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Patterns and Predictors of Early Care and Education for Children in Foster Care

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Children's early care and education (ECE) experiences play a significant role in their development, affecting such domains as self-regulation, academic achievement, and psychosocial functioning (Belsky et al., 2007; Magnuson & Waldfogel, 2005; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 2005). Although effects of ECE have been documented through adolescence and beyond (Campbell et al., 2008; Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010) they appear to vary according to characteristics of the ECE, children, and their families (Peisner-Feinberg et al., 2001; Pluess & Belsky, 2009; Vandell et al., 2010). Current research is moving toward examining which types of ECE experiences are most effective in improving outcomes for given groups of children. Although not always consistent, evidence indicates that ECE may be a more powerful predictor of developmental outcomes for children from at-risk families (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Peisner-Feinberg et al., 2001; Vandell et al., 2010). Such work is limited, in part, because it typically focuses only on socioeconomic risks (versus risks due to maltreatment, poor health, or developmental disabilities, for example) and often fails to include sufficient numbers of high-risk children in the study samples to adequately detect differential effects. Additionally, most of the existing knowledge regarding ECE for high-risk children comes from evaluations of specific programs, such as public pre-kindergarten (e.g. Burchinal et al., 2008), and early interventions that include wrap-around services (e.g., Barnett, Young, & Schweinhart, 1998; Campbell et al., 2008). Such studies do not provide information about the potential diversity of high-risk children's everyday ECE experiences. The current study takes an important step toward advancing our understanding of ECE for very high-risk children by studying children in foster care, a population that has typically been excluded from previous research in this area.

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1.1 Early Care and Education

Although research on the ECE experiences of high-risk children is fairly limited, there is a substantial body of research on the ECE experiences of children in the general population which has helped to delineate the ways in which diverse ECE experiences may have varied effects on children's development. For example, recent findings (NICHD ECCRN, 2005; Vandell et al., 2010) show that the magnitude and the direction of effects on children's development might depend on the type (center vs. non center-based), quantity, and quality of care that children receive. Center-based programs are often associated with both higher cognitive and academic skills and more problem behaviors. However, there appears to be an important distinction between quality and quantity of care: higher *quality* care predicts better cognitive, academic, and psychosocial outcomes, while higher *quantities* of care have been linked to increased problem behavior (e.g., NICHD ECCRN, 2005; Vandell et al., 2010). This distinction is also apparent in research on the ECE experiences of children in poverty. Evaluations of Head Start programs and other intensive preschool-based interventions for these children show that quality of care varies substantially across programs, as do effects on children's outcomes. Programs with the highest quality of care appear to have the most positive effects (Barnett, 1995; Burchinal et al., 2008; Gilliam & Zigler, 2000; U.S. Department of Health and Human Services, 2010).

Overall, extant research indicates that, in the general population, children's ECE experiences are extremely diverse and this diversity affects whether and to what extent the experiences will be beneficial for the children. The associations between characteristics of ECE and child outcomes may be even more complex for children from high-risk backgrounds who have specific vulnerabilities and needs, including children in foster care.

1.2 Children in Foster Care

Over 500,000 children in the U.S. live in foster care (U.S. Department of Health and Human Services, 2008). Children in foster care often face an extensive array of adverse circumstances that span socioeconomic, biological, and familial factors, such as poverty (Needell & Barth, 1998), prenatal exposure to toxins (Astley, Stachowiak, Clarren, & Clausen, 2002), abuse and neglect (Chernoff, Combs-Orm, Risley-Curtiss, & Heisler, 1994), and unstable environments (Rubin, O'Reilly, Hafner, Luan, & Localio, 2007). As a consequence of such early adversity, children in foster care may exhibit a range of neurobiological, cognitive, academic, and psychosocial difficulties (e.g., McMillen et al., 2005; Pears & Fisher, 2005; Pears, Kim, & Fisher, 2008; Pears, Heywood, Kim, & Fisher, 2011; Ringeisen, Casanueva, Urato, & Cross, 2008). Not surprisingly, in turn, these children show elevated rates of referral to a variety of educational and mental health services (Research Triangle Institute [RTI], 2008; Stahmer et al., 2005).

Researchers have partnered with child welfare offices to develop and investigate the impacts of preventive interventions for children in foster care and their foster parents (e.g., Fisher, Burraston, & Pears, 2005; Leve, Fisher, & Chamberlain, 2009; Pears, Fisher, & Bronz, 2007; Zeanah et al., 2001). Yet enormous unmet needs for services remain. For example, findings from the National Survey of Child and Adolescent Well-Being (NSCAW, n.d.) showed that 65% of five and six year olds involved in the child welfare system who exhibited behavioral problems did not receive a single mental health service and 63% of those children identified as needing a referral for special education services did not have an active Individual Education Plan (RTI, 2008). In a chronically under-funded system, older children and adolescents disproportionately consume more services than young children (Leslie et al., 2000; Stahmer et al., 2005).

