Child Care during the Summer and First Grade Year: How Extent and Type of Care Relate to Child Socioemotional Skills

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September 10, 2007

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Abstract

Nearly half of all school-age children are exposed to non-parental care in their early school years and summers, yet, how these typical school-age child care arrangements relate to child outcomes is poorly understood. The present study addresses this gap in the school-age child care literature by examining the links between extent and type of child care during the summer before first grade as well as during the first grade year and children's socioemotional well-being using the Early Childhood Longitudinal Study-Kindergarten cohort (ECLSK). In addition, this study uses multiple imputation to produce two different sets of results and compares the estimates from these different imputation specifications with more typical regression estimates. Preliminary results indicate that attending center child care during the summer before first grade is related to increased behavior problems at the end of first grade. First grade child care experiences do not appear to relate to child socioemotional well-being.

Formal after-school programs and activities receive much attention from both researchers and policymakers, but little is known about other, more typical types of school-age child care experiences and their relationship to child well-being. Often referred to as after-school care or out-of-school time (OST), school-age child care includes both formal after-school programs as well as a wide-range of non-parental care options such as center, relative, and non-relative care. In addition, school-age child care includes care experiences both during the school year and the summer months. A large body of research investigates the relationship between child care and child well-being. Yet, virtually all of these studies focus on pre-school child care experiences. Few, if any, studies examine how child care during the early school years and summer breaks might relate to child well-being.

Surveys estimate that nearly half of all 6-9 year old children with an employed mother attend some type of non-parental child care during the school year, and 60% of these children experience both formal and informal non-parental care during the summer months (Capizzano, Adelman, & Stagner, 2002; Capizzano, Tout, & Adams, 2000).[1] Of the children in child care, during the school year, a little over one third of 6-9 year old children are cared for by a relative, just under one third by a non-relative in the child's or non-relative's home, and the remaining third attend center care including formal before- and after-school programs. In the summer, of children in care, almost half are cared for by a relative, 17% by non-relatives, and the remaining third attend center care or formal programs. Nearly half of all school-age children are exposed to non-parental care in their early school years and summers, yet, how these typical school-age child care arrangements relate to child socioemotional well-being is poorly understood. The

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[1] Surveys rarely estimate the total proportion of school-age children in non-parental care; rather, surveys focus on school-age children with employed mothers. The present study includes all children in care not just those with employed mothers.

present study aims to address this gap in the school-age child care literature by examining the links between extent and type of child care during the summer before first grade as well as during the first grade year and children's socioemotional well-being using the ECLSK. This study also uses multiple imputation and compares two different sets of imputed results to more typical regression estimates.

Child care and child well-being

Children's lives are influenced by multiple contexts such as home, school, and child care. Children interact with these contexts, and the environments present children with a range of opportunities and expectations. Transactional and ecological developmental theories suggest that child development is the product of the interaction of the child with these multiple contexts (Bronfrenbrenner & Ceci, 1994; Sameroff, 1994). As children participate in different environments, their characteristics and predispositions affect how their parents, caregivers, teachers, and peers respond and relate to them. Likewise, the characteristics of parents, caregivers, teachers, and peers along with their own predispositions affect both the environment and the child. Children's developmental trajectories are influenced by these interactions with multiple contexts (Bronfrenbrenner & Ceci, 1994; Bronfrenbrenner & Morris, 1998). Child care is often considered an important developmental context for children, but most research focuses on its role in early childhood development rather than middle childhood.

Middle childhood, typically beginning with the transition to formal school and ending with adolescence, is an important period for child development. In middle childhood, children develop a range of capacities including new cognitive skills, self-concept and identity, and social relationships (Huston & Ripke, 2006). The contexts of children's lives also expand in middle childhood to include a variety of non-familial experiences including school, child care, peers,

and activities. The large number of contexts that children experience in middle childhood might help to explain why researchers have largely neglected typical middle childhood child care experiences. Researchers have focused on formal, structured activities finding that children who attend structured OST activities have better social skills than those not in activities (Mahoney, Larson, & Eccles, 2005), and time in unstructured activities with no supervision can place children at risk (Pettit, Bates, Dodge, & Meece, 1999). In addition, poor socioemotional competencies in middle childhood relate to a range of early problems including poor achievement, delinquency, expulsion, attention problems, and peer rejection (Alexander, Entwisle, & Dauber, 1993; Cooper & Farran, 1988; Gilliam, 2005; McClelland, Morrison, & Holmes, 2000; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 2004a), and poor relationships in middle childhood place a child at risk of social and emotional problems in adolescence and adulthood (Hartup & Moore, 1990; Rubin, Bukowski, & Parker, 1998).

