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Do early care and education services improve language development for maltreated children? Evidence from a national child welfare sample

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ABSTRACT

Young children under 6 years old are over-represented in the U.S. child welfare system (CWS). Due to their exposure to early deprivation and trauma, they are also highly vulnerable to developmental problems, including language delays. High quality early care and education (ECE) programs (e.g. preschool, Head Start) can improve children's development and so policymakers have begun calling for increased enrollment of CWS-supervised children in these programs. However, it is not a given that ECE will benefit all children who experience maltreatment. Some types of maltreatment may result in trauma-related learning and behavior challenges or developmental deficits that cause children to respond to ECE settings differently. The current study uses data from a nationally representative survey of children in the U.S. child welfare system, the National Survey of Child and Adolescent Well-Being II, to assess whether young CWS-supervised children ($N = 1{,}652$) who were enrolled in ECE had better language development outcomes 18 months later than those not enrolled in ECE. We also explore whether the type of maltreatment that brought children to the CWS' attention moderates the relationship between ECE and children's language development. After controlling for children's initial scores on the Preschool Language Scale (PLS-3), type(s) of maltreatment experienced, and child and caregiver demographics, we found that ECE participation predicted better PLS-3 scores at follow-up, with a positive interaction between ECE participation and supervisory neglect. ECE seems to be beneficial for CWS-involved children's early language development, especially for children referred to the CWS because they lack appropriate parent supervision at home.

Introduction

During the past two decades, the number of infants and young children entering the U.S. child welfare system (CWS) has swelled (Klein & Harden, 2011). Currently, children birth through five years old compose almost half (46.7%) of newly substantiated victims of child maltreatment in the U.S. and more than a third (38.4%) of all U.S. children in foster care (United States Department of Health and Human Services, USDHHS, 2013a, 2013b).

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Literature Review

Language Development Among Maltreated Children. Due to their exposure to maltreatment-related early childhood deprivation and trauma, these young children are highly vulnerable to a range of developmental concerns, including language delays (Allen & Oliver, 1982; Casanueva et al., 2012a; Coster, Gersten, Beeghly, & Cicchetti, 1989; Eigsti & Cicchetti, 2004; Pears & Fisher, 2005; Spratt et al., 2012; Stacks et al., 2011). Data from a nationally representative study of children and families referred to the CWS in the United States demonstrate that, on average, young children in the CWS perform significantly worse than the general population on standardized measures of language development (Casanueva et al., 2012a; Stahmer et al., 2009). Roughly one out of four (26.0%) of children under the age of six reported to the CWS have serious delays in overall language development that were two or more standard deviations below the norm (Casanueva et al., 2012a). Among these children, approximately eighteen % (18.1%) had delays in receptive language (i.e. the ability to understand or comprehend language) and more than a quarter (25.4%) had delays in expressive language (i.e. the ability to articulate or communicate language) (Casanueva et al., 2012a).

Several smaller scale but descriptively rich studies confirm that lags in language development are common among children who experience maltreatment and also provide specifics about how language delays manifest in this population. Children who experience maltreatment use fewer words and less complex sentence structure than matched controls, have more trouble coherently connecting ideas when communicating, display less syntactical competence, and their spoken vocabulary is feebler (Coster & Cicchetti, 1993; Coster et al., 1989; Eigsti & Cicchetti, 2004; Gersten, Coster, Schneider-Rosen, Carlson, & Cicchetti, 1986). Typically, they also use less self-referential speech (e.g. fewer first person pronouns and mention of their own internal states and behaviors) (Beeghly & Cicchetti, 1994; Coster et al., 1989; Manso, Sanchez, & Alonso, 2012; McFadyen & Kitson, 1996). A recent study of 6–18 year olds living in residential care in Spain (presumably due to maltreatment) also observed low levels of morphological language competence among the study sample, many of whom struggled with forming or deriving new words from verbs, nouns and adjectives (Manso, Sanchez, & Alonso, 2012).

Maltreatment is associated with diminished receptive and expressive language capacity; however, delays in maltreated children's ability to express themselves tend to be even more sizable than delays in language comprehension (Allen & Oliver, 1982; Casanueva et al., 2012a; Culp et al., 1991; Fox, Long, & Langlois, 1988). According to one study, child maltreatment's negative effect on expressive language is also more persistent over time (Jacobsen, Moe, Ivarsson, Wentzel-Larsen, & Smith, 2013).

Differential Effects of Abuse and Neglect on Language Development. Neglected children seem to have a particularly hard time developing language. Fox and colleagues (1988) observed that severely neglected 3–8 year olds' language comprehension not only lagged behind non-maltreated controls, but also behind children who experienced abuse or general neglect. Pears and Fisher (2005) found that PLS-3 scores for a group of 3–6 year olds in foster care ($n = 99$) were significantly lower among those who had a history of neglect or emotional abuse ($R = -0.22$). Other studies confirm that the link between delayed language and neglect is stronger than the link between delayed language and abuse and further demonstrate that children who are referred to the CWS solely for neglect tend to have even more negative language outcomes than children referred for both abuse and neglect (Allen & Oliver, 1982; Culp et al., 1991). Culp and colleagues (1991) observed that language capabilities for preschoolers in the CWS who solely experienced neglect were, on average, 6–9 months delayed, whereas children who were both neglected and abused were 4–8 months delayed, and children who were solely abused were 0–2 months delayed. The curious finding that neglect alone is more detrimental to language development than abuse and neglect in combination may be explained by the public's tendency to perceive abuse as more serious than neglect (Zellman, 1990). Culp and colleagues (1991) suggest that the public may therefore tend to report suspected abuse with greater alacrity than neglect, resulting in children who are identified victims only of neglect being more likely to have suffered repeated or chronic maltreatment by the time they come to the CWS' attention than those who have also been abused.

