Published in final edited form as:

Early Child Res Q. 2013 October 1; 28(4): . doi:10.1016/j.ecresq.2013.05.007.

Beyond an “Either-Or” Approach to Home- and Center-Based Child Care: Comparing Children and Families who Combine Care Types with Those Who Use Just One

Rachel A. Gordon^a, Anna Colaner^a, Margaret L. Usdansky^b, and Claudia Melgar^c

^aDepartment of Sociology and Institute of Government and Public Affairs, University of Illinois at Chicago, 815 West Van Buren St., Suite 525, Chicago, IL 60607

^bDavid B. Falk College of Sport and Human Dynamics, 400 Sims Hall, Syracuse University, Syracuse, NY 13244

^cDepartment of Human and Community Development, University of Illinois at Urbana-Champaign, 274 Bevier Hall, M/C 180, 905 South Goodwin, Urbana, IL 61801

Abstract

Most research focuses on preschoolers' primary non-parental child care arrangement despite evidence that multiple arrangements are relatively common. Using the nationally-representative Early Childhood Longitudinal Study, Birth Cohort, we compare characteristics and outcomes of families whose 4-year olds attend both home- and center-based child care with those who attend either home- or center-based care exclusively or receive no non-parental care at all. We find that about one fifth of 4-year olds attend both home- and center-based child care. Mothers' priorities for care (getting their child ready for school, matching their families' cultural background) and perceptions of good local care options predict their combining home- and center-based care. Preschoolers score higher on reading and math assessments, on average, when they attend centers, alone or in combination with home-based child care, than when they are cared for only in homes, either by their parents or by others. Preschoolers' average socioemotional outcomes generally do not differ between families who do and who do not combine care types. Implications for research and policy are discussed.

Keywords

child care; family child care; early childhood education; preschool; Head Start

Home-based and center-based child care often seem to be “either/or” options in research, practice and policy. In terms of research, children are often classified based on their primary non-parental child care arrangement at the time of data collection (Burchinal, Howes, & Kontos, 2002; Early & Burchinal, 2001; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007). When this is done, children fall into either some kind of center arrangement or some

© 2013 Elsevier Inc. All rights reserved.

Direct correspondence to: Dr. Gordon at ragordon@uic.edu, 312-413-0295 (phone), or 312-996-1688 (FAX).

An earlier version of this paper was presented in the paper session on Parenting Challenges at the National Council of Family Relations meetings (November 17, 2011, Orlando, FL).

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

kind of home arrangement, but not both, at any given age. As a consequence, the large body of research on child care and early education informs the field primarily about parent choices of either center-based care or home-based child care, and the consequences of those care types for children and families. In contrast, as far as we are aware, just four published studies have examined families' use of multiple, concurrent care arrangements in the U.S. (Folk & Yi, 1994; Morrissey, 2008, 2009; Tran & Weinraub, 2006). As a result, very little is known about why families might combine center- and home-based child care, or the effects of combining these care types for children. This is so despite the fact that, descriptively, it has been estimated that approximately 1 out of every 6 children under the age of 5 (17%) is in more than one child care arrangement (Laughlin, 2010).

This state of affairs likely reflects, in part, the complexity of gathering, conceptualizing, and analyzing information about secondary child care arrangements. Researchers typically ask follow-up questions about characteristics of care arrangements, either from parents or from providers themselves. Often, a separate question series is designed for center-based and home-based providers, recognizing the numerous ways in which center-based child care differs from home-based child care (NICHD Early Child Care Research Network [ECCRN], 1999; Snow et al., 2007). For example, the former are typically large organizations with multiple hierarchies of staff whereas the latter are smaller, sometimes comprised of a single caregiver and a few children (Fitz Gibbon, 2002; Wrigley & Dreby, 2005). State regulations also differ for child care in centers and homes (National Child Care Information and Technical Assistance Center and National Association for Regulatory Administration [NCCITAC/NARA], 2010). For example, regulations typically allow mixed-age groupings within home-based child care but require same-age groupings with age-graded staff:child ratios in centers. Quality measures are likewise generally specific to either home- or center-based care (Halle, Whittaker, & Anderson, 2010; Vandell & Wolfe, 2000; Zaslow, Martinez-Beck, Tout, & Halle, 2011). This broad variation by type of care can lead research, practice, and policy to focus on one type of care at a time, and to sometimes think of parents as "center child care users" or "home child care users," but not both, at least at any given moment.

In the current paper, we begin to address this gap in the literature by using nationally representative data to establish which types of families are more or less likely to combine home- and center-based arrangements compared to families using home- or center-based child care exclusively or no non-parental care at all. We also examine cognitive and socioemotional outcomes for children who attend these various care arrangements. We allow for the possibility that some families may perceive benefits of using each type of care, perhaps strategically seeking out both types, whereas other families may have little choice but to rely on multiple providers. We add to the existing small set of studies of multiple concurrent care arrangements in the U.S. (Folk & Yi, 1994; Morrissey, 2008, 2009; Tran & Weinraub, 2006) by focusing on one age group of children – 4-year olds – for whom parents may be particularly likely to strategically combine center-based preschool with home-based arrangements (Morrissey, 2008). We also extend prior studies because our data has a richer set of maternal reports about their priorities for care (getting their child ready for school, being culturally similar to their family, or meeting their family's practical constraints) and their perceptions of available care in their area (presence of good choices and ease of locating care). We additionally relate combining care arrangements to children's outcomes in two domains, cognitive and socioemotional, which is important given the contrasting ways in which type of care was associated with each domain of development in prior studies of children's primary child care arrangements.

Type of Care and Child Outcomes

We begin by reviewing the larger body of research that documents the average ways in which children's cognitive and socioemotional outcomes associate with the type of primary non-parental child care that they attend. A brief summary of this literature is that children who attend centers average higher cognitive development but more problem behaviors than children who attend home-based child care. Due to space constraints, we refer to comprehensive reviews of this literature that draw these conclusions; and, we highlight results from two of the largest recent studies. Although our discussion glosses over the nuance found in specific studies, it suggests one intriguing way in which combining center-based and home-based child care could be advantageous: families who combine centers and homes might accrue benefits associated with each type. Specifically, children might achieve the higher cognitive development associated with center care along with the lower levels of behavior problems often associated with home-based child care in prior research. At the same time, combining arrangements could be disruptive to parents and to children, as parents must handle the logistics and relationships with more than one provider and children must transition between the arrangements, which can be unsettling (De Schipper, Tavecchio, Van IJzendoorn, & Linting, 2003; De Schipper, Tavecchio, Van IJzendoorn, & Van Zeijl, 2004; Morrissey, 2009).

Reviews consistently conclude that children who attend centers average higher scores on cognitive assessments than children in home-based child care (Bradley & Vandell, 2007; Burchinal, 1999; Vandell, 2004). There is also some evidence that center attendance relates to lower socioemotional outcomes than home-based child care, although this finding is controversial and less consistent (Burchinal, 1999; McCabe & Frede, 2007; Vandell, 2004; Vermeer & van IJzendoorn, 2006). The findings from one of the largest longitudinal studies, the NICHD Study of Early Child Care and Youth Development (SECCYD), have been widely disseminated. Important to our study of 4-year olds is evidence that children in the SECCYD averaged higher scores on the Preschool Language Scale and the Woodcock Johnson Cognitive Memory for Sentences subtest at four years of age when they had spent more time in centers (NICHD ECCRN, 2002). The widely publicized association between child care and caregiver-reported aggression in the SECCYD (NICHD ECCRN, 2003) has been found to be sensitive to how and at what age analyses were conducted (Belsky et al., 2007). Relevant to our study of 4-year olds are reports that the association was evident at age four and that it was specific to spending more time in center care (Belsky et al., 2007; NICHD ECCRN, 2004).

Results from a sister study to the dataset that we use – the Early Childhood Longitudinal Study, Kindergarten Cohort (ECLS-K) – also documented higher cognitive scores but more behavior problems among children who attended center-based rather than home-based child care. For example, Loeb and colleagues (2007) found that children in the ECLS-K who had attended center-based care in the year prior to kindergarten averaged higher math and reading scores on direct assessments in the fall of kindergarten than did children who were in exclusive parental care in the preceding year. Kindergarten teachers also rated those children who had attended centers as displaying less-skillful behavior (less self control, fewer interpersonal skills, and more externalizing problems) on average than children who had been cared for by parents. These associations were especially evident for children in care full time. Children who had attended other home-based, non-parental arrangements in the year before kindergarten did not differ from those who had been in exclusive parental care on reading and math assessments, but kindergarten teachers rated children who had been in home-based child care as having more skillful behavior than children who had been in exclusive parental care.

These average associations (more skillful cognition; less skillful behavior) likely reflect the organization and regulation of center-based versus home-based child care (Fitz Gibbon, 2002; Vandell, 2004; Wrigley & Dreby, 2005). As noted above, centers are usually formal organizations that are either licensed or affiliated with schools or churches and run by professionally trained staff. State licensing regulations reflect and likely contribute to the greater formality of most centers, for example, by referring to caregivers in centers as teachers and assistant teachers, by requiring teachers in many states to have at least a high school diploma or GED, and by requiring centers to address child development in activities and to offer particular learning-related equipment and materials, such as books, manipulatives, and counting materials. In contrast, state regulations generally use caring language to describe the roles of in-home caregivers (provider, assistant provider) and rarely require in-home providers to have a high school diploma, to address child development, or to offer particular learning-related equipment and materials (NCCITAC/NARA, 2010). Consistently, research has documented the higher average education levels of center-based teachers than home-based caregivers (Dowsett, Huston, Imes, & Gennetian, 2008; Li-Grining & Coley, 2006; NICHD ECCRN, 2000, 2004); and, independent observers in these studies recorded greater learning materials and cognitive stimulation in center-based than home-based child care settings (Dowsett et al., 2008; Li-Grining & Coley, 2006). Differences between center- and home-based child care likely also result from other policy and regulatory contexts, including professional development strategies oriented at center teachers, the focus of many state Quality Rating and Information Systems on centers, and the fact that many family child care providers are isolated from the broader early childhood field whereas centers by their very nature are organizations with field ties (Kontos, 1992; Tout et al., 2010; Zaslow, Tout, Halle, Whittaker, & Lavelle, 2010). Of course, some family child care providers, especially the providers who care for many children year after year, may be more similar to center teachers, with higher education levels and a focus on learning (Dowsett et al., 2008). However, the typical differences by type of care in training, materials, and activities may contribute to the average language, reading, and math advantage seen among children attending centers.

Conversely, home-based child care settings are generally smaller and have fewer children per caregiver than centers. For example, the most common state-required group size for 3- and 4-year olds in centers is 20; the most common maximum number of children in a licensed home child care is six (including the providers own children; NCCITAC/NARA, 2010). Consistently, research has documented that group sizes and child:adult ratios are smaller in home-based child care than in centers; and, independent observers rate children in centers as spending more time in peer play and spending more time unengaged (unoccupied or in transition) than children in home-based child care (Dowsett et al., 2008; Li-Grining & Coley, 2006). These group size differences may contribute to average differences in behavior problems seen in prior research. Being in a center with many other children may be stressful, and center teachers may be less able to offer individual attention to mitigate stress when caring for many versus fewer children, especially if they lack the skills and training to do so (McCabe & Frede, 2007). Consistently, prior research has shown that the stress hormone cortisol increased from morning to afternoon on days when children were in child care centers, but not on days these same children were in their own home (Vermeer & van IJzendoorn, 2006).