Pre-school child care. One important context in children's development is child care. However, uncovering how child care affects child development is difficult because children's lives are dynamic and children are influenced by a variety of contexts. Characteristics of both the child and the parents influence decisions about work and children's schooling. Similarly, decisions about child care are also influenced by both parental and child characteristics (Fuller, Holloway, & Liang, 1996; Singer, Fuller, Keilly, & Wolf, 1998). Thus, in order to fully understand how child care relates to child development, researchers must consider the importance of characteristics of both children and their families.

The role of child care experiences prior to school entry in child socioemotional well-being is well-documented. These early care experiences are an important influence on children's

socioemotional development (Baydar & Brooks-Gunn, 1991; Burchinal, Peisner-Feinberg, Bryant, & Clifford, 2000; Caughy, Dipietro, & Sobrobino, 1994; Halle et. al., 2005; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2005; NICHD ECCRN, 1998, 2000, 2001, 2003, 2004b; Peisner-Feinberg, Burchinal, Clifford, Yazejian, Byler, & Rustici, et. al., 1999; Votruba-Drzal, Coley, & Chase-Lansdale, 2004). Components of child care such as quality and stability also to socioemotional outcomes (Burchinal et al., 2000; NICHD ECCRN, 1998, 2000, 2001, 2002, 2003, 2004b; Peisner-Feinberg et. al., 1999, Phillips, Mekos, Scarr, McCartney, & Abbott-Shim, 2001; Votruba-Drzal et al., 2004), although these components of child care are not readily available in many studies. This extensive literature on early child care experiences suggests that child care is an important context in early child socioemotional development. In particular, these early care experiences can not only promote positive behaviors, but also lead to increases in negative, or problem behaviors.

Two components of pre-school child care that have been shown to relate to child socioemotional outcomes are extent and type of care (Baydar & Brooks-Gunn, 1991; Burchinal et al., 2000; Caughy et al., 1994; Halle et al., 2005; Loeb et al., 2005; NICHD ECCRN, 1998, 2000, 2001, 2003, 2004b; Peisner-Feinberg et. al., 1999; Votruba-Drzal et al., 2004). Typically, these studies find that center child care and the extent of center care prior to school entry are related to increases in problem behaviors and decreases in positive behaviors, although not all studies find this negative relationship. In addition, many of these studies produce small to modest effect size estimates.

In two studies of pre-school child care using the nationally representative ECLSK, children in center child care the year prior to kindergarten entry had lower ratings of positive behaviors from their kindergarten teachers (Loeb et al., 2005), and children in any non-parental

care prior to kindergarten entry had less optimal teacher reports of self control (Halle et al., 2005). In addition, children in long hours of center care had lower ratings on positive behaviors (Loeb et al., 2005) and attention (Halle et al., 2005) in kindergarten. Neither of these studies examines child care experiences after school entry, and neither study can address why or how center care prior to school entry leads to child behavior problems.

This link between pre-school center care and increases in behavior problems is less consistent for particular subgroups of children. The NICHD ECCRN (2001, 2002, 2003), a sample of primarily middle- and high-SES children from ten U.S. locations, finds that children who spent more time in center child care prior to school entry had lower ratings on peer relations. In this sample, the amount of time in any child care prior to kindergarten entry is related to increased externalizing problems in kindergarten independent of both type and quality of child care. In contrast, in a sample of primarily low-income, minority children in three cities, more time in pre-school child care is associated with decreases in behavior problems (Votruba-Drzal et al., 2004). In this sample of low-income children, quality child care relates to positive socioemotional development.

The relationship between extent of pre-school child care and children's socioemotional well-being during the pre-school years is complex and can vary by child characteristics. Additional time in child care and center care itself might be beneficial (Votruba-Drzal et. al., 2004) or neutral for low-income children (Halle et. al., 2005; Loeb et. al., 2005), while the extent of care as well as center care might be associated with negative socioemotional outcomes for more diverse group of children (Halle et. al., 2005; Loeb et. al., 2005; NICHD ECCRN, 2001, 2003). These findings suggest that studies must consider the interaction between child

characteristics and child care experiences in order to understand the relationship between child care and child well-being.

