse (28.37%). Concordance between self-report and case file was calculated for each type of abuse.

(Figure 2). For all types of abuse, there was a greater prevalence of youth who experienced at least one incident of abuse according to self-report data, as compared to maltreatment prevalence in case file records. Moreover, it was often the case that youth experienced at least one incident of two different maltreatment types or polyvictimization (see Table 3). According to case file data, polyvictimization ranged from 14.49% (co-occurrence of sexual and emotional abuse) to 40.82% (co-occurrence of physical abuse and neglect). For self-report data, polyvictimization ranged from 44.90% (co-occurrence of physical and sexual abuse) to 91.63% (co-occurrence of emotional abuse and neglect).

On the BASC-2-TRF, youth demonstrated school problems and adaptive skills in the non-clinical range on average, as compared to *T*-scores based on the normed sample of the BASC-2-TRF (Reynolds & Kamphaus, 2004; see Table 1). Moreover, youth scores tended to fall within the average range for both verbal and nonverbal IQ scores (Kaufman & Kaufman, 2004), as well as English and math grades (as indicated by a mean score of approximately a *C* or average letter grade). On average, youth in the current study experienced nine placement changes while in foster care.

Individual maltreatment dimensions predicts academic grades and behavior

To test hypothesis one, a structural model with the frequency and severity score for each type of maltreatment predicting English and math grades, school problems and adaptive skills was tested using SEM. Additionally, verbal and nonverbal IQ, placement changes, and age were included in the model as covariates. The model was computed twice, once using self-reported maltreatment data and a separate model using case file maltreatment data. The standardized parameter estimates and R^2 for each model are provide in Table 4. Both models demonstrated excellent model fit (Self-report: $\chi^2_{(36, n=490)} = 107.06$, p <.001, RMSEA$_{(.05-.08)}$= .06, SRMR= .06,

CFI = .97, TLI= .89; Case File: $\chi 2$ $_{(36,\ n=\ 490)}$= 61.54, p =.005, RMSEA $_{(.02-.05)}$= .04, SRMR= .04,

CFI = .98, TLI= .94).

The standardized parameter estimates of each predictor were examined for statistical

significance to determine what dimension of maltreatment contributed to school grades and

behavior. For maltreatment experiences obtained from self-report, sexual abuse frequency was a

significant predictor of school problems (B = .20, p = .01) and emotional abuse severity was a

significant predictor of English grades (B = .19, p = .03). Moreover, physical abuse frequency

was a significant predictor of adaptive skills (B = -.23, p = .04) and marginally significant

predictor of English grades (B = -.20, p = .09). No other self-report maltreatment dimension was

a significant predictor of school behavior or grades. In addition to maltreatment dimensions, age

was a significant predictor of adaptive skills (B = .23, p < .01), and verbal IQ was a significant

predictor of adaptive skills (B = .32, p < .01), school problems (B = -.29, p < .01), and marginally

significant predictor of English grades (B = .02, p = .06). No variables were significant predictors

of math grades.

Standardized parameter estimates in the model using case file maltreatment revealed a

different pattern. Of the maltreatment variables, only neglect frequency was a marginally

significant predictor of English grades (B = .17, p = .06). Among the covariates, age was a

significant predictor of adaptive skills (B = .18, p = .02) and marginally significant predictor of

math grades (B = -.13, p = .09), and verbal IQ was a significant predictor of adaptive skills (B =

.28, p < .01) and school problems (B = -.29, p < .01).

Maltreatment measurement model predicts academic grades and behavior

The second part of the analyses examined the influence of youths' collective

maltreatment experiences on school problems, adaptive behavior and grades using a higher order

one-factor maltreatment model, which included the collective contribution of the frequency and severity scores for each maltreatment type. The proposed model included correlations between the frequency and severity score of each maltreatment dimension and the fixing of the maltreatment latent variable to 1.0. The analysis was calculated for both self-reported and case file maltreatment data. For self-report data, the proposed model demonstrated poor fit ($\chi2_{(80, n= 490)}$= 559.75, p < .001, RMSEA $_{(.10-.12)}$= .11, SRMR= .09, CFI = .77 , TLI= .66). The correlations and modification indices were examined for improvement in model fit. Results suggested the residuals between emotional abuse frequency and physical and neglect frequency be freed, as well as the residuals between emotional abuse severity and neglect frequency and severity. The final model for self-reported maltreatment (Figure 4) demonstrated adequate fit ($\chi2_{(76, n= 490)}$= 252.13, p < .001, RMSEA$_{(.06-.08)}$= .07, SRMR= .08, CFI = .92 , TLI= .87). The proposed maltreatment model based on case file maltreatment history (Figure 5) demonstrated excellent fit ($\chi2_{(80, n= 490)}$= 141.18, p < .001, RMSEA $_{(.03-.05)}$= .04, SRMR= .05, CFI = .96 , TLI= .94). No modifications were made to this model.

Factor loadings and standardized parameter estimates were examined for statistical significance in the model (Table 5). In the model based on self-reported maltreatment history, maltreatment was a marginally significant predictor of both adaptive skills (B = -.14, p = .09) and school problems (B = .14, p = .09). In addition to maltreatment, verbal IQ was a significant predictor of adaptive skills (B = .28, p < .01) and school problems (B = -.28, p < .01). Age was also a significant predictor of adaptive skills (B = .22, p < .01) and marginally significant predictor of math grades (B = -.13, p = .09). According to the case file model, maltreatment was a marginally significant predictor of adaptive skills (B = -.17, p = .06), school problems (B = .15, p = .08), and math grades (B = .15, p = .09). Additionally, age was a significant predictor of

adaptive skills ($B = -.20$, $p < .01$) and marginally significant predictor of math grades ($B = -.14$, $p = .06$). Lastly, verbal IQ was a significant predictor of adaptive skills ($B = .30$, $p < .01$).and school problems ($B = -.29$, $p < .01$).

Discussion

Maltreated youth tend to experience more difficulty in school, as compared to non-maltreated peers, often manifesting as below average grades and more behavioral problems in the classroom (Romano et al., 2015; Trout et al., 2008). Inconsistencies in the literature, however, have raised questions about whether it is the type, frequency, or severity of abuse that contributes to the maltreatment-school functioning relation. The current study sought to improve understanding of the relation between maltreatment and academic functioning by simultaneously examining if maltreatment conceptualized by its various dimensions (type, frequency, and severity) was associated with school grades and behavior. Additionally, the current study sought to take this one-step further by a) examining the cumulative impact of maltreatment using a maltreatment measurement model, which incorporated each dimension of maltreatment, and b) comparing the findings between maltreatment histories gathered from the two most common sources; self-report and case file data. Results from the dimensional analysis, which simultaneously examined each dimension of maltreatment, generally supported the notion that maltreatment frequency, as opposed to type or severity, may contribute to how youth behave in school. Furthermore, the results also demonstrate that the measurement model approach may be a better approach when examining the maltreatment-academic relation, and that there are differences in the outcomes depending on the maltreatment information source (case file vs. self-report).

Maltreatment type

When each dimension of maltreatment was examined separately, there was no type of maltreatment that appeared to be more influential to school grades and behavior than another type. This appeared to be true for school grades and behavior regardless of the source of maltreatment information (e.g., case file and self-report data). Of the maltreatment types, measured as severity and frequency for each type, there was no type of maltreatment where both dimensions for that type were associated with one or more of the academic outcomes. If one were to expect type of maltreatment to matter when examining how youth behave or perform in school, then one might expect to find a significant association between both dimensions for a given type of maltreatment and one or more of the academic outcomes examined in the current study. Furthermore, one might expect to see similarities between the case file and self-report models.

Of the different maltreatment types, previous findings suggested that neglect was associated with greater deficits in academic functioning (e.g., lower grades in school), as opposed to the various forms of abuse (Hildyard & Wolfe, 2002; Romano et al., 2015). However, in the current study, when neglect was included with all other maltreatment types, neither neglect frequency nor severity were associated with school grades and behavior, which was observed for both self-report and case file data. Only neglect frequency, based on case file data, was marginally significantly associated with English grades.

One explanation for why neglect was not significantly associated with school grades and behavior could be that contrary to past research, the present study accounted for youths' complete maltreatment history in the analyses. Previous studies that have compared the effect of neglect on academic grades and behavior have tended to categorize youth into groups based on their primary maltreatment classification, and then compare differences in academic functioning

across the groups of maltreatment types (e.g., Kurtz et al., 1993). This type of method may hide the potential influence of other maltreatment experiences by not taking into account experiences of other maltreatment types and polyvictimization, leading to assumptions that neglect is what is only accounting for differences in academic functioning. This may be especially true for neglect, as it is the most prominent type of maltreatment (U.S. Department of Health & Human Service, 2016), and one of the most prominent types in the current study. Furthermore, like most youth in foster care, youth in the present study tended to experience more than one type of maltreatment (Finkelhor et al., 2013), and neglect was one of the most prominent polyvictimization experiences. Overall, the considerable overlap between each type of abuse and insignificant associations between a specific type and the academic outcomes suggest that neglect and the other types of maltreatment do not have enough unique explanatory influence to predict how children function in school.

Maltreatment severity

As with maltreatment type, results suggest that when examining each dimension of maltreatment separately in the same model, severity of maltreatment experiences may not be an important indicator for youths' academic functioning for both school grades and behavior as well. With the exception of emotional abuse severity based on self-report data, none of the other severity dimensions for self-report data and none of the maltreatment severity dimensions for case file data were significantly (or marginally significant) with school grades and behavior. Again, if one were to expect severity to be an important contributor to academic functioning, one might expect to find several associations between the academic outcomes and the severity measurements across maltreatment types and data sources.

These findings are in line with some of the few previous studies that have examined maltreatment severity and academic functioning, and found no relation (Coohey et al., 2011; Kinard, 2001). However, as with the maltreatment literature at large, differences and limitations in previous study's operationalization techniques of severity have made the association between severity and academic functioning unclear (Manly, 2005). For example, Coohey et al. (2011) used a dichotomous severity variable and Kinard (2001) only used a severity score for the most severe event a child experiences when examining academic performance. As compared to these past studies, the current study used a well-established technique for measuring maltreatment severity (i.e., the MMCS; English et al., 2005a) with separate measurements of severity for each maltreatment type, which has been shown to be a more valid approach to studying maltreatment severity, as compared to just an overall severity score for example (Manly, 2005). However, what these results show is that even when using a well-validated measure of severity, severity still did not generally contribute to academic functioning. This suggests that focusing on severity and examining severity independently may not be an advantageous approach when trying to understand how maltreated youth perform in school, no matter which operationalization technique is used for severity when studying the maltreatment-academic relation.