We speculate that parents may perceive some similar tradeoffs among different types of care (e.g., centers might prepare children for school but fit less well with children's temperaments or with parental budgets and schedules), and our paper offers an initial attempt to investigate such parental perceptions and how they relate to the use of particular child care arrangements. Parents are unlikely to have detailed knowledge of the regulatory context of child care, let alone of scholarly research findings, but parents may form

impressions and expectations about characteristics of different types of care through personal experience and media reports of research on child care type and quality, some of which has received widespread publicity (Beckstrom, 2003; Sampson, 2001; Wrigley & Dreby, 2005). Thus, we anticipate that parents may evaluate, even if subconsciously, how these characteristics fit the needs of their family and children. Care settings that are organized in ways that mimic school may strike parents as better suited to get children ready academically (Fuller, 2010). For example, settings with explicit curricula, regular schedules that include time spent on reading and math, preschool classrooms that contain desks, and teachers with college degrees may connote school preparation. Consistently, Early and Burchinal (2001) found that parents who emphasized caregivers with special training for their preschoolers were more likely to use center-based than home-based child care. On the other hand, some parents may sense that spending long hours with many other children may be stressful for their child and may expose him or her to germs. Parents who feel like their child is not ready for such stresses or who worry about juggling their work schedule if their child gets sick more often, might avoid the largest group contexts. Consistently, Li-Grining and Coley (2006) found that parents rated home-based providers higher on flexibility than center-based providers; and, Kim and Fram (2009) found that parents who emphasized practical concerns were more likely to use home-based than center-based child care.

Some parents may also emphasize the importance of having a caregiver who is as close a substitute as possible for the care the parent would offer if they could (Colaner, 2012); that is, someone who is “culturally similar.” Parents like these may find it easiest to find a good “substitute” for themselves by selecting a home-based provider, given that in a center families may not have a say about which teacher’s classroom their child attends. Consistently, Radey and Brewster (2007) found that mothers’ reports of feeling attached to their racial-ethnic heritage were positively associated with using a maternal relative as a caregiver. Parent’s child care decisions are likely also influenced by cultural norms about what it means to be a good provider and good parent (Meyers & Jordan, 2006). For instance, Liang, Fuller, and Singer (2000) found that parental beliefs and practices about child development varied by race/ethnicity and helped explain racial-ethnic differences in children’s center attendance. To the extent that some parents have such preferences for cultural similarity as well as preferences for school readiness, combining home-based child care with a center may be attractive. That is, a parent might take advantage of some of the perceived “home-like” aspects of family child care along with some of the perceived “school-like” aspects of a center by combining arrangements. Of course, being able to achieve this ideal likely depends on the options that are available in their local area. Our study contributes to the literature by examining parental reports of priorities in conjunction with their perceptions of constraints.

Prior Research on Multiple Care Arrangements

Nearly 3 in 10 (28%) of 3- and 4-year olds with employed mothers are regularly cared for in more than one non-parental child care setting each week (Laughlin, 2010). Yet surprisingly little research has examined parents who combine care arrangements. Studies that do so have focused on whether parents used more than one arrangement, rather than on which types they combined. They also emphasized the potentially negative aspects of using multiple arrangements, an important starting point given that that instability of care has been associated with less skillful socioemotional development (De Schipper et al., 2003; De Schipper et al., 2004). However, this emphasis on multiplicity rather than on which care types are combined may mask the potential benefits of accessing different aspects of quality across arrangements discussed above. Prior studies also either focused on infants or toddlers, or combined children ages birth to 4 years. None focused on 4-year olds specifically. We focus on this age group because we anticipate that parents of 4-year olds may be most likely

to strategically combine part-day preschool in centers to get children ready for school with part-day home-based child care for cultural similarity, convenience, or flexibility.

To our knowledge, four studies have examined parents' use of multiple child care arrangements in national U.S. data sets. Three of these used the Study of Early Child Care and Youth Development (SECCYD), a longitudinal study of approximately 1,350 children sampled from birth records at ten hospitals in nine states across the nation (Morrissey, 2008, 2009; Tran & Weinraub, 2006). One study used the National Survey of Families and Households (NSFH), a national sample of households conducted in 1987–1988; the authors focused on families in the study who had children under five years of age (Folk & Yi, 1994). Two of the studies predicted which families used multiple arrangements (Folk & Yi, 1994; Morrissey, 2008). The other two related multiple arrangements to child outcomes (Morrissey, 2009; Tran & Weinraub, 2006). Tran and Weinraub (2006) examined infants and toddlers (at ages 6 and 15 months). Morrissey (2009) focused on 2- and 3-year olds (at ages 24 and 36 months). Morrissey (2008) and Folk and Yi (1994) included children from infancy through 4-years of age, but combined them together in a single analysis. The studies also focused on children who were in child care and/or whose mothers were employed, and varied in whether they examined only non-parental care or included father care as “child care.” Thus, they provide only a partial portrait of multiple care use and generally omit the comparison groups of children who combine parental care with preschool or who do not have any non-parental child care arrangements.

Although the specific findings differed between the two studies that predicted multiple care use, they generally suggested that both priorities and constraints may operate. Using data from the 6- through 54- month waves of the SECCYD, Morrissey (2008) found that children were more likely to have multiple arrangements when they were older, had a mother employed part-time, and lived with a cohabiting or single parent rather than a married parent. In their study of families with children under the age of 5 from the NSFH, Folk and Yi (1994) found that mothers who worked full-time, had a varying schedule, had more education, and had a father as the primary caregiver were more likely to use multiple arrangements. Both studies also found that children whose primary arrangement was home-based were more likely to use multiple arrangements. Only Morrissey (2008) examined a direct measure of parent perceptions of care. She found that mothers who had reported greater satisfaction with their primary care arrangement at a prior study wave (from nine to eighteen months earlier) were less likely to use multiple arrangements at the next wave.

The two studies that examined child outcomes associated with care in multiple arrangements used the SECCYD and found negative associations with certain aspects of child development (Morrissey, 2009; Tran & Weinraub, 2006). Tran and Weinraub (2006) focused on cognitive and language outcomes and found that having a mixture of family and nonrelative caregivers was associated with less language development by 15 months of age. A complex interaction between multiple arrangements and quality of the primary arrangement also emerged, hinting at the different reasons parents might use multiple arrangements (constraints and priorities). Among children with low-quality primary arrangements, using multiple arrangements was associated with lower language development. Among children with high-quality primary arrangements, using multiple arrangements was associated with higher language development. Morrissey (2009) examined how multiple arrangements associated with 2- and 3-year-olds' socioemotional outcomes. She found that moving from single to multiple arrangements between the ages of 2 and 3 was associated with decreases in maternal reports of social competence and increases in maternal reports of externalizing behavior problems. A similar pattern was evident for caregiver reports of child behaviors, although the associations were not

statistically significant. Caregiver reports of internalizing problems also increased significantly for children who moved from single to multiple arrangements.

The results of these two studies inform ours in several ways. Morrissey's (2009) findings emphasize to us the potential for combining multiple care arrangements to increase stress, due to the multiple transitions children must make across settings and the logistical challenges parents face of traveling to and interacting with multiple providers. To the extent this is true, children who combine center-based and home-based child care may not fully realize the average benefits of each type, demonstrating somewhat lower cognitive outcomes than children in exclusive center care and somewhat greater behavior problems than children in exclusive home care. It is difficult to generalize Tran and Weinraub's (2006) findings for children's cognitive outcomes to ours, given the substantial differences in developmental tasks, parent preferences, use of center arrangements, and average quality of care arrangements between toddlerhood and preschool (Kreader, Ferguson, & Lawrence, 2005; Sandstrom, Moodie, & Halle, 2011). One important takeaway is that extent of exposure to the aspects of quality found in the more "school-like" center environment (Dowsett et al., 2008; Li-Grining & Coley, 2006) could moderate the association between attending a center and higher cognitive outcomes in our study. We account for this possibility by distinguishing full-time and part-time care.

The Present Study

Our study builds on prior research by focusing on preschool-aged (4-year-old) children, distinguishing families who combine a home and center child care arrangement from those who combine two centers or two homes, examining a larger set of parental perceptions of care, and considering a wider range of child outcomes (both cognitive and socioemotional) together in a single study. We take advantage of a large national data set that offers sufficient sample sizes for separating each care configuration of interest and that allows us to paint a representative portrait of which families use these various configurations.

Although our study is descriptive, we draw on conceptual and empirical work on parents' child care choices to frame our research questions and hypotheses (Chaudry, Henly, & Meyers, 2010; Fram & Kim, 2008; Kim & Fram, 2009; Meyers & Jordan, 2006; Pungello & Kurtz-Costes, 1999). This literature broadly conceptualizes that parents' priorities for care predict their choices, but that constraints limit their ability to realize those priorities. The constraints fall at multiple levels, including within the family and in the broader community, and are both within and outside of the families' control, such as limited income to afford a desired child care setting and lack of availability of center care offering evening hours. These models can be extended to include child outcomes, recognizing that some of the same factors that predict the type of care families use also predict child outcomes (Duncan & Gibson-Davis, 2006; NICHD ECCRN & Duncan, 2003).

We incorporate constraints into our models using parents' reports of the importance of practical concerns when choosing care (cost, proximity, flexibility, and availability of sick care) and their perceptions of the local care market (ease of finding the care they wanted; availability of good choices). As noted above, parents rate center-based arrangements as less responsive to their practical needs (Kim & Fram, 2009; Li-Grining & Coley, 2006) and as less likely to accept a sick child (Early & Burchinal, 2001) than home-based child care settings. Centers are also more expensive than home-based arrangements (Child Care Aware of America, 2012). Additionally, home-based child care can be located in the child's own home or a neighbor's home, and thus would often be closer than a center. For these reasons, we anticipate that parents might combine part-time center care with part-time home-based child care rather than use center-based care exclusively, in order to reduce costs (relative to

using a center full time), to access the flexibility and sick care typically found with a home-based provider (possibly including on days the child would normally attend a center, but is sick or the center is closed for a holiday), and ease commuting (at least on some days of the week). On the other hand, combining a center with a family child care provider would presumably be more expensive than only using a center part time. The increased logistical complexity of combining care arrangements is also likely a practical barrier for some parents; and, the inflexibility, distance and cost of centers may still be an obstacle for some parents, even when combined with home-based care. These factors may weaken the hypothesized association between practical needs and combining care. Regarding parents' perceptions of the local market, we expect that parental reports of ease with finding desired care and perceptions of good choices would be associated with combining both types of care, given that doing so requires locating a good match in two settings rather than only one.

Based on our full conceptual model, we organize our predictor variables into four major categories: (1) priorities for child care, (2) perceptions of care options, (3) family demographics, and (4) lagged measures of child development. The first two sets contain our focal predictors, featured in our research questions and hypotheses. The second two sets of variables reduce bias in our non-experimental estimates, with the lagged variables offering a particularly robust adjustment for many potential confounds, including those that are difficult to measure (such as genetic factors; Johnson, 2005; Wooldridge, 2009).

Specifically, we examine two overarching research questions:

1. How do parental priorities for child care and perceptions of local care options predict their likelihood of combining center-based with home-based non-parental child care?
2. How do children's cognitive and socioemotional outcomes associate with attending both a center-based and a home-based non-parental child care arrangement?

Within these overarching research questions we lay out the following hypotheses, based on the literature reviewed above. For research question one, we anticipate that:

- 1a Parents who endorse school readiness as a priority when choosing care will be more likely to combine center care with home-based child care than those who use home-based child care exclusively or those that use no non-parental child care.
- 1b Parents who endorse cultural similarity as a priority when choosing care will be more likely to combine home-based child care with a center than to use center-based care exclusively.
- 1c Parents who report practical concerns will be more likely to combine home-based child care with a center than to use center-based care exclusively.
- 1d Parents who report better child care options in their community will be more likely to combine center- and home-based child care than to use care of one type exclusively.