With so many young vulnerable children in foster care not receiving clinical intervention services, ECE may be a critical context for development and preventive intervention. To that end, federal policy designates children in foster care as categorically eligible for Head Start and Early Head Start regardless of income. Additionally, recent memorandums of information and funding announcements at the federal level are encouraging collaborations between state child welfare and early childhood systems, including both Head Start and other child care providers (a, b, cU.S. Department of Health and Human Services, 2011a, b, c). Descriptive data from the National Survey on Child and Adolescent Well-being indicate that between 55 and 59% of 3–5-year-old children involved in the child welfare system are enrolled in some form of center-based child care or preschool program, including Head Start (Ward et al., 2009). To our knowledge, however, there are no published studies on the ECE experiences of children in foster care. Policy makers and practitioners alike are therefore left to make decisions about services for these vulnerable young children without an empirical knowledge base.

An examination of ECE for children in foster care would serve several important functions. Information about the characteristics of ECE that children in foster care experience would provide important foundational knowledge about how ECE might function as a developmental context for these vulnerable young children. Such knowledge would not only be important in guiding future inquiries into the impact of ECE on the development of children in foster care but could also inform policies related to referrals. Ultimately this work could advance the development of interventions within ECE programs to enhance the potential benefits for children in foster care and other high-risk situations. Moreover, examination of ECE for these children who have experienced substantial adversity could shed light on the discussion in the larger ECE field about potential differential effects of ECE on development for high-risk children, and the factors that may increase children's response to ECE. First, however, we must understand much more about how foster families use early care and education.

1.3 Associations with Child and Foster Family Characteristics

Identifying characteristics that distinguish between children with different kinds of ECE experiences may also be critical to understanding the impacts of ECE on the development of children in foster care. Child ethnicity and type of foster care (kinship vs. non-kinship) appear to predict service receipt in general for children in foster care (Burns et al., 2004; Ringelsen, Casanueva, Cross, & Urato, 2009). Kinship care, in which the foster parent is a relative of the child, is becoming increasingly common (Ehrle & Geen, 2002). Children placed with kinship foster parents, compared to those placed with non-kinship foster parents, appear to experience some advantages, including fewer child welfare system placements (Testa, Bruhn, & Helton, 2010), improvement in behavioral symptoms (Rubin et al., 2008), and more positive parenting (NSCAW, n.d.).

Kinship care also may be a particularly important determinant of ECE use as kinship foster parents differ from non-kinship foster parents in ways that may have implications for the ECE usage of children in their care. Kinship foster parents are substantially less likely to be married than non-kinship foster parents; 48% of kinship and 76% of non-kinship foster parents are married (NSCAW, n.d.). Although kinship foster parents tend to be older than non-kinship foster parents (61% are grandmothers), the overwhelming majority are not yet of retirement age (NSCAW, n.d.); they are more likely to be employed outside the home than are non-kinship foster parents (Berrick, Barth, & Needell, 1994). Thus, kinship foster parents are likely to need more hours and days of child care.

The current study will examine kinship care as well as demographic characteristics of children's foster families as potential predictors of children's ECE. There are no prior

studies of predictors of ECE for children in foster care to guide the current study. However, findings from studies of the general population have shown that higher household income, parental employment, and parent education are associated with more center-based ECE (Huston, Chang, & Gennetian, 2002; Kim & Fram, 2009; NICHD ECCRN, 2005) and also with quality of ECE (NICHD ECCRN, 2005). The number of children and adults living in the home has also been linked with characteristics of children's ECE (Huston et al., 2002; Kim & Fram, 2009; NICHD ECCRN, 2005).

In addition to foster family characteristics, the current study examines associations between ECE and characteristics of children's foster care histories. More instability in child welfare placements has been associated with elevated rates of mental, emotional, and behavioral difficulties (e.g., Leslie et al., 2000; Lewis, Dozier, Ackerman, & Sepulveda-Kozakowski, 2007; Webster, Barth, & Needell, 2000) and may also interfere with children's abilities to receive consistent ECE services. Age of entry into care is another potentially important factor, in light of evidence that children removed from maltreating environments at earlier ages demonstrate greater developmental gains than those removed later (Elmer, 1986; Judge, 2003; Rutter & the English and Romanian Adoptees Study Team, 1998) and thus might show greater gains with earlier placement into ECE contexts. Overall, understanding associations among foster family and child characteristics and children's ECE experiences may aid in helping caseworkers and other service providers to refine ECE referrals for young children in foster care, particularly for working foster families, as well as aid in tailoring early interventions within ECE settings to the children and foster families who are most likely to attend given types of ECE.