School-age child care. While pre-school child care experiences are studied as important contexts for early childhood development, school-age child care as a context for middle childhood development is not often considered. The literature on the implications of school-aged child care is sparse. Most all of the research on school-age care focuses on formal after-school, or OST activities rather than on the more diverse array of child care arrangements of school-aged children. Evidence shows that formal after-school programs relate to better peer relationships, conduct, and emotional adjustment (Posner & Vandell, 1994, 1999; Riley, Steinberg, Todd, Junge, & McClain, 1994). OST activities benefit children socially and emotionally, particularly low-income children (Harvard Family Research Project, 2003; Mahoney et al., 2005; Morris & Kalil, 2006; Ripke, Huston, & Casey, 2006; Simpkins, Friedricks, Davis-Kean, & Eccles, 2006). However, higher income youth are more likely to participate and participate with greater frequency than their low-income counterparts (Harvard Family Research Project, 2003).

A review of 54 experimental or quasi-experimental OST programs found that OST programs increased communication skills, confidence/self esteem, desire to help others, and general well-being (Harvard Family Research Project, 2003). These programs also decreased aggression among participants. However, as in most studies of school-age activities, this research focused solely on formal before- and after-school programs, rather than on the more diverse range of school-age care that children actually experience.

In terms of school-age child care, patterns of use vary by child age and family income (Capizzano et al., 2000; Smith, 2000). Not surprisingly, younger school-age children attend more non-parental child care arrangements, while older children are often unsupervised or in formal

before- and after-school programs. In addition, higher income families use more formal center care for their school-age children, while low-income families utilize relative care (Capizzano et al., 2000). However, in the summer months, young school-age children (ages 6-9) of all backgrounds experience a substantial amount of relative care—significantly more relative care than during the school year (Capizzano et al., 2002). Given the large proportion of young school-age children who experience non-parental care, understanding how these experiences relate to child socioemotional well-being is important for middle childhood development.

In one of the only studies of early school-age child care experiences, Claessens (2006) finds that center child care during the kindergarten year is associated with increases in externalizing behaviors and decreases in positive behaviors of self control, attention (approaches to learning), and interpersonal skills. This study also shows that the extent of non-parental care is not related to child well-being, and that relative and non-relative child care arrangements are not related to child socioemotional well-being. Further, Claessens (2006) finds that the relationship between center care and increased child problem behaviors was consistent across subgroups of children by race/ethnicity, sex, and SES as well as by full- or part-day kindergarten.

Summer break and child well-being. A large literature documents the relationship between summer break and academic achievement loss (Alexander, Entwisle, & Olson, 2007; Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996), showing that it is particularly detrimental for low-income children. However few studies examine the relationship between summer break and socioemotional well-being. While the primary focus of most summer programs is academic, some scholars have argued that more attention should be focused on the whole child during the summer months (Halpern, 2005). Halpern (2005) suggests that high quality, developmentally appropriate summer experiences can build confidence, motivation, and self-esteem. Yet, studies

of school-age summer activities and experiences rarely include measures of socioemotional well-being.

In a survey of parents and children about summer activities and child care, Duffett and colleagues (2004) find that summer is the most difficult time to find quality programs and child care. In addition, low-income parents are more concerned than high-income parents that they will have difficulty arranging summer care. Further, Capizzano and colleagues (2002) suggest that lower income children receive lower quality child care and engage in fewer enrichment activities during the summer months. Given that parents are concerned about the availability of quality non-parental care for their children in the summer months and the large proportion of children who are exposed to non-parental are, it is surprising that research rarely examines how these care arrangements relate to child socioemotional well-being.

The present study aims to address this gap in the middle childhood and child care literatures. This study examines the relationship between extent and type of child care during both the summer months and the first grade year and child socioemotional well-being measured at the end of first grade. First, I provide a description using a nationally representative sample, of the extent and type of children's summer and first grade child care experiences. Then, I examine how these experiences relate to socioemotional functioning at the end of first grade. Finally, I compare two different sets of estimates using multiple imputation to more typical regression results. Given that type of care during the kindergarten year and not extent of care is related to increases in problem behaviors and decreases in positive behaviors (Claessens, 2006), I expect that the type of child care, rather than the extent of care will be associated with increases in problem behaviors during both the summer and the first grade year.

Method

Data

Data used in this analysis come from the Early Childhood Longitudinal Study-

Kindergarten (ECLSK) cohort. Designed to focus on children's early school experiences, the

ECLS follows a nationally representative sample of 21,260 children who entered kindergarten in

1998-99. The study will collect data at both fall and spring of kindergarten and first grade, and

spring of third, fifth, eighth, tenth, and twelfth grades. This paper uses data collected in the fall

and spring of kindergarten and first grade. Data come from multiple sources including direct

assessments of children, interviews with parents, and surveys of teachers and school

administrators.