It is worth noting that of the various dimensions of maltreatment, emotional abuse severity based on self-report demonstrated a positive association with English grades, which was the only severity dimension associated with any of the academic outcomes examined. In the maltreatment literature, there is a considerable lack of research specifically examining how emotional abuse is associated with academic functioning (Maguire et al., 2015), and this is the first study to specifically examine emotional abuse severity in relation to school grades. This finding seems counterintuitive to what one would assume to find. It may be that youth who

experience emotional abuse are better able to perform at school because they feel more supported at school, as compared to home. Parents and other primary caregivers are typically the perpetrators of emotional abuse (Trickett, Mennen, Kim, & Sang, 2009), which may mean that for foster care youth, teachers are one of the only supportive adults who they interact with on a typical basis. This may increase their potential to perform well in school, as perceived social support from teachers has been shown to be especially important for academic functioning, as well as academic engagement and motivation, even when accounting for youths' previous traumatic experiences (Pan, Zaff, & Donlan, 2017). Given the overall lack of research on emotional abuse, more research on emotional abuse and academic functioning is needed to clarify this relation.

Maltreatment frequency

As compared to the type and severity, evidence from the current study appears to suggest that the frequency of maltreatment may be the most influential aspect of maltreatment with regard to how youth perform and behave in school. Across the maltreatment types, there were several significant and marginally significant associations observed between frequency and school behavior and grades. Leiter and Johnson (1997) reported similar findings that suggested a high frequency of abuse was associated with more negative school behaviors, which included school absences and high school dropout. In their study, they combined incidents of physical, sexual, and emotional abuse into a single "abuse" variable, making it unclear as to whether this relation was specific to a certain type of abuse. The current study builds on these findings by providing evidence that the frequency for all three individual types, and the frequency of abuse in general, may be especially predictive of school behavior, even when taking into consideration the influence of each frequency type simultaneously.

The findings for maltreatment frequency also support the claims made by Petrenko et al. (2012), who hypothesized that the frequency of maltreatment might have a greater influence on youths' ability to perform in school, as opposed to type or severity. For example, frequency of physical abuse was negatively, marginally associated with English grades, which is closely in line with Kinard (2001) who also found a negative association between physical abuse frequency and reading ability. Moreover, results from the current study also expand on Petrenko et al.'s claims by showing that frequency might be influential for school behavior as well, which is closely associated with academic performance. It is possible that the rationale for frequency being more important (regardless of type of abuse) for school performance and behavior may be due to the nature of repeated disruption to the typical cognitive and behavioral development process (Petrenko et al., 2012). Perhaps more than experiencing one to two severe events, experiencing recurrent "any" abuse event interferes with the youth's capacity for mastery of certain stage-salient tasks (e.g., developing efficient problem solving or emotional regulatory abilities), making it harder to learn more complex cognitive tasks at future developmental stages or properly behave in school (Davies, Manning, & Cicchetti, 2013; Ursache, Blair, & Raver, 2012). This may be especially true for behavioral development, as the frequency of maltreatment tends to be more closely associated with externalizing behaviors, as compared to other maltreatment dimensions (Manly, 2005). The current findings provide some support for the Manly review as well given than many of the negative behaviors captured by the school behavior measure included externalizing problems.

Additionally, more frequent maltreatment experiences may put youth at-risk for psychopathology, as compared to more severe maltreatment events (Hazen, Connelly, Roesch, Hough, & Landsverk, 2009; Li & Godinet, 2014). This in turn can interfere with academic

functioning. For example, sexual abuse frequency was significantly associated with school problems in the current study. A greater frequency of sexual abuse incidents is often cited as a stronger risk factor for post-traumatic symptoms, as compared to other types of maltreatment (McMahon, Grant, Compas, Thurm, & Ey, 2003), and post-traumatic symptoms are a strong contributor to attention and learning problems (Schoeman, Carey, & Seedat, 2009; Thompson & Massat, 2005). Thus, the frequency of abuse may be more likely to indirectly influence academic performance, and to some degree academic behavior as well, through its influence on psychopathology, as compared to severity or type alone.

Overall, the lack of consistent associations in the current study suggest that when examined simultaneously, there is no particular dimension of maltreatment that contributes uniformly to how youth perform in school (i.e., grades), but that frequency of maltreatment may contribute to how youth behave in school. However, one might still question the potential importance of frequency for school behavior, and to some extent school performance, because all of the significant and marginally significant findings were found based on self-report maltreatment data. If one maltreatment dimension was particularly important, one might expect that dimension to be significantly associated with the same outcome for both self-report and case file data. For example, if neglect frequency was the "most important" of the other maltreatment dimensions for math grades, it should be the case that neglect frequency would be associated with math grades in both the model based on case file and self-report data. However, there were no significant maltreatment dimensions based on case file data associated with school functioning overall (albeit, neglect frequency marginally).

Maltreatment measurement model

In addition to examining each maltreatment dimension separately, the current study also utilized a measurement model approach. Instead of separate estimates for each maltreatment dimension in the same model, each maltreatment dimension was combined into a single, cumulative latent variable of maltreatment, which was then used to examine the association between maltreatment and youths' performance and behavior in school. Although there was an overall lack of significant and consistent associations when examining each maltreatment dimension separately, with the exception of frequency based on self-report data, analyses using the maltreatment measurement model for both self-report and case file data, suggested that maltreatment may still influence academic functioning, more specifically school behavior. In both the case file and self-report maltreatment measurement model, maltreatment was marginally associated with both adaptive skills and school problems. Furthermore, maltreatment in the case file model was marginally associated with math grades.

This novel approach of using a measurement model to study the academic functioning of maltreated youth in the current study appears to provide several advantages over the dimensional approaches used in the current study and typically used in past research on maltreatment and academic functioning. For one, this type of analysis method incorporated youths' complete maltreatment history. Maltreatment is a complex variable, and trying to capture or reduce this construct in a single yes/no variable, or through a single dimension, may exclude important information about these experiences that might influence youths' performance and behavior in school (Manly, 2005). There is also considerable overlap between the maltreatment dimensions and the use of the measurement model helps to account for the overlap or polyvictimization within and between each maltreatment type (Gabrielli et al., 2017). This was observed in the current study as well as the majority of youth experienced more than one type of maltreatment

and multiple events of maltreatment. Furthermore, maltreatment incidents likely do not occur in isolation, and each event is likely to share several underlying characteristics, such as factors associated with family or community environment or threat. The use of a latent model of maltreatment helps to capture some of the commonality and shared variance between the different maltreatment experiences, allowing for perhaps a more reliable measurement of maltreatment and academic functioning. This technique also helps achieve a potentially more true measurement, as the measurement model reduces some of the measurement error, which is likely to be present when measuring maltreatment because maltreatment cannot be measured directly, but it is instead measured through questions and tools that assess maltreatment's various dimensions.

Additionally, results suggest the use of a measurement model for maltreatment provides a more consistent estimate of how maltreatment may influence academic functioning. This was observed when comparing the results of the dimensional approach and measurement model approach between case file and self-report data. There was significant discrepancy between the dimensional approach models, as there were several associations between maltreatment dimensions and academic functioning based on self-report data, but none when using the case file data for school problems, adaptive skills, or math grades. However, when using the measurement model, there was a more consistent pattern of findings across the maltreatment source types, as both models showed a similar, marginally significant association between maltreatment and the academic behavioral outcomes. Although information is obtained about a similar child, the self-report and the case file measurement models serve as a type of replication of the findings since each model is built from difference sources. Inconsistency in findings is often observed in maltreatment research, as well as in maltreatment-academic research

specifically. What the results of the measurement model suggest is that the possible influence of differences in maltreatment measurement and operationalization, which may contribute to the observed inconsistencies in the literature, may be reduced by using a measurement model approach that incorporates several sources of maltreatment measurement in a single model.

Overall, given the lack of consistent associations when examining each dimension of maltreatment separately, but multiple significant associations when using the maltreatment measurement model, this suggests that what may be needed in research on academics and maltreatment is to take into consideration all aspects of youths' maltreatment experiences, as opposed to only looking at one dimension independently. It may be inaccurate to claim that maltreatment as a whole is not associated with a certain outcome if a study were to find no relation between a certain type of maltreatment or a characteristic of maltreatment such as severity and frequency. For example, a study may only test and find no relation between physical abuse, sexual abuse, emotional abuse, and neglect frequency scores and the outcome being examined. It would be misleading to then claim that maltreatment in general is not related with the outcome examined. It may be the case that maltreatment severity is what contributes to the outcome, or as with the current results, that the cumulative experiences of frequency and severity dimensions together matter. One could compare this to studying Autism Spectrum Disorder (ASD), and claiming that by finding an insignificant association between stereotype or repetitive motor movements and learning problems that ASD is not associated with learning problems. When in actuality, there are many other aspects of ASD that might influence this association (American Psychiatric Association, 2013). As with other areas of study that involve a multidimensional construct, it may be the most accurate or valid to examine the contrast of maltreatment cumulatively.

Case file vs. self-report

Consistent with past research, the results of the present study differed depending on the source of the maltreatment information (Cho & Jackson, 2016; Cohen et al., 2001). Perhaps surprisingly, none of the academic functioning variables were associated with the maltreatment dimensions based on self-report data. One possibility for the discrepancy in findings between self-report and case file data when examining school functioning, which did not appear to depend on type of maltreatment, could be the result of slight differences in how each dimension of maltreatment was measured for self-report and case file data. The self-report maltreatment frequency score was a combination of a count measurement (how many times) and chronicity measurement (how often), whereas the case file maltreatment frequency scores were only a count measurement, or how many times. This was also the case with the severity score, as the severity scores were based on a three point scale for self-report and a five point scale for case file. This small difference in the operationalization of frequency and severity may have influenced the associations, or lack of associations, observed in the current study when using the dimensional approach. Past research that has compared different operationalization techniques of frequency provides evidence that the way in which frequency is defined, may influence the observed relation between maltreatment and an outcome of interest (English et al., 2005b; Manly, 2005). Including chronicity as an aspect of the frequency variable for the self-report data could explain why there was a marginally significant association between emotional abuse frequency and adaptive skills, and sexual abuse frequency and school problems in the self-report model, but not in the case file model. That is, the operationalization of frequency based on self-report data may have been more sensitive to differences in academic functioning given that it incorporated both how many times and how often youth experienced maltreatment. Additionally, consistent with

past research, the self-report data included many more instances of abuse than were reported in the case file data (Fallon et al., 2010; Macmillan et al., 2003). However, despite the observed differences using the dimensional approach, there was far less discrepancy between the data sources in terms of how maltreatment is associated with academic functioning when using the measurement model approach.