1.4 Present Study

The present study takes a crucial first step to understanding the context of ECE for children in foster care by documenting patterns and predictors of ECE prior to Kindergarten entry. Given that children experience quality, quantity, type, and duration of ECE as interrelated elements rather than as isolated variables, this study supplements the traditional variable-centered approach to data analysis with a person-centered approach that examines *patterns* of children's ECE experiences (Bergman & Magnusson, 1997; Magnusson, 2003). Most commonly, researchers utilize variable-centered techniques, which operate at the group level to explain average experiences or development. In contrast, person-centered approaches retain information at the individual level and thus, describe individual differences in overall *patterns across variables* rather than simply quantifying the amount of individual variation within variables (see Bergman & Magnusson, 1997; Magnusson, 2003). Recent work suggests that these person-centered approaches may be particularly important, since average associations can actually fail to describe the experience of even one individual (Magnusson, 2003). With respect to the current study, we will use a variable centered approach to examine associations among aspects of ECE experiences for children in foster care (quality, quantity, type, and duration) and a person-centered approach to better understand how these features of ECE come together to collectively describe the children's ECE experiences.

Although there is very little prior evidence to guide specific hypotheses, we generally expect that (1) characteristics of foster families that serve as markers for higher need for, and ability to afford ECE (i.e., more professional occupations, higher incomes, and fewer adults living in the household) will be associated with higher quantities of ECE. Given the diverse nature of families and ECE arrangements, we further expect that (2) children in foster care will exhibit different patterns of early care and education experiences (based on quality, quantity, type, and duration), and that (3) these patterns of ECE will be related to children's foster care histories and characteristics of the foster families with whom they live.

Method

2.1 Participants

The participants in this study were 192 children (98 females) in foster care. To be eligible for the study, each child had to be in either non-kinship or kinship foster care at recruitment, entering kindergarten in the fall, and a monolingual or bilingual English speaker. The children and their foster families were recruited from two counties in the Pacific Northwest of the United States, each with a mid-sized metropolitan area. Staff members first contacted each child's caseworker to request consent for the child to participate and then contacted the foster parent(s) to invite them to participate. Both the caseworker and foster parent(s) had to consent to participate. The mean age of the children was 5.25 years ($SD = 0.34$). Sixty-two percent of the children were in non-kinship foster care. The children had experienced an average of 3 unique foster placements ($SD = 1.7$) and an average of 492 days in care ($SD = 385$). They entered foster care at an average age of 3.38 years ($SD = 1.48$). The ethnicity breakdown of the sample was as follows: 53% European American, 31% Latino, 13% mixed race, and 3% other.

2.2 Procedure

The children in this study were part of an efficacy trial of a school readiness intervention for children in foster care that took place during the summer before and the fall of Kindergarten. All data for the current study were collected at the baseline assessment prior to the start of the intervention. Children's foster parents completed structured interviews about demographic information, and services and resources they and/or their children accessed, including early care and education. Data regarding children's foster care histories were abstracted from child welfare case files. (Additionally, foster parents completed questionnaires about the children's behaviors and children completed a battery of standardized laboratory tasks that were not utilized in this study.) All study procedures were approved by the institutional review boards of the research institution conducting the study and the state's Department of Human Services.

2.3 Measures

2.3.1 Early care and education—Foster parents answered a series of questions about the target child's ECE, adapted from The National Center for Education Statistics (NCES) National Education Survey (NCES, 1993). They reported whether children were *currently* attending Head Start, and whether children were *currently* attending an "other nursery school, prekindergarten, preschool, or day care center" (hereafter labeled as "*other ECE*"). Additionally, foster parents were asked whether children had *ever* attended Head Start or other ECE. For children currently attending one or more ECE programs, including Head Start, foster parents reported the frequency (hours per week and number of days per week), and the quality (group size and ratio of children-to-adults) of those settings in an open-ended format. Foster parents also reported the duration of attendance, using a five-point scale 1 (*less than one school year*), 2 (*one school year*), 3 (*more than one but less than two school years*), 4 (*two school years*), 5 (*more than two school years*).

2.3.2 Foster family characteristics—The primary foster parent in each household reported household income, with 13 response options from 1 (*less than \$4,999*) to 13 (*\$100,000+*), the number of children in the household, and the number of adults in the household. They also reported their own levels of education, with 14 response options from 1 (*below 6th grade*) to 14 (*graduate degree*). The primary foster parent answered an open-ended question about employment: "What is your occupation?" Responses were summarized into seven categories: 1 (*menial skilled or unemployed*), 2 (*unskilled*), 3 (*semiskilled*), 4 (*skilled*), 5 (*clerical/sales*), 6 (*technician/semiprofessional*), 7 (*manager/*

minor professional). Foster parents were also asked, “Is your family currently receiving any of the following types of assistance?”, with a list of 20 services including items such as food stamps, disability, medical assistance, WIC, housing and utility assistance, loans or gifts from family and friends, and soup kitchens. Each positive response was scored “1” and these were summed to create a measure of “service use”. Finally, foster parents reported their relationship to the child. This information was used to verify the designation in child welfare records of the child’s placement as either a “kinship” (i.e., care of a biological relative) or a “non-kinship” placement. This designation was then used in the current study.