Contrary to these studies, Stacks and colleagues' (2011) analysis of NSCAW II data did not find evidence that the relationship between expressive language and neglect was stronger than for other types of maltreatment; in fact, the association between receptive language and neglect was actually weaker than for physical abuse. However, they operationalized type of maltreatment as the child welfare worker's perception of the *most serious* form of maltreatment experienced, thereby recognizing only one type of maltreatment per child. Given that it is quite common for abuse and neglect to co-occur (Allen & Oliver, 1982), this measurement approach probably resulted in numerous subjects who were also neglected being categorized as "physically abused."

How Early Maltreatment Compromises Language Learning. Child maltreatment hinders language development because language is initially acquired within the context of relationships, particularly a young child's relationship with his or her primary caregivers (Tamis-LaMonda & Rodriguez, 2009). Both the quantity and quality of parent–child interaction help determine the extent to which children have the opportunity to observe, learn, rehearse, and refine nascent language skills (Stocks & Fisher, 2006). Specifically, Tamis-LaMonda and Rodriguez (2009) suggest that it is the quality of caregiver–child engagement (e.g. sensitivity/responsiveness to a child and cognitive stimulation), provision of developmentally appropriate learning materials, and the frequency of participation in routine learning activities with children (e.g., bedtime book reading) that set the stage for early language development, all of which may be compromised when maltreatment is present. Maltreating parents tend to be less verbally interactive with their children than are other parents, and when they do engage, use more

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simplistic language, ask fewer questions, and demonstrate less empathy (Christopolous, Bonvillian, & Crittenden, 1988; Eigsti & Cicchetti, 2004). One study suggests that neglectful mothers are particularly terse and non-supportive in their interactions with their children (Eigsti & Cicchetti, 2004). Moreover, Manso and colleagues' (2012) document a direct relationship between parenting approach and language development among residentially placed children wherein punitive parenting styles were associated with lower levels of children's morphological language competence, and restrictive, controlling, and 'affectively marginalizing' parenting styles were associated with lower levels of syntactical competence.

Consequences of Early Language Delays. As Stock and Fisher (2006) detail, the high rate of language delays among maltreated children is concerning for several reasons. When language delays are left unaddressed during early childhood, they can have a deleterious effect on children's later chances of academic success. More than any other developmental domain, language competency predicts children's school readiness. Children need to be able to understand teachers' directions in order to complete tasks and are typically expected to use written and spoken language to demonstrate mastery of learning content. Additionally, early language development is strongly associated with literacy, and children who are poor readers often fall behind in a variety of subjects because assignments, regardless of the topic, regularly require students to derive knowledge from text (Stock & Fisher, 2006).

Early language delays also foreshadow future inter-personal problems. Delays in both receptive and expressive language skills can negatively effect young children's social–emotional development by impeding their ability to form and sustain positive relationships, a process that requires the ability to understand others (receptive language), as well as articulate one's own feelings/needs and negotiate conflicts when they arise (expressive language) (Coster & Cicchetti, 1993; Stock & Fisher, 2006). When young children lack the language to do these things, they find alternative ways to elicit attention from others, 'acting out' in ways that harm rather than foster relationships. According to one study, 70% of children with language delays also have co-morbid behavior problems, which are frequently precursors to mental health disorders (Im-Bolter & Cohen, 2007 in Spratt et al., 2012). For instance, attention-deficit and hyperactivity disorder, conduct disorder, oppositional defiant disorder, depression and anxiety are all highly correlated with language delays (Im-Bolter & Cohen, 2007 in Spratt et al., 2012).

Effects of Early Care and Education on Children's Language Outcomes. Research strongly suggests that high quality ECE programs can help buffer at-risk children against adverse language outcomes. Rigorously controlled studies of comprehensive ECE programs such as Head Start, Early Head Start, and the Chicago Child–Parent Centers (CPC) document positive, albeit modest and not always enduring, program impacts on children's early language development and literacy (Abbott-Shim, Lambert, & McCarty, 2003; Clements, Reynolds, & Hickey, 2004; Love et al., 2005; Ludwig & Phillips, 2008; USDHHS, 2010a, 2012). In the case of Head Start, there is even evidence that siblings not directly participating in the program benefit (Currie & Thomas, 1995; Ludwig & Phillips, 2008). Moreover, these positive findings are not limited to just these program models. The Early Child Care Research Network (2000) documents a positive association between high quality ECE programs in general and preschool language development, and the positive language outcomes associated with participation in high quality ECE appear to be particularly strong for low-income children (Dearing, McCartney, & Taylor, 2009).

Rationale for Current Study

Based on these findings, it would seem probable that ECE is also beneficial for maltreated children, many of who come from impoverished families (Sedlak et al., 2010). Indeed, this logic recently prompted the U.S. Children's Bureau to publish conjoint memoranda with the Office of Head Start and Office of Child Care calling for improved service coordination and increased enrollment of CWS-supervised children into high quality child care and preschool programs (USDHHS, 2010b, 2011). The U.S. Administration for Children and Families also funded two grant initiatives, the Early Head Start/Child Welfare Services Initiative and the Child Welfare – Early Education Partnerships to Expand Protective Factors for Children with Child Welfare Involvement discretionary grants, to support pilot projects around the country focused on strengthening collaborations between local child welfare and ECE partners.

