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Effect of Home Environment on Academic Achievement in Child Protective Service-Involved Children: Results from the Second National Survey of Child and Adolescent Well-Being Study

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Abstract

Background: Children involved with Child Protective Services (CPS) have been shown to have lower academic achievement. It is unclear whether certain qualities of the home environment can optimize academic achievement in this vulnerable population.

Objective: This study sought to determine whether home environments with higher levels of emotional support and cognitive stimulation predict later academic achievement and whether this relationship is moderated by placement type (i.e. biological/adoptive parent care, kinship care, or non-kinship foster care).

Participants and Setting: This study included 1,206 children from the second National Survey of Child and Adolescent Well-Being (NSCAW-II) who were involved with CPS between 2–7 years of age.

Methods: Multivariate analyses were completed to examine the effect of the Home Observation for Measurement of the Environment (HOME) score on later Woodcock-Johnson III Tests of Achievement (WJ-ACH) scores. Moderation analyses were conducted to determine the effect of placement type on this relationship.

Results: Although these relationships between HOME scores and WJ-ACH scores were significant in bivariate analyses, they were not statistically significant in multivariate analyses, primarily due to the variable of household income. Although children placed primarily in non-kinship foster care demonstrated higher WJ-ACH scores for Passage Comprehension and Letter-

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Word Identification subscales, placement type did not appear to moderate the relationship between HOME scores and academic achievement.

Conclusion: Child- and caregiver-level factors, as well as financial resources available in the environment, may account for the relationship between home environment and academic achievement.

Keywords

child maltreatment; academic achievement; placement; home environment; foster care; child protective services

Poor academic achievement has long been associated with child maltreatment despite taking into account intellectual capabilities or developmental delays (Romano et al., 2015). Approximately one-third of school-aged children involved with Child Protective Services (CPS) for allegations of child maltreatment have below-average cognitive, reading, and mathematics scores, as well as consistently lower grade point averages compared to the general population (Crozier & Barth, 2005; Romano et al., 2015). Maltreated children are over twice as likely as their peers to repeat a grade, and these youth are much more likely to require special education services (Eckenrode et al., 1993; Flynn & Biro, 1998; Flynn et al., 2004; Rowe & Eckenrode, 1999; Shonk & Cicchetti, 2001). Differences in academic achievement are believed to be particularly pronounced among children who have experienced multiple maltreatment types, neglect or early maltreatment, frequent moves between placements, and/or out-of-home placements (Romano et al., 2015). Children who have experienced maltreatment are also at increased risk for school dropout (Romano et al., 2015). Additionally, poor academic achievement puts this population at increased risk for incarceration, substance abuse, homelessness, and dependency on welfare programs in later life (Attar-Schwartz, 2009; Doyle, 2007; Spengler et al., 2018). Academic achievement provides an important target for intervention since it predicts later well-being and success, as measured by level of educational attainment and later income (Spengler et al., 2018).

Multiple mechanisms have been postulated to explain poor academic achievement in children involved with CPS. A lack of sensory stimulation in early life as well as the effect of toxic stress on developing neurons can lead to poor brain development in areas controlling social and cognitive functions (Romano et al., 2015). A poor caregiver-child relationship may lead to a decreased sense of control over one's environment and, eventually, learned helplessness in the child (Romano et al., 2015). In addition, CPS-involved children often experience instability in placements and schooling, which may substantially impact their grades and learning (Romano et al., 2015). In one study, an 18% increased odds of academic skills delay was found with each additional placement (Zima et al., 2000).

Although several studies have indicated that children in out-of-home placements have lower academic achievement, recent studies have shown that children involved with CPS, regardless of whether claims are substantiated or the child is placed outside the home, exhibit similar levels of academic achievement (Berger et al., 2015; Stahmer et al., 2009). For example, language skills have been noted as an early marker of literacy, self-regulation, and academic achievement; children who experience maltreatment are more likely to

demonstrate poor receptive vocabulary (Stacks et al., 2011; Zajac et al., 2018). Studies have shown that out-of-home placement is associated with higher receptive vocabulary but was explained by caregiver education level, marital status, and household income (Zajac et al., 2018). This suggests that the children's improved vocabulary is not simply related to placement type (in-home versus out-of-home) but that improved language skills may stem from caregiver attributes and resources available in the home, which provide more cognitively-stimulating experiences.

In addition to the level of cognitive stimulation available in the home, multiple studies suggest that the effect of maltreatment on academic achievement can be mitigated by high levels of emotional support. Protective factors in early life, such as family context and social resources, play an important role in alleviating the effect of child maltreatment on academic achievement (Meng et al., 2018). More sensitive, consistent, and emotionally-supportive home environments for children have been positively linked to language development, which may predict later academic success (Stacks et al., 2011). Greater levels of academic involvement, more positive literacy environment, and greater academic expectations in foster caregivers have been shown to increase academic achievement (Cheung et al., 2012). These studies suggest that increased amounts of engagement and stimulation in the home environment may influence later academic achievement in children who have experienced maltreatment, but it remains unclear whether placement type, especially kinship versus non-kinship placement, affects this relationship.