2.3.3 Foster Care History—Up-to-date placement records, including date of first entry into the child welfare system and entry/exit dates from all foster placements thereafter, were obtained for each child and were used to calculate the child’s age at first entry into the child welfare system, number of unique foster parents that the child had had, and the total number of days that the child had spent in both kinship and non-kinship foster care prior to the start of the study.

2.4 Data Analysis

2.4.1 Variable-centered—Bivariate correlations were employed to test Hypothesis 1, regarding associations among children’s ECE experiences, and characteristics of foster families and child welfare history. Associations among categorical data were examined with non parametric correlations (Kendall’s tau-b).

2.4.2 Person-centered—Examination of Hypotheses 2 and 3 regarding patterns of early care and education experiences (based on quality, quantity, type, and duration) and their associations with child and foster family characteristics, was conducted through latent class analysis. These analyses employed the sample of children who were currently enrolled in ECE at the time of the study ($n = 103$) because associations among ECE variables and family characteristics, which can change frequently for children in foster care, are most meaningful concurrently. Latent class analysis was conducted within a general latent variable framework, allowing investigation of exogenous predictors of children’s probability of membership in each latent class (Muthén, 2002). This latent class model has advantages over other approaches because children’s class membership remains probabilistic rather than deterministic, which improves precision when estimating effects of exogenous predictors (Roeder, Lynch, & Nagin, 1999).

To identify the optimal number of latent classes, several models with varying numbers of classes were compared with one another. To date, there is no single index of model fit that can be used to clearly determine the most appropriate number of classes; current practice suggests the use of several model fit indices simultaneously. The Bayesian Information Criteria (BIC), which simultaneously accounts for model fit, sample size, and the number of parameters estimated in the model, has been shown to perform reasonably well in determining the correct number of patterns in simulation analyses (Nylund, Asparouhov, & Muthén, 2007). When comparing several models with varying numbers of classes or patterns, the model with the lowest BIC value is considered to be the most optimal fit. The Likelihood Ratio Test (LRT) is often used to compare alternative models, but cannot be used to compare nested models with varying numbers of latent classes (McLachlan & Peel, 2000). There are two alternatives to the LRT that *can* be used to compare nested latent class models: the Lo-Mendell-Rubin LRT (LMR-LRT) and the bootstrap LRT (BLRT). Both the LMR-LRT and BLRT provide p values to compare k class models to $k-1$ class models (e.g. Nylund et al., 2007).

Entropy was also considered in comparisons of models with varying numbers of classes. Entropy is a function of posterior class probabilities and helps to determine the extent of separation or distinction between classes. Entropy values range between zero and one, with higher values indicating better separation between classes. Slight variations in entropy between models are typical; more dramatic shifts may be an indication of model misspecification or an unreasonable number of classes. In addition to examining these empirical markers, we also considered the practical and theoretical implications of models with varying numbers of classes.

Finally, characteristics of children's foster care history and current foster family demographics were examined as exogenous predictors of children's probability of membership in latent classes, utilizing full-information maximum likelihood (FIML) with Mplus Version 6.0 (Muthén & Muthén, 1998–2010). Predictors were considered to be significant when the parameter for the hypothesized relationship had a significant *t*-value (ratio of the parameter estimate to the standard error of the estimate), with *p* values less than .05. The likelihood ratio test statistic (LRT) was used to examine whether observed differences in quality (group size and ratio) across the three classes were statistically significant. Current practice suggests that the LRT, calculated as the difference between the deviance statistics of alternative models (which is equivalent to twice the difference in the log likelihood values for the nested models), is the preferred indicator of relative model fit when comparing nested models where the variables are the same but constraints are applied to some parameters (Singer & Willett, 2003).

Results

3.1 Descriptive Results

Results show high rates of participation in center-based ECE prior to Kindergarten. Eighty-eight percent ($n = 169$) of the 192 children in foster care had attended either Head Start ($n = 77$; 40% of total), another center-based ECE program ($n = 37$; 19% of total), or both ($n = 55$; 29% of total) by the end of the pre-Kindergarten year. Children had attended their current ECE program for an average of one school year, with a range from less than one year to more than two years. Of the programs where children currently spent the most time each week, they attended for an average of 4.41 hours per day ($SD = 2.14$) and 3.88 days per week ($SD = 0.95$). The average group size in those programs was 14.45 children ($SD = 4.92$), with an average ratio of 5.60 children per adult ($SD = 2.59$).