However, the effects of ECE on maltreated children's development, particularly maltreated children's language development, is under-studied, and there is reason to suspect that maltreatment may interfere with a child's ability to fully profit from ECE services. Recent research on the physiological consequences of toxic stress demonstrate that repeated, early exposure to maltreatment-related trauma can alter a child's neurochemistry and brain structure, contributing to higher rates of learning and behavioral problems (Ciccheti, 2002; Lipscomb, Schmitt, Pratt, Acock, & Pears, 2014; Twardosz & Lutzker, 2010; Watts-English, Fortson, Gibler, Hooper, & DeBellis, 2006). Therefore, the potential benefits of ECE for maltreated children may be undermined if caregivers/teachers are not equipped to respond empathetically and effectively to children whose exposure to early trauma and toxic stress has impaired their ability to regulate their own behavior in the classroom. Such children may be viewed by caregivers/teachers as 'behavior problems' to be controlled rather than young people to be developed/educated.

Conversely, it is possible that ECE may be *especially* beneficial for maltreated children, particularly neglected children who tend to have the greatest lags in cognitive and language development and therefore the most to gain from an emotionally responsive and cognitively stimulating ECE learning environment. A recent study of three year olds in ECE found that

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frequent, positive verbal interactions with an ECE caregiver/teacher helped buffer children whose mothers provided low levels of verbal stimulation at home against language delays (Vernon-Feagans & Bratsch-Hines, 2013).

We are aware of only one study to date that measures the relationship between ECE and language outcomes for maltreated children. Dinehart and colleagues' (2012) analysis of children attending center-based ECE in Miami-Dade, Florida ($N = 164$) found that both CWS-involved children and low-income controls tended to have better developmental outcomes, including better expressive and receptive language outcomes, when they were attending accredited vs. non-accredited ECE programs. In addition to supporting program accreditation as a valid indicator of ECE program quality, their study makes an important contribution to the child welfare knowledge base by providing evidence that accredited ECE programs can improve maltreated children's early language development. However, Dinehart and colleagues' (2012) study did not include a no-ECE condition and, thus, was not designed to answer the question of whether ECE in general (irrespective of accreditation status or program quality) promotes maltreated children's language development. From a policy standpoint, this may be a more pragmatic question to ask as only a subset of ECE programs are accredited. The most prominent ECE accreditation body, the National Association for the Education of Young Children (NAEYC), estimates that it accredits only five percent of the ECE market (NAEYC, n.d.); whereas there are more than 300,000 maltreated 0–5 year olds identified in the U.S. every year (USDHHS, 2013b).

Research Questions. The current study expands on Dinehart and colleagues' (2012) work by taking a more expansive look at maltreated children's language development as a function of their participation in ECE irrespective of program accreditation status. It also builds on the existing literature about the differential effects of abuse vs. neglect on early language development by considering the possibility that ECE outcomes for maltreated children may vary according to the specific type(s) of maltreatment children experience. Specifically, we use data from a nationally representative survey of children and families referred to the U.S. CWS to explore the following research questions:

1. Is enrollment in center-based ECE associated with improvement in CWS-involved 0–5 year olds' language development 18 months later? and
2. Does the type of maltreatment that brings children to the CWS' attention moderate the relationship between enrollment in center-based ECE and their language development.

Based on the literature, we hypothesized that ECE would have a positive main effect on language development for CWS-involved children (Research Question 1), and that this effect would be most pronounced for neglected children (Research Question 2).

Research Methods

The data used in the current study were from the first two waves of the NSCAW II, a national, longitudinal study of children referred to the CWS because of suspected maltreatment. The NSCAW II was designed to highlight child, familial and environmental characteristics associated with the well-being of children in the U.S. public child welfare system in various contexts. Data were primarily collected via child, caregiver, and caseworker interviews and assessments. The computer-assisted (CAI) method of interviewing was used, allowing for complex routings in questionnaires and increasing accuracy in the administration of the surveys. In addition to capturing details about the maltreatment allegation that led to the child's inclusion in the study, the NSCAW II dataset also includes a wealth of information about child, parent, non-parent caregiver (when applicable), and caseworker characteristics; patterns of service utilization, including utilization of ECE services; and children's functioning and development across multiple domains, including language. The design of the study is quite complex and a detailed account is documented in the *NSCAW II, Combined Waves 1–2 Data File User's Manual, Restricted Release* (NSCAW, 2011). (The Department of Health and Human Services (DHHS) was authorized by The Personal Responsibility and Work Opportunity Reconciliation Act of 1996; PL 104-193) to collect longitudinal data concerning abused and neglected youth who are involved with the child welfare system. The data collection culminated with two studies distributed by the National Data Archive on Child Abuse and Neglect at Cornell University, titled, The National Survey of Child and Adolescent Well-Being (NSCAW I and II).)

The study described herein is a secondary analysis of data from the first two waves of NSCAW II. Wave 1 includes data on an initial cohort of 5,872 children (ages 0–17.5 years) who interfaced with the CWS during a 15-month reference period immediately preceding study enrollment. Wave 2 data were collected approximately 18 months after Wave 1, at which time the sample was reduced to 4,750 (weighted child response rate = 82.8% and weighted caregiver response rates = 86.3%). Because of our interest in early childhood education outcomes, we further restricted our study sample to children less than five years old (0–59 months) at sampling ($N = 3,504$). Twenty-five percent of this reduced sample was enrolled in an ECE program at Wave 1.