Sample

While the baseline sample included over 21,000 children, this analysis uses the 5,000

children included in the fall of first grade sub-sample. The ECLSK attempted to follow-up with

all children at the spring of each grade. However, in the fall of first grade they randomly sampled

a third of the schools that the children attended, resulting in a sample of 27% of the eligible

children. When weighted, the fall of first grade sub-sample is representative of the larger

nationally representative sample of kindergartners. In addition, the ECLSK provides weights to

adjust for attrition. The weighted and unweighted results of this study are virtually identical.

The analytic sample used here includes approximately 2,600 of the approximately 5,000

children sampled due to missing data. Children are excluded from the analysis if they are missing

data on any of the child socioemotional outcomes, child care information, and any of the

covariates described below. Because missing data reduces the sample by almost 50%, I use

multiple imputation techniques to increase the sample to 4,410. This excludes children who were missing data on sex, race/ethnicity, and age at the baseline survey, and children who were missing data on summer child care experiences. Further, because the fall of first grade sub-sample is a random sample of the larger 21,000 children, I also use multiple imputation to increase the sample to over 14,000 children, again excluding children who were missing data on sex, race/ethnicity, and age at baseline.

Measures

    Type and extent of child care. The primary independent variables of interest—extent and type of summer and first grade child care—were constructed using fall of first grade parent reports. In the fall of first grade, parents were asked about their child's regular weekly child care arrangements during the summer and their child's current, first grade, child care arrangements. Parents were asked these questions about the extent of care for each type of care—center, non-relative, and relative care. Dichotomous variables for the three types of summer and first grade child care were create, resulting in six variables for type of care. In addition, six continuous variables capturing the average weekly hours of child care by type were created from these parent reports for both summer and first grade child care. Both the dichotomous and continuous variables allow for children to attend more than one type of care during the summer and/or the first grade year.

    Child outcomes.[2] The outcomes of interest are children's socioemotional skills in the spring of first grade measured by teacher reports. Teachers assessed sample children in their classrooms in the spring of first grade using the Social Rating Scale (SRS) designed specifically

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[2] I initially included reading and math achievement test scores as outcomes; however, as in previous research using the ECLSK and school-age child care experiences, there was no relationship between child care and these outcomes.

for the ECLSK.[3] Teachers rated children in five areas: approaches to learning, self control, interpersonal skills, and externalizing and internalizing behaviors. The SRS is a self-administered questionnaire on which teachers rate children in five domains: self control, interpersonal skills, approaches to learning, and externalizing and internalizing problem behaviors. Each item within a domain was rated on a four point scale 1= "never" and 4= "very often." The test-retest reliabilities of these scales range from .79 to .89.

The four item self control scale indicates a child's ability to control behavior by respecting the property rights of others, controlling temper, accepting peer ideas for group activities and responding appropriately to pressure from peers. The five item interpersonal skill scale rates the child's ability to form and maintain friendships, get along with people who are different, comfort or help other children, express feelings, ideas and opinions in positive ways, and show sensitivity to the feelings of others. The approaches to learning scale includes six items that measure the child's attentiveness, task persistence, eagerness to learn, learning independence, flexibility and organization. The five item externalizing problem behaviors scale rates the frequency with which a child argues, fights, gets angry, acts impulsively, and disturbs ongoing activities. The four item internalizing problem behavior scale rates the child's anxiety loneliness, low self-esteem, and sadness.

Covariates. Given that parents' selection of child care is related to both parental and child characteristics (Fuller et al., 1996; Singer et al., 1998), including extensive family and child demographic and background characteristics as controls is important. Descriptive statistics for these variables are shown in Appendix A. Child background characteristics include age, sex,

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[3] The ECLSK Users' Manual indicates that the SRS used in the ECLSK is adapted from the Social Skills Rating System ([SSRS] Gresham & Elliott, 1990; however, no item-level information is available in the dataset.

race/ethnicity, and overall health. Home environment characteristics include number of siblings,

household composition, mother's age at both first child's and sample child's birth, whether or

not the mother worked between child's birth and kindergarten, four or more moves prior to

kindergarten, and number of books in the home. Covariates also include the length of the

summer in days and whether or not the child attended summer school, camp, or activities. The

analysis also includes primary type of pre-school child care as well as controls for type of

kindergarten child care. Children's kindergarten entry socioemotional skills and achievement

test scores are included in some models, and spring of kindergarten teacher ratings of

socioemotional skills and achievement test scores are included in all models.