Current CPS practices prioritize caregiver/parent reunification and kinship care over placement with non-kinship foster parents in order to preserve family and community ties. However, it is unclear how this practice affects children's academic development (Conn et al., 2015; Fusco & Calahane, 2015; Lin, 2014). Recent studies have noted that children placed in non-kinship care have lower academic achievement scores at baseline with subsequent improvement, whereas children in kinship care have higher academic achievement scores at baseline but with subsequent decline or stagnation (Font, 2014). Prior studies have also noted that kinship caregivers are usually older, are less likely to have two caregivers in the household, and have significantly lower average levels of educational attainment and household incomes as well as higher unemployment rates (Gebel, 1996; Lin, 2014; Sakai et al., 2011). Although kinship caregivers are more likely to have positive perceptions about children in their care and higher rates of stable placement, they are also more likely to favor physical discipline and demonstrate lower levels of empathy toward the children (Gebel, 1996; Lin, 2014). These findings are of concern given that kinship caregivers, particularly those in informal kinship care, receive substantially less financial support, services, and training as well as less CPS oversight (Gebel, 1996; Fusco & Calahane, 2015; Lin, 2014; Sakai et al., 2011).

Meta-analyses of six longitudinal studies demonstrate that early academic ability (i.e., kindergarten entry skills) is the best predictor of later academic achievement (Duncan et al., 2007). Similarly, in his seminal work on reasons why society should invest in young children, Heckman argues that higher investments in one period (e.g., preschool) can lead to greater productivity in consecutive periods such as kindergarten, primary school, and secondary school (Heckman & Masterov, 2007). This population is also understudied in

the academic achievement literature. Therefore, this study primarily sought to determine whether a higher level of cognitive stimulation and emotional support in the home environment is associated with later academic achievement in CPS-involved children two to seven years old. A secondary aim was to determine whether the child's placement type moderated this relationship between the home environment and future academic achievement.

Methods

Sample

Participants (N = 1,206) were a subsample of children from the second National Survey of Child and Adolescent Well-Being (NSCAW-II). The NSCAW-II is a nationally representative, longitudinal survey of children and families who have been the subjects of an investigation by CPS for abuse or neglect. The full dataset includes children (birth to 17.5 years old) across 81 counties in the United States who were referred to CPS for alleged child maltreatment from February 2008 to May 2009. Baseline interviews and assessments were conducted at the close of the CPS investigation for reported child maltreatment at Wave 1 (which will be referred to as "baseline" in this study). Children were re-assessed at Wave 2 (18 months after the baseline assessment) between October 2009 through January 2011, and at Wave 3 (36 months after the baseline assessment) between June 2011 and December 2012. For this research study, the authors focused only on children who were between two and seven years old at the time of their baseline assessments given the increased relative importance of environmental factors in early childhood on later outcomes. Additionally, academic achievement in early elementary school is understudied, but prior studies have indicated that early academic achievement is the strongest predictor of later achievement, with gaps widening over time (Duncan et al., 2007). These children were followed through Wave 3, which provided access to academic achievement scores and their predictors. All children in the study had both a completed Home Observation for the Measurement of the Environment (HOME) Short Form at baseline and the Woodcock-Johnson III Tests of Achievement (WJ-ACH) at Wave 3 (i.e., 36 month follow-up). Children were excluded from the study if their intelligence quotient (IQ) score was missing or less than 70 on a Kaufman Brief Intelligence Test (KBIT).

Procedures

The National Data Archive on Child Abuse and Neglect granted access to the NSCAW-II restricted dataset, and the authors' affiliated Institutional Review Board approved this secondary data analysis. The NSCAW-II dataset includes a variety of measures designed to obtain a full picture of children's functioning across domains. Sampled families from each participating CPS agency were contacted (depending on state/agency policies) either directly by NSCAW-II field representatives or via a postcard informing them of the study and providing passive consent for the CPS agency to provide their contact information to the NSCAW-II study. Data was collected via face-to-face interviews at the three time points with multiple informants (i.e., children, caregivers, teachers, and CPS caseworkers) associated with each child and family in the sample.

Variables and Measures

Demographics.—Demographic variables were informed by the literature based on their associations with academic achievement. These variables include: (1) children's sex (male or female); (2) age group (<3 years, 3 to <6 years, 6 to <8 years); (3) race/ethnicity (White/Non-Hispanic, Black/Non-Hispanic, Hispanic, or Other); (4) household income measured as percent of federal poverty level (<50%, 50 to <100%, 100–200%, or > 200%); (5) existence of a prior CPS report (no or yes); (6) number of out-of-home placements over the three-year study (continuous variable); (7) alleged type of maltreatment (physical abuse, sexual abuse, emotional abuse, neglect, parental substance use, or other/don't know); and (8)placement type based on where children spent most of their time during the three-year study (parent care, kinship care, or non-kinship foster care). With the exception of placement type and number of out-of-home placements, all demographic variables were obtained at baseline, and the household income was obtained based on the home environment that the child was in at the close of their CPS investigation.

In this study, parent care was defined as any placement in which at least one biological or adoptive parent was present in the home with the child. Kinship care was defined as the child living with a relative or family friend (often referred to as fictive kin) in a formal or non-formal arrangement. All other placements, including therapeutic foster care, group homes, or other arrangements where the child lived away from parents and kin, were defined as non-kinship foster care.

Home environment.—The independent variable in this study was the overall emotional support and cognitive stimulation that children received in their baseline home environment (the home they were in at the time the CPS investigation concluded) as evaluated by the HOME short form. The HOME short form is a modification of the HOME inventory that was developed for the National Longitudinal Study of Youth (Bradley and Caldwell, 1984; Bradley et al., 1992). It consists of interview and observational items administered by a trained professional. For instance, the short form evaluates caregiver behavior toward the child—*"If child got so angry that she hit you, what would you do?"*—as well as interviewer observations on the child's physical environment - *"Child's play environment is safe?"* In the NSCAW-II survey, HOME scores were collected for all children under 10 years old as long as they had been in their baseline placement for at least one month prior to the assessment. Although independent tests of inter-observer reliability were not conducted as part of the NSCAW-II, inter-observer agreement has been noted to be greater than 85% in prior studies (Dowd et al., 2013). Secondary independent variables for this study included the HOME subscales: Cognitive Stimulation (CS) and Emotional Support (ES). As the total number of questions on the HOME differed for those children who were under three years old at the start of the study, an equivalent HOME score and its subscales were created in this study for this sub-population by dividing each child's scores by the total number of points possible and then multiplying it by the number of points possible on each section for those over three years old.