We included children with both substantiated and non-substantiated CWS reports in our analytic sample, rather than restricting our analysis solely to those with substantiated reports. This decision was based on mounting empirical evidence that substantiation status is an unreliable indicator of abuse/neglect and a poor predictor of associated developmental impairments; children with unsubstantiated reports have developmental outcomes that are just as adverse as children with substantiated allegations, and a significant portion end up being subsequently re-reported to the CWS (Casanueva,

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Cross, & Ringeisen, 2008; Hussey et al., 2005). Additionally, our study focuses on young children, including a large portion of preverbal children for whom substantiating valid maltreatment reports can be difficult. Moreover, as differential and alternative response practices have become more common in the United States, low risk maltreatment cases are now frequently referred out to community-based services in lieu of substantiation and formal, prolonged CWS involvement.

Measures

The constructs utilized in this study measure ECE participation, early language development, maltreatment type, the presence of learning delays/developmental disabilities, and socio-demographic characteristics of children and families.

Dependent Variable – Early Language Development. Our outcome variable is a continuous scale measuring language development for preschool-aged children. The Preschool Language Scales-3 (PLS-3) (Zimmerman, Steiner, & Pond, 1992) is a standardized assessment tool for children 0–5 years old comprised of two sub-scales measuring (a) expressive communication and (b) auditory comprehension, as well as behaviors associated with language precursors. The auditory component assesses receptive language skills related to attention; semantics; vocabulary and concepts; syntax; and integrative thinking skills, and the expressive component measures verbal communication in the same skill areas. Children's Total Language PLS-3 score, which combines both the auditory and expressive subscales, measured at Wave 2 is the dependent variable for the current study. This scale has very good internal reliability (Cronbach's alpha = 0.87) and is able to discriminate between children with typical and atypical language development 66–80% of the time (Zimmerman, Steiner, & Pond, 1991).

Independent Variables. Early Care and Education. Our primary independent variable of interest is children's participation in an ECE program. Current caregivers were asked whether or not the focal child for the study was "currently in any type of day care program including a Head Start program, nursery school, or early childhood development program? (this includes any center-based program, but home-based babysitting or home day care is not included)." Based on their response to this question during the Wave 1 interview, we coded children as either receiving ECE services ("1") or not ("0").

Maltreatment Type. NSCAW II interviewers asked caseworkers to identify the specific type or types of alleged maltreatment that precipitated the focal children's enrollment in the study from a list of 17 possibilities. Each type of maltreatment was separately recorded as present ("1") or not ("0"). For simplification, the current study collapses these 17 variables into six variables that reflect the most common types of maltreatment reported. These six dichotomous variables represent whether the allegation of maltreatment involved: 1. *physical abuse*; 2. *physical neglect* (failure to provide); 3. *supervisory neglect* (lack of supervision); 4. *substance exposure* (born with drugs in their system); 5. *exposure to domestic violence*; and/or 6. *substance abusing parent*. Because different types of maltreatment often co-occur, we measure each of these six maltreatment types separately as either present or not, instead of using NSCAW II's derived child maltreatment type variable which is based on caseworker's perceptions of the most serious type of maltreatment associated with the allegation and thus fails to capture information about co-occurrence.

Covariates. The covariates in our analysis were chosen based on previous research associating them with ECE participation and/or early language development. These variables include child socio-demographics (e.g., gender, race) and caregiver characteristics and household factors, such as poverty level and number of children in the home. Caregiver highest education level has three categories: less than high school (reference group), high school, and post-secondary. Number of children in the home also has three categories: families with only one child in the home; two to three children (reference group); and four or more children. We chose families with two–three children as the reference group because this is the normative number of children in American families with related children (Vespa, Lewis, & Kreider, 2013). Poverty level was dichotomized as above or below the Federal Poverty Level. We also controlled for the caregiver's report of the primary language spoken in the home.

Whereas the PLS-3 is available in both English and Spanish, NSCAW II subjects were only tested in English (H. Larrabee, personal communication, April 10, 2014), potentially placing non-native English speakers at a disadvantage with respect to their scores. Therefore, we derived a variable to control for whether English was primarily spoken in the home vs. another language.

We also included a covariate reflective of whether a child had a learning delay and/or developmental disability. This variable was derived via an exploratory factor analysis by way of iterated principal axis factoring with an orthogonal varimax rotation, which concentrates on the latent component and common variance among items (Henson & Roberts, 2006). Positive responses to several questions querying caregivers about their child all loaded on the same factor. These included whether or not the caregiver had ever been told by a professional that the child had Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD); mental retardation or developmental delay; whether the child was receiving physical, occupational or speech therapy; whether the child has trouble understanding simple instructions; whether people outside of the family have trouble understanding the child; and if the child needs special education services. Higher scores on this factor indicate that the child had more of these indicators of a learning delay/developmental disability.

Lastly, we entered the Wave 1 PLS-3 Total Language score as a covariate. This allowed us to control for any pre-existing group differences in the language aptitude of children who were enrolled in ECE vs. those who were not, helping to control for selection bias.

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Table 1
Descriptive statistics for full sample and sub-groups of children enrolled or not in early care and education.

	Full sample (N = 3,504) % or M (SD)	Children in ECE (n = 869) % or M (SD)	Children not in ECE (n = 2,632) % or M (SD)
Dependent variable			
Language development (Wave 2)**	82.17 (17.99)	86.17 (18.38)	80.85 (17.68)
Independent variables			
Any vs. No ECE	24.82	100	0
Language development score (Wave 1)*	89.92 (18.43)	88.71 (18.29)	90.39 (18.50)
Maltreatment type			
% Physical Abuse	18.97	20.39	18.48
% Physical Neglect	17.40	18.29	17.13
% Supervisory Neglect*	35.00	38.55	33.87
% Substance Exposure**	18.58	11.84	20.79
% Domestic Violence Exposure**	15.01	18.42	13.91
% Substance Abusing Parent	27.12	26.18	27.46
Age (months)**	17.11 (15.51)	24.35 (18.27)	14.73 (13.68)
% Male	52.34	53.16	52.01
Race/ethnicity			
% White	31.45	30.09	31.93
% Black**	33.83	41.32	31.29
% Hispanic**	29.04	24.31	30.64
% Other*	5.67	4.28	6.14
Under 100% federal poverty line**	49.36	41.23	52.07
% Speak non-English at home**	19.43	14.50	21.09
Caregiver education			
% Less than HS**	24.45	15.82	27.32
% High school	43.04	41.80	43.42
% Above HS**	32.51	42.38	29.26
Learning disability/developmental delay**	0.67 (0.99)	0.79 (1.21)	0.71 (1.06)
Number of children in the home			
One	33.31	34.06	36.09
Two–three*	41.74	43.73	39.29
4 or more	24.95	22.21	24.62