Analytic Strategy

I estimate two separate relationships between extent and type of child care and children's

socioemotional well-being. The first, the relationship between type of summer and first grade

child care, apart from time in care, and child outcomes, takes the form:

(1) $\text{Child Outcome}_{iS1} = a_1 + ß_1 \text{Relcare}_{iSUM} + ß_2 \text{Non-relcare}_{iSUM} + ß_3 \text{Centercare}_{iSUM} + ß_4 \text{Relcare}_{i1} + ß_5 \text{Non-relcare}_{i1} + ß_6 \text{Centercare}_{i1} + ß_7 \text{Child Outcome}_{iSK} + ß_8 \text{Child}_{iFK} + ß_9 \text{Fam}_{iFK} + \varepsilon_{iS1}$

Where Child Outcome$_{ijS1}$ is the spring of first grade (S1) child outcome (socioemotional skill) of

child i. Relcare$_{iSUM}$, Non-relcare$_{iSUM}$, and Centercare$_{iSUM}$ are dichotomous measures for the type

of child care child i attended during the summer between kindergarten and first grade. They are

defined as relative, non-relative, and center child care. Children who are not in child care during

the summer serve as the reference group. Relcare$_{i1}$, Non-relcare$_{i1}$, and Centercare$_{i1}$ are

dichotomous variables for the type of child care child i attended during the first grade year. As

with summer child care, they are defined as relative, non-relative, and center child care. Children who are not in child care during first grade serve as the reference group.

Child Outcome$_{iSK}$ is the spring of kindergarten (SK) measure of the child outcome of interest for child i. This model also includes Child$_{iFK}$ and Fam$_{iFK}$ which are background and demographic characteristics of both the child and the family measured in fall of kindergarten.

The second relationship of interest, between extent of child care during the summer and first grade year by type of care and child outcomes, takes the form:

$$\textbf{(2)} \quad \textbf{Child Outcome}_{iS1} = a_1 + \beta_1 \textbf{ RelHrs}_{iSUM} + \beta_2 \textbf{ Non-relHrs}_{iSUM} +$$

$$\beta_3 \textbf{CenterHrs}_{iSUM} + \beta_4 \textbf{ RelHrs}_{i1} + \beta_5 \textbf{Non-relHrs}_{i1} + \beta_6 \textbf{CenterHrs}_{i1} +$$

$$\beta_7 \textbf{Child Outcome}_{iSK} + \beta_8 \textbf{Child}_{iFK} + \beta_9 \textbf{Fam}_{iFK} + \varepsilon_{iS1}$$

Where RelHrs$_{iSUM}$, Non-relHrs$_{iSUM}$, and CenterHrs$_{iSUM}$ are the average weekly hours that child i spends in relative, non-relative, and center child care during the summer between kindergarten and first grade. RelHrs$_{i1}$, Non-relHrs$_{i1}$, and CenterHrs$_{i1}$ are the average weekly hours that child i spends in relative, non-relative, and center child care during the first grade year. All other components are identical to the first model shown (1).

In addition to these two specifications, I test for a nonlinear relationship between extent of child care and the outcomes of interest using a series of dummy variables for weekly hours of care by type to investigate any differences between spending a small number of hours in child care and spending more extensive time in child care, again by type of care. Because the relationship between type and extent of child care might be different for different groups of children, I also estimate the extent and type of child care models [(1) and (2)] for specific subgroups of children including race/ethnicity (white, Latino, Black), sex, and SES.

Because children are not randomly assigned to extent or type of child care, both observed and unobserved characteristics of the child and family could bias the estimates of the coefficients β_1, β_2, and β_3. In addition, the sampling design included multiple children per kindergarten classroom, so I estimate the models to adjust for classroom clustering using Huber-White methods (White, 1980). I also include baseline $Child_{iFK}$ and Fam_{iFK} variables to try to eliminate any omitted variable bias. Capitalizing on the longitudinal nature of the data, each model controls for the spring of kindergarten measure of the outcomes of interest. Sometimes referred to as a "lagged-y" or "residual change" model, inclusion of this measure of the outcome of interest reduces potential omitted variable bias as there are likely unobserved characteristics of the child that are related to both the spring of kindergarten and the spring of first grade measures of socioemotional well-being (Votruba-Drzal et. al, 2004).