3.2 Variable-Centered Results

Table 1 provides zero-order correlations among study variables. There were significant positive associations between currently attending a non-Head Start child care center and total days of kinship foster care, current residence with kinship foster parents, and foster family household incomes. Children who were currently attending Head Start had entered their first child welfare placement at younger ages. There were also positive associations between Head Start attendance and total days of kinship foster care and group sizes in current ECE programs. There was a significant positive association between foster parent occupation and number of days per week spent in ECE for more days per week.

Longer duration of attendance in non-Head Start child care centers was positively associated with more hours of care per day ($r = .25, p < .01$), which in turn was positively associated with more days per week of care ($r = .43, p < .01$). This is suggestive of a possible pattern, further examined in the latent class analysis below, in which some children attend elevated quantities of ECE in terms of duration, hours per day, and days per week.

3.3 Person-Centered Results: Patterns of Early Care and Education

Results from latent class analysis of child care variables (type, duration, quantity, and quality) for the 103 children who were currently attending ECE at the time of the study suggested that there were three distinct typologies of children in foster care's ECE experiences. As shown in Table 2, the BIC decreases from the one-class model to the two- and then the three-class model and then increases again for the four-class model; this pattern supports a three-class model. The LMR-LRT and the BLRT also both support a three-class model. Entropy is good for the three-class model, indicating clear distinction between classes, but is marginal for the four-class model. The proportion of children in the smallest latent class (17%) is reasonable for the three-class model.

The largest class, labeled "Part-Time Head Start", represents approximately 57% of the sample ($n = 61$). The vast majority (85%) of children who had high probabilities of belonging to this class only attended Head Start; the remaining 15% attended both Head Start and non-Head Start center-based ECE, with an average duration of slightly less than one school year (Table 3). They attended their primary ECE program for an average of four hours per day, four days per week. Foster parents reported slightly larger group sizes and average children-adult ratios in these children's programs (Table 3). Results from the LRT indicated that observed differences in quality across the three groups were statistically significant. Constraining group size ($\chi^2(2) = 27.74, p < .01$) and children-adult ratio ($\chi^2(2) = 19.15, p < .01$) to be equal across the three classes significantly reduced the fit of the model to the data.

The second largest class, labeled "Part-Time Other ECE" represents an estimated 26% of the sample ($n = 27$). Children who were most likely to belong to this class almost all attended non-Head Start ECE, for an average duration of approximately one school year (Table 3). They attended their current ECE program for an average of three hours per day for three days per week. Children in this group seemed to experience the most optimal quality of care, with smaller group sizes and better children-adult ratios in their programs than the programs of children in the other two latent classes.

The third and final latent class represented approximately 17% of the sample ($n = 18$). This class is labeled "Full Time Mixed ECE" because children in this group attended both Head Start (39%) and non-Head Start ECE (72%). Children attended their primary ECE program for an average of nearly nine hours per day for five days per week (Table 3). Children in this group also experienced the longest durations of ECE with average durations exceeding one school year for both Head Start and other ECE, as well as a relatively large average group size and the least optimal children-adult ratio in their programs.

3.4 Child and Foster Family Predictors of ECE Patterns

Children who were most likely to belong to the Part-Time Head Start group entered foster care at younger ages than those in the other two typologies but experienced fewer transitions (Table 4). They were significantly more likely to be in non-kinship foster care (compared to kinship foster care) and to have foster parents with lower levels of education than those in other two classes, as well as lower household income than children in the Full-Time Mixed ECE group.

As shown in Table 4, children likely to be in the Part-Time Other ECE and Full-Time Mixed ECE were similar to one another, with the exception that there were fewer adults living in the homes (i.e., more likely to be single parent) of children from the Full-Time Mixed ECE group. Children in both of these groups were more likely to be in kinship care, and had experienced more transitions in foster care than children in the Part-Time Head Start group.

Discussion

The present study provides the first systematic examination of the center-based ECE experiences of young children in foster care. High rates of ECE attendance, including both Head Start and other center-based ECE prior to Kindergarten entry were found in the current sample. Such ECE attendance may be important given that children in foster care tend to have fewer educational experiences at home than other children (e.g. NSCAW, n.d.). However, the ECE experiences of children in foster care appear to be diverse and there may be distinct patterns of ECE associated with children's foster care histories and characteristics of their foster families.

4.1 ECE Arrangements of Children in Foster Care

Results suggest that children in foster care may be at least as likely to attend center-based ECE as pre-Kindergarten-aged children in the general population. The Early Childhood Longitudinal Survey - Kindergarten Cohort (ECLS-K) found that 68% of the children attended center-based ECE prior to Kindergarten entry (Rosenthal, Rathbun, & West, 2005). Using the survey questions that were employed in the ECLS-K, the present study documented 88% attendance in this sample of children in foster care in the Pacific Northwest. Thus, findings appear to reveal a higher rate of ECE for children in foster care compared to the general population, although the current sample was not nationally representative. It was not possible to estimate the total number of hours of attendance of ECE for the children in this study because hours of attendance were only reported for children's primary ECE arrangement. On average, children in foster care attended their primary ECE program part-time (approximately 16 hours per week), though there was substantial variability in ECE attendance.