Limitations

In light of these findings, there are limitations of the current study. One limitation could be the use of school grades as a measure of academic performance, and perhaps nationally normed and validated tests of academic achievement would better reflect a youth's academic skills (e.g., Woodcock Johnson Tests of Cognitive Ability; Woodcock, McGrew, Mather, & Schrank, 2003). Since standardized tests of academic achievement tests follow a standardized protocol and a specific question set, when administered properly it provides a score of youth's academic competence that can accurately compared to other youths' scores on the same test. Although using school grades is common in research on youth in foster care (O'Higgins, Sebba, & Gardner, 2017), grade data from the youth in the study came from over 24 different schools across several school districts perhaps calling into question the equivalence of the grades across the sample.

Additionally, only information about the youths' maltreatment was used when examining the association with academic functioning and information about youths' exposure to other, potentially traumatic events was not included. Maltreatment is only one type of trauma youth can experience and maltreatment is often considered distinct from other traumatic events in that maltreatment is an incident of direct, interpersonal victimization as a result of another's actions or lack of action (D'Andrea, Ford, Stolbach, Spinazzola, & van der Kolk, 2012; Finkelhor,

2008). Although maltreatment and other general traumas may be distinct from each other, both have been shown to potentially influence academic functioning (e.g., Delaney-Black et al., 2002). Moreover, youth who experience maltreatment often have experiences of other general traumas as well, and findings suggest that experiencing maltreatment may increase the risk for experience general trauma events, and vice versa (Costello et al., 2002). This suggests that general traumas may contribute to academic grades and behavior directly and indirectly through their influence on maltreatment exposure.

Lastly, the current study utilized a cross-sectional design when examining the association between maltreatment dimensions and academic functioning, thus causal explanations are not possible. Although maltreatment occurred prior to the measurement of academic grades and behavior, the exact time between and since the maltreatment and when academic functioning was measured is unknown, and the recency or timing of maltreatment has been associated with how youth behave and perform in school (Leiter & Johnsen, 1997). A longitudinal design, which measures changes in academic functioning, as well as potential changes in maltreatment experiences, would have allowed for casual inferences to be determined about the role of maltreatment in academic functioning.

Directions for future research

Despite these limitations, the current study helps to address gaps in the literature and resolve inconsistencies about which dimension of maltreatment (type, frequency, and severity) might contribute to how youth perform and behave in school, as well as provide new information about which method may be best to examine the maltreatment-academic relation. Based on the findings, several recommendations may help direct future research in this field. One, given that many of the dimensions of maltreatment (type and severity) were unrelated to academic

outcomes when examined separately, but when combined together in the maltreatment

measurement model were consistently associated with school behavior, future research should

examine maltreatment in a comprehensive manner. This includes not only measuring the various

components of maltreatment, but also using analysis techniques that account for the whole of

youths' maltreatment experiences. These types of analysis techniques may provide the most

valid approach for studying the relation between maltreatment and academic functioning because

it accounts for the polyvictimization that youth often experience and the shared commonalities

between maltreatment experiences.

As in the current study, one option for future research in this field is to use a

maltreatment measurement model where the various characteristics of youths' maltreatment

experience are used as indicator variables. This type of analysis technique is still an ongoing area

of research and more evidence is needed to develop a proper measurement model. For example,

while the current study used a single maltreatment factor model, it may be the case that a two

factor or three factor model is needed (e.g., sexual and non-sexual abuse factor model; Briere,

Runtz, Eadie, Bigras, & Godbout, 2017). Future research using this type of approach should

work to identify models that best capture the accumulation of maltreatment exposure in youth,

which may also include the use of other maltreatment characteristics, such as recency of abuse.

Furthermore, the robustness of these models should also be examined in several populations

(e.g., foster care vs. community sample) and across data sources (e.g., case file vs. self-report).

Another option may be to utilize person-centered approaches to maltreatment

measurement using techniques such as latent class and latent profile analysis, that incorporate

each dimension of maltreatment in the analysis (for review, see Rivera, Fincham, & Bray, 2017).

As with the measurement model approach, this approach can also be used as a way to account for

the considerable overlap or polyvictimization that youth experience as a cumulative measure of maltreatment. Using a person centered approach such as latent class and profile analysis can help identify prevalent patterns in polyvictimization exposure and determine if and how these patterns in maltreatment contribute to academic functioning.

However, it is important to note that development of these methods also includes future work to develop techniques for how to best capture the various aspects of maltreatment. For example, to build reliable and valid measurement models, there must also be reliable and valid indictors of maltreatment. This is still an ongoing task in the field of maltreatment research, and consensus has still not be reached on what is the best method for measuring maltreatment. Additionally, current techniques for the proper documentation and measurement of all the maltreatment characteristics can be a timely and challenging to use. For example, while the widely used MMCS (English et al., 2005a) provides researchers with a psychometrically sound tool for documenting the various aspects of maltreatment, researchers may not have the capacity (e.g., access to case files, personnel, time) required for proper use of this tool (Huffhines et al., 2016). However, as the results of the current study suggest, the comprehensive information that tools such as these provide may produce a more accurate measure of maltreatment to use when studying the maltreatment-academic relation. Thus, to help progress the field for this line of research, maltreatment measurement tools that are comprehensive and also accessible and manageable for researchers are needed in conjunction with or prior to the development of comprehensive analysis techniques of maltreatment.

Two, a novel aspect of the current study was the comparison between self-report and case file maltreatment data sources and academic functioning for youth in foster care. The goal was not to determine the accuracy of each source, but rather bring awareness that potential

differences may arise when using different sources of information. Rarely do studies have access to or report on maltreatment history from both self-reported and case file data, and studies that do have access to both sources tend to report differences in findings (Cho & Jackson, 2016; Cohen et al., 2001). Researchers attempting to compare findings on academic functioning and maltreatment across studies or replicate the findings from a previous study should take into account possible differences in the source of maltreatment information between the studies. Moreover, researchers with accessibility to both sources of information should examine potential factors that may contribute to differences in findings between the sources. One possibility may be that differences between case file and self-report data are the result of differences in operationalizations. Future research may benefit from examining how different operationalizations of maltreatment information for both case file and self-report data are associated with academic outcomes. For example, researchers could ask youth about their maltreatment history in terms of how often, how many times, and for how long they experienced a certain type of maltreatment, and then compare these definitions of frequency with different frequency coding schemes of case file information (e.g., number of events in the case file, how long the case file was open). Comprehensive investigation such as this may help identify where there are significant discrepancies in what is known about youth's maltreatment history, which in turn may help to identify why there are differences in findings between self-report and case file information.

Three, a complete focus on maltreatment when studying its relation with academics may exclude other equal or more important factors that can influence youths' performance and behavior in school. In general, negative outcomes that may be present in youth with experiences of maltreatment are not necessarily a direct consequence of maltreatment. Maltreatment is a non-

specific risk factor, thus problems in school might manifest or be exacerbated as the result of other issues associated with the maltreatment experiences, such as issues with social relationships or poor emotional regulation abilities (Lansford et al., 2002), but not the maltreatment directly or independently. Future research in this area should work to identify other closely related factors associated with school functioning that might be influenced by maltreatment. This may be especially true when studying populations of foster care youth because many aspects of the foster care experience may explain and contribute to youths' performance and behavior in school. The current study attempted to control for placement changes, one aspect of foster care shown to be associated with school performance (O'Higgins, et al., 2017). However, placement changes was not significantly associated with school grades and behavior. This might suggest that other factors associated with foster care, factors such as placement types (e.g., kinship, non-kinship care), social support, and time in care (Trout et al., 2008) could also be relevant to academic health. In all, researchers need to keep in mind that while youth in foster care are most often defined by their atypical maltreatment experiences, their exposure to maltreatment may not be the only or best way to conceptualize their life experiences.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental*

    disorders: DSM-5. Washington, D.C: American Psychiatric Association.

Aitken, M., Martinussen, R., & Tannock, R. (2017). Incremental validity of teacher and parent

    symptom and impairment ratings when screening for mental health difficulties. *Journal*

    of Abnormal Child Psychology, *45*, 827-837. doi: 10.1007/s10802-016-0188-y

Anthonysamy, A., & Zimmer-Gembeck, M. J. (2007). Peer status and behaviors of maltreated

    children and their classmates in the early years of school. *Child Abuse & Neglect, 31*,

    971-991. doi: 10.1016/j.chiabu.2007.04.004

Attar-Schwartz, S. (2009). School functioning of children in residential care: The contributions

    of multilevel correlates. *Child Abuse & Neglect, 33*, 429-440. doi:

    10.1016/j.chiabu.2008.12.010

Bain, S. K., & Jaspers, K. E. (2010). Review of Kaufman brief intelligence test, second edition.

    Journal of Psychoeducational Assessment, 28, 167-174. doi: 10.1177/0734282909348217

Barnett, D., Manly, J. T., & Cicchetti, D. (1993). Defining child maltreatment: The interface

    between policy and research. In D. Cicchetti & S. L. Toth (Eds.), *Advances in applied*

    developmental psychology: Child abuse, child development and social policy (pp. 7–73).

    Norwood, NJ: Ablex Publishing.