Note: **$p < 0.01$; *$p < 0.05$. Asterisks represent significant differences between those enrolled in ECE (column 2) and those not enrolled (column 3). The full sample (column 1) includes all children 0–59 months old at Wave 1. Three children were missing data on their ECE involvement and so they are not included in columns 2 & 3. ECE = early care and education; M = mean; SD = standard deviation. Maltreatment type exceeds 100% due to counts of all reported instances of each type.

Data Analyses

To examine ECE effects on maltreated children's early language development and whether these effects vary according to the type of maltreatment children experience, we first conducted exploratory analyses to examine the distribution of our variables and confirmed that our dependent variable was normally distributed. Descriptive statistics inclusive of full sample means and standard deviations or frequencies are presented in column one of Table 1. Wave 2 analysis weights (based on the longitudinal nature of the study) were applied due to the variation in selection probabilities and clustered sampling design; one is based on a national level and a second is used for the stratum level. Complex survey data require the application of these weights to allow for unbiased estimates of means, proportions, and regression coefficients.

Next, we conducted bivariate analyses. A correlation matrix was generated to assess for any multicolinearity problems, and descriptive statistics (means, standard deviations and/or percentages) were generated for all of the study variables to explore differences between subjects who were and were not participating in ECE at Wave 1. Significant differences were determined via chi-square and t tests (see columns two and three of Table 1). We also examined frequencies of missing data for each of the study variables and compared children for whom complete data was available to the full sample to assess for practically meaningful differences across study variables (tables available upon request).

Lastly, we conducted a standard multivariate likelihood linear regression analysis to measure the relationship between ECE participation at Time 1 and subsequent language development at Time 2, controlling for the children's initial language development score; whether they had an allegation of physical abuse, physical neglect, supervisory neglect, substance exposure, domestic violence, and/or a substance abusing parent; the interaction between ECE participation and each of these types of maltreatment; and the previously mentioned child and family-level covariates. All of the covariates included in the equation were mean centered based on the analysis group due to the inclusion of interactions in the model. As the language development score is measured on a continuous scale, results should be interpreted such that negative coefficients indicate PLS-3 scores are expected to decrease when that particular covariate increases by one and positive coefficients indicate scores are expected to increase. Survey regression syntax in STATA/SE 13.1 was used to conduct the analysis and to produce standardized beta coefficients for all statistically significant parameter estimates. Our decision to present results from the final full model (Table 1) addresses sensitivity to left-out-variable error (i.e., LOVE problems) in our modeling (Mauro, 1990).

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Results

Descriptive Analyses

At Wave 1, the children in our study sample were toddlers, averaging 17 months old, and the vast majority (75%) were *not* enrolled in an ECE program. Their mean Total Language score on the PLS-3 was within normal limits (86 points or above), but at the low end of the acceptable range (Zimmerman et al., 1991). Scores ranged from a low of 50 (20 points below the cut off for a severe language delay) to a high of 145 (59 points above the cut off for normal language development). One out of five of the children in our sample spoke a language other than English at home. Out of a possible score of seven on the learning problems/developmental disability factor, they typically had between zero and one indicators (0.69). More than a third (35%) of the sample had been reported to child welfare authorities for supervisory neglect, 27% for having a substance abusing parent, 19% for physical abuse, 19% for substance exposure, 17% for physical neglect, and 15% for exposure to domestic violence. Slightly more than half of the study subjects were male and roughly a third were white (32%), Black (34%), and Hispanic (29%). Most commonly, they were one of two–three children in the family home (42%). Their caregivers were typically high school educated (43%), and approximately half of the children in our sample were from impoverished families.

Based on the results of pairwise polychoric correlation analyses (table available upon request), the data did not present any multi-collinearity problems. The most sizeable correlation was between language spoken at home and race/ethnicity ($R = 0.35$).

Bivariate Comparison of Children Enrolled and Not Enrolled in Early Care and Education. As depicted in Table 1, there were several notable differences between children enrolled in ECE at Wave 1 and those who were not. Children who were enrolled in ECE had lower initial PLS-3 scores than children not enrolled in ECE programs ($M = 88.71$ vs. $M = 90.39$, $p < 0.05$), but this relationship reversed at Wave 2 (~18 months later) by which time children participating in ECE had higher PLS-3 scores ($M = 86.17$ vs. $M = 80.85$, $p < 0.01$). While children in both groups experienced a decline in their language scores from Wave 1 to Wave 2, the decline was less precipitous for the children who were enrolled in ECE.