For research question two, we anticipate that:

- 2a Children who combine center- and home-based child care (and children who attend center-based care exclusively) will have higher cognitive outcome scores, on average, than children who attend home-based child care or who rely on exclusive parental care.

- 2b** Children who combine center- and home-based child care (and children who attend home-based care exclusively) will be more skillful socially and emotionally, on average, than children who attend only center-based child care.

In examining these hypotheses, we distinguish center care that is and is not funded by Head Start, allowing us to see whether patterns differ for this program, which primarily serves low-income families and has historically offered part-day and part-year care (Currie, 2001; Gormley, 2007). Importantly, prior studies have found that Head Start attendance is positively associated with cognitive performance, at least in the short term, and also often positively associated with socioemotional competence (Currie, 2001; Halle, Hair, Wandner, & Chien, 2012; U.S. Department of Health and Human Services, 2010). Thus, we expect Hypothesis 2a will hold for both centers and Head Start, but Hypothesis 2b may be evident only in contrast to children who exclusively attend centers that are not funded by Head Start.

Method

Study Design and Sample Selection

The Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) is a nationally representative, longitudinal study of children drawn from vital statistics birth records in 2001 (Snow et al., 2007). The study oversampled children who were Asian/Pacific Islander, American Indian, Alaska Native, and Chinese, who were twins, and who were very low birth weight. Seventy-four percent of eligible families participated in the initial 9-month interview producing an initial sample size of 10,700 (all sample sizes are rounded to the nearest 50 as per the ECLS-B data sharing agreement). We focused on data collected at the 4-year (preschool) wave when 8,250 mothers completed the main interview. ECLS-B statisticians created sampling weights by first establishing base weights based on overall selection probabilities and then adjusting the weights for survey nonresponse, for undercoverage and to improve precision of estimates (Najarian, Snow, Lennon, & Kinsey, 2010; Snow et al., 2009). We applied these sampling weights in our analyses.

For our analytic sample predicting care configurations, we excluded 600 cases in which the adult respondent was someone other than the child's biological or adoptive mother ($n = 350$, primarily fathers and grandmothers) or who were missing one of our key variables (care configurations, priorities for care, and perceptions of care options; $n = 250$). We included dummy indicators of missingness for two demographic covariates with the greatest missing data (about eight percent missing family income and about three percent missing median family income in their community). We used listwise deletion to exclude the remaining cases with missing demographic covariate data ($n = 100$). Our final analytic sample size was 7,550. In Appendix Table A1 (included in our online supplementary materials), we showed how the cases included and excluded from our analytic sample compared, revealing that the excluded cases were somewhat less advantaged socioeconomically than the included cases (i.e., the excluded cases tended to have a lower household income, to have a mother with less education and without any partner present or with an unemployed partner). Additional cases were missing data on the child outcomes. One of the child outcomes was reported by preschool teachers or family child care providers, and thus was missing for all children who had no non-parental care arrangements. Other child outcomes were based on direct assessment, and not all children were assessed. We also provided descriptive statistics for these analytic samples in Appendix Table A1 (included in our online supplementary materials; for parsimony we focused the table on two outcomes, with the largest and smallest sample sizes: direct assessment of child reading [with $n = 6,450$] and caregiver report of the child's behavior [with $n = 4,550$]).

Measures

We show descriptive statistics for care configurations in Table 1. We provide descriptive statistics for child outcomes, priorities for care, perceptions of care options, demographic covariates, and lagged child development in Appendix Table A1 (included in our online supplementary materials).

Non-parental care configurations—We identified eleven mutually exclusive and exhaustive configurations of non-parental child care arrangements (see Table 1) based on mothers reports' about whether and for how many hours their 4-year-old spent time in three types of arrangements: 1) *home-based child care* by relatives or non-relatives in a private home, 2) *center-based care*, including nursery schools, preschools, pre-kindergarten programs and community-based child care centers that were not funded by Head Start, and/or 3) *Head Start*, including school- or center-based programs funded by Head Start. To reduce the volume of results and to focus on our hypotheses, we highlighted in regression models the contrasts between two configurations (combining a center with home-based child care; combining Head Start with home-based child care) and the remaining nine configurations. Mothers were asked to report about all regular arrangements at the time of the interview with someone other than herself and the child's other parent, regardless of whether it was paid. Mothers were asked to exclude "occasional baby-sitting or backup care providers." We categorized hours of care as part-time or full-time based on whether care was used for less than 20 versus 20 or more hours per week. Families who were regularly combining multiple arrangements were using each arrangement part-time, but the child was in care full-time across all arrangements (see Table 1 for average hours). We thus distinguished part-time and full-time care only for families using a single type of care.

Priorities for care—At the 4-year wave, interviewers told mothers, "I'm going to read some things that people look for in selecting child care arrangements or early childhood programs for their children. For each one, please tell me if you think it is very important, somewhat important, or not too important in selecting a care arrangement for [child]." We grouped the questions into sets that represented *practical priorities* (4 items: a place close to your home; a reasonable cost; a caregiver/teacher who provides flexible hours to fit your schedule; a place where children will be cared for when they are sick; Cronbach's alpha = .61) and *cultural priorities* (5 items: a caregiver/teacher who shares your beliefs about raising children; a caregiver/teacher of the same racial or ethnic background as child; a caregiver/teacher who speaks the child's native language; if the caregiver was not a relative, someone you already knew; if the arrangement was a center, one that is affiliated with your family's religion; Cronbach's alpha = .56). We summed the items within each of the two sets and then dichotomized the result at the median. We used a single item, "a place that will help prepare your child for kindergarten", to represent a *school readiness priority*. We dichotomized this variable, with a score of one representing responses of very important, and zero indicating responses of not too important or somewhat important.

Perceptions of care options—Mothers also reported whether they had looked for child care and, if they had, answered the questions "Do you feel there are good choices for child care where you live?" and "How much difficulty did you have finding the type of child care or early childhood program you wanted for [child]?" We dummy coded four mutually-exclusive categories: (1) have not looked for care, (2) looked for child care and said there were no good choices in the area, (3) looked for child care and felt there were good choices in the area, but had difficulty securing the care that they wanted, and (4) looked for child care and said that there were good choices and that they had no difficulty finding care.

Child outcomes—The ECLS-B investigators created a *Reading Composite* and a *Math Composite* based on direct assessments of children. For reading, the investigators selected items from three subtests of the Preschool Language Assessment Scales (Simon Says, Art Show and Let's Tell Stories; Duncan & De Avila, 1998), from the Peabody Picture Vocabulary Test—Third Edition (Dunn & Dunn, 1997), and a measure of emergent early literacy, including letter sounds, early reading, phonological awareness, knowledge of print conventions, and matching words (Snow et al., 2007, 2009). For mathematics, ECLS-B investigators took items from the Test of Early Mathematics Ability, the ECLS-K (Snow et al., 2007), and other sources in the following areas: number sense, geometry, counting, operations, and patterns (Najarian et al., 2010; Snow et al., 2007, 2009). We used the reading and math composite scores that ECLS-B staff created using item response theory (IRT) models (Najarian et al., 2010; Snow et al., 2007, 2009). To facilitate interpretation of predicted values shown in figures, we converted the IRT scores to positive numbers by adding a constant of 3. ECLS-B reported IRT-based internal consistency reliability estimates of .84 for reading and .89 for math (Najarian et al., 2010, p. 84, 92).

To measure socioemotional outcomes, the ECLS-B study designers selected items from the Preschool and Kindergarten Behavior Scales—Second Edition (Merrell, 2003), Social Skills Rating System (Gresham & Elliott, 1990), and ECLS-K in three areas: 1) social competence (e.g., how often the child plays with others, is liked by others, and is accepted by others), 2) behavior problems (e.g., exhibits aggression, anger, and worry; absence of happiness), and 3) inattention/hyperactivity (child does not pay attention well, disrupts the class, and is overly active). In responding to questions that referred to other children, respondents were asked to think about “other children close in age” to the child, no more than 2 years older or younger. Both mothers and caregivers/teachers rated these items regarding the child's behavior in the last three months. When the child had multiple arrangements, the caregiver who provided the most hours of care to the child per week was interviewed (in our data, 52% of respondents were home-based providers when children combined a center with home-based child care; 40% of respondents were home-based providers when children combined Head Start with home-based child care). We averaged the items, which were scored from 1 = *Never* to 5 = *Very often*. Cronbach's alpha values were acceptable to excellent (for mothers and caregivers/teachers respectively: .83 and .83 for social competence, .68 and .74 for emotional and behavioral regulation, .70 and .88 for attention and concentration).

Lagged child outcomes—When predicting child preschool outcomes at 4 years, we controlled for the child's development at 2 years. We used a mental score created with IRT methods by the ECLS-B staff from the Bayley Short Form—Research Edition (BSF-R; Andreassen & Fletcher, 2007), which ECLS-B staff adapted from the Bayley Scales of Infant Development—Second Edition (Bayley, 1993). The scale assessed the children's emerging cognitive skills such as putting objects in a container, imitating words, naming pictures, and attending to stories. ECLS-B staff also used IRT methods to create a BSF-R motor scale, assessing skills such as reaching and grasping, manipulating small objects, balancing and walking (Andreassen & Fletcher, 2007; Nord, Edwards, Andreassen, Green, & Wallner-Allen, 2006; Snow et al., 2007, 2009). We assessed the child's temperament by summing seven items that ECLS-B staff had selected from the Infant/Toddler Symptom Checklist (whether the child was frequently fussy or irritable, easily went from a whimper to a cry, was unable to wait without crying, was easily distractible, needed help to fall asleep, tuned out from activities, and couldn't shift focus easily; Cronbach's alpha = .66; DeGangi, Poisson, Sickel, & Weiner, 1995; Nord et al., 2006). Finally, we created an indicator of whether the mother reported at the 2 year interview that the child had any respiratory illness, gastrointestinal illness, or ear infections since the prior (9-month) interview.

Demographic covariates—We included individual-level demographic variables including the child's gender (female = 1), age (in months), the mother's employment status (employed = 1), the presence and employment status of a spouse/partner (coded into three categories: no partner in household [reference], partner/not employed, and partner/employed), the family's income to needs ratio (income divided by the federal poverty level for the family's size coded into five categories: <1 [reference], 1–1.99, 2–2.99, 3–3.99, and 4 or higher, plus an indicator of missing family income; U.S. Census Bureau, n.d.), mother's race/ethnicity (coded into four categories: non-Hispanic White [reference], non-Hispanic Black, non-Hispanic other, Hispanic), and mother's educational attainment (coded into three categories: high school or less [reference], some college, bachelor's or more). We also indicated whether the mother reported any relatives living in the area (nearby relatives = 1) as well as the median family income from the 2000 decennial census in the family's ZIP code (coded into four categories: <\$40,000, \$40,000–\$49,999, \$50,000–\$64,999, and \$65,000 or more plus an indicator of missing ZIP code income).

Plan of Analysis

Our analyses proceeded in three steps. We first examined the distribution of families across non-parental child care configurations, as well as the distribution by maternal employment status, family low-income status, and maternal race/ethnicity so that readers could readily identify which care types were used most often by families within each subgroup.