Berlin, M., Vinnerljung, B., & Hjern, A. (2011). School performance in primary school and

    psychosocial problems in young adulthood among care leavers from long term foster

    care. *Children and Youth Services Review, 33*, 2489-2497. doi:

    10.1016/j.childyouth.2011.08.024

Briere, J., Runtz, M., Eadie, E., Bigras, N., & Godbout, N. (2017). Disengaged parenting: structural equation modeling with child abuse, insecure attachment, and adult symptomatology. *Child Abuse & Neglect, 67*, 260-270. doi: 10.1016/j.chiabu.2017.02.036

Briscoe-Smith, A. M., & Hinshaw, S. P. (2006). Linkages between child abuse and attention-deficit/hyperactivity disorder in girls: Behavioral and social correlates. *Child Abuse & Neglect, 30*, 1239-1255. doi: 10.1016/j.chiabu.2006.04.008

Brody, N. (1997). Intelligence, schooling, and society. *American Psychologist, 52*, 1046-1050. doi: 10.1037/0003-066X.52.10.1046

Brown, J., Cohen, P., Johnson, J. G., & Salzinger, S. (1998). A longitudinal analysis of risk factors for child maltreatment: Findings of a 17-year prospective study of officially recorded and self-reported child abuse and neglect. *Child Abuse & Neglect, 22*, 1065-1078. doi: 10.1016/S0145-2134(98)00087-8

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. Bollen & J. Long (Eds.), Testing Structure Equaiton Models (pp. 136-162). Newbury Park, CA: *Sage Focus Editions.*

Cho, B., & Jackson, Y. (2016). Self-reported and case file maltreatment: Relations to psychosocial outcomes for youth in foster care. *Children and Youth Services Review, 69*, 241-247. doi: 10.1016/j.childyouth.2016.08.013

Cohen, P., Brown, J., & Smailes, E. (2001). Child abuse and neglect and the development of mental disorders in the general population. *Development and Psychopathology, 13*, 981-999.

Coohey, C., Renner, L. M., Hua, L., Zhang, Y. J., & Whitney, S. D. (2011). Academic achievement despite child maltreatment: A longitudinal study. *Child Abuse & Neglect, 35*, 688-699. doi: 10.1016/j.chiabu.2011.05.009

Costello, E. J., Erkanli, A., Fairbank, J. A., & Angold, A. (2002). The prevalence of potentially traumatic events in childhood and adolescence. *Journal of Traumatic Stress, 15*, 99-112. doi: 10.1023/A:1014851823163

Crittenden, P. M., Claussen, A. H., & Sugarman, D. B. (1994). Physical and psychological maltreatment in middle childhood and adolescence. *Development and Psychopathology, 6*, 145-164. doi: 10.1017/S0954579400005927

Crozier, J. C., & Barth, R. P. (2005). Cognitive and academic functioning in maltreated children. *Children & Schools, 27*, 197-206. doi: 10.1093/cs/27.4.197

D'Andrea, W., Ford, J., Stolbach, B., Spinazzola, J., & van der Kolk, B. A. (2012). Understanding interpersonal trauma in children: why we need a developmentally appropriate trauma diagnosis. *American Journal of Orthopsychiatry, 82*, 187-200. doi: 10.1111/j.1939-0025.2012.01154.x

Daignault, I. V., & Hébert, M. (2008). Short-term correlates of child sexual abuse: An exploratory study predicting girls' academic, cognitive, and social functioning 1 year later. *Journal of Child & Adolescent Trauma, 1*, 301-316. doi: 10.1080/19361520802505693

Daignault, I. V., & Hébert, M. (2009). Profiles of school adaptation: Social, behavioral and academic functioning in sexually abused girls. *Child Abuse & Neglect, 33*, 102-115. doi: 10.1016/j.chiabu.2008.06.001

Davies, P. T., Manning, L. G., & Cicchetti, D. (2013). Tracing the cascade of children's

    insecurity in the interparental relationship: The role of stage-salient tasks. *Child*

    Development, 84, 297-312. doi: 10.1111/j.1467-8624.2012.01844.x

De Bellis, M.D., Hooper, S.R., Spratt, E.G., Woolley, D.P. (2009). Neuropsychological findings

    in childhood neglect and their relationships to pediatric PTSD. *Journal of International*

    Neuropsychological Society, 15, 868-878. doi: 10.1017/S1355617709990464

Delaney-Black, V., Covington, C., Ondersma, S. J., Nordstrom-Klee, B., Templin, T., Ager, J.,

    ... & Sokol, R. J. (2002). Violence exposure, trauma, and IQ and/or reading deficits

    among urban children. *Archives of Pediatrics & Adolescent Medicine, 156*, 280-285. doi:

    10.1001/archpedi.156.3.280

Eckenrode, J., Laird, M., & Doris, J. (1993). School performance and disciplinary problems

    among abused and neglected children. *Developmental Psychology*, *29*, 53-62. doi:

    10.1037/0012-1649.29.1.53

English, D. J., Bangdiwala, S. I., & Runyan, D. K. (2005c). The dimensions of maltreatment:

    Introduction. *Child Abuse & Neglect, 29*, 441-460. doi: 10.1016/j.chiabu.2003.09.023

English, D. J., Graham, J. C., Litrownik, A. J., Everson, M., & Bangdiwala, S. I. (2005b).

    Defining maltreatment chronicity: Are there differences in child outcomes?. *Child Abuse*

    & Neglect, 29, 575-595. doi: 10.1016/j.chiabu.2004.08.009

English, D. J., Marshall, D. B., Coghlan, L., Brummel, S., & Orme, M. (2002). Causes and

    consequences of the substantiation decision in Washington State Child Protective

    Services. *Children and Youth Services Review, 24*, 817-851. doi: 10.1016/S0190-

    7409(02)00241-4

English, D., Upadhyaya, M., Litrownik, A., Marshall, J., Runyan, D., Graham, C., & Dubowitz, H. (2005a). Maltreatment's wake: The relationship of maltreatment dimensions to child outcomes. *Child Abuse & Neglect, 29*, 597–619. doi: 10.1016/j.chiabu.2004.12.008

Fallon, B., Trocmé, N., Fluke, J., MacLaurin, B., Tonmyr, L., & Yuan, Y. Y. (2010). Methodological challenges in measuring child maltreatment. *Child Abuse & Neglect*, *34*, 70-79. doi: 10.1016/j.chiabu.2009.08.008

Fantuzzo, J. W., Perlman, S. M., & Dobbins, E. K. (2011). Types and timing of child maltreatment and early school success: A population-based investigation. *Children and Youth Services Review, 33*, 1404-1411. doi: 10.1016/j.childyouth.2011.04.010

Finkelhor, D. (2008). *Childhood victimization*. New York, NY: Oxford University Press.

Finkelhor, D., Ormrod, R., Turner, H., & Hamby, S. L. (2005). The victimization of children and youth: A comprehensive, national survey. *Child Maltreatment, 10*, 5-25. doi: 10.1177/1077559504271287

Finkelhor, D., Turner, H. A., Shattuck, A., & Hamby, S. L. (2013). Violence, crime, and abuse exposure in a national sample of children and youth: An update. *JAMA Pediatrics, 167*, 614-621. doi: 10.1001/jamapediatrics.2013.42

Finkelhor, D., Vanderminden, J., Turner, H., Hamby, S., & Shattuck, A. (2014). Upset among youth in response to questions about exposure to violence, sexual assault and family maltreatment. *Child Abuse & Neglect*, *38*, 217-223. doi: 10.1016/j.chiabu.2013.07.021

Flynn, R. J., Ghazal, H., Legault, L., Vandermeulen, G., & Petrick, S. (2004). Use of population measures and norms to identify resilient outcomes in young people in care: An exploratory study. *Child & Family Social Work, 9*, 65-79. doi: 10.1111/j.1365-2206.2004.00322.x

Gabrielli, J., Jackson, Y., & Brown, S. (2016). Associations between maltreatment history and severity of substance use behavior in youth in foster care. *Child Maltreatment*, *21*, 298-307. doi: 10.1177/1077559516669443

Gabrielli, J., Jackson, Y., Tunno, A. M., & Hambrick, E. P. (2017). The blind men and the elephant: Identification of a latent maltreatment construct for youth in foster care. *Child Abuse and Neglect, 67*, 98-108. doi: 10.1016/j.chiabu.2017.02.020

Gilbert, R., Kemp, A., Thoburn, J., Sidebotham, P., Radford, L., Glaser, D., & MacMillan, H. L. (2009). Recognizing and responding to child maltreatment. *The Lancet, 373*, 167-180. doi: 10.1016/S0140-6736(08)61707-9

Greenhoot, A. F. (2011). Retrospective methods in developmental science. In B. Laursen, T. D. Little, & N. A. Card (Eds.), *Handbook of developmental research methods* (pp. 196–210) (1st Ed.). New York, NY: Guilford Press.

Hamby, S. L., Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2004). *The juvenile victimization questionnaire (JVQ): Administration and scoring manual*. Durham, NH: Crimes Against Children Research Center.

Hazen, A. L., Connelly, C. D., Roesch, S. C., Hough, R. L., & Landsverk, J. A. (2009). Child maltreatment profiles and adjustment problems in high-risk adolescents. *Journal of Interpersonal Violence, 24*, 361-378. Doi: 10.1177/0886260508316476

Hildyard, K. L., & Wolfe, D. A. (2002). Child neglect: Developmental issues and outcomes. *Child Abuse & Neglect, 26*, 679-695. doi: 10.1016/S0145-2134(02)00341-1

Hodgdon, H. B. (2009). *Child maltreatment and aggression: The mediating role of moral disengagement, emotion regulation, and emotional callousness among juvenile offenders* (Unpublished doctoral dissertation). Temple University, Philadelphia, PA.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*, 1-55. doi: 10.1080/10705519909540118

Huffhines, L., Tunno, A. M., Cho, B., Hambrick, E. P., Campos, I, Lichty, B., & Jackson, Y. (2016). Case file coding of child maltreatment: Methods, challenges, and innovations in a longitudinal project of youth in foster care. *Children and Youth Services Review, 67*, 254-262. doi: 10.1016/j.childyouth.2016.06.019

Hussey, J. M., Chang, J. J., & Kotch, J. B. (2006). Child maltreatment in the United States: Prevalence, risk factors, and adolescent health consequences. *Pediatrics, 118*, 933-942. doi: 10.1542/peds.2005-2452

Jackson, Y., Gabrielli, J., Fleming, K., Tunno, A. M., & Makanui, P. K. (2014). Untangling the relative contribution of maltreatment severity and frequency to type of behavioral outcome in foster youth. *Child Abuse & Neglect*, *38*, 1147-1159. doi: 10.1016/j.chiabu.2014.01.008

Jonson-Reid, M., Drake, B., & Kohl, P. L. (2009). Is the overrepresentation of the poor in child welfare caseloads due to bias or need?. *Children and Youth Services Review, 31*, 422-427. doi: 10.1016/j.childyouth.2008.09.009

Kamphaus, R., & VanDeventer, M. (2007). Behavior Assessment System for Children-Second Edition. In S. Smith, & M. VanDeventer (Eds.), *The clinical assessment of children and adolescents: A practitioners handbook* (pp. 311-326). East Sussex, England: Psychology Press.