With respect to maltreatment histories, children in ECE were more likely than children not in ECE to have been reported to CWS for supervisory neglect (38.55% vs. 33.87%, $p < 0.05$) and exposure to domestic violence (18.42% vs. 13.91%, $p < 0.01$). They were substantially less likely to have been reported for substance exposure (11.84% vs. 20.79%, $p < 0.01$). Children in ECE were also, on average, older ($M = 24.35$ vs. 14.73 months, $p < .01$). They were more likely to be Black (41.32% vs. 31.29%, $p < 0.01$) and less likely to be Hispanic (24.31% vs. 30.64%, $p < 0.01$) or of a some other race/ethnicity than white, Black or Hispanic (4.28% vs. 6.14%, $p < 0.05$). Their caregivers were generally better educated with a substantially higher percentage having a post-secondary education (42.38% vs. 29.26%, $p < 0.01$) and a substantially lower percentage having failed to complete high school (15.82% vs. 27.32%, $p < 0.01$). Children enrolled in ECE were less likely to be living in poor families (41.23% vs. 52.07%, $p < 0.01$) and in homes were the primary language spoken was something other than English (85.50% vs. 78.91%, $p < 0.01$). They were slightly more likely to come from typically-sized American families of two to three children (43.73% vs. 39.29%, $p < 0.05$). Interestingly, children enrolled in ECE had significantly, albeit modestly, higher scores on the learning disability/developmental delay factor ($M = 0.79$ vs. $M = 0.71$, $p < 0.01$) than children not enrolled in ECE, perhaps because some ECE programs actively screen for such delays, resulting in higher identification rates.

Inferential Analysis

Our regression analysis for the adjusted full model is based on a final NSCAW II sample of children 0–59 months old at Wave 1 who had data available for all of the measures in the model ($N = 1,652$). A comparison of the full sample ($N = 3,504$) and our final analytic sample revealed only a few substantive group differences. There were a slightly higher percentage of white children in the analytic sample compared to the full sample (35.59% vs. 31.45%) and a slightly smaller percentage of Hispanics (26.69% vs. 29.04%). Additionally, the percentage of children in the analytic sample from homes in which English is not the primary language spoken was smaller (13.68% vs. 19.43%), and the analytic sample also included a higher percentage of only children than in the full sample (36.26% vs. 33.31%). Otherwise, there was remarkably little difference between the analytic and full samples with respect to the frequencies and means of the study variables.

The weighted results of the regression analysis, including unstandardized beta coefficients and, for the significant predictors, standardized beta coefficients, are presented in Table 2. The model explains 48% of the variance in children's language development at Wave 2 ($p < 0.01$).

As hypothesized, ECE participation at Wave 1 predicted modestly better language development at Wave 2 ($\beta = 0.09$, $p < 0.01$). Not surprisingly, starting out with a higher language score at Wave 1 ($\beta = 0.45$, $p < 0.01$), being an older child ($\beta = 0.31$, $p < 0.01$), and coming from a non-poor family ($\beta = 0.13$, $p < 0.01$) were also associated with better language development at Wave 2. However, having been reported to the CWS for substance exposure ($\beta = -0.05$, $p < 0.01$) and having more indicators of a learning disability/developmental delay ($\beta = -0.15$, $p < 0.01$) predicted worse language development. Additionally, there was a significant, positive interaction between participation in ECE and supervisory neglect ($\beta = -0.11$, $p < 0.05$), but not between ECE and any of the other types of maltreatment. Fig. 1 depicts this interaction effect annotating the confidence bars for the means of each of the four interaction conditions: No ECE/No Supervisory Neglect ($M = 83.33$) vs.

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Table 2
Multivariate likelihood linear regression results, relationship between participation in early care and education and language development ($N = 1{,}652$).

Variable	*b*	SE	*β*
Any vs. No ECE	3.70*	1.53	0.09
Language development score (Wave 1)	0.46**	0.05	0.45
Type of maltreatment			
Physical Abuse	−1.93	1.71	
Physical Neglect	−0.82	1.66	
Supervisory Neglect	−0.79	1.51	
Substance Exposure	−4.39*	2.09	−0.05
Domestic Violence	−0.61	2.03	
Substance Abusing Parent	1.48	2.29	
Age (months)	0.37**	0.07	0.31
% Male	−1.69	1.56	
Race/ethnicity			
Black	−1.96	2.35	
Hispanic	−3.88	2.01	
Other	−0.49	2.75	
>100% FPL	5.02**	1.61	0.13
Language other than English spoken in home	−1.58	1.86	
Caregiver education			
High school	−0.48	1.84	
Above high school	2.90	1.99	
Learning problem/developmental disability	−2.61**	0.59	−0.15
Number of children in home			
1 child	−3.97	1.89	
4 or more children	1.28	2.25	
Interactions			
Any ECE/No ECE × Physical Abuse	−0.99	0.53	
Any ECE/No ECE × Physical Neglect	−0.09	0.51	
Any ECE/No ECE × Supervisory Neglect	2.02*	0.71	0.11
Any ECE/No ECE × Substance Exposure	−0.86	0.62	
Any ECE/No ECE × Domestic Violence Exposure	−0.21	0.71	
Any ECE/No ECE × Substance Abusing Parent	−0.22	1.09	
R^2	0.48		
F for change in R^2	63.94**		

Note: Weighted; *$p < 0.05$; **$p < 0.01$.