Foster parent-reports of the quality of the children's ECE programs indicated that the vast majority of ECE arrangements (90%) had better ratios of children-to-adults than required by the state minimum licensing standard and federal Head Start performance standards (i.e., ratio of 10-1). Similarly, 82% of ECE groups in the current study were smaller than required by the state licensing standard and federal Head Start performance standards (i.e., maximum 20 children). These findings suggest that children in foster care *may* be attending quality ECE programs; however, several cautions are warranted. First, accuracy of foster parent reports of group sizes and ratios may be limited as they may not spend much time at the children's ECE centers. Second, standards for state licensing and Head Start performance criteria are *minimum* standards for care and do not indicate quality. More comprehensive, third-party measures of the quality of ECE for children in foster care, including observations of adult-child interaction, are necessary to provide a more accurate reflection of quality, and to assess the impact of ECE quality on the development of children in foster care. Replication of the current findings with larger and more geographically diverse samples is also warranted.

4.2 Associations with Child and Foster Family Characteristics

Children's foster care histories and their foster families' characteristics were linked more closely with children's likelihood of attending ECE than they were with specific characteristics of ECE arrangements. Attendance in Head Start was associated with children being younger at the time of first foster care placement; average age of entry into foster care was 3.30 years. Thus, it appears that children may be more often referred to Head Start if they enter foster care when they are near the younger window of age-eligibility (around 3 years) rather than when they are closer to Kindergarten age. Attendance in other center-based ECE was associated with higher household income, kinship care, and more days in kinship care. Further research is needed to understand the reasons behind these associations,

considering elevated rates of school readiness difficulties among children in foster care (Pears et al., 2011) and the potential for Head Start to help close readiness gaps for subgroups of children with elevated risk factors (U.S. Department of Health and Human Services, 2010). Whether these families were unaware that children were eligible for Head Start, did not have access to a local Head Start program, needed more hours of child care than is provided by Head Start, and/or chose not to enroll in Head Start is an important question for future research.

4.3 Person-Centered Patterns of ECE

Findings further indicated that to better understand the role of ECE in the lives of young children in foster care it is useful to examine how multiple characteristics of ECE (type, duration, quantity, and quality) naturally coincide to comprise children's overall experiences in ECE. Findings from the current study revealed three naturally occurring patterns of ECE for pre-Kindergarten children in foster care. Characteristics of children's foster care histories and foster families were more useful in predicting these overall patterns of ECE than they were in predicting specific ECE characteristics. These analyses were only possible for children currently attending ECE. Although these patterns only describe the children's *primary* ECE program (the one they attend for the most amount of time), the vast majority of children (90%) attended only one program.

Approximately 57% of the children who were attending ECE at the time of the study fell into a group best described as "Part- Time Head Start". These children attended Head Start for an average of four hours per day, four days per week, had attended for slightly less than one school year, and had slightly larger group sizes in ECE than the two other patterns. These children appear to be more "at-risk" in terms of foster family demographics than other children who were currently attending ECE, as indicated by lower household income and lower foster parent education. However, Head Start is designed as a preventive intervention for families in this demographic, and is associated with some gains in school readiness, especially among children who share some risks with children in foster care such as special needs and lower cognitive skills (U.S. Department of Health and Human Services, 2010). On the other hand, the efficacy of Head Start in reducing the negative ramifications of early adversity, and often continued disadvantage, for children in foster care remains unknown. Children in this Part-Time Head Start group had also experienced fewer foster care transitions than had children in the other two ECE groups, which may serve as a protective mechanism; instability in child welfare placements has been associated with elevated rates of mental, emotional, and behavioral difficulties (e.g., Leslie et al., 2000; Lewis et al., 2007; Webster et al., 2000).

The smallest group (17%; Full-Time Mixed Care), may be most concerning because children in this group experienced the highest quantities of ECE (i.e., longer hours of care and more days per week), and the lowest quality ECE (i.e., large parent-reported group sizes and ratios). These children are also more likely to live in single parent households; this was the only child or foster family characteristic that distinguished children with this ECE pattern from those in the Part-Time Other ECE group. They also had experienced more foster care transitions and total days in foster care than children in the Part-Time Head Start group. The combination of long hours of ECE, frequent transitions between foster placements, and single parent households might represent compounded risks for this group of children. Long hours of ECE are linked with a pattern of rising cortisol production across the day (Dettling, Gunnar, & Donzella, 1999; Watamura, Seabanc, & Gunnar, 2002), which in turn is associated with internalizing and externalizing behavioral problems (Gunnar, Kryzer, Van Ryzin, & Phillips, 2010). Moreover, instability in foster care placements appears to adversely impact the development of self-regulation (Fisher, Gunnar, Dozier, Bruce, & Pears, 2006; Lewis et al., 2007). This pattern may be particularly concerning for