Kaufman, A. S., & Kaufman, N. L. (2004). *Kaufman brief intelligence test, second edition*. Bloomington, MN: Pearson, Inc.

Kelly, K. (2000). The education crisis for children in the California juvenile court system. *Hastings Constitutional Law Quarterly, 27*, 151-714.

Kendall-Tackett, K. A., & Eckenrode, J. (1996). The effects of neglect on academic achievement and disciplinary problems: A developmental perspective. *Child Abuse & Neglect*, *20*, 161-169. doi: 10.1016/S0145-2134(95)00139-5

Kinard, E. (2001). Characteristics of maltreatment experience and academic functioning among maltreated children. *Violence and Victims, 16*, 323-337.

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York, NY: Guilford Publications.

Kurtz, P. D., Gaudin, J. M., Wodarski, J. S., & Howing, P. T. (1993). Maltreatment and the school-aged child: School performance consequences. *Child Abuse & Neglect, 17*, 581-589. doi: 10.1016/0145-2134(93)90080-O

Lansford, J. E., Dodge, K. A., Pettit, G. S., Bates, J. E., Crozier, J., & Kaplow, J. (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. *Archives of Pediatrics & Adolescent Medicine, 156*, 824-830. doi: 10.1001/archpedi.156.8.824

Leiter, J., & Johnsen, M. C. (1997). Child maltreatment and school performance declines: An event-history analysis. *American Educational Research Journal, 34*, 563-589. doi: 10.2307/1163250

Li, F., & Godinet, M. T. (2014). The impact of repeated maltreatment on behavioral trajectories from early childhood to early adolescence. *Children and Youth Services Review, 36*, 22-29. doi: 10.1016/j.childyouth.2013.10.014

Liem, J. H., Lustig, K., & Dillon, C. (2010). Depressive symptoms and life satisfaction among emerging adults: A comparison of high school dropouts and graduates. *Journal of Adult Development, 17*, 33-43. doi: 10.1007/s10804-009-9076-9

Litrownik, A. J., Lau, A., English, D. J., Briggs, E., Newton, R. R., Romney, S., & Dubowitz, H. (2005). Measuring the severity of child maltreatment. *Child Abuse & Neglect, 29*, 553-573. doi: 10.1016/j.chiabu.2003.08.010

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130-149. doi: 10.1037/1082-989X.1.2.130

MacMillan, H. L., Jamieson, E., & Walsh, C. A. (2003). Reported contact with child protection services among those reporting child physical and sexual abuse: Results from a community survey. *Child Abuse & Neglect, 27*, 1397-1408. doi: 10.1016/j.chiabu.2003.06.003

Maguire, S. A., Williams, B., Naughton, A. M., Cowley, L. E., Tempest, V., Mann, M. K., ... & Kemp, A. M. (2015). A systematic review of the emotional, behavioural and cognitive features exhibited by school-aged children experiencing neglect or emotional abuse. *Child: Care, Health and Development, 41*, 641-653. doi: 10.1111/cch.12227

Manly, J. T. (2005). Advances in research definitions of child maltreatment. *Child Abuse & Neglect, 29*, 425-439. doi: 10.1016/j.chiabu.2005.04.001

Manly, J. T., Cicchetti, D., & Barnett, D. (1994). The impact of subtype, frequency, chronicity, and severity of child maltreatment on social competence and behavior problems. *Development and Psychopathology, 6*, 121-143. doi: 10.1017/S0954579400005915

McMahon, S. D., Grant, K. E., Compas, B. E., Thurm, A. E., & Ey, S. (2003). Stress and

psychopathology in children and adolescents: is there evidence of specificity?. *Journal of*

Child Psychology and Psychiatry, 44, 107-133. doi: 10.1111/1469-7610.00105

Moore, T. D., McDonald, T. P., & Cronbaugh-Auld, K. (2016). Assessing risk of placement

instability to aid foster care placement decision making. *Journal of Public Child Welfare,*

10, 117-131. doi: 10.1080/15548732.2016.1140697

O'Higgins, A., Sebba, J., & Gardner, F. (2017). What are the factors associated with educational

achievement for children in kinship or foster care: A systematic review. *Children and*

Youth Services Review, *79*, 198-220. doi: 10.1016/j.childyouth.2017.06.004

Pan, J., Zaff, J. F., & Donlan, A. E. (2017). Social Support and Academic Engagement Among

Reconnected Youth: Adverse Life Experiences as a Moderator. *Journal of Research on*

Adolescence, 27, 890-906. doi: 10.1111/jora.12322

Perfect, M. M., Turley, M. R., Carlson, J. S., Yohanna, J., & Saint Gilles, M. P. (2016). School-

related outcomes of traumatic event exposure and traumatic stress symptoms in students:

A systematic review of research from 1990 to 2015. *School Mental Health, 8*, 7-43. doi:

10.1007/s12310-016-9175-2

Petrenko, C. L., Friend, A., Garrido, E. F., Taussig, H. N., & Culhane, S. E. (2012). Does

subtype matter? Assessing the effects of maltreatment on functioning in preadolescent

youth in out-of-home care. *Child Abuse & Neglect, 36*, 633-644. doi:

10.1016/j.chiabu.2012.07.001

R Core Team. (2014). *R: A language and environment for statistical computing*. Vienna, Austria:

R Foundation for Statistical Computing.

Rescorla, L. A., Bochicchio, L., Achenbach, T. M., Ivanova, M. Y., Almqvist, F., Begovac, I., ... & Fombonne, E. (2014). Parent–teacher agreement on children's problems in 21 societies. *Journal of Clinical Child & Adolescent Psychology, 43*, 627-642. doi: 10.1080/15374416.2014.900719

Raykov, T. (2005). Analysis of longitudinal studies with missing data using covariance structure modeling with full-information maximum likelihood. *Structural Equation Modeling, 12*, 493-505. doi: 10.1207/s15328007sem1203_8

Reynolds, C. R., & Kamphaus, R. W. (2004). *Behavior assessment scale for children (second edition)*. Circle Pines, MN: AGS Publishing.

Reyome, N. D. (1994). Teacher ratings of the achievement-related classroom behaviors of maltreated and non-maltreated children. *Psychology in the Schools, 31*, 253-260. doi: 10.1002/1520-6807(199410)31

Rivera, P., Fincham, F., & Bray, B. (2017). Latent classes of maltreatment: a systematic review and critique. *Child Maltreatment*, 1-22. doi: 10.1177/1077559517728125.

Romano, E., Babchishin, L., Marquis, R., & Fréchette, S. (2015). Childhood maltreatment and educational outcomes. *Trauma, Violence, & Abuse*, *16*, 418-437. doi: 0.1177/1524838014537908

Rouse, H. L., & Fantuzzo, J. W. (2009). Multiple risks and educational well-being: A population-based investigation of threats to early school success. *Early Childhood Research Quarterly*, *24*, 1-14. doi: 10.1016/j.ecresq.2008.12.001

Rubin, D. M., O'Reilly, A. L., Luan, X., & Localio, A. R. (2007). The impact of placement stability on behavioral well-being for children in foster care. *Pediatrics, 119*, 336-344. doi: 10.1542/peds.2006-1995

Ryan, J. P., & Testa, M. F. (2005). Child maltreatment and juvenile delinquency: Investigating the role of placement and placement instability. *Children and Youth Services Review, 27*, 227-249. doi: 10.1016/j.childyouth.2004.05.007

Schoedl, A. F., Costa, M. C. P., Mari, J. J., Mello, M. F., Tyrka, A. R., Carpenter, L. L., & Price, L. H. (2010). The clinical correlates of reported childhood sexual abuse: an association between age at trauma onset and severity of depression and PTSD in adults. *Journal of Child Sexual Abuse, 19*, 156-170. doi: 10.1080/10538711003615038

Schoeman, R., Carey, P., & Seedat, S. (2009). Trauma and posttraumatic stress disorder in South African adolescents: A case–control study of cognitive deficits. *The Journal of Nervous and Mental Disease, 197*, 244-250. doi: 10.1080/10538711003615038

Schwartz, D., Gorman, A. H., Nakamoto, J., & Toblin, R. L. (2005). Victimization in the peer group and children's academic functioning. *Journal of Educational Psychology, 97*, 425-435. doi: 10.1037/0022-0663.97.3.425

Sedlak, A.J., &, Broadhurst, D.D. (1996*). Executive summary of the Third National Incidence Study of Child Abuse and Neglect*. Washington, DC: US Department of Health and Human Services.

Shaffer, A., Huston, L., & Egeland, B. (2008). Identification of child maltreatment using prospective and self-report methodologies: A comparison of maltreatment incidence and relation to later psychopathology. *Child Abuse & Neglect, 32*, 682-692. doi: 10.1016/j.chiabu.2007.09.010

Sprang, G., Clark, J. J., & Bass, S. (2005). Factors that contribute to child maltreatment severity: A multi-method and multidimensional investigation. *Child Abuse & Neglect, 29*, 335-350. doi: 10.1016/j.chiabu.2004.08.008

Stone, S. (2007). Child maltreatment, out-of-home placement and academic vulnerability: A

    fifteen-year review of evidence and future directions. *Children and Youth Services*

    Review, *29*, 139-161. doi: 10.1016/j.childyouth.2006.05.001

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston, MA: Pearson

    Education. Inc.

Thompson, T., & Massat, C. R. (2005). Experiences of violence, post-traumatic stress, academic

    achievement and behavior problems of urban African-American children. *Child and*

    Adolescent Social Work Journal, 22, 367-393. doi: 10.1007/s10560-005-0018-5

Tiet, Q. Q., Bird, H. R., Davies, M., Hoven, C., Cohen, P., Jensen, P. S., & Goodman, S. (1998).