The decision to use HOME scores at baseline was based on preliminary analyses showing relative stability in total HOME scores across the 36-month study as well as the known

importance of at-risk children receiving supportive services as early in life as possible. A similar approach was utilized by Stacks and colleagues (2011).

Academic achievement.—The dependent variables in this analysis were academic achievement scores at Wave 3, measured by the WJ-ACH. The WJ-ACH is a norm-referenced standardized assessment that is well-validated and can be used with individuals 2 to 80 years old (Woodcock et al., 2001). The WJ-ACH is a set of tests to measure various aspects of academic achievement. In this study, three WJ-ACH subscores were evaluated: 1) Applied Problems, which measured children's ability to analyze and solve math problems; 2) Passage Comprehension, which measured children's broad reading and reading comprehension; and 3) Letter-Word Identification, which measured children's ability to identify letters and words. Applied Problems involves excluding extraneous information and incorporating relevant information into a learned process, Letter-Word Identification relies on rote memorization and phoneme awareness skills, and Passage Comprehension relies on language and working memory skills. Previous studies have administered the WJ-ACH with families from diverse socioeconomic backgrounds that are similar to the current sample (Aikens & Barbarin, 2008; Dupere et al., 2010; Stevens, 2016).

Placement type.—The moderator in this analysis was the child's primary placement type: parent care, kinship care, or non-kinship foster care. The decision to utilize these three categories was determined by the bulk of placement literature, which generally separates placement into two categories (e.g. in-home versus out-of-home care or licensed versus unlicensed care) or three categories (e.g. parent, kinship, and non-kinship care) (Helton & Bruhn, 2013; James et al., 2009; Leslie et al., 2010; Romano et al., 2015). The amount of time spent in each placement between baseline and wave 3 was calculated in this order of preference: based on caseworker interview (completed Wave 3); child completed Wave 3 interview date; caregiver completed Wave 3 interview date; or April 1, 2012 if no Wave 3 interview dates were. The April 1, 2012 date was selected because it was the median date of the Wave 3 data collection period. The amount of time spent in each type of placement (parent care, kinship care, or non-kinship foster care) was totaled, and the dominant placement type was determined to be the type of placement where the child spent most of their days during the course of the study.

Statistical Analyses

Descriptive statistics were used to describe the demographic characteristics of the sample. Bivariate linear regression analyses examined the association between HOME scores (total HOME, HOME CS, and HOME ES) at baseline, WJ-ACH subscales (Applied Problems, Passage Comprehension, and Letter-Word Identification) at Wave 3, and demographic variables. Demographic variables that were statistically significant (i.e. $p < 0.05$) were retained in the multivariate linear regression analyses. Analyses took into account the stratified, clustered nature of the sampling design used in the NSCAW-II. Sampling design features and appropriate case weights were used to produce generalizable statistical estimates with confidence intervals. Weighted analyses and statistical computations were performed with Stata/SE 15.1 (College Station, TX).

Results

The distributions of total HOME scores and subscale scores by demographic variables are presented in Table 1. Over half of children were male, and most were between three and six years old. A little over 45% of children were identified as White, 22.4% as Black, 25.4% as Hispanic, and 6.8% as "Other." About 80% of baseline caregivers reported a household income equal to or less than 200% of the federal poverty level. Approximately half of the children did not have a prior CPS report. Most had an alleged type of maltreatment of neglect (32.3%), followed by physical abuse (17.6%), parental substance use (13.2%), emotional abuse (11.8%), and sexual abuse (6.1%). The majority (79.9%) of children's primary placement type was with at least one parent (adoptive or biological) for the majority of the three-year study.

Additional demographic analyses were examined that are not included in Table 1. The average amount of time that children spent in the home environment prior to the HOME assessment being administered was 49.72 months (SD = 26.50). In the current study, 400 children (33.2%) spent at least one day in out-of-home care (kinship care or non-kinship foster care) during the three-year period of the study. On average, those children that spent at least one day in out-of-home care during the study period spent 30% of the study time in the care of a parent, 48% of the study time in kinship care, and 22% of the study time in non-kinship foster care. The mean number of out-of-home placements for the entire sample was 0.31. For those children who spent at least one day in out-of-home care, the average number of out-of-home placements was 1.65 (SD = 1.10) with a range of one to eight placements over the three years for the sample. All three of these additional measures of placement type and stability were included in initial bivariate analyses, but they do not appear in the final multivariate analyses as they were not found to be significantly related to academic achievement at the bivariate level.

Bivariate Analyses

Table 2 represents the bivariate linear regression analyses for the total HOME score and subscale scores at baseline and the outcomes of the WJ-ACH subtests at Wave 3.

WJ-ACH Applied Problems.—The HOME ES score (β=0.52, 95% CI= 0.05, 0.99, p=0.029) and the total HOME score (β=0.40, 95% CI= 0.10, 0.69, p=0.009) were significantly associated with the WJ-ACH Applied Problems score. However, the HOME CS score was not statistically-significantly related to the Applied Problems score. Having a household income >200% compared to <50% of the federal poverty level was associated with higher Applied Problem scores (β=7.30, 95% CI= 3.56, 11.04, p<0.0001).

