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Predictors of Special Education Receipt Among Child Welfare-Involved Youth

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Abstract

Although the cognitive, physical and psychosocial consequences of maltreatment can heighten maltreated children's risk for special education, we know less about how a broader set of socio-ecological factors relate to their receipt of special education. This quantitative study investigated how selected attributes of children (e.g., gender) and their microsystems (e.g., caregiving settings) related to the receipt of special education among a sample of 1855 child welfare-involved youth (48% male, 52% female, M_{age} = 11 years) from the National Survey of Child and Adolescent Well-Being II. Results from logistic regression models show children with cognitive challenges had higher odds of receiving special education (odds ratio [*OR*] = 3.13; *p* < .001). Regarding children's microsystems, youth in foster care had odds of receiving special education that was approximately 2.7 times higher relative to children in biological or adoptive care (*OR* =

2.72; $p < .05$). The association between foster care and special education receipt underscores the importance of supports that foster families may need to promote the educational wellbeing of children with disabilities under their care.

Keywords: maltreated children; disability; special education; foster care

1. Introduction

For children across the US who endure neglect, physical abuse, psychological maltreatment or sexual abuse, many suffer lasting educational consequences: lowered achievement in mathematics and reading, higher rates of absenteeism, and increased grade repetition (Romano, Babchishin, Marquis, & Fréchette, 2014; Stone, 2007; Veltman & Browne, 2001). These consequences are intimately linked to the broader neurological, physical, and behavioral disorders caused by maltreatment, disorders that leave children vulnerable to developmental delays, emotional and behavioral disturbances (Trickett & McBride-Chang, 1995), lowered social functioning (Fantuzzo, Weiss, Atkins, Meyers, & Noone, 1998) as well as increased depressive symptoms (Bennett, Sullivan, & Lewis, 2010). Given these conditions, the prevalence of disabilities[1] can be higher in maltreated versus non-maltreated children (Sullivan & Knutson, 2000). Consequently, maltreated children are often identified for special education (Leone & Weinberg, 2010) at significantly higher rates as well. Some estimates show that as many as 25

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[1] Under the Individuals with Disabilities Education Improvement Act of 2004 a "child with a disability" is defined as a child "with mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities; and who, by reason thereof, needs special education and related services." (Individual with Disabilities Education Improvement Act, 2004).

percent of maltreated children aged 6 to 17 years receive special education (Casanueva, Smith, Dolan, & Ringeisen, 2011)—more than double the rate in the national childhood population.

Several factors can influence whether maltreated children receive special education services. These factors involve complex decisions that parents, caregivers, and educators collaboratively make and the broader institutional contexts of the educational and child welfare systems in which they make those decisions. Further, characteristics of children themselves are salient. However, although we have a robust understanding of influences underlying special education receipt in the broader population of children (Hibel, Farkas, & Morgan, 2010) as well as among maltreated infants (Scarborough et al. 2006; 2008), to date, there are limited investigations that have comprehensively and systematically analyzed factors related to special education receipt among maltreated school-aged children.

Accordingly, the purpose of this study is to analyze how a selected set of child and microsystem factors are associated with special education receipt among maltreated children. This study is guided by the following research question: How do child and microsystem factors relate to the probability that CWS-involved children receive special education?

To answer this question, this study draws upon key components of a socio-ecological framework (Bronfenbrenner, 2006) as applied to the experiences of maltreated children (Belsky, 1980). This framework conceptualizes the factors influencing special education receipt as a nested system (Belsky, 1980) whose core centers on maltreated children's attributes and then broadens out to encompass characteristics of their caregiving environments and experiences of maltreatment. By identifying factors relevant to special education receipt this study offers important insights useful to key stakeholders—spanning both the educational and child welfare

communities—who ensure and promote the educational well-being of one of the most vulnerable

childhood populations, a population whose educational needs remain largely invisible.

1.1. Who are children of abuse and neglect?

Children of abuse and neglect are among the most vulnerable groups of children in the US,

vulnerable physically, emotionally, and psychologically. The vulnerabilities they can face are

formally specified under the federal definition for child abuse and neglect (Child Abuse

Prevention and Treatment Act (CAPTA) Reauthorization, 2010):

> Any recent act or failure to act on the part of a parent or caretaker which results in death,
> serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to
> act, which presents an imminent risk of serious harm.

Under this definition, states recognize four types of maltreatment: neglect, physical abuse,

psychological maltreatment and sexual abuse[2] (U.S. Department of Health & Human Services,

2016). Over 3.6 million referrals of alleged maltreatment were made to local Child Welfare

Services (CWS) agencies in 2014; each referral often included multiple children, and in total,

these referrals involved 6.6 million children. After CWS screened, reported and investigated

these alleged cases, approximately 700,000 cases were *substantiated*, meaning that under

applicable state policies and laws, sufficient evidence existed to verify that a child was

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[2] According to the US Department of Health and Human Services (U.S. Department of Health & Human Services, 2016), *neglect* is "the failure by the caregiver to provide needed, age-appropriate care although financially able to do so or offered financial or other means to do so" (p. 102); *physical abuse* includes "physical acts that caused or could have caused physical injury to a child." (p. 103); *psychological (or emotional) maltreatment* includes "Acts or omissions—other than physical abuse or sexual abuse—that caused or could have caused— conduct, cognitive, affective, or other behavioral or mental disorders" (p. 104); and *sexual abuse* is "the involvement of the child in sexual activity to provide sexual gratification or financial benefit to the perpetrator, including contacts for sexual purposes, molestation, statutory rape, prostitution, pornography, exposure, incest, or other sexually exploitative activities." (p. 106)

maltreated (Scarborough & McCrae, 2010; U.S. Department of Health & Human Services, 2016).