Initially, I use listwise deletion to account for missing data. However, listwise deletion, along with other missing data strategies, such as mean substitution and missing data dummy variables, can produce biased estimates (Acock, 2005). These methods can also reduce or exaggerate the power to detect effects. Multiple imputation offers an improvement over other approaches to handling missing data (Acock, 2005). Multiple imputation under the appropriate assumptions offers a range of benefits (Allison, 2000, 2001). Multiple imputation allows for generally unbiased estimates of all the parameters through the introduction of random error (Allison, 2000,2001; Landerman, Land, & Pieper, 1997; Little & Rubin, 1989). This procedure also provides better standard error estimates than single imputation techniques (Allison, 2000, 2001; Landerman et al., 1997; Little & Rubin, 1989). The key assumption when implementing multiple imputation is that the data are missing at random conditioned on the predicting

covariates. If this assumption is violated, multiple imputation can actually produce more biased estimates than using listwise deletion (Allison, 2000).

Given that the analytic sample is reduced by nearly 50% due to missing data, I use multiple imputation to estimate two sets of results in addition to the initial results obtained using listwise deletion. First, I use multiple imputation to impute for the full sub-sample of children included in the fall of first grade survey, n=4,144. I assume in this instance that the data are missing at random after examining the pattern of missingness in the available data. There was no discernible pattern to the missings. Then, I impute for the full sample of children with available data in the kindergarten year, but not included in the fall of first grade survey, n=14,166. Here, the missing at random assumption is clear since the sub-sample of children surveyed in the fall of first grade were randomly sampled from the larger sample. Using STATA ICE and MICOMBINE commands (Royston, 2005), I am able to impute for these two different comparisons. I use sampling weights and 5 imputations for each dataset.[4]

Results

Table 1 presents the means and standard deviations for the outcomes of interest and summer and first grade child care type and extent for the full sample of children surveyed in the fall of first grade and for children in summer care and first grade child care. In the fall of first grade sub-sample, 10% of children attend center care in the summer between kindergarten and first grade, while 27% are in relative care, and another 12% are in non-relative care. In first

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[4] The variables listed in appendix table B.1 are used in each imputation equation. Each imputation is done separately creating two distinct sets of multiply imputed data. The first for the subsample n-4,144. The second for the larger sample, n=14,166.

grade, 17% attend center child care, 22% relative care, and 9% non-relative care. Almost two thirds of the sample is white (59%), and the sample is half girls.

For children in summer child care, the modal weekly hours of all three types of care is 40. The average weekly hours of care for children in summer child care is 6.8 hours of center care, 16.7 hours of relative care, and 6.9 hours of non-relative care. Most of the children (62%) are in relative care during the summer.   Of the children in first grade child care, the modal weekly hours of care for all three types of care is 10. Children in first grade child care spend, on average, 5.6 hours per week in center care, 11.7 hours in relative care, and 5.2 hours in non-relative care. Children in first grade child care are primarily in relative care arrangements.

Table 2 presents the correlations between the average weekly hours of both summer and first grade child care by type of care and the spring of first grade socioemotional outcomes. The average weekly hours of all three types of child care in both summer and first grade are typically negatively correlated with the positive measures of approaches to learning, self control, and interpersonal skills and positively correlated with the negatively scaled measures of externalizing and internalizing behaviors. While the magnitude of these correlations is quite small, ranging from -.06 to -.01, the correlation between average weekly hours of center care in both the summer and first grade and externalizing problems is slightly larger, .11.

Table 3 presents the coefficients and standard errors from regression models predicting spring of first grade child socioemotional skills using the three types of summer and first grade child care for the full sample of children included in the fall of first grade survey using listwise deletion. The outcome variables are standardized to the full weighted sample, so that results can be interpreted in terms of standard deviation increments. The first model for each outcome controls for child race/ethnicity and sex and the child and family background characteristics

shown in Appendix A. These controls include the length of the summer, whether or not the child attended summer school, camp, or other activities, and the type of child care the child attended during the kindergarten year and pre-school. These models also control for the spring of kindergarten measures of child achievement and socioemotional skills. The second model for each outcome adds the fall of kindergarten measures of child achievement and socioemotional skills to the first model.

Type of child care in the summer or first grade does not appear to relate to approaches to learning, self control, or interpersonal skills measured at the spring of first grade. However, center child care during the summer does relate to an increase in externalizing behavior in the spring of first grade of .12 of a standard deviation (models 7 and 8, table 3). While center care during first grade is associated with an increase in externalizing behavior in model 7 of .12 of a standard deviation, it is no longer statistically significant in model 8 when fall of kindergarten achievement and socioemotional skills are added to the model. In addition, center child care during the summer is also related to an increase in internalizing behavior of .17 of a standard deviation.