WJ-ACH Letter-Word Identification.—There were no significant relationships for the total or subscale HOME scores with the WJ-ACH Letter-Word Identification scores. However, females had statistically-significantly higher scores on the Letter-Word Identification subtest than males (β=4.57, 95% CI= 1.10, 8.05, p = 0.011). Also, having a household income >200% compared to <50% of the federal poverty level was associated with higher Letter-Word Identification scores (β=4.66, 95% CI= 0.62, 8.69, p=0.024).

Children placed primarily in non-kinship foster care had higher scores than children who were placed with at least one parent (β=11.70, 95% CI= 2.57, 20.83, p=0.013).

WJ-ACH Passage Comprehension.—The HOME CS score was significantly associated with the WJ-ACH Passage Comprehension score (β=0.88, 95% CI= 0.15, 1.61, p=0.018). However, there were no statistically-significant associations of the HOME ES subscale or the total HOME score with the Passage Comprehension score. Females had higher Passage Comprehension scores than males (β=6.20, 95% CI= 3.43, 8.97, p<0.0001) and children who were between 6 to <8 years old compared to those <3 years old had lower Passage Comprehension scores (β=−4.95, 95% CI= −9.40, −0.51), p=0.03). Emotional abuse was associated with higher Passage Comprehension scores (β=8.19, 95% CI= 1.87, 14.52, p=0.012) compared to physical abuse. Children placed primarily in non-kinship foster care had higher scores than children who remained with at least one parent (β=10.11, 95% CI= 3.95, 16.27, p=0.002).

Moderation Analysis

One of the study aims was to determine whether the child's placement type influenced the relationship between the home environment at baseline and academic achievement at Wave 3. Findings indicate that placement type did not moderate the relationship between the total HOME score and the three academic achievement subscales (i.e., Applied Problems, Passage Comprehension, or Letter-Word Identification). Since moderation analyses indicated that there was no significant association between HOME score by placement type and the three WJ-ACH outcomes, placement type was entered into each multivariate model rather than the interaction term of HOME scores by placement type.

Multiple Linear Regression Analyses

Multivariate linear regression analyses examined the study's primary aim to determine whether a higher level of cognitive stimulation and emotional support at baseline was associated with later academic achievement in CPS-involved children after accounting for demographic characteristics. Table 3 represents the multivariate analyses for the HOME subscales, and Table 4 represents the multivariate analysis for the total HOME scores. The multivariate model in Table 3 with the HOME subscales yielded similar results as the model in Table 4 with Total HOME scores. As a result, the results for Table 4 are primarily reported below.

WJ-ACH Applied Problems.—The HOME CS and ES subscale scores were not associated with the WJ-ACH Applied Problems score after adjusting for all demographic variables that were retained in the final model. However, having household incomes 100–200% (β=5.00, 95% CI= 1.66, 8.35, p=0.004) or > 200% (β=6.36, 95% CI= 2.85, 9.88, p=0.001) compared to < 50% of the federal poverty level were associated with higher Applied Problems scores.

WJ-ACH Letter-Word Identification.—The HOME CS and ES subscale scores were not associated with the WJ-ACH Letter-Word Identification score after adjusting for demographic variables. However, females had significantly higher scores than males

(β=4.89, 95% CI= 1.81, 7.97, p=0.002). Also, having household incomes >200% versus <50% of the federal poverty level was associated with higher Letter-Word Identification scores (β=5.36, 95% CI= 0.72, 10.01, p=0.024). Furthermore, being placed primarily in non-kinship foster care was associated with higher scores on the Letter Word Identification compared to those who were placed with at least one parent (β=12.42, 95% CI= 1.81, 23.04, p=0.022).

WJ-ACH Passage Comprehension.—The HOME CS and ES subscale scores were not associated with the WJ-ACH Passage Comprehension score after adjusting for demographic variables. However, females had significantly higher Passage Comprehension scores than males (β=7.05, 95% CI= 4.49, 9.61, p<0.0001), and children who were between 6 to <8 years had lower scores than children who were <3 years (β= - 5.98, 95% CI= −10.28, −1.68, p=0.007). Having household incomes between 100–200% (β=3.93, 95% CI= 0.10, 7.76, p=0.044) or > 200% (β=5.55, 95% CI= 0.36, 10.73, p=0.036) compared to <50% of the federal poverty level were associated with higher Passage Comprehension scores. Emotional abuse compared to physical abuse was also associated with higher Passage Comprehension scores (β=7.12, 95% CI= 0.86, 13.39, p=0.027). Children primarily placed in non-kinship foster care had higher scores than children who were placed with at least one parent (β=7.30, 95% CI= 0.51, 14.09, p=0.035).

Discussion

This nationally-representative and longitudinal study with CPS-involved children ages 2 to 7 explored the relationship between the quality of the home environment (i.e., emotional support and cognitive stimulation) at study's baseline and later academic achievement, as well as the effect of placement type on this relationship. At the bivariate level in this study, children's overall HOME score and HOME ES scores were positively and significantly related to children's WJ-ACH Applied Problems subscale scores at Wave 3. However, this relationship was no longer significant in the multivariate analyses. This is likely explained by an overlap in variance explained by several variables in the multiple linear regression. For example, household income level was most consistently significantly associated with all three subscales, which likely accounted for much of the relationships seen between the home environment and academic achievement. A similar effect was noted on HOME CS scores for Passage Comprehension, which may be explained by the effect of emotional abuse and non-kin foster care on this outcome that are accounted for during multivariate analysis.