1.2 The special education identification process

Accessing special education and related services involves a series of sequential steps, typically beginning with referral (including screening), then evaluation, followed by eligibility determination and finally, placement (Klingner & Harry, 2006; Ysseldyke, Vanderwood, & Shriner, 1997). In theory, the special education identification process is collaborative, involving multiple social institutions—typically, family and school—as well as stakeholders who collectively make decisions within those institutions, including parents, educators and child psychologists. Among stakeholders who participate in a team meeting to discuss and decide upon a child's potential need for special education, a child psychologist often plays the most influential role, followed by special education teachers and parents (Klingner & Harry, 2006). Importantly, for maltreated children, the child welfare system, including social workers and caregivers (e.g., foster parents), may also play crucial roles in the special education process.

1.3 Factors associated with special education receipt for maltreated children: A conceptual framework and empirical evidence

The factors influencing whether maltreated children receive special education can be conceptualized within a broader socio-ecological framework (Bronfenbrenner & Morris, 2006) that has been adapted to understand children of maltreatment (Belsky, 1980, 1993; Cicchetti & Valentino, 2006; Scannapieco & Connell-Carrick, 2005). Drawing upon this framework, this study conceptualizes the interrelated set of influences as a nested system (Belsky, 1980). At its core, this system centers on characteristics of children; then, it broadens out to encompass multiple and often overlapping contexts (i.e., micro-, exo- and macro-contexts) (Belsky, 1980;

Bronfenbrenner & Morris, 2006). This study focuses on proximal influences in the system, specifically (a) characteristics of maltreated children, themselves (e.g., their cognitive abilities), and (b) characteristics of the immediate environments directly involving the maltreated child—known as their *microsystems* (Belsky, 1980; Bronfenbrenner & Morris, 2006)—including their caregiving environments which include caregiver characteristics, the type of maltreatment (Cicchetti & Barnett, 1991), and the child welfare system. Prior research has demonstrated how these proximal influences relate to special education receipt for maltreated children.

1.3.1 Children's characteristics

Prior studies have shown that maltreated children's gender and ethnicity strongly predicts whether they will receive special education services. For instance, among a nationwide sample of children maltreated as infants, the odds of having an IEP by the time they turned 5.5 years old was three times higher for boys versus girls (Scarborough & McCrae, 2008). This reflects a finding among the broader population of non-maltreated children with disabilities: boys have higher odds of being placed into special education (Hibel et al., 2010), with rates nearly twice that of girls (Wehmeyer & Schwartz, 2001).

Besides gender, maltreated children's ethnicity matters: the odds of having a reported IEP for maltreated Hispanic children was 80% lower versus Whites (Scarborough & McCrae, 2010). Interestingly, though a body of literature has addressed differential representation of African Americans in special education in the overall population of children (Losen & Orfield, 2002; Morgan, Farkas, Cook, et al., 2017; Oswald, Coutinho, Best, & Singh, 1999; Skiba, Poloni-Staudinger, Simmons, Renae Feggins-Azziz, & Chung, 2005; Zhang, Katsiyannis, Ju, & Roberts, 2014), African American children who were maltreated faced similar odds of receiving special education relative to their White counterparts (Scarborough & McCrae, 2010).

One additional attribute of children that has shown to shape their prospects of receiving special education is their behavioral dispositions—known as person *forces* (Bronfenbrenner & Morris, 2006)—including children's approaches learning. For example, Hibel and colleagues (2010) found that children who had higher levels of task engagement (e.g., eagerness to learn and task persistence) at kindergarten entry were less likely to be placed in special education by fifth grade. However, whether task engagement also matters for maltreated children remains unknown and open to further empirical investigation.

1.3.2. Microsystems

Caregiving setting. A prominent challenge facing maltreated children, especially those in foster care, is their high rate of mobility, leading to educational instability (Godsoe, 2000; Miller, 2006; Zetlin, 2006). Foster children frequently change care settings and thereby their schools which can disrupt their access to special education services. This disruption is caused by significant administrative delays and miscommunication in transferring their educational records, including their Individualized Education Program (IEP), from school to school (Godsoe, 2000). Further, foster children in the midst of the referral and evaluation process may never remain in one school long enough to complete the placement process (Godsoe, 2000). On the other hand, because of instability and uncertainty, children who move between care settings can experience detriments to their developmental outcomes (Rubin, O'Reilly, Luan, & Localio, 2007) and consequently, may face an increased likelihood of special education receipt.