children in foster care, who already tend to exhibit altered patterns of cortisol production during the day (Dozier et al., 2006) and more difficulties with self-regulation (McMillen et al., 2005; Pears & Fisher, 2005; Pears et al., 2008; for a review see Oswald, Heil, & Goldbeck, 2010). Finally, children in the Full-Time Mixed Care group have less optimal levels of quality, which has been identified as a critical modulator of the impact of ECE on children's development (e.g., NICHD ECCRN, 2005; Vandell et al., 2010), including children's cortisol production (Groeneveld, Vermeer, van IJzendoorn, & Linting, 2010; Watamura, Kryzer, & Robertson, 2009).

The remaining 26% of children in the current sample belonged to the "Part-Time Other ECE" group. These children attended ECE less than part-time; additionally, they experienced smaller group sizes and children-adult ratios. This may indicate that these children were attending more formal "preschool" programs, instead of full-time child care centers. The children in this group were also more likely to have a second adult living in the home than children in the Full-Time Mixed Care group, and were more likely to be in kinship care and to have foster parents with more education than children in the Part-Time Head Start group.

4.4 Conclusions

Taken together, findings from the present study demonstrate that ECE is a regular part of the daily lives of many children in foster care. However, within this subpopulation, the children's ECE experiences vary substantially. In light of research evidence showing that characteristics of the care children receive are critical to understanding the effects of ECE on developmental outcomes, it is crucial for research to document the characteristics of ECE for this highly vulnerable group of children. The current study provides an important first step by documenting patterns of foster parent-rated quality, quantity, and duration of the center-based ECE experiences of children in foster care.

A few limitations of the present study should be noted. The current study employed a relatively small sample of children in foster care in two counties in the Pacific Northwest; future research should focus on the generalizability of these results to children living with foster families in other areas. Additionally, children in the current study were at the end of the preschool years when the information presented here was collected. Subsequent studies should begin at earlier ages, considering prior research on the importance of children's total cumulative time in ECE on their development (NICHD ECCRN, 2005), and the methodological challenges inherent in asking foster parents retrospective questions about children's lives.

Another limitation of this study involved measures of ECE, which were restricted to center-based programs. Findings from studies of the general population indicate the importance of assessing other types of ECE. This will be especially important if future work in this area were to include infants and toddlers (NICHD ECCRN, 2005). The accuracy of foster parent-reports of group sizes and ratios is potentially limited. Such reports should ideally be corroborated by objective measures of quality, including quality of caregiver-child interactions, in future research. In addition, foster parent responses regarding whether children in foster care *ever* attended Head Start or other center-based ECE programs may be limited because foster parents may have little information about the prior experiences of the children in their care. Thus, analyses employed measures of children's *current* ECE experiences.

It will also be important for future research to continue to examine the associations among children's foster care histories, foster family characteristics, and ECE. For example, considering that all children in foster care are eligible for Head Start, more research is

needed to understand why a substantial proportion of the children may not attend any Head Start programs, as was the case in this study. Prior research on parent decision-making related to ECE highlights a variety of factors, including logistical issues (e.g, schedule, cost, and location) and priorities for children's experiences that may influence the characteristics of ECE for children in the general population (Kim & Fram, 2009). Additional factors may influence whether children in foster care are placed in Head Start and/or other ECE, including access to referrals and information about ECE options. Information on how children in foster care gain access to ECE and what influences the characteristics of ECE they attend may have important implications for policy and practice related to ECE referrals for young children in foster care.

In sum, the present study provides an important first step in understanding ECE for children in foster care upon which further research on ECE for children in foster care, including that on factors influencing ECE placements, and the impact of ECE on the development of children in foster care may build. Given the variety of children's ECE experiences and the complexity of their daily lives, impacts of ECE on the development of children in foster care are not likely to be straightforward. For some, their ECE programs may serve an important therapeutic and education function. For others, they may exacerbate existing challenges. Thus, it will be critical for future research on ECE for children in foster care to examine how various facets of ECE interact with other contextual factors in the lives of the children. As this work continues to progress it has the potential to open new opportunities to advance our understanding of ECE for high risk children, and also to generate important policy-relevant knowledge for the fields of child welfare and early care and education.

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Highlights

- Children in foster care attended ECE prior to Kindergarten at high rates, including Head Start, other center-based ECE, or both.
- Children who attended Head Start were younger when first placed in foster care. Children who attended other center-based ECE services were more likely to live with kinship foster parents and families with higher incomes.
- Latent class analysis of ECE quantity, quality, type, and duration revealed three patterns: part-time Head Start, part-time other ECE, and full-time mixed ECE.
- Child and foster family characteristics predicted these patterns, illustrating distinct groups with potential implications for the development of children in foster care.