In the multivariate analyses, household income level was related to all academic achievement outcomes, but it was most strongly related to the Applied Problems subtest. This was similar to findings by Zajac et al. (2018), which demonstrated that the relationship between placement type and language development (an early marker of academic achievement) was likely explained by caregiver attributes, most notably the availability of financial resources. When children are in low SES environments early in life, the gap in academic achievement compared to their high-SES peers widens over their early school years (Aikens & Barbarin, 2008; Duncan et al, 2007). Many mechanisms have been postulated for this strong association, including availability of cognitively-stimulating experiences and resources in the home, caregiver distress, caregiver education, quality of

schools and childcare, amount of household chaos as measured by disorganization and instability, and neighborhood factors (Aikens & Barbarin, 2008; Dupere et al., 2010; Garrett-Peters et al., 2016).

Additionally, for the Passage Comprehension subscale, children that had experienced emotional maltreatment scored significantly higher than those who had experienced physical maltreatment. This aligns with recent research showing the effect of physical punishment and abuse on educational outcomes. Physical punishment has been associated with a decline in school engagement, as well as increased peer isolation with harsh physical punishment and declines in cognitive performance with physical abuse (Font & Cage, 2018). Physical abuse has also been linked to lower receptive vocabulary and communication skills, which may explain why children who have been physically abused had comparatively lower scores on the Passage Comprehension subscale (Perry et al., 1983). In comparison, children experiencing emotional abuse have previously been shown to exhibit similar verbal intelligence quotient scores to those who had not been maltreated, but further research on this category of abuse is needed (Choi et al., 2009).

The skills involved in the Applied Problems subtest (i.e. mathematical problem solving) differ markedly from those involved in the other subscales. Problem solving skills require self-efficacy, which is directly linked to academic resilience (Cassidy, 2015). Problem solving also requires good observational skills, persistence, and innovative thinking. As caring and supportive relationships, positive expectations, and opportunities to participate meaningfully in the world around them are key factors in the development of resilience in children, this would likely account for the significant link between the HOME score and the Applied Problems subscale at the bivariate level (Benard, 1995; Meng et al., 2018). This is of particular importance as early math skills have been shown to have the greatest predictive power on academic achievement in later life (Duncan et al., 2007).

In our multivariate analyses, children placed primarily in non-kinship foster care demonstrated higher scores on WJ-ACH Passage Comprehension and Letter-Word Identification subscales when compared to those remaining primarily in the home with a parent. In contrast, those children placed primarily with kin did not show significant differences in outcomes compared to those that remained with a parent. Despite this finding, it was noted that placement type did not moderate the relationship between the quality of the home environment and academic achievement. This adds to the extensive discussion on the risks and benefits of different placement types (Berger et al., 2009; Conn et al., 2015; Fusco & Calahane, 2015; Lin, 2014). Determining the best placement for children requires attention to goals of safety, permanency, and overall well-being (Berger et al., 2009). Removing a child from their parent’s care is a traumatic experience for children regardless of the circumstances, but it may, in certain circumstances, offer opportunities for more emotionally-supportive relationships with caregivers and/or increased resources (Berger et al., 2009; Zajac et al., 2018). Although maintaining the child in a consistent home environment is important, out-of-home placements can provide a buffer from prior traumas, which may improve the child’s regulation skills and, in turn, academic functioning (Conn et al., 2015). Therefore, it is important that the decision for out-of-home placement and kinship

versus non-kinship foster care be made on a case-by-case basis that takes into account the quality of the home environment and of potential caregivers.

Strengths and Limitations

Major strengths of this study were the use of a large, longitudinal, and nationally-representative sample, allowing for measurements conducted at different time points and generalizability of the study findings. The large sample size and vast amount of information available for each child allowed for the adjustment of demographic factors that were related to academic achievement. Additionally, the WJ-ACH is a standardized assessment that has been well-validated for children (Woodcock et al., 2001). This study's focus on the effect of the environment in toddlerhood and early elementary school on later academic achievement targets an understudied population, as most studies have focused on academic achievement in the junior high and high school populations. This is important as higher investments in early childhood can reverse some of the harm experienced as a result of trauma and disadvantage and has high economic return (Heckman & Masterov, 2007).

A notable limitation in this study is that children are more likely to be removed from home environments that are deemed to be of lower quality due to potential risk to the child and less developmental support, creating a selection bias for those placed in foster care, particularly non-kinship foster care (Berger et al., 2009; Doyle, 2007). Additionally, little is known about the quality of home environment in the periods between measurements or prior to the study's onset. Although the number of placements and total amount of time spent in each placement was known for most children in the study, it was unclear whether each child remained or was placed in a setting with similar amounts of emotional responsivity and cognitive stimulation. Children placed in foster care often experience a greater severity of maltreatment, which was unable to be adequately accounted for in this study due to the lack of data (Berger et al., 2009; Stahmer et al., 2009). Additionally, differences have been seen between placement types in measures of parental stress, parenting skills, involvement in the criminal justice system, illegal substance use, domestic violence, and availability of social support (Berger et al., 2009; Stahmer et al., 2009). These baseline characteristic differences between children in different types of placements are difficult to adequately account for in analyses involving out-of-home placement. Given that children in non-kinship foster care demonstrated higher levels of academic achievement in our study despite studies showing these children have higher risks at the time of their placement, it is suspected that these higher risk factors contributed to the lack of significance seen between HOME scores and WJ-ACH scores on multivariate analyses. Given findings by Font (2014), it is possible that children in parent or kinship care had a propensity for higher academic achievement at baseline with subsequent stagnation compared to children placed in non-kinship foster care. Although some benefit was demonstrated in non-kinship foster care placements for academic achievement, this study did not look at other outcomes of interest, such as social-emotional development or mental health conditions, which may contribute to placement decisions.