Though mobility can influence access to special education, other features of care settings— including the resources and characteristics of caregivers—can be influential. Children placed in the care of relatives, known as *kinship care*, may experience challenges in accessing special education because kin caregivers, compared to non-kinship caregivers, receive less support,

services, and training, and have fewer resources (Berrick, Barth, & Needell, 1994; Gebel, 1996; Scannapieco, Hegar, & McAlpine, 1997). Without support, many kinship caregivers may be less able to follow through with services for the child (Gleeson & Philbin, 1996) including special education services. Further, older kinship caregivers may be less well equipped with the know-how to advocate for a child's educational needs because of a "generation gap" (Cuddeback, 2004). Finally, children who are returned to the care of a biological parent/guardian who was initially involved in the abuse or maltreatment of the child—a commonly accepted practice known as *family reunification*—can experience poorer developmental outcomes (Biehal, Sinclair, & Wade, 2015), thereby heightening their chances of needing special education.

Maltreatment. As noted by Cicchetti and Valentino (2006), for CWS involved youth, their microsystem can includes features of maltreatment, such as the type of maltreatment. The type of abuse or neglect has been shown, in some cases, to be predictive of special education receipt. For example, among a sample of maltreated children in St. Louis, Missouri, children of physical abuse had a 50 percent higher risk of special education entry versus those sexually abused (Jonson-Reid, Drake, Kim, Porterfield, & Han, 2004). Physical abuse, relative to sexual abuse, may have placed children at higher risk for particular disabilities—especially those related to the physical injuries children have sustained—consequently influencing their probability of special education receipt. Yet, other studies have found no significant influence of maltreatment on special education (Scarborough, 2008).

Child welfare system. Aspects of the child welfare system can also influence whether a maltreated child with disabilities will receive special education. For instance, a significantly higher proportion of children had an IEP if their case of abuse or neglect was substantiated by CWS (i.e., it was verified under applicable legal statues) rather than unsubstantiated (Casanueva

et al., 2008). Similarly, the level of CWS involvement can matter, with children living at home with an on-going and active CWS case, relative to their peers without an active case, facing an increased likelihood of receiving special education (Casanueva et al., 2008). Both substantiation status and CWS involvement may heighten a caseworkers' awareness towards children's needs, triggering a formal service plan that may also focus on a child's special education needs (Casanueva et al., 2011).

1.4 Present study

Though existing evidence suggests that for maltreated children with disabilities, their probability of receiving special education is shaped by individual characteristics and their immediate microsystems, one area that remains less fully understood is the relative importance of individual versus microsystem factors in influencing special education receipt among CWS-involved youth. Of particular interest are the microsystems in which children are embedded—these systems, such as differential caregiving settings, can be more malleable and conducive to changes in policies and or practices to support children with special needs. Further, prior systematic and comprehensive investigations of these factors have tended to focus on CWS-involved infants or youth at the start of formal schooling (e.g., Scarborough & McCrae, 2008) or more localized samples of maltreated children (e.g., Jonson Reid et al., 2004). Thus, there is a need for additional empirical work examining how the factors play out on a larger nationwide scale, especially for school-aged maltreated children. Accordingly, this present study seeks to determine the effect of both child and microsystem factors on the probability that a CWS-involved child will receive special education.

2. Method

2.1. Dataset and sample

This study used restricted-use secondary data from the Department of Health and Human Service's (DHSS) National Survey of Child and Adolescent Well-Being II (NSCAW-II), a nationwide longitudinal study of children who were reported to have been abused or neglected (U.S. Department of Health and Human Services, 2012). The data used for these analyses come from the first two waves of data, collected during the following timeframes: March 2008 to September 2009 (wave one) and October 2009 to January 2011 (wave two). This study leverages only the first two waves of data because teacher reports of a child's special education status were only available in those two waves.

The NSCAW II sample (unweighted) includes 5,872 children and adolescents aged 0 to 17 years old who were initially surveyed in wave one. The sample was drawn using a two-stage stratified design with nine primary strata that included eight states, each serving as its own strata[3], with the largest welfare caseloads and one strata comprised of the remaining 38 states, including Washington DC.

This study used the subsample of 1855 children who were aged 6 to 17 in wave one with a non-zero and non-missing sampling weight. Sampling weights were incorporated into this study's analyses to ensure that the results were representative of the population of children in the US who were the focus of a Child Protective Services (CPS) maltreatment investigation or assessment (Dowd et al., 2013). Children with a missing or zero sampling weight did not contribute to the analyses.

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[3] Within the nine main strata, primary sampling units (PSUs) were identified with each PSU representing a distinct geographical area served by a primary CWS agency. Within each PSU (there were 81 participating PSUs across all strata), a sample of children were drawn from a list of children who had undergone a formal Child Welfare Services (CWS) investigation (either closed or completed) or an assessment process that followed a report of child abuse or neglect (Dowd et al., 2013).

2.2. Measures

2.2.1. Outcome variable: Receipt of special education

Children were coded as having received special education (= 1) if the child's teacher or

caseworker reported them as having an IEP or receiving special education, 0 otherwise. In cases

where a teacher did not know or the teacher's response was missing, the caseworker's report was

used. Receipt of special education in wave two was used as the primary outcome of interest,

while receipt in wave one was also used as a predictor.