In our second set of analyses, we estimated multinomial logit regression models predicting care configurations (10 non-parental care configurations plus exclusive parental care) based on the mothers' priorities for care and perceptions of the care context, adjusting for demographic covariates. Due to the very large number of potential pairwise comparisons among the 11 care configurations we study, we focused our presentation of results on the subset of comparisons addressed in our hypotheses: examining how maternal priorities for care and perceptions of care options predicted the likelihood of combining home-based child care and center care or combining home-based child care and Head Start compared to the likelihood of using one of these two types of care exclusively or using no non-parental care at all. To facilitate interpretation of results, we calculated odds ratios (the exponential of the multinomial logit coefficient; Long, 1997; Long & Freese, 2005). In our tables, odds ratios greater than one indicated higher odds of combining two care types than of using only one care type; odds ratios less than one indicated lower odds of combining two care types than of using only one care type. We weighted all analyses with the ECLS-B sampling weight and adjusted all standard errors for the clustering of families within ZIP codes.

In our third set of analyses, we predicted child outcomes at four years of age based on configurations of non-parental child care (dummy coded with 10 indicator variables, using children who combined home-based and center-based child care as the reference), adjusting for maternal care priorities/perceptions, demographic covariates, and lagged child outcomes. We used ordinary least squares regression for all outcomes. We weighted all analyses with the ECLS-B sampling weight and adjusted all standard errors for the clustering of families within ZIP codes. We used predicted means to facilitate interpretation of the results (Long, 1997; Long & Freese, 2005). We first conducted overall F-tests of any association between the configurations of non-parental child care and child outcomes and then used Stata's *lincom* command to recover contrasts among each pair of care configurations. We used Stata's *margins* command to calculate predicted values (and their standard errors), indicating each care configuration, one at a time, and holding maternal priorities/perceptions, demographic covariates and lagged child outcomes constant at their means.

Results

Describing Configurations of Non-Parental Child Care

In Table 1, we list the 10 non-parental child care configurations we identified plus the exclusive parental care category, as well as the sample size, average hours in care, and percentages of families using each configuration. The categories included the combinations of focal interest: home-based child care combined with a center that is not funded by Head Start and home-based child care combined with Head Start. As noted above, we did not distinguish hours in care for families combining multiple arrangements. However, for families who used only one type of care, we retained all six configurations created by cross-classifying our three types of care (home-based, center, and Head Start) with hours in care (full-time or part-time); each resulting subgroup contained at least 100 families. We also show in Table 1 the percentage distributions of the resulting categories for the overall sample, as well as within key demographic groups based on maternal employment status, family income, and maternal race/ethnicity. Chi-square tests revealed that the distributions varied significantly for each demographic group (for the eleven care configurations crossed: by two employment categories, $\chi^2(10) = 1037.93, p < .01$; by two income categories, $\chi^2(10) = 791.23, p < .01$; by four racial ethnic categories, $\chi^2(30) = 696.57, p < .01$).

The results in the top row of Table 1 show that combining home-based and center-based care was common among 4-year olds. Overall, fully one-fifth of the 4-year olds regularly used both home-based and center-based care. The center-based portion of care was primarily not funded by Head Start (13 percent, versus 6 percent Head Start). Within the demographic groups, combining home and center care was particularly likely among families with employed mothers (28 percent) and particularly unlikely among families with Hispanic mothers (15 percent). Interestingly, families above and below 200 percent of the federal poverty line were approximately equally likely to combine home- and center-based care – 21 percent and 19 percent respectively – although, not surprisingly, low-income families were more likely than higher-income families to combine home-based child care with a center funded by Head Start.

There were also some salient patterns among families who exclusively used one kind of care. Exclusive center care was common among these 4-year olds, the status of fully half the sample (51%). Just 11% of 4-year olds attended only home-based non-parental child care. Not surprisingly, when families used only a center, the arrangement was more often part-time among non-employed mothers and full-time among employed mothers. Expectedly, among the families using just one type of care, lower-income families were more likely to use Head Start whereas higher-income families were more likely to use centers not funded by Head Start.

Just under one-fifth of the study's 4-year olds were cared for by their parents exclusively (19%). This fraction was higher for families in which the mother was not employed, but even within these families, nearly two-thirds of the 4-year olds attended some type of regular, non-parental child care arrangement. Exclusive parental care was also more common among lower-income families and among families with Hispanic mothers.

Predicting Configurations of Non-Parental Child Care

We next examined the results of our multinomial logit models predicting configurations of non-parental child care arrangements. In Table 2, we provide odds ratios for our key predictors: mothers' priorities for care and perceptions of care options. We present the odds ratios for the demographic covariates in Tables 3 and 4. Due to the large number of potential contrasts among the outcome categories, we present the subset of comparisons of key substantive interest: examining how maternal priorities for care and perceptions of care

options predicted the likelihood of combining home-based child care with a center (or with Head Start) compared to the likelihood of using one of these types of child care exclusively or using no non-parental care at all. In the top panel of results in Table 2, we present odds ratios for contrasts between families that combined home-based child care with a center and the nine categories of families that used just one type of care (including exclusive parental care). In the bottom panel, we present a parallel set of contrasts between families that combined home-based child care with Head Start and those using other configurations.

We begin by examining the results for the *school readiness* priority, which we had expected would predict parents combining center- and home-based child care, relative to using home-based child care exclusively and relative to using no non-parental care arrangements (Hypothesis 1a). The results confirmed this expectation. For example, the value in column 7 of the top row indicated that the odds of *Combining a center with home-based child care* versus *Home Only, Part-Time* child care was 2.39 times higher for mothers who endorsed school readiness as a priority for care than for mothers who did not endorse school readiness. Likewise, the odds ratios in columns 8–9 and column 1 of the top row were also larger than one and significant, indicating that mothers who endorsed school readiness were also more likely to combine home and center care (not funded by Head Start) than to use other exclusively home-based child care arrangements or exclusive parental care. Although not central to our hypotheses, the table also showed that the odds ratios for the contrasts of combining center and home-based child care versus exclusive center care in columns 2–6 of the top row were generally not significant. (The exception was that mothers who endorsed school readiness were significantly less likely to combine home-based child care with a center than to use a center exclusively, full-time).

Similar results were seen for *school readiness* in the bottom panel, where we present the odds ratios for combining home-based child care with Head Start relative to the nine other categories. These results again confirmed our first hypothesis; mothers who endorsed school readiness were more likely to combine home-based child care with Head Start than to use exclusive home-based child care or exclusive parental care (odds ratios greater than one and significant in columns 7–9 and in column 1).

Our second hypothesis was that mothers who endorsed *cultural similarity* of a provider would be more likely to combine home-based child care with a center than to use a center exclusively (Hypothesis 1b). Consistent with this expectation, the odds ratios in columns 2–6 of the rows labeled *cultural similarity* were all positive in sign and generally statistically significant. (The exception was the contrast with mothers who used Head Start part-time). This indicated that mothers who endorsed cultural similarity were more likely to combine home and center care than to use a center exclusively, which was in line with our hypothesis.

In Hypothesis 1c, we anticipated that mothers who expressed practical concerns when choosing care would be more likely to combine care types than to use center care exclusively. Our measure of *practical needs* only modestly supported this hypothesis. Four of the five contrasts in columns 2–6 of each panel were in the expected direction although only two were statistically significant. Mothers who reported practical needs were more likely to combine a center (or Head Start) with home-based child care than to use a center (or Head Start) on its own, part time (column 2). Mothers with practical needs were also more likely to combine home-based child care with a center arrangement (or Head Start) than to combine two or more center arrangements (column 6). The distinctions with full-time center care – which we had expected to be especially evident due to costs – had positive odds ratios, but were only approaching significance ($p < .05$ to $p < .11$ for odds

ratios of *Practical needs* in columns 3 and 5). These results provided only modest support for Hypothesis 1c.

Finally, in Hypothesis 1d, we also anticipated that mothers who reported better care options in their community would be more likely to combine center- and home-based child care than to use care exclusively of one type. The results for *perceptions of care options* were consistent with this hypothesis, but only in relation to exclusive home-based child care; all of the odds ratios in columns 7–9 were less than one and almost all were statistically significant, indicating that, in comparison to mothers who reported better care options, mothers who reported poorer care options were less likely to combine care than to rely solely on home-based child care. In relation to exclusive center-based care, however, our results did not support our hypothesis; mothers who reported poorer care options were not consistently less likely to combine center- and home-based care than to use exclusive center care.

Predicting Child Outcomes

We had anticipated that children who combined center- and home-based child care (and children who exclusively attended center-based child care) would have higher cognitive development, on average, than children who only attended home-based child care or were cared for exclusively by parents (Hypothesis 2a). We also expected that children who combined home-based care with a center (or who used exclusive home-based care) would be more skillful socially and emotionally than children cared for exclusively in centers (Hypothesis 2b). Due to the volume of results, we focused on predicted values and confidence intervals to present the findings. We provided covariate coefficients in Appendix Table A2, included in our online supplementary material.

We present the results for the direct assessments of the children's cognitive outcomes in Figure 1, with the ECLS-B-created reading composite in the top panel and the ECLS-B-created math composite in the bottom panel. We list the eleven configurations of non-parental care arrangements across the horizontal axis. We shade the bars in groups, with no non-parental care arrangements in solid black, combinations of home-based and center-based child care in white, center care only in light gray, and home-based child care only in dark gray. We place the level of the bars at the predicted value, and add error bars that extended 1.96 times the standard error of the prediction above and below that value. We use a horizontal black line across the figures to make it easier to identify which configurations had non-overlapping confidence intervals.

The overall F-tests revealed that children's average cognitive outcomes differed significantly across the eleven care configurations, adjusting for maternal priorities/perceptions, demographic covariates and lagged child development ($F(10,2850) = 4.86, p < .01$ for reading; $F(10,2850) = 6.31, p < .01$ for math; denominator degrees of freedom rounded to nearest 50 as per ECLS-B license agreement). The results showed a clear pattern, consistent with our expectations in Hypothesis 2a, in which the point estimate and confidence intervals for the combinations of home and center care (white bars) and center only care (light gray bars) were generally higher than those for no non-parental care arrangements (black bar) and home-based child care only (dark gray bars). Our results extend prior research by showing that the advantage to cognitive development of attending a center extends to children who combine part-time center care with part-time home-based child care. For both reading (Figure 1a) and math (Figure 1b), children who combined a center or Head Start with home-based child care averaged higher scores than those in only home-based child care (one arrangement, part-time or full-time) or in exclusive parental care.

In addition to being statistically significant, the differences in subgroup means were meaningful in substantive magnitude. For example, the difference in point estimates for the *Reading Composite* between children who combined home-based child care and a center (2.59) and children who used a single home-based child care arrangement part-time (2.36) was 30% of the outcome standard deviation of .76 (i.e., $(2.59 - 2.36)/.76 = .30$). Although just at the upper bound of a small effect size in absolute terms, this effect is of a meaningful size when compared to other demographic covariates in our model (for example, the difference in average reading composite scores between children whose mothers had a bachelor's degree or greater versus those with a high school degree or less was .30 points, or 40% of the outcome standard deviation; we presented additional covariate results in Appendix Table A2 included in our online supplementary materials).

We present the results based on the caregivers' reports of the child's socioemotional outcomes in Figure 2. We omitted children with no non-parental care arrangements from these figures, since they had no caregiver report of behavior. For all three aspects of socioemotional development, the overall F-tests revealed significant associations with configurations of non-parental child care ($F(9,2300) = 9.49, p < .01$ for social competence in Figure 2a; $F(9,2300) = 4.52, p < .01$ for problem behaviors in Figure 2b; $F(9,2300) = 4.09, p < .01$ for inattention/hyperactivity in Figure 2c). The results for social competence in Figure 2a were partially consistent with our expectations in Hypothesis 2b. Home-based caregivers reported significantly higher average social competence for children in their care than did center-based teachers; and, in some cases children who combined a center with home-based child care were reported to be more skillful socially than children who attended only a center. The latter result was evident only when the center portion of care was not funded by Head Start, however. Children who combined a Head Start arrangement with home-based care had social competence reports that were lower than those in exclusive home-based care and overlapped with children in exclusive center-based care. In contrast, none of the findings for problem behaviors (shown in Figure 2b) and for inattention/hyperactivity (shown in Figure 2c) were consistent with Hypothesis 2b. For these outcomes, it was children cared for in centers part time who averaged the lowest caregiver-reported problem behaviors and inattention/hyperactivity, significantly lower than many other configurations, including one or both combinations of home- and center-based care as well as full time care that took place exclusively in centers or in homes.