As this was a secondary dataset analysis, variables were limited to those available in the dataset, which prevented inclusion of some child- or caregiver-specific factors that

may contribute to academic achievement. Although this is the most recent nationally-representative data of children involved with CPS, it should be noted that NSCAW-II data was obtained eight to twelve years ago. Therefore, caution is recommended in applying the current study results when formulating policies. However, given that the challenges faced by caregivers today are similar to those faced at the time of the study, findings from this study are still relevant and important.

Although aggregate-level analysis allows us to more easily identify patterns and trends that would be missed with an individualized lens and can better inform policy, it is particularly important to note in a study of this kind that what applies to the CPS-involved population as a whole does not necessarily apply to the individual child. Each situation is unique and thus requires adequate assessment and understanding of the child's life and environment in order to promote their future well-being with regards to their academic achievement and overall success.

Implications

Although the relationship between quality of the home environment and academic achievement was not moderated by placement type in our findings, higher Passage Comprehension and Letter-Word Identification scores for those placed primarily in non-kinship foster care indicated some benefit of this placement type, especially given the previously reported higher prior severity of abuse and rate of developmental disabilities in this population. This association is likely partially explained by the increased training and resources available to non-kinship foster caregivers. Research has consistently shown that early childhood interventions are more effective to combat experienced disadvantages than are interventions that take place later in life (Heckman & Masterov, 2007). Because of this, parents and kinship caregivers of children involved with CPS would likely benefit from increased training on how to provide emotional support and cognitive stimulation to young children, which may attenuate the effect of CPS involvement on academic achievement as well as related sequelae. This support is particularly important for kinship caregivers, who may have fewer resources and more difficulty navigating the system and receive lower levels of reimbursement and training as well as CPS oversight. Specifically, kinship caregivers receive roughly half the financial support received by non-kinship caregivers, are four times less likely to receive parent training, and are seven times less likely to receive respite care or support group services (Gebel, 1996; Fusco & Calahane, 2015; Lin, 2014; Sakai et al., 2011). Given the strong association between household income and academic achievement found in this study, policies aimed at increasing financial support, especially in parent and kinship caregivers, may be of particular importance.

Future research should focus on factors related to the child and caregivers that may help to determine the best placement type for a given child. Additionally, the factors contributing to the link between household income and academic outcomes should be further explored within this population to determine whether these factors may be modified to improve outcomes. These findings can inform policy and advocate for increased caregiver support and training to help mitigate negative academic achievement effects associated with CPS involvement.

Conclusion

Child- and caregiver-level factors, as well as financial resources available in the environment, may account for the relationship between home environment and academic achievement. Priority in policies should be given to providing adequate training and support to caregivers of CPS-involved children in order to help mitigate negative outcomes in later life.

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Table 1.

Distribution of HOME Scores (Total and Subscales) at Baseline by Demographic Variables.

	Total (*N* = 1206) n (%)	Total HOME Score *M (SD)*	HOME-CS *M (SD)*	HOME-ES *M (SD)*
Children's Sex				
Male	642 (56.5)	19.54 (3.38)	10.33 (2.21)	9.22 (2.42)
Female	564 (43.6)	19.67 (3.84)	10.46 (2.69)	9.21 (2.33)
Age Group				
< 3 years	211 (17.2)	20.46 (3.99) **	11.04 (1.97) ***	9.42 (3.12)
3 to < 6 years	640 (53.6)	19.68 (3.53) **	10.88 (2.33) ***	8.81 (2.20)
6 to < 8 years	355 (29.2)	18.93 (3.29) **	9.08 (2.28) ***	9.85 (2.11)
Race/Ethnicity				
White/Non-Hispanic	492 (45.4)	19.69 (3.47)	10.36 (2.47)	9.33 (2.34)
Black/Non-Hispanic	348 (22.4)	19.01 (3.78)	10.43 (2.34)	8.60 (2.68)
Hispanic	281 (25.4)	19.76 (3.49)	10.27 (2.29)	9.47 (2.16)
Other	84 (6.8)	20.39 (3.54)	10.83 (2.53)	9.55 (2.06)
Household Income (% Federal Poverty Level)				
< 50%	257 (23.3)	18.35 (3.42) ***	9.87 (2.39) **	8.50 (2.23) **
50 to < 100%	343 (29.2)	19.28 (3.42) ***	10.08 (2.28) **	9.20 (2.34) **
100 to 200%	307 (27.6)	20.52 (2.96) ***	11.00 (1.92) **	9.52 (2.40) **
> 200%	229 (13.7)	20.47 (4.72) ***	10.74 (3.44) **	9.72 (2.52) **
Prior CPS Report				
No	568 (51.0)	19.91 (3.33)	10.66 (2.22) *	9.26 (2.28)
Yes	638 (49.0)	19.27 (3.80)	10.10 (2.60) *	9.17 (2.48)
Alleged Type of Maltreatment				
Physical Abuse	208 (17.6)	19.80 (2.78)	10.25 (1.97)	9.55 (2.04)
Sexual Abuse	83 (6.1)	20.07 (3.21)	10.76 (2.35)	9.32 (2.79)
Emotional Abuse	161 (11.8)	19.75 (3.97)	10.66 (2.49)	9.09 (2.46)
Neglect	356 (32.3)	19.37 (3.43)	10.10 (2.32)	9.26 (2.36)
Parental Substance Use	153 (13.2)	19.84 (3.95)	10.75 (2.28)	9.10 (2.72)
Other/Don't Know	245 (19.1)	19.39 (4.03)	10.44 (2.95)	8.96 (2.27)
Placement Type				
Parent Care	805 (79.9)	19.61 (3.17)	10.33 (2.13)	9.28 (2.16)
Kinship Care	163 (7.6)	19.78 (4.82)	10.51 (2.92)	9.27 (3.33)
Non-Kinship Foster Care	122 (3.2)	19.87 (5.99)	10.65 (3.19)	9.23 (3.82)