2.2.2. Predictors

The main set of child and microsystem predictors included in this study were selected based

on the evidence from the prior empirical literature reviewed in section 1.3 and are conceptually

organized according to the socio-ecological framework underlying this study. All predictors were

measured in wave one, unless otherwise noted.

2.2.2.1. **Children's characteristics**

Children's characteristics included their age and gender as reported by the caregiver as well as

their racial and ethnic backgrounds in three categories: (a) Black non-Hispanic (reference

category), (b) White non-Hispanic; Hispanic, and (c) other (i.e., children whose racial and ethnic

backgrounds are other than Black, White or Hispanic).

A set of standardized assessments were also used to identify children who faced cognitive or

emotional/behavioral challenges in wave one. Construction of these variables is based upon

Ringeisen et al.'s, (2011) analyses of cognitive and emotional/behavioral risk factors among

children in special education in the NSCAW II. Children were classified as facing a cognitive

challenge (coded as 1 = faces a cognitive challenge; 0 otherwise), if they scored two standard

deviations below the mean on the Kaufman Brief Intelligence Test (K-BIT) (based on a

composite normalized score on both the vocabulary and matrices subtests) or two standard deviations below the mean on the Woodcock-Johnson III (WJ-III; based on scores on the Letter-Word Identification; Passage Comprehension and Applied Problems subtests). The K-BIT has been shown to have strong internal consistency reliability among respondents in the prior administration of the NSCAW II (α = .84) (Administration for Children and Families, 2005) while the WJ-III subtests have been shown to have strong reliability based on a large nationally representative norming sample (α = .94 for Letter-Word Identification; α = .88 for Passage Comprehension; and α =.93 for Applied Problems) (Schrank, McGrew, & Woodcock, 2001).

　　Children were classified as facing emotional/behavioral challenges (coded as 1 = faces an emotional/behavioral challenge; 0 otherwise) based on their scores on several assessments, including whether they had clinically significant T-scores (65 or greater) on either: (a) the Children's Depression Inventory (CDI), (b) the Post-traumatic Stress subscale of the Trauma Symptom Checklist for Children (TSCC), or (c) the Total Problems, Internalizing, or Externalizing scales on either the CBCL (Child Behavior Checklist), YSR (Youth Self Report) or TRF (Teacher Report Form). The CDI, CBCL, YSR and TRF have been shown to have strong internal consistency reliabilities among respondents in a prior iteration of the NSCAW (Administration for Children and Families, 2005). For the CDI, reliability was α = .81 among 7 to 12 year olds. For the CBCL, reliabilities were: α =.96 (Total problems), α = .92 (Externalizing), and α =.90 (Internalizing). For the TRF, reliabilities were: α =.96 (Total problems), α =.91 (Externalizing), and .91 (Internalizing). Similarly for the YSR reliabilities were α =.96 (Total problems), α =.90 (Externalizing), and α =.90 (Internalizing) (Administration for Children and Families, 2005).

Finally, given Hibel et al.' s (2010) finding that academic task engagement was related to special education placement, I also included an engagement measure. This measure is based on their responses to a set of 11 items (reliability = .69) about school engagement included in the NSCAW II that come from the Drug-Free Schools and Communities Act Survey. For each item, children rated, on a 4-point Likert scale (1 = *never,* 2 = *sometimes*, 3 = *always*, 4 = *almost always*) how often they enjoyed being in school, completed homework, tried to do their best work in school, etc. Consistent with prior research on these 11 items in the NSCAW (Cage et al., 2019), I used factor analysis to composite these items which revealed three separate underlying dimensions of learning engagement: (a) behavioral (i.e. actions that support learning and engagement in school, such as listening and paying attention), (b) emotional (i.e., attitudes and dispositions toward learning, such as liking school), and (c) cognitive-behavioral (i.e., behaviors that children pursue when facing learning challenges, such as refusing to turn in homework when struggling academically) (Cage, et al., 2019).[4] For each of these factors, I created a continuous factor score with a mean of 0 and SD of 1 with more positive scores indicating a higher level of engagement.

2.2.2.2. Microsystems

Caregiving setting. This study used a measure of a child's current fulltime care setting in wave one. Care setting was captured in four categories: (a) in-home (either with a biological or

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[4] Each factor had eigenvalues above 1 (2.16, 1.74 and 1.21 respectively) and accounted for 19%, 15% and 11% of the variance, respectively. The reliability of the items underlying the first factor (behavioral engagement) was .57 while reliabilities were .66 and .26 for factors two (emotional) and three (cognitive-behavioral). Given the low reliability for the items underlying the cognitive-behavioral factor, I retained only the first two factors (behavioral and emotional engagement) for subsequent analyses.

adoptive parent), (b) kin care (either formal or informal[5]), (c) foster care; and other (group home,

residential facility, or other out-of-home arrangement).

From these four caregiving setting variables, a dichotomous variable was also generated to

document whether a child switched between any type of setting between waves one and two.

This variable was coded as switched = 1; 0 otherwise.