As was the case for the cognitive outcomes, the significant differences in subgroup means were meaningful in substantive magnitude. For example, the difference in point estimates for caregiver-reported social competence between children who combined home-based child care and Head Start (3.87) and children who used a single home-based child care arrangement full-time (4.05) was 29% of the outcome standard deviation of .63 (i.e., $(4.05 - 3.87)/.63 = .29$). Although again small as an absolute effect size, this effect was relatively larger when compared to demographic covariates in our model (for example, the difference in caregiver-reported social competence between children whose mothers had a bachelor's degree or greater versus those with a high school degree or less was .04 points, or just 6% of the outcome standard deviation; we present additional covariate results in Appendix Table A2 included in our online supplementary materials).

We present results based on the mothers' reports of the child's socioemotional outcomes in Figure 3. The overall F-tests revealed significant associations only for mother-reported social competence ($F(10,3000) = 2.15, p < .02$ in Figure 3a) and not for mother-reported problem behaviors ($F(10,3000) = 1.33, p > .20$ in Figure 3b) or for mother-reported inattention/hyperactivity ($F(10,3000) = 1.48, p > .14$ in Figure 3c). Consistent with these overall tests, most confidence intervals overlapped, including those of key interest to our

hypotheses. These results indicated no support for our expectations in Hypothesis 2b based on mother reports of children's socioemotional development.

Discussion

Using the nationally-representative ECLS-B, we found that nearly one out of every five preschoolers combined home-based and center-based non-parental child care arrangements. Descriptively, combining home-based child care and center care was particularly likely among families with employed mothers and particularly unlikely among families with Hispanic mothers, 28 percent and 15 percent respectively. In contrast, being above or below 200 percent of the federal poverty line was unrelated to the chances of combining home and center care, although lower-income families were more likely than higher-income families to combine home-based child care with a center that was funded by Head Start.

Results of multinomial logistic regression models were consistent with our expectations, showing that mothers who prioritized school readiness were more likely to combine center- and home-based child care than to use only home-based arrangements and that mothers who prioritized cultural similarity were more likely to combine care types than to use only centers. We found only modest support for our hypothesis that mothers who reported practical concerns would be more likely to combine center- and home-based child care than to use centers exclusively. On the other hand, we found consistent evidence in support of our hypothesis that mothers who reported good local care options were more likely to combine home-based child care with a center than to use only a home-based child care provider. We did not find such an association when contrasting combining care to exclusive center care, however.

When we associated care arrangements with child outcomes, our findings were as anticipated for cognitive outcomes. Children who attended centers – either alone or in combination with home-based child care – averaged higher scores on math and reading assessments than children who were cared for at home (either by a parent or in a non-parental arrangement). These results were evident in models that adjusted for maternal priorities for care, perceptions of care options, demographic covariates and for children's earlier cognitive skills and temperament. In contrast, the associations of care configurations with children's socioemotional outcomes were generally not consistent with our hypotheses. Maternal reports of children's socioemotional competence did not vary significantly by care configurations. Caregiver reports were only partially in line with our hypotheses and with prior research.

Taken as a whole, our results document for the first time that mothers may use more than one type of care in order to obtain all of the aspects of quality that they desire. This conclusion is based on the finding that mothers who combine centers with home-based child arrangements share some similarities with mothers who only use center-based care (i.e. prioritizing school readiness) and share some similarities with mothers who only use home-based child care (i.e. prioritizing cultural similarity). These results support the latest directions in child care quality research that identify multiple aspects of child care quality, including not only developmentally relevant aspects, such as encouraging academic readiness, but also family sensitive and culturally responsive aspects, such as parents' comfort level with a provider (Bromer et al., 2011; Holloway & Fuller, 1999; Shivers & Sanders, 2011). Our results suggest that rather than requiring all settings to achieve certain levels on all aspects of quality, that it may be possible for families to draw on different types of care, some of which are higher on some aspects of quality and others of which are higher on other aspects of quality.

Our results for child outcomes are partly consistent with our hypotheses and with the typical priorities of mothers who combine care arrangements, in the sense that children who attended centers averaged higher math and reading scores, one marker of academic school readiness, even when centers were combined with home-based child care. Contrary to our hypotheses and prior research, however, we generally did not find that children in home-based child care – alone or in combination with a center – were more skillful socially and emotionally than children in exclusive center-based child care. As noted above, across our two informants and three domains, we found only one result in line with our expectations; children had higher average caregiver-reported social competence when they were cared for in homes rather than centers. Children who combined home-based arrangements with center-based care fell in between, with lower social competence than children in exclusive home-based care (especially when combining home care with Head Start) yet higher social competence than children in exclusive center-based care (especially when combining home care with a center that was not funded by Head Start). The fact that the expected benefits to social competence of spending time in home-based care were not fully revealed for children who spent some time in centers is consistent with the possibility that multiple arrangements create disruptive transitions and that the portion of time spent in larger peer contexts may be stressful. Most associations with socioemotional outcomes were not consistent with our hypotheses, however, including maternal reports on all three domains (with no significant associations) and caregiver-reported problem behaviors and inattention/hyperactivity (in which children in centers part-time had the lowest average scores).

We cannot be sure the reasons for these differences by respondent and sub-domain. It is possible that the lack of consistency between maternal and caregiver reports reflects differences in children's actual behaviors in their own home and in child care. On the other hand, the inconsistencies by category of respondent may reflect differences in the ways that caregivers and mothers perceive children's behavior. Center teachers' greater training in early childhood education and experience with more children may lead them to use a different benchmark when rating child behavior than the benchmarks used by many home-based caregivers and mothers. To the extent that this is true, maternal ratings may offer a fairer comparison between children in home- and center-based care since it is plausible that holding degrees and certificates in early childhood education and having experience with large groups of preschoolers would distinguish center teachers from home-based care providers while such education and experience would vary less among mothers. However, there are numerous other challenges to disentangling real differences across contexts from methodological variation across informants, including cultural variation in perception of behaviors (Dirks, Reyes, Briggs-Gowan, Cella, & Wakschlag, 2012). Since home-based caregivers might provide a closer cultural match to children than center teachers, the latter factor might work in the opposite direction as variation in early childhood education and experience. It is also possible that the short socioemotional battery created for the ECLS-B may be less reliable and valid than the full scales from which the ECLS-B investigators drew items. Unfortunately, the ECLS-B did not conduct IRT analyses of the socioemotional battery, in contrast to their IRT analyses of the short form cognitive assessments, so the reliability and validity of the short form socioemotional battery is not well established. We encourage future work on its psychometric properties.

Our results also suggest that, on the one hand, combining care arrangements may sometimes be a solution to practical constraints but also that, on the other hand, combining care types may sometimes be inhibited by market constraints. We draw the first conclusion because we found some support that mothers who reported practical concerns were more likely to combine a center with home-based child care than to use a center exclusively. We expect that the mothers who combine care types may like the access to flexibility and sick care offered by their home-based provider, as well as the lower cost and closer proximity of the

portion of their care that is home-based. These results were not seen for all contrasts, however, and we encourage future studies that collect in-depth information from mothers who combine care types in order to further examine these possibilities. We draw the second conclusion from our finding that mothers who reported gaps in their local options (lack of good choices, difficulty securing care) were less likely to combine home-based child care with a center or Head Start than to use only home-based care. It is possible that the mothers using just home-based arrangements would also use a center, if they had more choices. Absent an explicit question about satisfaction with current care arrangements and without longitudinal data with perceptions preceding choices, we cannot be sure.

As reviewed above, just a handful of prior studies looked at multiple care arrangements in the U.S. (Folk & Yi, 1994; Morrissey, 2008, 2009; Tran & Weinraub, 2006). Like those prior studies, we found evidence that mothers may combine care arrangements partly to achieve their priorities for care and partly due to their constraints (Folk & Yi, 1994; Morrissey, 2008). We extended this prior research by moving beyond demographic variables to relate mothers' explicit reports of priorities for care and perceptions of the local care context to combining care and we focused on the type of combination (center- and home-based child care) that we anticipated would be particularly relevant for the 4-year olds who were the focus of our study. Our results differed from prior studies which generally found that children's language, social competence, and behavioral control were lower, on average, among families who used multiple care arrangements (Morrissey, 2009; Tran & Weinraub, 2006). A number of differences between the prior two studies and ours may explain these results. For example, we may have found more benefits to combining care for children's cognitive outcomes than did Tran and Weinraub (2006) given prior evidence that observers' ratings of quality are higher, on average, for preschool than infant and toddler classrooms (Kreader et al., 2005; Sandstrom et al., 2011). Two ways in which Morrissey's (2009) study differed from ours were that she also studied younger children (from two to three years of age) and her study used full-scale measures of socioemotional development.

Limitations

As with all secondary data analyses, our study had strengths and limitations. One strength of our study was the large size of our sample, allowing us to have sufficient numbers of families to study various configurations of non-parental child care. As an initial description of families who combined center- and home-based child care for 4-year olds, our national sample was ideal for painting a representative portrait. Our focus on 4-year-olds allowed us to highlight the potential benefits of combining care types to access preschool as children approach school age while maintaining continuing with family child care arrangements. Results might look different for younger children, however, especially for socio-emotional outcomes; and, we encourage future studies to continue to examine which care arrangements parents of infants and toddlers combine, why they do so, and how combining care relates to children's outcomes.

It is also important to keep in mind that the 4% of cases that we excluded because respondents were not mothers (primarily fathers and grandmothers) and the additional 4% of cases excluded because of missing data had somewhat lower socioeconomic status than included cases. Another data limitation was that not all constructs we would like to measure were available in the data (e.g., maternal satisfaction with care, why mothers combined care types, stresses of managing multiple arrangements) and not all measures were as strong as we would like (e.g., validated short form socioemotional measures). We also primarily relied on cross-sectional associations. Although we adjusted for demographic covariates and, when predicting child outcomes, for maternal priorities for care, perceptions of care options, and earlier child development, we cannot infer causality from the associations. Additionally, we cannot be sure about the direction of associations. It is possible that some

mothers may revise their care priorities based on the types of care that they use, for example, coming to endorse school readiness because of their experiences in a center, or coming to rate their local care options as good because they like a particular provider that they used. We encourage future longitudinal studies on these topics.

The ECLS-B data allowed us to capture mothers who regularly combined two or more part-time arrangements, typified by part-day/part-week preschool combined with either wraparound center care or part-day home-based child care. The data were not as well suited, however, for examining the patchworks of multiple arrangements that have been studied in prior qualitative studies (Henly & Lyons, 2000; Lowe & Weisner, 2004), because ECLS-B questions explicitly instructed mothers to exclude occasional babysitting or backup care providers. Sample size also did not allow us to distinguish relative from non-relative caregivers. We encourage future studies to extend ours by highlighting how regular care is combined with various backup arrangements and by distinguishing relative and non-relative home-based providers.