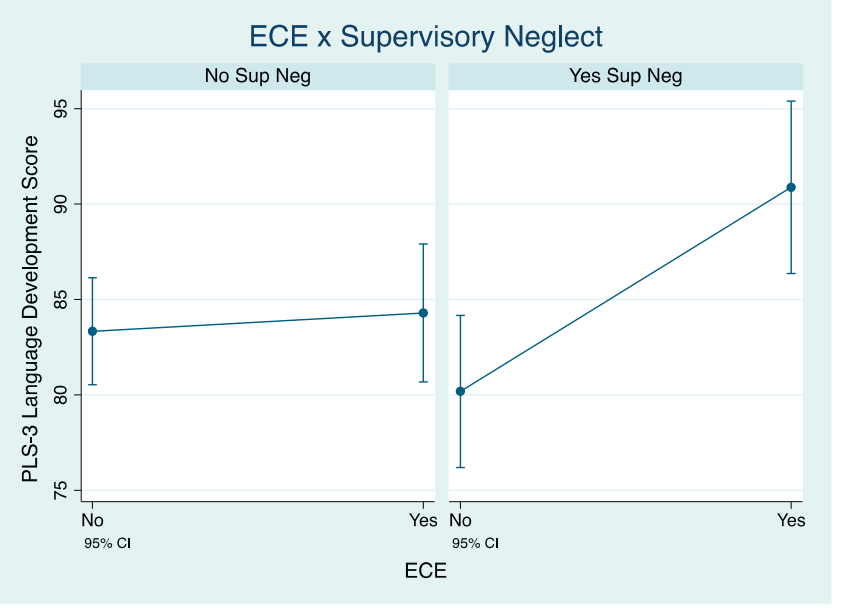

Fig. 1. Interaction between supervisory neglect and early care and education as predictor of language development.

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Yes ECE/No Supervisory Neglect ($M = 84.29$) and No ECE/Yes Supervisory Neglect ($M = 80.18$) vs. Yes ECE/Yes Supervisory Neglect ($M = 90.87$).

Discussion

Consistent with our hypotheses, our regression analysis found that young children in the CWS who were enrolled in ECE programs had better language development outcomes at an 18-month follow-up than children in the CWS who were not participating in ECE, although the size of the observed effect was modest. This finding suggests that early education programs can be protective resources for CWS-involved children, who, as a group, tend to be vulnerable to delays in language as well as in other developmental domains (Allen & Oliver, 1982; Casanueva et al., 2012a; Coster et al., 1989; Eigsti & Cicchetti, 2004; Pears & Fisher, 2005; Spratt et al., 2012; Stacks et al., 2011); however, ECE is hardly a 'cure all' for CWS-involved children when they are considered as a singular group.

Multiple studies document the benefits of high quality ECE programs for children in the general population and children from low-income families (Abbott-Shim et al., 2003; Clements et al., 2004; Dearing et al., 2009; Love et al., 2005; Ludwig & Phillips, 2008; Magnuson & Shager, 2010; NICHD Early Child Care Research Network, 2000; USDHHS, 2010a, 2012), but research on how ECE effects maltreated children has been far more limited. The current study helps fill this knowledge gap, joining a small set of other studies on ECE outcomes for children in non-parental care and/or the CWS that conclude that these programs have a role to play in buffering maltreated and/or placed children against negative developmental outcomes (Dinehart, Manfra, Katz, & Hartman, 2012; Lipscomb, Pratt, Schmitt, Pears, & Kim, 2013; Lipscomb et al., 2014). Further, it builds on findings from the only one of these studies to specifically measure language development, Dinehart and colleagues' (2012) analysis of accredited ECE program effects for CWS-involved children, by establishing that participation in ECE programs, *irrespective of their accreditation status*, predicts better language development outcomes for this population. This is welcome news as it suggests that increasing maltreated children's access to an intervention that is already widely available, ECE, can improve their ability to comprehend and communicate language. There is reason to hope that ECE might also, indirectly, buffer children against other negative developmental outcomes associated with maltreatment. Prior research suggests that early language functioning may operate as an initial 'domino' that, when impaired, sets off a destructive developmental chain reaction triggering delays in other domains (e.g., social-emotional functioning) (Coster & Cicchetti, 1993; Im-Bolter & Cohen, 2007 in Spratt et al., 2012; Stock & Fisher, 2006). Therefore, to the extent that ECE helps buffer maltreated children against early deficits in language, it may also help protect them from other types of developmental impairments that are strongly linked to language delays.

While the main effects of our study are promising, in light of their modest size they should not be overstated. Holding all of the covariates constant, children who were enrolled in ECE only scored an average of four points higher on the PLS-3 (range of possible scores: 50–150) at Wave 2 than children not enrolled in ECE. Although small, this main effect is still notable for a few reasons. First, it was achieved over the course of a fairly brief follow-up period (only 18 months). Second, from a policy perspective, reforms that promote practices linked to even small improvements at the individual level, such as the federal government's recent efforts to increase the numbers of children in the CWS enrolled in Head Start, Early Head Start and other ECE programs (USDHHS, 2010b, 2011), can add up to substantial cumulative change at the population-level. Third, NSCAW II did not collect data on the quality of ECE programs that respondents attended. Had we been able to control for program quality, we might have observed larger ECE effects. Research strongly suggests that higher quality ECE settings produce better developmental outcomes, particularly for poor children (Dearing et al., 2009).

As anticipated, we found a positive interaction between neglect, specifically supervisory neglect, and ECE. Children in the analytic sample who did not receive ECE, both those referred to the CWS for their parents' 'failure to supervise' and those referred for some other type(s) of maltreatment, tended to have PLS-3 outcomes at Wave 2 indicative of a mild language delay ($M = 80.18$ for children referred for supervisory neglect and for children referred for other type/s of maltreatment ($M = 83.33$). However, among the children who participated in ECE, those who experienced supervisory neglect scored higher ($M = 90.87$) on the PLS-3 at Wave 2 than those not enrolled in ECE ($M = 84.29$), placing them within the normal limits for early language functioning. (PLS-3 scores: 86 and above = within normal limits; 78–85 = mild deficit; 71–77 = moderate deficit; 70 and below = severe deficit (Zimmerman et al., 1991).) In contrast, children referred to the CWS for other type(s) of maltreatment tended toward only slightly better language outcomes than their non-ECE counterparts with PLS-3 scores that remained in the mildly delayed range ($M = 84.29$). In other words, ECE made little practical difference on language development outcomes for children referred for other type(s) of maltreatment, but for the third of the study sample referred to CWS for supervisory neglect, it had an incredibly salient positive impact.