    Adverse life events and resilience. *Journal of the American Academy of Child &*

    Adolescent Psychiatry, 37, 1191-1200. doi: 10.1097/00004583-199811000-00020

Townsend, L., Flisher, A. J., & King, G. (2007). A systematic review of the relationship between

    high school dropout and substance use. *Clinical Child and Family Psychology Review,*

    10, 295-317. doi: 10.1007/s10567-007-0023-7

Trickett, P. K., Mennen, F. E., Kim, K., & Sang, J. (2009). Emotional abuse in a sample of

    multiply maltreated, urban young adolescents: Issues of definition and identification.

    Child Abuse & Neglect, 33, 27-35. doi: 10.1016/j.chiabu.2008.12.003

Trout, A. L., Hagaman, J., Casey, K., Reid, R., & Epstein, M. H. (2008). The academic status of

    children and youth in out-of-home care: A review of the literature. *Children and Youth*

    Services Review, 30, 979-994. doi: 10.1016/j.childyouth.2007.11.019

Turner, H. A., Finkelhor, D., & Ormrod, R. (2010). Poly-victimization in a national sample of

    children and youth. *American Journal of Preventive Medicine, 38*, 323-330. doi:

    10.1016/j.amepre.2009.11.012

Ursache, A., Blair, C., & Raver, C. C. (2012). The promotion of self-regulation as a means of enhancing school readiness and early achievement in children at risk for school failure. *Child Development Perspectives, 6*, 122-128. doi: 10.1111/j.1750-8606.2011.00209.x

U.S. Department of Health and Human Services, Administration on Children, Youth and Families. (2016). *Child maltreatment 2014*. Washington, D.C.: U.S. Government Printing Office.

Vinnerljung, B., Berlin, M., & Hjern, A. (2010). School performance, educational attainments, and risks for unfavorable development among children. *Socialstyrelsen (Ed.), Social Rapport*, 227-266.

Woodcock, R. W., McGrew, K. S., Mather, N., & Schrank, F. A. (2003). *Woodcock-Johnson III diagnostic supplement to the tests of cognitive abilities*. Itasca, IL: Riverside.

Zima, B. T., Bussing, R., Freeman, S., Yang, X., Belin, T. R., & Forness, S. R. (2000). Behavior problems, academic skill delays and school failure among school-aged children in foster care: Their relationship to placement characteristics. *Journal of Child and Family studies, 9*, 87-103. doi: 10.1023/A:1009415800475

Table 1. Descriptive Statistics of Continuous Variables

	Self-Report			Case File		
	Mean (*SD*)	Min	Max	Mean (*SD*)	Min	Max
Maltreatment Dimensions						
Physical Abuse Frequency	11.89 (10.69)	0	58	2.15 (3.42)	0	30
Physical Abuse Severity	1.19 (.67)	0	3	.83 (.91)	0	4
Sexual Abuse Frequency	5.08 (9.08)	0	50	.71 (1.57)	0	14
Sexual Abuse Severity	.81 (1.01)	0	3	.91 (1.61)	0	6
Emotional Abuse Frequency	21.27 (18.4)	0	105	.8 (1.32)	0	8
Emotional Abuse Severity	1.58 (.74)	0	3	1.02 (1.43)	0	5
Neglect Frequency	87.96 (20.65)	0	116	2.68 (3.65)	0	25
Neglect Severity	1.79 (.56)	0	3	1.30 (1.31)	0	5
School Behavior and Grades	Mean (*SD*)	Min	Max			
School Problems	59.87 (11.07)	37	89			
Adaptive Skills	48.2 (7.77)	31	69			
English Grades	3.31 (1.13)	1	5			
Math Grades	3.00 (1.32)	1	5			
Covariates	Mean (*SD*)	Min	Max	Mean (*SD*)	Min	Max
Placement Changes				9.15 (6.44)	1	46
Age	13.13 (3.09)	8.01	21.01			
Verbal IQ	87.71 (12.04)	59	125			
Nonverbal IQ	93.16 (15.71)	40	132			

Table 2. Bivariate Correlations Between Variables

Study Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. SR PA Frequency																							
2. SR SA Frequency	.47*																						
3. SR EA Frequency	.79*	.49*																					
4. SR Neglect Frequency	-.12*	-.06*	-.16*																				
5. SR PA Severity	.62*	.32*	.54*	.01																			
6. SR SA Severity	.43*	.62*	.45*	-.02	.43*																		
7. SR EA Severity	.42*	.23*	.50*	.08*	.56*	.34*																	
8. SR Neglect Severity	.08*	.02	.12*	.47*	.26*	.15*	.31*																
9. CF PA Frequency	.14*	.01	.11*	.03	.04	.03	.02	-.01															
10. CF SA Frequency	.11*	.24*	.16*	-.03	.09*	.23*	.02	.01	.10*														
11. CF EA Frequency	-.12*	-.01	.17*	.03	-.14*	-.00	.09	.06	.43*	.17*													
12. CF Neglect Frequency	-.07	-.07	-.02	-.01	-.09*	-.01	-.04	-.09*	.11*	.09*	.26*												
13. CF PA Severity	.13*	.03	.11*	-.01	.06	.06	.07	.00	.52*	.13*	.28*	.22*											
14. CF SA Severity	.08	.23*	.12*	-.04	.03	.21*	-.01	-.04	.11*	.65*	.16*	.10*	.20*										
15. CF EA Severity	-.04	-.09*	.01	.03	.04	-.03	.04	.05	.26*	.10*	.65*	.25*	.23*	.11*									
16. CF Neglect Severity	-.00	-.02	.01	.07	.07	.05	.03	.05	.17*	.16*	.31*	.38*	.25*	.22*	.32*								
17. Age	.02	.09*	.02	-.02	-.02	.03	-.09*	.17	.09	.04	.04	-.10*	.04	.11*	-.03	.01							
18. Verbal IQ	-.03	-.16*	-.08*	.03	-.09*	-.14*	-.16*	-.01	-.01	.03	.10*	.17*	.07	.03	.07	.05	-.12*						
19. NV IQ	-.04	-.11*	-.07*	-.01	-.06	-.12*	-.07*	-.01	-.01	-.01	.05	.12*	.03	.02	.03	.01	-.11*	.55*					
20. Placement	.11*	.08*	.08*	-.05	.11*	.08*	.05	.04	.01	.01	.02	-.08	.03	.06	-.04	-.15*	.15*	-.01	-.10*				
21. School Problems	.06	.12*	.07	-.07	.04	.09	.10*	.02	.05	.08	.12	-.06	.11	.12	.13	.07	.12*	-.32*	-.28*	.29*			
22. Adaptive Skills	-.12*	-.09	-.09	.09	-.12*	-.10	-.13*	.00	-.11	.02	-.13	.02	-.18*	.01	-.01	.01	.05	.19*	.10	-.26*	-.80*		
23. English Grades	-.05	-.08	-.12	.06	-.02	-.03	-.14*	-.01	.02	-.08	.05	-.06	.02	-.03	.06	-.06	-.02	-.09	.01	.07	.43*	-.40*	
24. Math Grades	.09	.04	.01	.06	.03	.09	-.05	.05	-.06	-.02	-.03	-.09	-.02	.06	-.05	-.06	.12	.00	.00	.09	.22	-.07	.37*

SR= Self-report, CF= Case file, PA= Physical abuse, SA= Sexual abuse, EA= Emotional abuse, NV= Non-verbal

* p < .05

Table 3. Polyvictimization Among Maltreatment Types

	Case File Data			Self-report Data		
	PA	SA	EA	PA	SA	EA
SA	19.18%			44.90%		
EA	30.00%	14.49%		84.69%	45.31%	
N	40.82%	23.06%	34.49%	88.16%	46.73%	91.63%

PA= Physical Abuse, SA= Sexual Abuse, EA= Emotional Abuse, N= Neglect

Table 4. Path Estimates for Models Examining Maltreatment Dimensions Separately

Path Estimates	Self-Report		Case File	
	Standardized Estimates	R^2	Standardized Estimates	R^2
Adaptive Skills on		.21		.14
Physical Abuse Frequency	-.23**		.04	
Physical Abuse Severity	-.11		-.12	
Sexual Abuse Frequency	-.08		.00	
Sexual Abuse Severity	.10		-.00	
Emotional Abuse Frequency	.19*		-.17	
Emotional Abuse Severity	.01		.06	
Neglect Frequency	-.06		.02	
Neglect Severity	-.06		.00	
Placement Changes	-.09		-.07	
Age	.23**		.18**	
VIQ	.32**		.28**	
NVIQ	-.01		-.01	
School Problems on		.21		.18
Physical Abuse Frequency	.12		-.12	
Physical Abuse Severity	.11		.08	
Sexual Abuse Frequency	.20**		.05	
Sexual Abuse Severity	-.14		.08	
Emotional Abuse Frequency	-.15		.13	
Emotional Abuse Severity	-.01		.07	
Neglect Frequency	.06		-.06	
Neglect Severity	.06		-.05	
Placement Changes	.12		.09	
Age	-.06		-.02	
VIQ	-.29**		-.29**	
NVIQ	-.10		-.10	
English Grades on		.08		.07
Physical Abuse Frequency	-.20*		-.01	
Physical Abuse Severity	-.03		.00	
Sexual Abuse Frequency	..06		.12	
Sexual Abuse Severity	.00		-.05	
Emotional Abuse Frequency	.17		-.10	
Emotional Abuse Severity	.19**		-.01	
Neglect Frequency	-.07		.17*	
Neglect Severity	-.04		-.06	
Placement Changes	-.09		-.11	
Age	.09		.08	
VIQ	.16*		.12	
NVIQ	-.07		-.10	
Math Grades on		.05		.09
Physical Abuse Frequency	-.18		.15	
Physical Abuse Severity	.10		-.02	
Sexual Abuse Frequency	-.02		.09	
Sexual Abuse Severity	-.04		-.10	
Emotional Abuse Frequency	.10		-.04	
Emotional Abuse Severity	.10		.06	
Neglect Frequency	-..05		.14	
Neglect Severity	-..14		-.01	
Placement Changes	-.08		-.12	
Age	-.11		-.13*	
VIQ	.00		-.05	
NVIQ	..01		.01	