Implications for Research and Policy

Our results suggest that future research should pay more attention to configurations of care, examining not only whether multiple arrangements are used but also the types of care the family combines. Doing so will better reflect the reality of arrangements for many children, allowing future research to build on our initial examination of predictors of combining home- and center-based child care and of associated child outcomes to examine how families who combine care differ from those who do not in other aspects of child development, in terms of parental employment trajectories, and in relation to work-family stress. For example, we were unable to examine the potential benefits and challenges of combining home and center care to mothers' well-being. Mothers who combine care may feel their priorities for care are better met and may have access to information and back up care from both providers. However, the logistics of getting their child to and from each arrangement may be stressful, and coordinating time off schedules and payments for two providers may be complicated.

Our study is also important for policy and practice. We found that mothers who reported few good options in their area were less likely to combine home-based child care with a center than to use only home-based arrangements. Increasing options for mothers who want to combine care might be one direction for practice and policy. A recent demonstration in Illinois documented positive experiences of parents, teachers, and providers when preschoolers stayed in family child care part of the week while attending state-funded preschool the rest of the time, with transportation provided between settings (Forry et al., 2011). Such programs may also more broadly support universal pre-school movements, which have sometimes been aligned with schools (Bogard & Takanishi, 2005; Pew Center on the States, 2011). For example, Latino children are less likely to participate in preschool than are children from other ethnic backgrounds (Fuller, 2010; Fuller, Eggers-Pierola, Holloway, Liang, & Rambaud, 1996), but might be more likely to do so if they could combine preschool with home-based child care, as some families in our study report doing so when they prioritize both school readiness and cultural similarity.

Conclusion

One out of every five preschoolers regularly spent time in both a home-based and a center-based child care arrangement. Families who combined home and center care appeared to be meeting their priorities for both getting their child ready for school and having a familiar caregiver who shared their background and beliefs. Perceived good child care choices in the community also associated with combining care versus using only home-based child care.

Children who attended centers, alone or in combination with home-based child care, averaged higher reading and math scores than children cared for in homes, either by parents or in non-parental arrangements. Children's socioemotional outcomes were inconsistently associated with care types. Practice models are beginning to consider the potential benefits to families of combining care, and our results suggest more research is needed into why parents are already doing so and whether these arrangements are associated with other aspects of child development, with parental employment, and with work-family balance outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

The research presented here was supported in part by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, through Grant R01HD060711. The opinions expressed are those of the authors and do not represent views of the Institute.

References

- Andreassen, C.; Fletcher, P. Early Childhood Longitudinal Study, Birth Cohort (ECLS-B): Psychometric report for the 2-year data collection (NCES 2007-084). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education; 2007. Retrieved from http://nces.ed.gov/pubs2007/2007084_Front_C1.pdf
- Bayley, N. Bayley Scales of Infant Development. 2. San Antonio, TX: The Psychological Corporation; 1993.
- Beckstrom, M. The parenting trap – recent studies about the negative effects of child care can raise any parent's anxiety level. Saint Paul Pioneer Press; 2003 Aug 12. Retrieved from <http://infoweb.newsbank.com>
- Belsky J, Vandell DL, Burchinal M, Clarke-Stewart KA, McCartney K, Owen MT. the NICHD ECCRN. Are there long-term effects of early child care? Child Development. 2007; 78:681–701.10.1111/j.1467-8624.2007.01021.x [PubMed: 17381797]
- Bogard K, Takanishi R. PK-3: An aligned and coordinated approach to education for children 3 to 8 years old. SRCD Social Policy Report. 2005; 19:1–23. Retrieved from <http://srcd.org/sites/default/files/documents/spr19-3.pdf>.
- Bradley RH, Vandell DL. Child care and the well-being of children. Archives of Pediatric and Adolescent Medicine. 2007; 161:669–676.10.1001/archpedi.161.7.669
- Bromer, J.; Paulsell, D.; Porter, T.; Henly, JR.; Ramsburg, D.; Weber, RB. Families and Quality Working Group Members. Family-sensitive caregiving: A key component of quality in early care and education arrangements. In: Zaslow, M.; Martinez-Beck, I.; Tout, K.; Halle, T., editors. Quality measurement in early childhood settings. Baltimore, MD: Brookes; 2011. p. 161-180.
- Burchinal MR. Child care experiences and developmental outcomes. Annals of the American Academy of Political and Social Science. 1999; 563:73–97.10.1177/000271629956300105
- Burchinal M, Howes C, Kontos S. Structural predictors of child care quality in child care homes. Early Childhood Research Quarterly. 2002; 17:87–105.10.1016/S0885-2006(02)00132-1
- Chaudry, A.; Henly, J.; Meyers, M. Conceptual frameworks for child care decision-making (ACF-OPRE White Paper). Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services; 2010. Retrieved from <http://www.researchconnections.org/files/childcare/keytopics/conceptualframeworkpaper.pdf>
- Child Care Aware of America. Parents and the high cost of child care: 2012 report. 2012. Retrieved from http://www.naccrra.org/sites/default/files/default_site_pages/2012/cost_report_2012_final_081012_0.pdf

- Colaner A. Multiple institutional logics in the child care market. 2012 Unpublished manuscript.
- Currie J. Early childhood education programs. *Journal of Economic Perspectives*. 2001; 15:213–238.
- DeGangi, DA.; Poisson, S.; Sickel, RZ.; Weiner, AS. *Infant/Toddler Symptom Checklist: A screening tool for parents*. San Antonio, TX: The Psychological Corporation; 1995.
- De Schipper JC, Tavecchio LWC, Van IJendoorn MH, Linting M. The relation of flexible child care to quality of center day care and children's socioemotional functioning: A survey and observational study. *Infant Behavior and Development*. 2003; 26:300–325.10.1016/S0163-6383(03)00033-X
- De Schipper JC, Tavecchio LWC, Van IJendoorn MH, Van Zeijl J. Goodness-of-fit in center day care: Relations of temperament, stability, and quality of care with the child's adjustment. *Early Childhood Research Quarterly*. 2004; 19:257–272.10.1016/j.ecresq.2004.04.004
- Dirks MA, De Los Reyes A, Briggs-Gowan M, Cella D, Wakschlag LS. Annual research review: Embracing not erasing variability in children's behavior: Theory and utility in the selection and use of methods and informants in developmental psychopathology. *Journal of Child Psychology and Psychiatry*. 2012; 53:558–574.10.1111/j.1469-7610.2012.02537.x [PubMed: 22360546]
- Dowsett CJ, Huston AC, Imes AE, Gennetian L. Structural and process features in three types of child care for children from high and low income families. *Early Childhood Research Quarterly*. 2008; 23:69–93.10.1016/j.ecresq.2007.06.003 [PubMed: 19609366]
- Duncan, SE.; De Avila, EA. *PreLAS 2000*. Monterey, CA: CTB/McGraw-Hill; 1998.
- Duncan GJ, Gibson-Davis CM. Connecting child care quality to child outcomes: Drawing policy lessons from nonexperimental data. *Evaluation Review*. 2006; 30(5):611–630.10.1177/0193841X06291530 [PubMed: 16966678]
- Dunn, LM.; Dunn, LM. *Peabody Picture Vocabulary Test*. 3. Upper Saddle River, NJ: Pearson; 1997.
- Early DM, Burchinal MR. Early childhood care: Relations with family characteristics and preferred care characteristics. *Early Childhood Research Quarterly*. 2001; 16:475–497.10.1016/S0885-2006(01)00120-X
- Fitz Gibbon, HM. Child care across sectors: A comparison of the work of child care in three settings. In: Cancian, FM.; Kurz, D.; London, AS.; Reviere, R.; Tuominen, M., editors. *Child care and inequality: Rethinking carework for children and youth*. New York: Routledge; 2002. p. 145-159.
- Folk KF, Yi Y. Piecing together child care with multiple arrangements: Crazy quilt or preferred pattern for employed parents of preschool children? *Journal of Marriage and Family*. 1994; 56:669–680.10.2307/352877
- Forry, N.; Anderson, R.; Banghart, P.; Zaslow, M.; Kreader, JL.; Chrisler, A. *Linking home-based child care and state-funded preschool: The community connections preschool program (Illinois Action for Children)*. Evaluation phase 1– implementation study; Prepared for Illinois Action for Children; Chicago, IL. 2011.
- Fram MS, Kim J. Race/ethnicity and the state of child care: A multi-level analysis of factors influencing first child care experiences. *Early Childhood Research Quarterly*. 2008; 23:575–590.10.1016/j.ecresq.2007.06.003
- Fuller, B. *Standardized childhood: The political and cultural struggles over early education*. Stanford, CA: Stanford University Press; 2010.
- Fuller B, Eggers-Pierola C, Holloway S, Liang X, Rambaud M. Rich culture, poor markets? Why Latino families forgo preschooling. *Teachers College Record*. 1996; 97:400–418.
- Gormley WT. Early childhood care and education: Lessons and puzzles. *Journal of Policy Analysis and Management*. 2007; 26:633–671.10.1002/pam.20269
- Gresham, FM.; Elliott, SN. *Social Skills Rating System manual*. Circle Pines, MN: American Guidance Service; 1990.
- Halle T, Hair EC, Wandner LD, Chien NC. Profiles of school readiness among four-year-old Head Start children. *Early Childhood Research Quarterly*. 2012; 27:613–626.10.1016/j.ecresq.2012.04.001
- Halle, T.; Whittaker, JV.; Anderson, R. *Quality in early childhood care and education settings: A compendium of measures*. 2. Washington, DC: Child Trends; 2010.
- Henly JR, Lyons S. The negotiations of child care and employment demands among low-income parents. *Journal of Social Issues*. 2000; 56:683–706.10.1111/0022-4537.00191

- Holloway SD, Fuller B. Families and child care: Divergent viewpoints. *The Annals of the American Academy of Political and Social Science*. 1999; 563:98–115.10.1177/000271629956300106
- Johnson D. Two-wave panel analysis: Comparing statistical methods for studying the effects of transitions. *Journal of Marriage and Family*. 2005; 67:1061–1075.10.1111/j.1741-3737.2005.00194.x
- Kim J, Fram MS. Profiles of choice: Parents' patterns of priority in child care decision-making. *Early Childhood Research Quarterly*. 2009; 24:77–91.10.1016/j.ecresq.2008.10.001
- Kontos, S. Family child care: Out of the shadows and into the limelight. Washington, DC: National Association for the Education of Young Children; 1992.
- Kreader, JL.; Ferguson, D.; Lawrence, S. Infant and toddler child care quality (Research-to-Policy Connections, No 2). New York, NY: Child Care & Early Education Research Connections, National Center for Children in Poverty; 2005. Retrieved from <http://academiccommons.columbia.edu/catalog/ac%3A127445>
- Laughlin, L. Who's minding the kids? Child care arrangements: Spring 2005 and Summer 2006 (Current Population Reports, P70–121). Washington, DC: U.S. Census Bureau; 2010. Retrieved from <https://www.census.gov/prod/2010pubs/p70-121.pdf>
- Liang X, Fuller B, Singer JD. Ethnic differences in child care selection: The influence of family structure, parental practices, and home language. *Early Childhood Research Quarterly*. 2000; 15:357–384.10.1016/S0885-2006(00)00071-5
- Li-Grining CP, Coley RL. Child care experiences in low-income communities: Developmental quality and maternal views. *Early Childhood Research Quarterly*. 2006; 21:125–141.10.1016/j.ecresq.2006.04.001
- Loeb S, Bridges M, Bassok D, Fuller B, Rumberger RW. How much is too much? The influence of preschool centers on children's social and cognitive development. *Economics of Education Review*. 2007; 26:52–66.10.1016/j.econedurev.2005.11.005
- Long, JS. Regression models for categorical and limited dependent variables. Thousand Oaks, CA: Sage; 1997.
- Long, JS.; Freese, J. Regression models for categorical and limited dependent variables with Stata. 2. College Station, TX: Stata; 2005.
- Lowe ED, Weisner TS. "You have to push it – who's gonna raise your kids?" Situating child care and child care subsidy use in the daily routines of lower income families. *Children and Youth Services Review*. 2004; 26:143–171.10.1016/j.childyouth.2004.01.01
- McCabe LA, Frede EC. Challenging behaviors and the role of preschool education. NIEER Preschool Policy Brief. 2007; 16 Retrieved from <http://nieer.org/publications/policy-matters-policy-briefs/policy-brief-challenging-behaviors-and-role-preschool>.
- Merrell, KM. Preschool and Kindergarten Behavior Scales (PKBS-2). Austin, TX: ProEd; 2003.
- Meyers MK, Jordan LP. Choice and accommodation in parental child care decisions. *Community Development*. 2006; 37:53–70.10.1080/15575330609490207
- Morrissey TW. Familial factors associated with the use of multiple child-care arrangements. *Journal of Marriage and Family*. 2008; 70:549–563.10.1111/j.1741-3737.2008.00500.x
- Morrissey TW. Multiple child-care arrangements and young children's behavioral outcomes. *Child Development*. 2009; 80:59–76.10.1111/j.1467-8624.2008.01246.x [PubMed: 19236393]
- Najarian, M.; Snow, K.; Lennon, J.; Kinsey, S. Early Childhood Longitudinal Study, Birth Cohort (ECLS-B): Preschool-kindergarten 2007 psychometric report (NCES 2010-009). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education; 2010. Retrieved from <http://nces.ed.gov/pubs2010/2010009.pdf>
- National Child Care Information and Technical Assistance Center and National Association for Regulatory Administration (NCCITAC/NARA). The 2008 Child Care Licensing Study. Lexington, KY: Author; 2010.
- NICHD ECCRN. Phase I instrument document. 1999 Unpublished manuscript.
- NICHD ECCRN. Characteristics and quality of child care for toddlers and preschoolers. *Applied Developmental Science*. 2000; 4:116–135.10.1207/S1532480XADS0403_2