To examine the relationship between average weekly hours of summer and first grade child care and the child outcomes, I use a series of dummy variables for average weekly hours of care by type. Rather than present the results for the linear specification shown in equation (2), I present these nonlinear results since they can also be used to examine a linear pattern (i.e. the coefficients for the dummy variables increase at the same rate). This specification tests for a non-linear relationship between average weekly hours of care and the outcomes. Table 4 shows the results using the series of dummy variables for time in summer and first grade child care by type. The first panel of table 4 shows the coefficients and standard errors for weekly hours of summer

center, relative, and non-relative care, and the second panel shows the results for hours of first grade care. As in the previous table, the first model for each outcome includes the child and family background characteristics and spring of kindergarten achievement and socioemotional skills. The second model adds kindergarten entry measures of child achievement and socioemotional skills. The results in table 4 show few statistically significant relationships between average weekly hours of child care and child socioemotional skills. In addition, few of the coefficients are statistically significantly different from each other, indicating that the relationship between summer and first grade child care and these outcomes is best represented using type of child care rather than weekly hours of care.

While over 5,000 children were included in the fall of first grade survey, the results in tables 3 and 4 are based on less than 3,000 children due to missing data. Because the previous research on kindergarten child care experiences and child socioemotional skills produces an effect size of .05 to .10 (Claessens, 2006), it is not surprising that the analyses summarized in table 3 produce few statistically significant results. The standard errors for the coefficients in these models are typically .05 or higher. Therefore, only effect sizes of .1 or higher can be detected from the sample used here. In order to examine the extent to which the missing data may be biasing these results, I use a multiply imputed dataset with 4,144 children to estimate the relationship between summer and first grade child care and child socioemotional outcomes.

Coefficients and standard errors from the same regression models shown in table 3 using a multiply imputed dataset are shown in table 5. As in table 3, center child care during the summer is still associated with increases in externalizing behavior in both models 7 and 8. The point estimate using the multiply imputed data is higher, .16, than the .12 estimate shown in table 3. As was the case in table 3, center care during the first grade year is associated with an

increase in externalizing behavior in model 7, .11, but this result is insignificant in model 8. Interestingly, using the multiply imputed data produces larger coefficient estimates and smaller standard errors for center child care during the summer. The results in table 5 indicate that center care during the summer is associated with a decrease in approaches to learning (-.12 standard deviation) and interpersonal skills (-.14 standard deviation) in the spring of first grade. Center care during the summer is also negatively associated with self control, although the coefficient estimate is not statistically significant. The results for relative and non-relative care during the summer and for all three types of first grade care are consistent with the results shown in table 3.

Table 6, like table 4, examines the average weekly hours of summer and first grade child care by type of care, relying on a series of dummy variables and using the multiply imputed dataset. Consistent with the results in table 4, table 6 presents little evidence of a linear or non-linear average weekly hours of care effect. Rather, table 6 supports the conclusion that type of child care rather than hours of care is associated with child socioemotional skills in the spring of first grade.

Table 7 presents the coefficients and standard errors from regression models examining type of summer and first grade child care and the spring of first grade child outcomes of interest. Like table 5, table 7 relies on a multiply imputed dataset; however, the dataset used in table 7 imputes values for nearly all the children available in the ECLSK dataset. The results shown in table 7 produce few statistically significant coefficients, despite the fact that the standard errors are much smaller than in the previous results. However, center child care during the summer is associated with an increase in externalizing behavior of .06 of a standard deviation (models 7 and 8). While this is about half the size of the estimate shown in table 3, it is consistently statistically

significant across all three estimates (tables 3, 5, and 7). Unlike the results in table 5, center child care during the summer is not associated with any of the other socioemotional outcomes. Center child care during first grade is associated with .10 of a standard deviation increase in externalizing behavior (models 7 and 8) and a decrease of .07 of a standard deviation in self control.

Table 8 uses a series of dummy variables for average weekly hours of summer and first grade child care by type and the larger multiply imputed dataset. Consistent with the results from the previous models of this form, it appears that there is neither a linear nor a non-linear relationship between average weekly hours of summer or first grade child care and child socioemotional skills.

Models were run separately for children by sex, race/ethnicity, and SES. These models showed no differences in results for these subgroups. The results of the subgroup analysis are not shown. The relationship between extent and type of child care and child socioemotional well-being does not vary by child sex, race/ethnicity, or SES.

Discussion

Using a nationally representative sample of children who began kindergarten in 1998, this study adds to the existing research on child care by examining the effect of typical summer and first grade child care arrangements on children's socioemotional well-being. Net of child and family characteristics, center child care, and not the number of hours in care, during the summer is associated with increased externalizing behaviors in the spring of first grade. Although not consistently statistically significant across all models tested, center child care during the first grade year also appears to relate to increased externalizing behaviors. The extent of care and relative and non-relative care do not relate to child socioemotional well-being. While center care

is related to increased externalizing behavior problems, center care during the summer or first grade year is not consistently related to the other four measures of child socioemotional well-being available in this study.