Notes. HOME-CS represents the HOME Cognitive Stimulation subscale. HOME-ES represents the HOME Emotional Support subscale. M = Mean. SD = Standard Deviation.

* $p < 0.05$

** $p < .01$

*** $p < .001$ and p-values indicate the differences between categories for HOME scores.

Table 2.

Bivariate analyses of baseline characteristics and their associations with the WJ-ACH subscale scores at Wave 3

	W-J Applied Problems		W-J Letter-Word Identification		W-J Passage Comprehension	
	β	95% CI	β	95% CI	β	95% CI
Total HOME score	0.40	(0.10, 0.69) **	0.28	(−0.11, 0.67)	0.35	(−0.05, 0.74)
HOME Cognitive Stimulation score	0.33	(−0.28, 0.95)	0.33	(−0.30, 0.96)	0.88	(0.15, 1.61) *
HOME Emotional Support score	0.52	(0.05, 0.99) *	0.29	(−0.36, 0.94)	−0.08	(−0.73, 0.56)
Children's Sex						
Male	Reference	--	Reference	--	Reference	--
Female	1.73	(−1.55, 5.00)	4.57	(1.10, 8.05) *	6.20	(3.43, 8.97) ***
Age Group						
< 3 years	Reference	--	Reference	--	Reference	--
3 to < 6 years	2.32	(−3.60, 8.24)	0.28	(−4.73, 5.29)	−1.77	(−6.35, 2.81)
6 to < 8 years	1.60	(−2.93, 6.14)	−0.05	(−5.32, 5.22)	−4.95	(−9.40, −0.51) *
Race/Ethnicity						
White/Non-Hispanic	Reference	--	Reference	--	Reference	--
Black/Non-Hispanic	−0.47	(−4.40, 3.47)	1.94	(−1.42, 5.30)	2.96	(−1.40, 7.33)
Hispanic	0.78	(−2.01, 3.58)	−0.71	(−5.02, 3.60)	0.81	(−3.15, 4.76)
Other	2.97	(−2.98, 8.93)	−0.05	(−6.61, 6.51)	4.21	(−0.80, 9.23)
Household Income (% Federal Poverty Level)						
< 50%	Reference	--	Reference	--	Reference	--
50 to < 100%	2.23	(−1.72, 6.18)	1.99	(−2.49, 6.47)	−0.85	(−6.00, 4.31)
100 to 200%	4.22	(−0.12, 8.57)	1.06	(−2.80, 4.93)	1.04	(−3.43, 5.51)
> 200%	7.30	(3.56, 11.04) ***	4.66	(0.62, 8.69) *	3.93	(−0.66, 8.52)
Prior CPS Report						
No	Reference	--	Reference	--	Reference	--
Yes	2.02	(−0.66, 4.69)	0.67	(−2.83, 4.18)	1.99	(−0.79, 4.77)
Out-of-home Placements	0.50	(−1.12, 2.12)	0.66	(−1.45, 2.76)	0.40	(−1.91, 2.71)
Alleged Type of Maltreatment						
Physical Abuse	Reference	--	Reference	--	Reference	--
Sexual Abuse	0.36	(−6.76, 7.48)	−4.48	(−13.05, 4.08)	0.85	(−5.55, 7.25)
Emotional Abuse	1.92	(−2.45, 6.30)	1.49	(−4.67, 7.65)	8.19	(1.87, 14.52) *
Neglect	0.05	(−4.43, 4.53)	−2.44	(−7.75, 2.86)	1.41	(−4.48, 7.29)
Parental Substance Use	1.03	(−2.95, 5.01)	−4.08	(−11.28, 3.12)	1.30	(−5.68, 8.28)
Other/Don't Know	2.36	(−1.56, 6.28)	−1.51	(−7.21, 4.19)	3.89	(−1.93, 9.70)
Placement Type						
Parent Care	Reference	--	Reference	--	Reference	--
Kinship Care	1.39	(−2.37, 5.14)	−0.30	(−4.92, 4.31)	−1.46	(−6.64, 3.73)

	W-J Applied Problems		W-J Letter-Word Identification		W-J Passage Comprehension	
	β	95% CI	β	95% CI	β	95% CI
Non-Kinship Foster Care	4.44	(−0.48, 9.36)	11.70	(2.57, 20.83) *	10.11	(3.95, 16.27) **

Note. β = Beta coefficient; CI = confidence interval; Reference = comparison group.

* $p < 0.05$

** $p < .01$

*** $p < .001$

Table 3.