Finally, a set of caregiver characteristics were included, including caregiver poverty level,

education level and household size. Poverty was a categorical measure and based on whether a

caregiver was (a) < 50%; (b) 50% to <100%, (c) 100% to 200%, or (d) > 200% of the Federal

Poverty Level in 2010 ($22,020 for a family of 4). A caregiver's self-reported education level

was captured in three categories: (a) less than high school, (b) high school or (c) above high

school. Finally, the number of children in the caregiver's household was included.

Maltreatment. Investigative caseworkers were asked during an in-person interview in wave

one to identify any maltreatment that the child experienced based on the child's case report. A

modified version of the Maltreatment Classification System (MCS; Barnett, Manly, & Cicchetti,

1993) was used to capture their responses which included 17 maltreatment categories. These 17

categories were then collapsed into eight categories for analytic purposes: (a) physical

maltreatment, (b) sexual maltreatment, (c) emotional maltreatment, (d) neglect (physical neglect

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[5] In-home care is when a CWS involved child remains in their home and the family receives support services
focused on improving family functioning (Child Welfare Information Gateway, 2014) while kin care is when a child
is removed from the home and is under the care of a relative (often a grandparent). There are typically two
categories of kin care. In cases of *formal* kin care, the state assumes custody of the child and legally arranges for a
relative to provide care, while in *informal* kin care are private arrangements that are made between parents and
relatives. However, these definitions are often fluid such that there is variation in the degree to which CWS is
formally involved in an informal arrangements; in fact, in many cases, under an informal kin arrangement, kin may
assume legal custody of the child. (Geen, 2004).

or lack of supervision), (d) other[6], (e) substance exposure, (f) domestic violence, and (g) a

substance-abusing parent.

Child welfare system. A dichotomous variable indicating whether CWS substantiated the

report of the child's maltreatment (= 1) or not (= 0) was included. Also, a set of dichotomous

indicator variables for primary welfare agency were included.

2.3 Analytic strategy

To estimate the association between child and microsystem factors and the probability of

special education receipt, I used logistic regression that incorporated a lagged endogenous

variable (Menard, 2010). I regressed a dichotomous variable capturing special education receipt

in wave two on an indicator for prior special education receipt in wave one (the lagged

endogenous variable), alongside child and microsystem factors measured in wave one.

Accounting for prior special education receipt controls for past unobserved factors that

influenced current special education receipt (e.g. parental or guardian knowledge of how to

navigate the special education process) and were potentially confounded with the predictors of

interest in the model (Menard, 2010).

More formally, I fitted the following logistic regression model to data for child i at time t:

$$\text{logit } Y_{it} = \alpha + \beta Y_{i(t-1)} + \gamma Z_{i(t-1)} + \delta X_{i(t-1)} + \theta_j \qquad (1)$$

where the outcome, $\text{logit } Y_{it}$, is the log odds that child i received special education or not at time

$t = 2$ (i.e., wave two). $Y_{i(t-1)}$ is a dichotomous variable capturing whether a child received special

education in wave one. $Z_{i(t-1)}$ is a vector of child and microsystem factors measured in wave one

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[6] Other includes: Moral/legal Maltreatment; Educational Maltreatment; Exploitation, Other; Prematurity (Low

Birthweight); Voluntary Relinquishment; Children in Need of Services (CHINS), Investigation Needed to Get

Services.

and whose effects are captured in γ. An advantage of including predictors $Z_{i(t-1)}$ that are

measured in the wave prior to the outcome, is that there is a clear temporal ordering between the

relationship of certain predictors (e.g., caregiving setting) and special education receipt. Finally,

$X_{i(t-1)}$ represents a vector of controls while θ_j denotes agency fixed effects (i.e., a set of

indicator variables for each agency minus one omitted agency) that control for observed and

unobserved factors varying between different welfare agencies.

Missing data was highest for the maltreatment categories (14.7%; $n = 273$) and school

engagement factor scores (13.2%; $n = 246$). To handle missing data, I used multiple imputation

(Royston & White, 2011) where I imputed missing data using chained equations and constructed

40 imputed datasets. The model in equation (1) was fitted separately on each of the imputed

datasets and then the results were pooled across the set of results. I fitted all models using Stata

15.1 and incorporated survey design information including survey weights while I estimated

standard errors using Taylor Linearization, the prescribed method for variance estimation. Given

that I focused on a subsample of children aged 6 to 17, I used the subpopulation option with

Stata's survey command. Prior to fitting models, I conducted a diagnostic test for

multicollinearity that resulted in a mean Variance Inflation Factor (VIF) of 1.34 across all

variables and a VIF below 2.0 for each variable; thus, multicollinearity was not a problem.

Finally, I adopted a conventional level of significance ($\alpha = .05$) which to test the null hypothesis

that the coefficient estimates from the model were zero.

3. Results

3.1. Weighted descriptive statistics

Weighted descriptive statistics are reported in Table 1 for the sample as a whole (column 1)

and disaggregated by whether a child received an IEP in wave two (columns 2 and 3). In the

overall sample, approximately 16% and 17% of children received special education in waves one
and two, respectively. Notably, these rates are about 10 percentage points lower than what is
reported in the literature (Casanueva et al., 2012). This is because prior estimates relied on
caregiver reports combined with teacher and caseworker reports while this current study uses
reports by only teachers and caseworkers. By race and ethnicity, the sample was predominately
White non-Hispanic (43%) followed by Hispanic (29%), then Black (20%). A majority of
children had emotional/behavioral challenges (89%) and approximately one-quarter (23%) had
cognitive challenges. In terms of alleged maltreatment, neglect (30%) was most prevalent
followed by physical maltreatment (26%). Finally, a majority of children (87%) were cared for
in-home by a biological or adoptive parent.