Future studies are needed to determine *why* ECE is more beneficial for children who experience supervisory neglect. Research has found that neglected children tend to come from homes with low levels of parent–child verbal interaction, particularly low levels of supportive communication (Christopolous et al., 1988; Eigsti & Cicchetti, 2004). ECE may offer critical compensation for the lack of verbal stimulation available in these children's homes, providing an alternative supportive context where their comprehension and communication competencies can develop. This explanation is consistent with recent findings that frequent, positive verbal interactions with an ECE caregiver/teacher buffered children with language-impoverished home environments against language delays (Vernon-Feagans & Bratsch-Hines, 2013).

While this may explain why neglected children particularly benefit from ECE, it does not, explain our finding that children who experienced other types of maltreatment did not. One possibility for this is that ECE teachers are not adequately

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prepared to meet the unique needs of children who have experienced other types of maltreatment. For instance, ECE caregivers may not, as a rule, be trained in how to promote the development of children who have neurologically-based cognitive impairments associated with prenatal drug exposure. Or, they may be unsure how to care for children who have externalizing behavior problems associated with histories of abuse that can make them challenging to 'manage' in a classroom setting. While our findings generally support recent policy efforts to promote enrollment of CWS-supervised children in ECE programs, they also indicate that additional research is needed to understand how ECE programs and caregivers can be better equipped and empowered to effectively meet the needs of physically abused, physically neglected, and substance exposed children, as well as those who witness domestic violence and whose parents abuse substances. Not only must maltreated children – *all* maltreated children – be made 'ready for school', but (pre)schools (i.e. ECE programs) must be made ready for them. Until then, caregivers and caseworkers of maltreated children should carefully assess the quality of the ECE programs in which they enroll their charges and plan on working closely with ECE providers to help them understand and appropriately address children's trauma-related behaviors and needs.

Limitations

The findings discussed above should be interpreted with certain methodological limitations in mind. First, our study design was observational, not experimental. While the richness of the NSCAW II dataset allowed us to control for multiple child and caregiver/family-level covariates in our model, it is possible that we still failed to account for some pre-existing difference(s) between the ECE and no-ECE groups that may provide an alternative explanation for their different language outcomes. As with any observational study, it remains possible that omitted variable error has biased our results, and so future experimental research is recommended to corroborate our findings.

Second, the generalizability of our findings is compromised by the large percentage (53%) of the original sample excluded because of missing data. However, a comparison of the full sample of NSCAW II children 0–59 months old a Wave 1 ($N = 3{,}504$) and our final analytic sample ($N = 1{,}652$) found very few meaningful differences between the groups. Exceptions include small differences with respect to race/ethnicity, primary language spoken at home and the number of children in the home.

Another important limitation of the current study is that the ECE measure is somewhat blunted in that it does not reflect how long children participated in ECE or at what level of intensity (dosage), nor does it differentiate between the types and/or quality of ECE programs in which children participated. Our ECE measure was derived from caregivers' responses to a question asked during the initial Wave 1 interview about whether their child was "currently in any type of day care program?" Data was not available regarding children's ECE participation in-between data collection waves, and so there is no way to know which children in our ECE group did or did not remain in ECE during the 18 month interval between waves. With respect to the possibility that different types of ECE programs may have differential effects on maltreated children's language development, particularly in so much as program type is a proxy for program quality, our analysis is limited by the data NSCAW II collected and sub-sample sizes. The NSCAW II interview protocol includes a follow-up question designed to identify children who were specifically enrolled in Head Start/Early Head Start vs. other ECE programs. However, the number of children in these specific ECE programs was too small to support reliable sub-group analyses by ECE and maltreatment type. It is possible that, had we been able to control for ECE program quality or dosage, we might have detected more meaningful (larger) effects.

Conclusions

Notwithstanding these study limitations, this research is important for our understanding as researchers and practitioners regarding the benefits of ECE enrollment for maltreated children. Children who experience early abuse and neglect are subject to a host of developmental insults that often manifest in language delays and subsequent impairment in social and academic functioning. Our findings contribute to a growing body of research that collectively suggests that ECE may help mitigate some of these negative outcomes and promote positive child development and school readiness for this vulnerable population (Dinehart et al., 2012; Lipscomb et al., 2013, 2014), especially for young children reported to the CWS for supervisory neglect.

Our research also provides important context for understanding the implications of the current under-utilization of ECE by children in the CWS. While approximately 65% of low-income 3–6 year olds in the general population who are not yet enrolled in Kindergarten are participating in center-based ECE (ChildStats, 2011), this is true of only 41% of 3–5 year olds in the CWS (Casanueva, Stambaugh, Tuellar, Dolan, & Smith, 2012b). Foster children are categorically eligible for Early Head Start and Head Start services, yet it is estimated that only nine percent of age-eligible foster children are actually attending these programs. Our research findings underscore the value in recent policy efforts to correct this service gap through information memoranda (USDHHS, 2010b, 2011) and discretionary grants promoting ECE-child welfare collaborations as a means of leveraging potential ECE program benefits for the child welfare population. However, our findings also suggest that these efforts are not sufficient. Further work is needed to learn how to prepare the ECE sector to more effectively meet the developmental needs of the entire child welfare population, not just those children who experience supervisory neglect.

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