Multivariate Linear Regression Analyses Examining HOME Subscales and Demographic Associations with the WJ-ACH Subscale Scores at Wave 3

	WJ-ACH Applied Problems		WJ-ACH Letter-Word Identification		WJ-ACH Passage Comprehension	
	β	95% CI	β	95% CI	β	95% CI
HOME Cognitive Stimulation score	0.01	(−0.70, 0.72)	0.16	(−0.58, 0.89)	0.5	(−0.30, 1.30)
HOME Emotional Support score	0.46	(−0.15, 1.06)	0.21	(−0.49, 0.92)	−0.27	(−0.83, 0.28)
Children's Sex						
Male	Reference	--	Reference	--	Reference	--
Female	1.88	(−1.28, 5.04)	4.89	(1.81, 7.97) **	7.06	(4.48, 9.65) ***
Age Group						
< 3 years	Reference	--	Reference	--	Reference	--
3 to < 6 years	−1.02	(−6.43, 4.39)	−2.36	(−6.77, 2.06)	−3.4	(−7.22, 0.42)
6 to < 8 years	−2.44	(−7.35, 2.47)	−2.11	(−7.18, 2.95)	−4.9	(−9.62, −0.17) *
Household Income (% Federal Poverty Level)						
< 50%	Reference	--	Reference	--	Reference	--
50 to < 100%	2.8	(−0.45, 6.05)	3.67	(−0.76, 8.09)	1.35	(−2.84, 5.54)
100 to 200%	5.01	(1.62, 8.40) **	2.43	(−1.59, 6.45)	3.91	(0.22, 7.60) *
> 200%	6.38	(2.88, 9.88) **	5.36	(0.72, 10.01) *	5.52	(0.37, 10.66) *
Alleged Type of Maltreatment						
Physical Abuse	Reference	--	Reference	--	Reference	--
Sexual Abuse	−0.75	(−8.26, 6.75)	−5.74	(−14.52, 3.04)	−1.7	(−8.03, 4.62)
Emotional Abuse	1.82	(−2.54, 6.19)	0.55	(−5.81, 6.90)	6.86	(0.85, 12.87) *
Neglect	0.57	(−3.45, 4.59)	−2.43	(−7.66, 2.81)	1.03	(−4.13, 6.19)
Parental Substance Use	0.58	(−3.77, 4.93)	−5.51	(−12.48, 1.47)	−0.58	(−6.64, 5.48)
Other/Don't Know	3.53	(−0.54, 7.60)	−0.87	(−7.08, 5.34)	4.28	(−1.28, 9.84)
Placement Type						
Parent Care	Reference	--	Reference	--	Reference	--
Kinship Care	0.13	(−3.58, 3.85)	−0.28	(−4.40, 3.84)	−1.91	(−6.29, 2.48)
Non-Kinship Foster Care	3.23	(−2.88, 9.34)	12.4	(1.88, 22.91) *	7.64	(0.78, 14.50) *

Note. β = Beta coefficient; CI = confidence interval.

* $p < 0.05$

** $p < .01$

*** $p < .001$

Table 4.

Multivariate Linear Regression Analyses Examining HOME Total Score and Demographic Associations with the WJ-ACH Subscale Scores at Wave 3

	WJ-ACH Applied Problems		WJ-ACH Letter-Word Identification		WJ-ACH Passage Comprehension	
	β	95% CI	β	95% CI	β	95% CI
Total HOME score	0.26	(−0.17, 0.69)	0.19	(−0.25, 0.62)	0.05	(−0.35 0.45)
Children's Sex						
Male	Reference	--	Reference	--	Reference	--
Female	1.89	(−1.29, 5.07)	4.89	(1.81, 7.97) **	7.05	(4.49, 9.61) ***
Age Group						
< 3 years	Reference	--	Reference	--	Reference	--
3 to < 6 years	−1.1	(−6.57, 4.37)	−2.37	(−6.81, 2.07)	−3.25	(−7.25, 0.74)
6 to < 8 years	−1.81	(−6.45, 2.83)	−2.04	(−6.94, 2.87)	−5.98	(−10.28, −1.68) **
Household Income (% Federal Poverty Level)						
< 50%	Reference	--	Reference	--	Reference	--
50 to < 100%	2.99	(−0.46, 6.43)	3.69	(−0.86, 8.24)	1.02	(−3.34, 5.38)
100 to 200%	5	(1.66, 8.35) ***	2.43	(−1.58, 6.44)	3.93	(0.10, 7.76) *
> 200%	6.36	(2.85, 9.88) **	5.36	(0.72, 10.01) *	5.55	(0.36, 10.73) *
Alleged Type of Maltreatment						
Physical Abuse	Reference	--	Reference	--	Reference	--
Sexual Abuse	−0.93	(−8.36, 6.50)	−5.76	(−14.52, 3.00)	−1.37	(−7.89, 5.15)
Emotional Abuse	1.68	(−2.74, 6.10)	0.52	(−5.93, 6.98)	7.12	(0.86, 13.39) *
Neglect	0.54	(−3.53, 4.62)	−2.43	(−7.68, 2.82)	1.09	(−4.21, 6.39)
Parental Substance Use	0.45	(−4.08, 4.98)	−5.52	(−12.63, 1.59)	−0.34	(−6.67, 5.99)
Other/Don't Know	3.49	(−0.57, 7.55)	−0.87	(−7.11, 5.36)	4.36	(−1.34, 10.07)
Placement Type						
Parent Care	Reference	--	Reference	--	Reference	--
Kinship Care	0.17	(−3.54, 3.88)	−0.28	(−4.41, 3.86)	−1.98	(−6.48, 2.51)
Non-Kinship Foster Care	3.43	(−2.70, 9.55)	12.42	(1.81, 23.04) *	7.3	(0.51, 14.09) *

Note. β = Beta coefficient; CI = confidence interval.

* $p < 0.05$

** $p < .01$

*** $p < .001$