Table 1

Zero-Order Correlations Among ECE and Child and Family Characteristics

Child/Family Characteristics	ECE Variables							
	Current HS ^a	Current OECE ^a	Duration HS	Duration OECE	Days/wk ECE	Hrs/day ECE	Group Size	Ratio
N days of kinship foster care	.16*	.13*	-.12	.13	.07	.13	-.02	.05
N days non-kinship foster care	.09	-.06	.35*	.03	-.10	-.12	.02	-.03
Age at first foster placement	-.20*	-.08	-.16	-.13	.08	.01	.04	.01
Child is caucasian ^a	-.01	-.11	-.02	.14	.06	-.06	.09	.03
Number of foster care transitions	.01	.01	.03	.02	-.10	-.06	-.03	-.04
Currently in kinship foster care ^a	-.01	.20*	-.13	.04	.04	.06	-.01	.06
Foster parent education level	.04	.10	-.05	.01	-.04	.05	-.10	-.13
Foster parent occupation level	-.01	.05	-.09	.14	.20*	.15	.01	-.05
Foster family household income	-.11	.16*	-.04	.17	.04	.05	-.16	-.08
Number of children in home	-.06	-.02	-.02	-.15	-.11	-.06	.06	.03
Number of adults in home	-.04	.03	-.04	-.11	-.12	-.05	-.03	-.12
Number of assistance services utilized	-.13*	-.12	-.15	.01	.10	-.01	.01	-.03

HS = Head Start

OECE = Other ECE

^a conducted with a Kendall's tau-b (non parametric correlation for categorical data)

* p < .01

Table 2

Model Fit Indices for Latent Class Analyses of ECE Variables

Number of Classes	BIC	Sample-Size Adjusted BIC	Entropy	LMR-LRT p-value	BLRT p-value	Estimated Proportion of Children in Smallest Class	Estimated Number of Children in Smallest Class
1	2668.04	2623.81	n/a	n/a	n/a	n/a	n/a
2	2600.60	2527.94	1.0	.07	.00	.36	38
3	2520.42	2419.32	.99	.00	.00	.17	18
4	2562.39	2432.85	.70	.66	1.0	.16	17

Table 3

Characteristics of ECE Typologies

	Part-Time Other ECE (1)		Part-Time Head Start (2)		Full-Time Mixed ECE (3)	
	Mean	SE	Mean	SE	Mean	SE
Hours per day	3.19	0.17	3.92	0.08	8.78	0.30
Days per week	3.33	0.22	3.88	0.08	4.56	0.18
Group Size	11.08	0.82	15.90	0.53	14.88	1.58
Children-Adult Ratio	5.24	0.57	5.60	0.29	6.49	0.77
Duration Head Start*	2.00	0.44	1.86	0.16	2.14	0.52
Duration Other ECE*	1.96	0.26	1.83	0.26	2.76	0.34

*. Duration variables are categorical: 1 = less than one school year; 2 = one school year; 3 = more than one school year

Table 4

Predictors of ECE Typologies

	Part-Time Other ECE (1) vs. Part-Time Head Start (2)	Part-Time Other ECE (1) vs. Full-Time Mixed ECE (3)	Part-Time Head Start (2) vs. Full-Time Mixed ECE (3)
	Estimate (SE)	Estimate (SE)	Estimate (SE)
Child Predictors:			
Age of Child	1.51 (1.03)	2.36 (1.46)	0.86 (1.34)
Age at first foster placement	1.54 (0.47)*	0.47 (0.60)	-1.07 (0.54)*
Days of any foster care	0.01 (0.00)*	<0.01 (.01)	<-0.01 (.01)
Number of foster care transitions	0.78 (.25)*	0.16 (0.30)	-0.61 (0.27)*
Child is Caucasian	-0.06 (0.76)	-0.79 (0.91)	-0.73 (0.81)
Family Predictors:			
Kinship vs. non-kinship foster care	1.37 (0.68)*	-0.82 (0.77)	-2.19 (0.82)*
Number of children in home	0.19 (0.40)	-0.01 (0.22)	-0.19 (0.20)
Number of adults in home	0.18 (0.15)	1.28 (0.64)*	1.09 (0.61)
Caregiver education level	0.28 (0.13)*	-0.01 (0.15)	-0.28 (0.13)*
Caregiver occupation level	-0.06 (0.27)	-0.39 (0.29)	-0.33 (0.29)
Household income	0.28 (0.16)	-0.16 (0.18)	-0.44 (0.17)*
N. of assistance services utilized	-0.28 (0.23)	0.26 (0.34)	0.54 (0.31)

Note. Estimates are unstandardized regression coefficients.