- NICHD ECCRN. Early child care and children's development prior to school entry: Results from the NICHD Study of Early Child Care. *American Educational Research Journal*. 2002; 39:133–164.10.3102/00028312039001133
- NICHD ECCRN. Does amount of time spent in child care predict socioemotional adjustment during the transition to kindergarten? *Child Development*. 2003; 74:976–1005.10.1111/1467-8624.00582 [PubMed: 12938694]
- NICHD ECCRN. Type of child care and children's development at 54 months. *Early Childhood Research Quarterly*. 2004; 19:203–230.10.1016/j.ecresq.2004.04.002
- Duncan GJ. NICHD ECCRN. Modeling the impacts of child care quality on children's preschool cognitive development. *Child Development*. 2003; 74:1454–1475.10.1111/1467-8624.00617 [PubMed: 14552408]
- Nord, C.; Edwards, B.; Andreassen, C.; Green, JL.; Wallner-Allen, K. Early Childhood Longitudinal Study, Birth Cohort (ECLS-B): User's manual for the ECLS-B longitudinal 9-month–2-year data file and electronic codebook (NCES 2006–046). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education; 2006.
- Pew Center on the States. Transforming public education: Pathway to a pre-k-12 future. Washington, DC: Author; 2011.
- Pungello EP, Kurtz-Costes B. Why and how working women choose child care: A review with a focus on infancy. *Developmental Review*. 1999; 19:31–96.10.1006/drev.1998.0468
- Radey M, Brewster K. The influence of race/ethnicity on disadvantaged mothers' child care arrangements. *Early Childhood Research Quarterly*. 2007; 22:379–393.10.1016/j.ecresq.2007.05.004
- Sampson, O. Child care confusion – national study and ensuing media coverage leave parents with more questions than answers. *The Gazette*. 2001 Apr 30. Retrieved from <http://infoweb.newsbank.com>
- Sandstrom, H.; Moodie, S.; Halle, T. Beyond classroom-based measures for preschoolers: Addressing the gaps in measures for home-based care and care for infants and toddlers. In: Zaslow, M.; Martinez-Beck, I.; Tout, K.; Halle, T., editors. *Quality measurement in early childhood settings*. Baltimore, MD: Brookes; 2011. p. 317–344.
- Snow, K.; Thalji, L.; Derecho, A.; Wheelless, S.; Lennon, J.; Kinsey, S.; Park, J. Early Childhood Longitudinal Study, Birth Cohort (ECLS-B): Preschool year data file user's manual (2005–06) (NCES 2008-024). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education; 2007.
- Snow, K.; Derecho, A.; Wheelless, S.; Lennon, J.; Kinsey, S.; Morgan, K.; Einaudi, P. Early Childhood Longitudinal Study, Birth Cohort (ECLS-B): Kindergarten 2006 and 2007 data file user's manual (NCES 2010-010). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education; 2009.
- Shivers, EM.; Sanders, K. Measuring culturally responsive early care and education. In: Zaslow, M.; Martinez-Beck, I.; Tout, K.; Halle, T., editors. *Quality measurement in early childhood settings*. Baltimore, MD: Brookes; 2011. p. 191–225.
- Tout, K.; Starr, R.; Soli, M.; Moodie, S.; Kirby, G.; Boller, K. Compendium of quality rating systems and evaluations. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, Department of Health and Human Services; 2010. Retrieved from http://www.acf.hhs.gov/sites/default/files/opre/qrs_compendium_final.pdf
- Tran H, Weinraub M. Child care effects in context: Quality, stability, and multiplicity in nonmaternal child care arrangements during the first 15 months of life. *Developmental Psychology*. 2006; 42:566–582.10.1037/0012-1649.42.3.566 [PubMed: 16756446]
- U.S. Census Bureau. Poverty thresholds: 2005. Washington, DC: U.S. Census Bureau; n.d. Retrieved from <http://www.census.gov/hhes/www/poverty/threshld/thresh05.html>
- U.S. Department of Health and Human Services. Head Start impact study: Final report, January 2010. 2010. Retrieved from http://www.acf.hhs.gov/sites/default/files/opre/hs_impact_study_final.pdf
- Vandell DL. Early child care: The known and the unknown. *Merrill-Palmer Quarterly*. 2004; 50:387–414.10.1353/mpq.2004.0027

- Vandell, DL.; Wolfe, B. Child care quality: Does it matter and does it need to be improved? (IRP Special Report No 78). Madison, WI: Institute for Research on Poverty; 2000. Retrieved from <http://www.irp.wisc.edu/publications/sr/pdfs/sr78.pdf>
- Vermeer HJ, van IJzendoorn MH. Children's elevated cortisol levels at daycare: A review and meta-analysis. *Early Childhood Research Quarterly*. 2006; 21(3):390–401.10.1016/j.ecresq.2006.07.004
- Wooldridge, JM. Introductory econometrics: A modern approach. 4. Mason, OH: South-Western Thomson Learning; 2009.
- Wrigley J, Dreby J. Fatalities and the organization of child care in the United States, 1985–2003. *American Sociological Review*. 2005; 70:729–757.10.1177/000312240507000501
- Zaslow, M.; Tout, K.; Halle, T.; Whittaker, JV.; Lavelle, B. Toward the identification of features of effective professional development for early childhood educators. Washington, DC: Office of Planning, Evaluation and Policy Development, U.S. Department of Education; 2010. Retrieved from <http://www2.ed.gov/rschstat/eval/professional-development/literature-review.pdf>
- Zaslow, M.; Martinez-Beck, I.; Tout, K.; Halle, T., editors. Quality measurement in early childhood settings. Baltimore, MD: Brookes; 2011.

Highlights

- About one-fifth of 4-year-olds in a national sample attended both home- and center-based non-parental child care.
- Mothers who prioritized school readiness were more likely to combine home-based care with a center than use home care only.
- Mothers who prioritized cultural similarity were more likely to combine center-based care with a home than use a center only.
- Children attending centers, alone or along with home care, averaged higher reading and math scores than those in homes only.
- Results were inconsistent for children's average socioemotional outcomes when they did and did not combine care types.

Figure 1. Predicted Directly Assessed Child Cognitive Outcomes

Note. Values are predicted conditional means from OLS regression models that control for maternal care priorities and perceptions, demographic covariates, and lagged child outcomes (see Appendix Table A2 in our online supplementary materials). To facilitate interpretation, we converted values to positive numbers by adding a constant of 3 to the scores. The analyses are weighted by the ECLS-B sampling weight and the standard errors are adjusted for the clustering of children within ZIP codes. The predictions are calculated by systematically indicating each care configuration, one at a time, and holding all other variables constant at their means. The standard errors of the predictions were also calculated, and the error bars extend 1.96 times the standard error above and below the predicted values.

The horizontal black line across each figure is placed at the lower bound of the *Home and Center, Not Head Start* confidence interval.

Figure 2. Predicted Caregiver-Reported Child Socioemotional Outcomes

Note. Values are predicted conditional means from OLS regression models that control for maternal care priorities and perceptions, demographic covariates, and lagged child outcomes (see Appendix Table A2 in our online supplementary materials). The analyses are weighted by the ECLS-B sampling weight and the standard errors are adjusted for the clustering of children within ZIP codes. The predictions are calculated by systematically indicating each care configuration, one at a time, and holding all other variables constant at their means. The standard errors of the predictions were also calculated, and the error bars extend 1.96 times the standard error above and below the predicted values. The horizontal black line across Figure 2a is placed at the lower bound of the *Home-Only, Part-Time* confidence interval. The horizontal black lines in Figures 2b and 2c are placed at the upper bound of the *Center Only, Not Head Start, Part-Time* confidence interval.

Figure 3. Predicted Mother-Reported Child Socioemotional Outcomes

Note. Values are predicted conditional means from OLS regression models that control for maternal care priorities and perceptions, demographic covariates, and lagged child outcomes (see Appendix Table A2 in our online supplementary materials). The analyses are weighted by the ECLS-B sampling weight and the standard errors are adjusted for the clustering of children within ZIP codes. The predictions are calculated by systematically indicating each care configuration, one at a time, and holding all other variables constant at their means. The standard errors of the predictions were also calculated, and the error bars extend 1.96 times the standard error above and below the predicted values.

Table 1

Configurations of Non-Parental Child Care, Overall and by Maternal Employment Status, Family Income Level, and Maternal Race-Ethnicity

Configurations of Non-Parental Child Care	Unweighted Sample Size	Weighted Average Total Hours in Care	Weighted Percentage							
			Overall	Mother Employed?		Family Income < 200% FPL		Maternal Race-ethnicity		
				No	Yes	No	Yes	Non-Hispanic White	Non-Hispanic Black	Hispanic
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(10)
Home- and center-based child care	1,550	20	7	28	21	19	21	22	15	15
Home-based and center	1,050	13	5	19	19	9	17	8	8	8
Home-based and Head Start	500	6	2	9	3	10	4	14	8	8
Center-based child care only	3,950	51	56	47	57	44	53	53	44	44
Center, part-time	1,350	18	27	12	27	10	24	5	12	12
Center, full-time	1,450	18	10	23	24	11	19	23	11	11
Head Start, part-time	350	5	8	3	1	8	3	5	9	9
Head Start, full-time	550	7	9	6	2	12	3	16	10	10
Two or more center-based	250	3	2	4	3	3	4	4	2	2
Home-based child care only	750	11	4	15	9	13	9	12	15	15
Home-based, part-time	150	3	2	3	2	3	2	2	4	4
Home-based, full-time	450	7	2	10	6	7	6	7	9	9
Two or more home-based	100	2	1	2	1	3	1	3	1	1
None (exclusive parental care)	1,300	19	32	10	12	25	18	13	26	26

Note. Values in columns 3–10 are column percentages (due to rounding error, the bolded values sum to 99 within columns 4 and 6 and to 101 within columns 3, 7, and 8; similarly, the unbolded values sum to within one of the bolded values within columns). Unweighted sample size rounded to nearest 50 as per ECLS-B data sharing agreement. Percentages weighted by ECLS-B sampling weight. The fourth racial-category (non-Hispanic of other race) not shown. FPL=federal poverty line. HS=Head Start.