Several significant differences existed between children with and without an IEP in wave two
as shown in columns 2 and 3 of Table 1. Children who had an IEP in wave two were
significantly more likely to also have had an IEP in wave one (56% versus 10%; $p < .001$) and
also had higher rates of having cognitive challenges (48% versus 19%; $p < .001$). By gender, a
higher proportion of children with an IEP in wave two were male (65%). In terms of
maltreatment, those with an IEP were more likely to experience physical maltreatment (35%
versus 24%; $p = .05$) and less like to have a substance abusing parent (3% versus 10%; $p < .001$)

<<insert Table 1 here>>

3.2. Predictors of special education receipt

<<insert Table 2 here>>

Table 2 displays estimates, converted to odds ratios, describing the association between child
and microsystem predictors and special education receipt. In terms of child attributes, prior
receipt of special education significantly predicted current receipt, a finding which was expected.

Children who had received special education in the past had odds of currently receiving special education that was approximately 10.6 times the odds of those who had not previously received special education (odds ratio [*OR*] = 10.61; 95% confidence interval [CI] [6.05, 18.61]; *p* < .001). Beyond this effect, children who had cognitive challenges (i.e., scoring 2 SDs or lower on either the WJ-III or K-BIT) had an odds of receiving special education that was approximately three times higher relative to children without cognitive challenges (*OR* = 3.13; 95% CI [1.81, 5.42]; *p* < .001). In contrast, although the relationship between emotional or behavioral challenges and special education receipt was in the direction expected—a higher odds—this effect was not statistically significant (*OR* = 1.37; 95% CI [.65, 2.85]; *p* = .40).

In addition to children's own characteristics, an important aspect of their caregiving microsystems was predictive: their caregiving setting. Children in foster care experienced a higher odds of special education receipt, nearly three times higher (OR = 2.72; 95% CI [1.15, 6.39]; *p* < .05) relative to children who were cared for by a biological or adoptive parent. Additional pairwise comparisons between the effects of other caregiving settings (e.g., foster care versus kin care) did not reveal any significant differences. Finally, neither attributes of caregivers within a child's caregiving microsystem nor any of the other maltreating microsystem factors such as maltreatment type of substantiation status significantly predicted the probability of receiving special education.

4. Discussion

Guided by a socio-ecological framework, this study investigated whether a set of child and microsystem factors was predictive of special education receipt among a sample of maltreated children, aged 6-17, from the NSCAW II. Although there is a robust knowledge base of how socio-ecological factors influence receipt of special education services for maltreated infants and

toddlers, less is known about how these factors influence receipt of special education for child welfare-involved school-aged children.

This study found that two key child attributes predicted the probability of receiving special education: whether they previously received special education and whether they had a cognitive challenge. In particular, maltreated children with cognitive challenges had a higher probability of receiving special education. This finding is expected given that that many of the children identified in this study as having a cognitive challenge based on the K-BIT and WJ-III would be eligible for special education due to intellectual disabilities. In contrast, children with emotional/behavioral challenges (i.e., clinically significant scores on the CDI, TSCC or CBCL) were not significantly more likely to have an IEP by wave two. Though these children would have likely qualified for special education based on having an emotional or behavioral disturbance (EBD), studies have shown that there is stigma associated with being classified as having an EBD, leading children to often go underidentified and underserved (Kauffman, Mock, & Simpson, 2007). Finally, in contrast to findings from Hibel et al. (2010), children's engagement with school—especially those with higher cognitive or emotional disengagement scores—was unrelated to a higher probability of receiving special education.

Although children's prior receipt of special and their cognitive performance was predictive, their racial or ethnic backgrounds were unrelated to special education receipt. This new finding contrasts with Scarborough and McCrae's (2010) finding that maltreated Hispanic children had lower odds of having an IEP relative to Whites. Also, this finding contrasts with the differential representation of African Americans in special education within the overall childhood population (Skiba et al., 2008), including recent empirical work demonstrating that children of color can be underrepresented in special education (Hibel et al., 2010; Morgan, Farkas, Hillemeier, &

Maczuga, 2017). Though only speculative, one reason why a child's race or ethnicity was not

predictive could be related to the schools that maltreated students in the NSCAW II sample

attended. Given that the racial and ethnic disproportionality in special education detected in the

broader population of children is driven, in part, by cultural and organizational barriers within

schools (O'Connor & Fernandez, 2006) that reinforce structural inequalities (Skiba et al., 2005),

these barriers may actually be less salient in the sample of schools that these maltreated attended.

Finally, in contrast to prior work that found that boys had a higher probability of receiving of

special education (Scarborough & McCrae, 2010; Wehmeyer & Schwartz, 2001), these findings

show that a child's gender was not associated with the probability of receiving special education

Regarding the microsystem level factors, based upon prior evidence, attributes of the

caregiving, maltreatment and child welfare microsystems were posited to be influential.