* $p \leq .10$, ** $p < .05$

Table 5. Factor Loadings and Path Estimates for Measurement Models

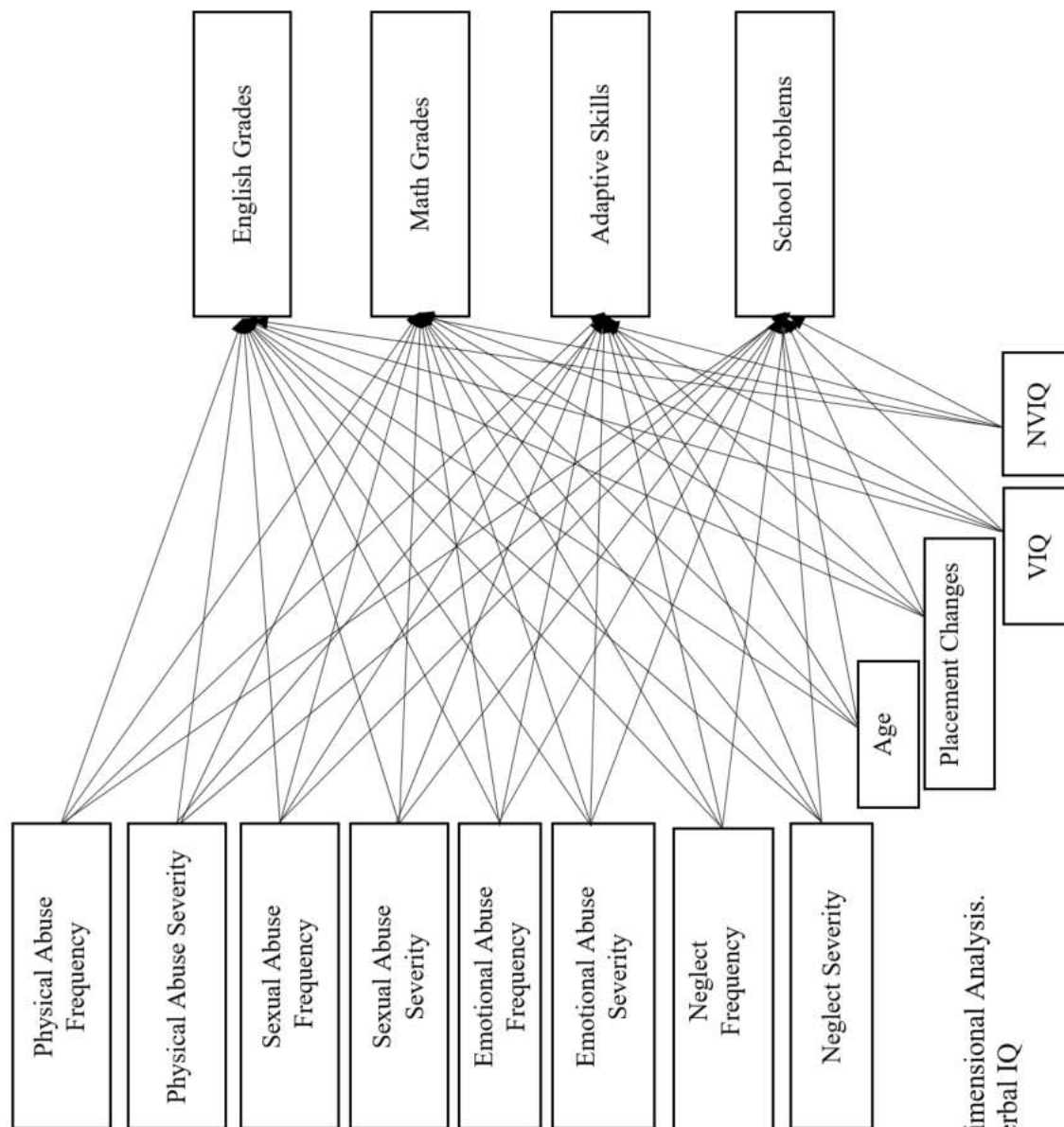| Measurement Model	Self-report		Case File	
	Standardized Loadings	R^2	Standardized Loadings	R^2
Physical Abuse Frequency	.48**	.23	.37**	.24
Physical Abuse Severity	.87**	.76	.49**	.21
Sexual Abuse Frequency	.27**	.07	.28**	.07
Sexual Abuse Severity	.42**	.18	.31**	.07
Emotional Abuse Frequency	.51**	.26	.60**	.49
Emotional Abuse Severity	.63**	.40	.56**	.34
Neglect Frequency	.22**	.05	.43**	.13
Neglect Severity	.64**	.40	.55**	.22
Structural Model	Standardized Estimates	R^2	Standardized Estimates	R^2
Adaptive Skills on		.15		.15
Maltreatment	-.14*		-.17*	
Placement Changes	-.11		-.09	
Age	.22**		.20**	
VIQ	.28**		.30**	
NVIQ	-.01		-.02	
School Problems on		.16		.16
Maltreatment	.14*		.15*	
Placement Changes	.12		.11	
Age	-.03		-.00	
VIQ	-.28**		-.29**	
NVIQ	.11		.11	
English Grades on		.03		.03
Maltreatment	.09		.06	
Placement Changes	-.09		-.09	
Age	.05		.07	
VIQ	.12		.12	
NVIQ	-.08		.09	
Math Grades on		.04		.06
Maltreatment	.04		.15*	
Placement Changes	-.02		-.11	
Age	-.13*		-.14*	
VIQ	-.02		-.05	
NVIQ	-.00		-.00	

* $p \leq .10$, ** $p < .05$

Figure 1. Proposed Model for Dimensional Analysis.
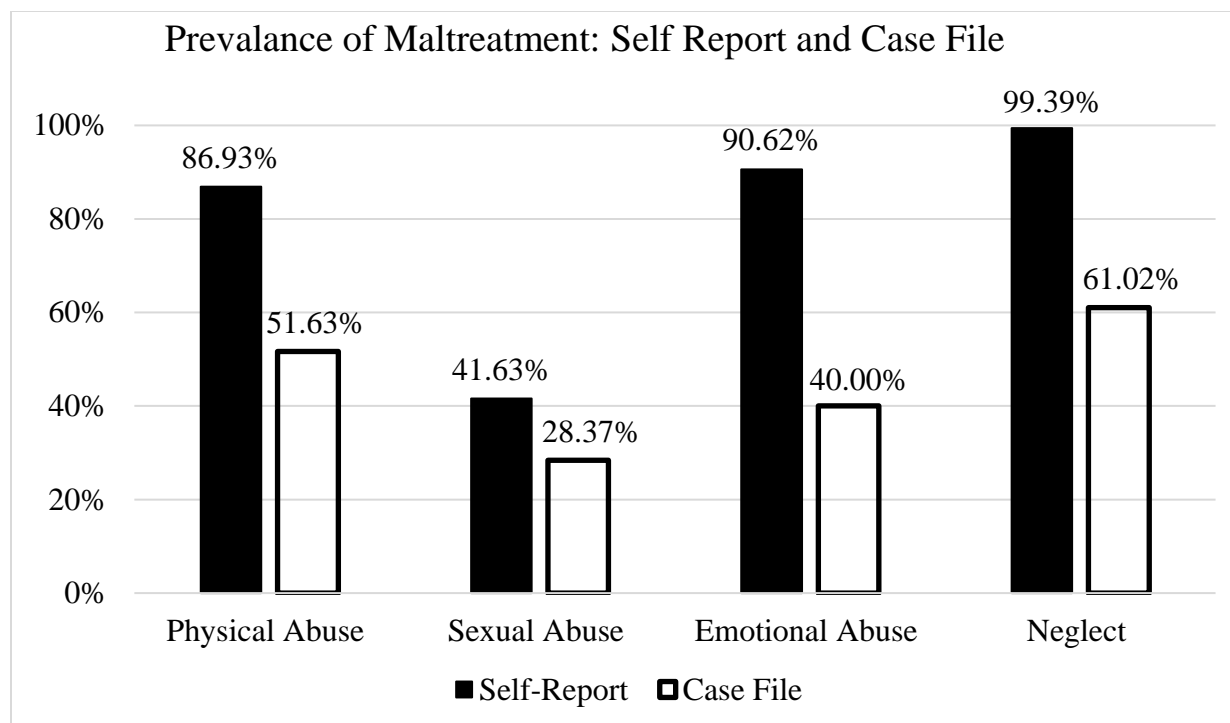VIQ= Verbal IQ, NVIQ= Nonverbal IQ

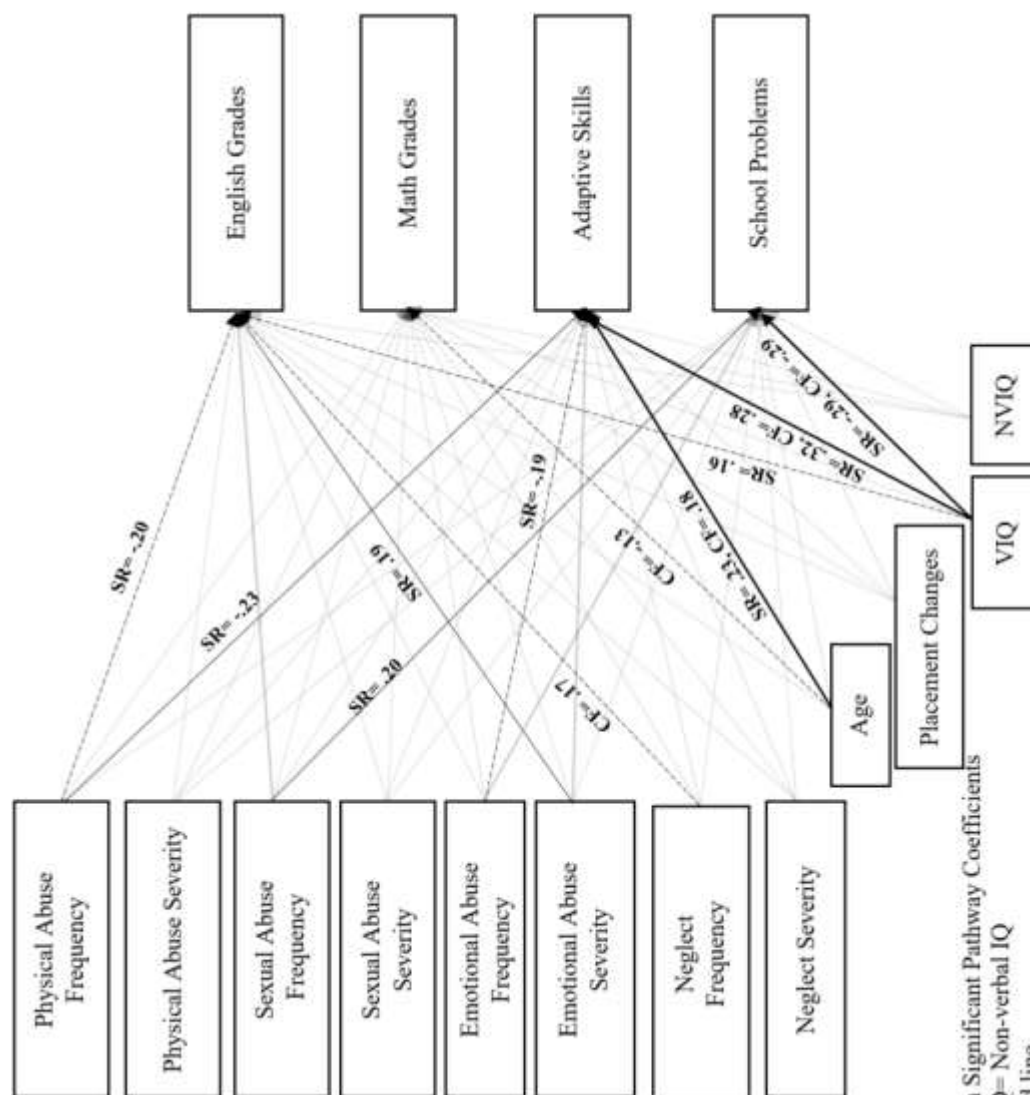Figure 2. Prevalence of Maltreatment: Self Report and Case File