Table 2

Odds Ratios and Significance For Maternal Priorities and Perceptions of Care from Multinomial Logit Model Predicting Eleven Care Configurations, Outcome Contrasts of Families Combining Home- and Center-Care with Other Families

	Contrast Outcome Category: Type of Non-Parental Care Arrangement								
	Center Only					Home Only			
	None (1)	Not Head Start, Part- Time (2)	Not Head Start, Full- Time (3)	Head Start, Part-Time (4)	Head Start, Full-Time (5)	Two or More (6)	Part-Time (7)	Full-Time (8)	Two or More (9)
<u>Combining a center with home-based child care</u>									
Priorities for Care									
School readiness	1.89 *	0.77	0.65 *	0.92	0.73	0.92	2.39 *	2.49 *	2.78 *
Cultural similarity	1.71 *	1.50 *	2.11 *	1.41	1.79 *	1.88 *	0.73	0.51 *	0.72
Practical needs	0.91	1.69 *	1.19	0.83	1.35	1.48 *	0.67	0.80	0.67
Perceptions of Care Options									
Looked, good choices, easy find	--	--	--	--	--	--	--	--	--
Looked, good choices, hard find	0.53 *	1.43 *	0.84	1.30	1.16	0.96	0.78	0.67 *	0.54 *
Looked but no good choices	0.32	1.05	0.66 *	0.77	0.93	1.06	0.35 *	0.50 *	0.24 *
Hasn't looked	0.01 *	0.85	1.91	0.12 *	0.34	>10.00 *	0.03 *	0.04 *	0.06 *
<u>Combining Head Start with home-based child care</u>									
Priorities for Care									
School readiness	2.16 *	0.88	0.75	1.05	0.83	1.05	2.73 *	2.86 *	3.18 *
Cultural similarity	1.52 *	1.33 *	1.87 *	1.25	1.58 *	1.67 *	0.65	0.45 *	0.64
Practical needs	1.03	1.90 *	1.34	0.93	1.52	1.66 *	0.75	0.90	0.75
Perceptions of Care Options									
Looked, good choices, easy find	--	--	--	--	--	--	--	--	--
Looked, good choices, hard find	0.37 *	1.01	0.60 *	0.92	0.82	0.68	0.55	0.47 *	0.38 *
Looked but no good choices	0.37 *	1.19	0.76	0.88	1.06	1.21	0.40 *	0.57 *	0.27 *
Hasn't looked	0.01 *	1.52	3.42 *	0.22 *	0.60	>10.00 *	0.05 *	0.08 *	0.11 *

Note. $n = 7,550$. Values are odds ratios that provide the odds of the outcome contrast (in the top panel, combining home-based child care with a center versus each other listed category; in the bottom panel, combining home-based child care with Head Start versus each other listed category) for the listed predictor contrast (the predictor category named in the row relative to its reference category). All demographic covariates were controlled in the models (see Tables 3 and 4 for covariate odds ratios). The results adjust for the ECLS-B sampling weight and for the clustering of families within ZIP codes. The values > 10.00 are more precisely $e^{19.81}$ in the top panel and $e^{20.39}$ in the bottom panel. -- indicates reference category for predictor variable.

* $p < .05$.

Table 3

Odds Ratios and Significance For Demographic Covariates from Multinomial Logit Model Predicting Eleven Care Configurations, Outcome Contrast with Combining a Center with a Home

	Combining Home and Center vs.									
	Center Only					Home Only				
	None	Not Head Start, Part-Time	Not Head Start, Full-Time	Head Start, Part-Time	Head Start, Full-Time	Two or More	Part-Time	Full-Time	Two or More	
Child is female	1.02	1.15	1.04	1.49*	0.99	0.95	1.61*	1.15	1.14	
Child's age (in months)	1.03*	0.99	0.96*	1.01	0.99	0.99	1.04	1.06*	1.12*	
Mother Employed	8.14*	8.53*	1.63*	7.01*	3.70*	1.52*	1.44	0.53*	0.65	
Partner Presence & Employment										
No Partner in Household	--	--	--	--	--	--	--	--	--	
Partner, Not Employed	0.45*	0.27*	1.88*	0.44*	0.43*	1.71	0.36*	2.53*	0.91	
Partner, Employed	0.46*	0.26*	0.87	0.60*	0.67*	1.02	0.52	1.22	0.72	
Family Income to Needs										
Less than 1	--	--	--	--	--	--	--	--	--	
Between 1 and 1.99	1.03	0.73	0.89	1.43	1.23	1.23	0.72	0.85	0.92	
Between 2 and 2.99	1.27	0.58*	0.68	3.39*	2.13*	2.30	1.03	0.92	2.59*	
Between 3 and 3.99	1.24	0.69	0.77	5.90*	6.64*	1.94	0.87	0.73	2.37	
Four or higher	3.32*	0.86	0.72	5.08*	7.80*	2.90*	2.93*	1.11	3.29	
Missing income	0.84	0.52*	0.40*	0.86	0.60	0.97	0.87	0.58	1.31	
Maternal Race-Ethnicity										
Non-Hispanic, White	--	--	--	--	--	--	--	--	--	
Non-Hispanic, Black	0.60*	1.08	0.34*	0.68	0.23*	0.66	0.50*	0.48*	0.30*	
Non-Hispanic Other	1.29	1.10	0.80	0.83	0.66	0.88	0.72	0.87	0.64	
Hispanic	0.67*	0.78	0.84	0.42*	0.36*	1.30	0.35*	0.41*	0.96	
Maternal Education										
High school or less	--	--	--	--	--	--	--	--	--	
Some college	1.79*	1.27	1.21	1.95*	1.62*	1.04	2.61*	1.53*	2.76*	
Bachelor's or more	2.58*	1.28	1.07	6.07*	6.28*	0.90	2.35*	2.41*	4.11*	

Combining Home and Center vs.										
	None	Center Only				Home Only				
		Not Head Start, Part-Time	Not Head Start, Full-Time	Head Start, Part-Time	Head Start, Full-Time	Two or More	Part-Time	Full-Time	Two or More	
Relatives in Area	1.31	1.24	1.55 *	1.55 *	1.16	1.29	1.09	1.07	0.91	
Median Income in ZIP code										
Less than \$40,000	--	--	--	--	--	--	--	--	--	--
\$40,000-\$49,999	1.05	1.16	1.41 *	1.19	1.61 *	1.25	0.60	0.88	1.63	
\$50,000-\$64,999	0.87	0.89	1.32	1.44	2.32 *	2.04 *	0.65	1.23	1.20	
\$65,000 or more	1.01	0.64 *	1.29	2.24 *	3.36 *	1.63	0.64	1.35	1.25	
Missing income	0.85	0.67	1.19	10.70 *	1.26	1.37	3.24 *	0.94	1.76	

Note. $n = 7,550$. Odds ratios provide the odds of the outcome contrast (combining home-based child care with a center versus each other listed category) for the listed predictor contrast (the predictor category named in the row relative to its reference category). Maternal priorities for care and perceptions of care options were also in the model (results shown in Table 2). The results adjust for the ECLS-B sampling weight and for the clustering of families within ZIP codes. --indicates reference category for predictor variable.

* $p < .05$.

Table 4

Odds Ratios and Significance For Demographic Covariates from Multinomial Logit Model Predicting Eleven Care Configurations, Outcome Contrast with Combining Head Start with a Home

	Combining Home and Head Start Center vs.									
	Center Only					Home Only				
	None	Not Head Start, Part-Time	Not Head Start, Full-Time	Head Start, Part-Time	Head Start, Full-Time	Two or More	Part-Time	Full-Time	Two or More	
Child is female	1.10	1.24	1.12	1.61*	1.07	1.03	1.75*	1.21	1.23	
Child's age (in months)	1.06*	1.02	0.99	1.04	1.02	1.01	1.06*	1.08*	1.14*	
Mother Employed	11.82*	12.38*	2.36*	10.18*	5.38*	2.21*	2.09*	0.78	0.94	
Partner Presence & Employment										
No Partner in Household	--	--	--	--	--	--	--	--	--	
Partner, Not Employed	0.23*	0.14*	0.96	0.23*	0.22*	0.87	0.18*	1.29	0.46	
Partner, Employed	0.31*	0.17*	0.58*	0.40*	0.45*	0.68	0.35*	0.82	0.48*	
Family Income to Needs										
Less than 1	--	--	--	--	--	--	--	--	--	
Between 1 and 1.99	0.89	0.63	0.77	1.23	1.06	1.06	0.62	0.74	0.79	
Between 2 and 2.99	0.81	0.37*	0.43*	2.17	1.36	1.47	0.66	0.59	1.66	
Between 3 and 3.99	0.44*	0.25*	0.27*	2.11	2.37	0.69	0.31*	0.26*	0.85	
Four or higher	0.63	0.16*	0.14*	0.96	1.47	0.55	0.55	0.21*	0.62	
Missing income	0.95	0.59	0.46*	0.97	0.67	1.10	0.98	0.66	1.48	
Maternal Race-Ethnicity										
Non-Hispanic, White	--	--	--	--	--	--	--	--	--	
Non-Hispanic, Black	2.03*	3.68*	1.15	2.30	0.76	2.24*	1.69	1.62	1.01	
Non-Hispanic Other	2.79*	2.39*	1.72	1.79	1.42	1.91	1.55	1.88	1.39	
Hispanic	1.59*	1.85*	1.99*	0.99	0.86	3.06*	0.84	0.96	2.28*	
Maternal Education										
High school or less	--	--	--	--	--	--	--	--	--	
Some college	1.15	0.82	0.77	1.25	1.04	0.67	1.68	0.98	1.77	
Bachelor's or more	0.73	0.37*	0.31*	1.73	1.79	0.26*	0.67	0.69	1.17	

Combining Home and Head Start Center vs.										
	None	Center Only				Home Only				
		Not Head Start, Part-Time	Not Head Start, Full-Time	Head Start, Part-Time	Head Start, Full-Time	Two or More	Part-Time	Full-Time	Two or More	
Relatives in Area	1.64 *	1.56 *	1.94 *	1.95 *	1.46 *	1.61 *	1.36	1.35	1.14	
Median Income in ZIP code										
Less than \$40,000	--	--	--	--	--	--	--	--	--	--
\$40,000-\$49,999	0.60 *	0.67	0.81	0.69	0.93	0.72	0.35 *	0.51 *	0.94	
\$50,000-\$64,999	0.40 *	0.41 *	0.61 *	0.66	1.06	0.93	0.30 *	0.57	0.55	
\$65,000 or more	0.30 *	0.19 *	0.39 *	0.68	1.01	0.49	0.19 *	0.41	0.38 *	
Missing income	0.37 *	0.29 *	0.52 *	4.72	0.55	0.60	1.43	0.41 *	0.77	

Note. $n = 7,550$. Odds ratios provide the odds of the outcome contrast (combining home-based child care with Head Start versus each other listed category) for the listed predictor contrast (the predictor category named in the row relative to its reference category). Maternal priorities for care and perceptions of care options were also in the model (results shown in Table 2). The results adjust for the ECLS-B sampling weight and for the clustering of families within ZIP codes. -- indicates reference category for predictor variable.

* $p < .05$.