Although this study found that maltreatment type and substantiation status was unrelated to

special education receipt, a child's caregiving setting was predictive—children in foster care had

a *higher* probability of receiving special education relative to children in-home care with an

adoptive or biological parent. This finding is noteworthy as prior research suggests the opposite

(Stanley, 2012). For instance, foster youth with disabilities tend to experience multiple

placements. This can lead to higher educational instability, thereby making the special education

identification process more challenging. Further, foster parents may not have educational rights

that enable them to obtain special education services (e.g., signing off on an IEP) leading to

delays in providing services (Zetlin, MacLeod, & Kimm, 2012). Though these results might

suggest that foster parents were, in fact, more successful in advocating for special education

services, these findings could also be explained by the targeted educational supports foster youth

may be receiving. For example, under California law, each school district must have a Foster

Youth Educational Liaison who oversees the educational well-being of foster youth and ensures

educational continuity when youth transfer schools (Shea, Zetlin, & Weinberg, 2010). Further, in

states like Massachusetts and Tennessee, foster youth who are in transitional or temporary foster

care may also benefit from the educational liaison services under the McKinney-Vento Homeless

Education Assistance Improvement Act of 2001 which safeguards the educational rights of youth

without stable housing (Woodward, n.d.). One critical role that these educational liaisons can

play is to advocate for educational support services, including special education services.

Although the type of care setting mattered, moving between those settings was unrelated to

special education receipt, a finding contrary to prior evidence. One important caveat is that this

study could only estimate the effects of moves into and out of care settings that occurred between

two time points that were more than 12 months apart. Changes in placement, however, often

occur more frequently. For instance, a study on placement changes for foster youth in Rhode

Island showed that the median time to a change in caregiving setting occurred within 3.9 months

(Connell et al., 2006). Thus, though within year placement changes likely occurred among this

sample of maltreated children, they are not captured in this study. Future studies should consider

capturing finer grained data on the timing and duration of multiple placements which can yield

more nuanced insights into how mobility may not only disrupt the receipt of special education,

but also the continuity of special education services children receive.

This study has several other limitations. First, this study presents correlational evidence;

these findings do not suggest that these factors—especially being in foster care—actually caused

increases in the probability that maltreated children received special education. There are

additional time-varying effects that could be confounded with these associations. For example,

children in foster care may have switched teachers (or schools) who then were more proactive in

identifying students as needing special education services; consequently, these teacher and/or

school effects could have enhanced a child's probability of receiving special education. Though

including a set of school-by-year fixed effects would have captured these trends, the NSCAW II

data does not include any identifiers for a child's school.

   Second, Hibel et al.'s (2010) study on special education placement demonstrates a "frog-

pond" effect such that the changing composition of children's own peers, both academically and

behaviorally, may influence whether a child is deemed eligible for special education services.

Thus, for example, if a child attends a school with peers who exhibit more severe problem

behaviors, the child might be less likely to be referred for special education. Incorporating

changes in the mean achievement and behavioral levels of children's classroom peers over time

in the model estimations would have captured this effect. But this was not possible because

school and classroom identifiers are unavailable in the NSCAW II dataset.

   In terms of implications of this study for policy and practice, the significant association

between foster care and a higher probability of special education underscores the importance of

supports and resources that foster families may need to promote the educational well-being of

children with disabilities under their care. As prior research has shown, foster parents face

specific challenges in caring for children with special needs, including arranging educational

services as well as balancing work commitments with time spent advocating for a child's

educational needs (Brown & Rodger, 2009). Providing foster families with respite care and

empowering them with knowledge of how to advocate for educational services could be

beneficial. One qualitative study showed that foster parents of children with disabilities

identified several key supports that would be helpful to them, including school systems that are

accommodating as well as respite care (Brown, Moraes, & Mayhew, 2005). Importantly, the

types of disabilities that children in foster care have can also influence the kinds of support

services that foster parents need for themselves. For example, given that children with autism

spectrum disorder (ASD) have a higher likelihood of entering foster care relative to children with

an intellectual disability (ID) (Cidav, Xie, & Mandell, 2018), foster parents may need help

developing strategies to handle the heightened parenting stress that can be associated with raising

a child with ASD (McStay, Dissanayake, Scheeren, Koot, & Begeer, 2014). Given well-

established pathways linking parental stress to children's educational and developmental

outcomes (Masarik & Conger, 2017), these caregiver supports coupled with school-based

learning supports can be mutually reinforcing, thereby promoting children's educational

outcomes. Thus, ensuring the educational welfare of maltreated children, especially those in

foster care with special needs, will not only require coordinated supports focused on the child via

the education and child welfare sectors, but through the social support sector that can also focus

on the broader needs of foster caregivers and families.