Figure 3. Combined Dimensional Approach Model with Significant Pathway Coefficients
SR= Self-report, CF= Case file, VIQ= Verbal IQ, NVIQ= Non-verbal IQ
Significant pathway estimates (*p* < .05) shown with bold line.
Marginally significant pathway estimates (.05 < *p* < .10) shown with dashed line.
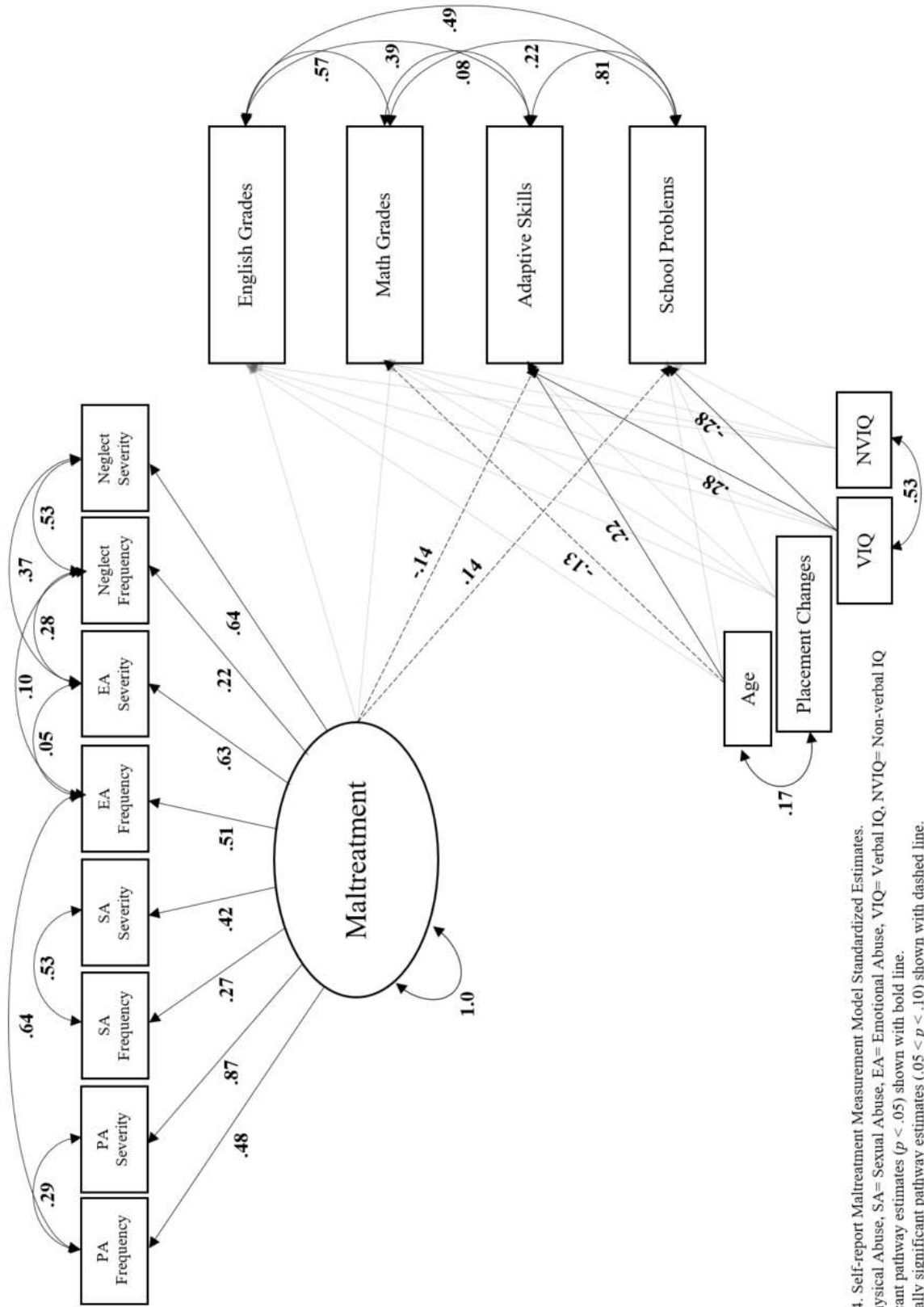
Figure 4. Self-report Maltreatment Measurement Model Standardized Estimates.
PA= Physical Abuse, SA= Sexual Abuse, EA= Emotional Abuse, VIQ= Verbal IQ, NVIQ= Non-verbal IQ
Significant pathway estimates ($p < .05$) shown with bold line.
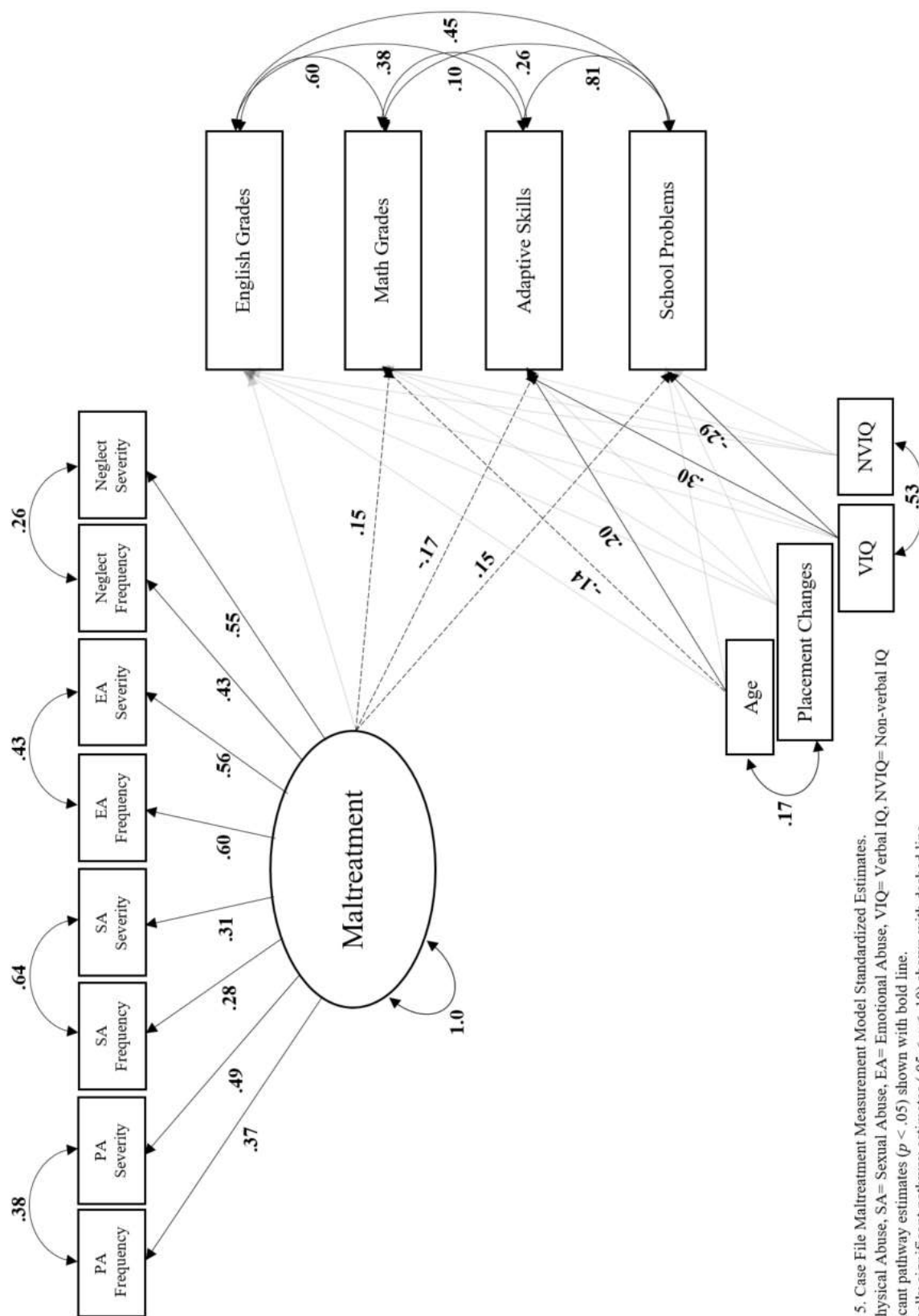Marginally significant pathway estimates ($.05 < p < .10$) shown with dashed line.

Figure 5. Case File Maltreatment Measurement Model Standardized Estimates.
PA= Physical Abuse, SA= Sexual Abuse, EA= Emotional Abuse, VIQ= Verbal IQ, NVIQ= Non-verbal IQ
Significant pathway estimates ($p < .05$) shown with bold line.
Marginally significant pathway estimates ($.05 < p < .10$) shown with dashed line.