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Tables

Table 1

Weighted Descriptive Statistics for a Sample of CWS-Involved Children by IEP Status (n = 1855)

		Had an IEP in wave 2		
Variables	Total	Yes % / *M* (*SE*)	No % / *M* (*SE*)	*p* - value
Outcome				
Currently receiving special education services (wave 2)		-	-	
Children's attributes				
Received special education services (wave 1)	17%	54%	10%	.00
Child age (in years)	10.85 (0.11)	10.72 (0.21)	10.89 (0.13)	.51
Male	48%	65%	45%	.00
Race and ethnicity				
Black non-Hispanic	20%	20%	21%	.89
White non-Hispanic	43%	50%	42%	.09
Hispanic	29%	24%	29%	.33
Race/ethnicity other than Black, White or Hispanic	8%	6%	8%	.24
Has cognitive challenges	23%	48%	19%	.00
Has emotional/behavioral challenges	89%	89%	88%	.75
Student engagement factor scores				
Behavioral	0.05 (0.04)	-0.07 (0.11)	0.07 (0.04)	.24
Emotional	-0.03 (0.04)	0.05 (0.11)	-0.04 (0.05)	.44
Caregiving microsystem				
Caregiving setting				
In-home (biological or adoptive)	87%	85%	87%	.50
Kin care (formal or informal)	9%	9%	9%	.77
Foster care	3%	4%	3%	.33
Group, residential or out-of-home	1%	3%	1%	.14
Switched caregiving setting	15%	15%	15%	1.00
Federal poverty level in 2010[a]				
<50%	21%	21%	22%	.83
50% to <100%	33%	39%	32%	.10
100% to 200%	27%	24%	27%	.55
> 200%	19%	16%	19%	.49
Caregiver education				
< HS	27%	30%	27%	.59
HS	43%	46%	42%	.49
> HS	30%	24%	31%	.09
Number of children in household	2.55 (0.06)	2.52 (0.12)	2.55 (0.07)	.79
Maltreating microsystem				
Maltreatment type or reason for investigation[b]				
Physical Maltreatment	26%	35%	24%	.05
Sexual Maltreatment	10%	12%	9%	.44
Emotional Maltreatment	6%	5%	6%	.59
Neglect (Failure to Provide & Lack of	30%	29%	31%	.70

Supervision)				
Other[c]	13%	12%	13%	.90
Substance Exposure	1%	1%	1%	.94
Domestic Violence	6%	4%	7%	.23
Substance-abusing Parent	9%	3%	10%	.00
Child welfare microsystem				
Substantiated case of abuse or neglect	23%	24%	23%	.68

Note. [a]For a family for 4, the poverty guideline in 2010 was $22,050.

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

[c]Other category includes: abandonment, moral/legal maltreatment, educational maltreatment, exploitation, other, prematurity or low birthweight, voluntary relinquishment, children in need of services (CHINS), and investigation only way to get services.

p-values in the last column are based on tests of equality of proportions for variables measured dichotomously. For continuous variables (e.g., age), variables were regressed on an indicator variable for IEP status in wave 2. All tests and models incorporate survey design information including weights while standard errors were estimated using Taylor linearization.

Table 2

Logistic Regression Results Describing the Relationship Between Child and Microsystem
Factors and the Odds of Receiving Special Education Services for CWS-Involved Children

	Odds Ratio	Standard Error
Children's attributes		
Received special education services (wave 1)	10.62***	(2.97)
Child age (in years)	0.97	(0.04)
Male	1.78	(0.57)
Race and ethnicity (reference: Black Non-Hispanic)		
White non-Hispanic	1.23	(0.52)
Hispanic	1.89	(0.94)
Race/ethnicity other than Black, White or Hispanic	0.95	(0.46)
Has cognitive challenges	3.14***	(0.86)
Has behavioral or emotional challenges	1.37	(0.50)
Student engagement factor scores		
Behavioral	0.92	(0.15)
Emotional	1.13	(0.18)
Caregiving microsystem		
Caregiving setting (reference: In-home [biological or adoptive])		
Kin care (formal or informal)	1.23	(0.47)
Foster care	2.72*	(1.16)
Group, residential or out-of-home	2.77	(1.62)
Switched caregiving setting	0.61	(0.23)
Federal poverty level in 2010 (reference: < 50%)		
50% to <100%	1.19	(0.41)
100% to 200%	0.60	(0.27)
> 200%	1.21	(0.58)
Caregiver education (reference: < HS)		
HS	1.10	(0.39)
> HS	0.90	(0.37)
Number of children in household	0.94	(0.08)
Maltreating microsystem		
Maltreatment type or reason for investigation (reference: Domestic violence)		
Physical Maltreatment	1.37	(0.73)
Sexual Maltreatment	1.46	(1.13)
Emotional Maltreatment	1.31	(1.03)
Neglect (Failure to Provide & Lack of Supervision)	1.02	(0.53)
Other	1.02	(0.69)
Substance Exposure	3.80	(4.11)
Substance-abusing Parent	0.36	(0.32)

Child welfare microsystem		
Substantiated case of abuse or neglect	1.09	(0.34)
Constant	0.02***	(0.02)
Observations (unweighted)	1691	

Note. Models include welfare agency fixed effects (i.e., indicators for each agency minus one omitted agency) and incorporate survey weights. Taylor linearized standard errors in parentheses. Results based on 40 imputed datasets where missing data was estimated using chained equations. There was no within agency variability in the outcome for $n = 8$ agencies and so after dropping those agencies $n = 1691$ observations were available for model estimation.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$