Unlike studies of child care prior to school entry that indicate that increased time in center child care leads to increases in behavior problems or to less optimal self control (Halle et. al., 2005; Loeb et. al., 2005; NICHD ECCRN, 2003), this study finds no evidence of a relationship between extent of summer and first grade child care and child outcomes. Instead, this study lends support to the hypothesis that exposure to any center child care leads to increases in externalizing behaviors (Claessens, 2006; Halle et. al., 2005; NICHD ECCRN, 2004b).

The findings also add to the limited literature on early school-age child care experiences. Consistent with one of the only other studies of early school-age child care, Claessens (2006), this study also finds that center care, not hours of care, is related to increases in externalizing problems. Interestingly, in both Claessens (2006) and the present study both relative and non-relative care are not associated with child socioemotional outcomes. This result suggests that many typical school-age child care arrangements are not detrimental to child well-being.

In addition, unlike the findings of Claessens (2006), this study finds no consistent evidence that center care during the summer months is related to other child socioemotional outcomes. Center care during the summer months might be some parents' best or only option for child care for their children. Although it is related to increased externalizing problems, it does not appear to be any better, or worse, for all other child socioemotional outcomes considered in this study.

Further, this study also finds no consistent relationship between center care during the first grade year and child socioemotional outcomes. Extent and type of pre-school child care is

important for child socioemotional well-being (Halle et. al., 2005; Loeb et al., 2005; NICHD

ECCRN, 1998, 2001, 2002, 2003). Similarly, type of kindergarten child care is related to child

socioemotional outcomes (Claessens, 2006), and type of summer child care, as shown in this

study, is related to externalizing behavior. However, child care during the first grade year is not

consistently related to these outcomes. This finding suggests that the importance of child care in

child socioemotional development might fade as children get older. Perhaps as children's lives

expand in middle childhood to encompass a wider range of developmental contexts the

importance of child care in child socioemotional development might decrease. Future research is

needed to explore the role, if any, or more typical school-age child care experiences for older

school-age children. The evidence from this study suggests that these child care experiences

might not be related to child socioemotional outcomes.

Studies of pre-school center child care and child socioemotional well-being show some

evidence that the relationship between center care and child behavior problems might vary by

characteristics of the child, specifically income or SES (Halle et. al., 2005; Loeb et. al., 2005;

NICHD ECCRN, 2001, 2003; Votruba-Drzal et al., 2004). This study finds no evidence of

differences for subgroups of children by sex, race/ethnicity, or SES. Center care during the

summer months is related to increases in externalizing behaviors regardless of these child

background characteristics. More research is needed to understand why these differences might

exist in pre-school child care experiences but not in typical school-age child care experiences.

As in other studies of child care and child socioemotional outcomes, this study finds a

modest relationship between center care during the summer before first grade and child

externalizing behaviors of around a tenth of a standard deviation. This effect size is modest and

indicates a low level of problem behaviors. As with the controversial findings in the literature on

pre-school child care and child behavior problems (NICHD ECCRN, 1998, 2001, 2002, 2003, 2006), it is unclear from the extant literature how important or how lasting these modest increases are. Parents make choices about their work and their children's child care that best fit their families' needs. While center care during the summer might lead to higher levels of externalizing behaviors, the effects of the available alternatives are unknown. Relative and non-relative care in this study are not related to child socioemotional well-being; however, even after controlling for family and child background characteristics, it is unclear that children in center care would have similar experiences in relative and non-relative care shown in these study. As many scholars have noted, more research is needed to understand the meaning of these modest effect sizes, whether or not they are lasting, and what the available alternatives to children and families are (Ahnert & Lamb, 2003; Crockenberg, 2003; Fabes, Hanish, & Martin, 2003; Longlois & Liben, 2003; Maccoby & Lewis, 2003).

Although this study cannot examine why center care is related to decreases in positive behaviors, several possible explanations exist. Child care regulations typically allow caregiver-child ratios in center care to be larger than in the non-relative and relative child care settings. In addition, group sizes might be larger in center child care than other type of care even when more adults are present. Because children in center child care are in larger groups, they are with more of their same age peers than children in other types of child care or no child care. Spending any time in a child care setting with more children could itself lead to more of these behavior problems, as children have to compete for the child care provider's attention.

Without a measure of child care quality, it is not clear that center care during the summer itself or something more specific to the quality of care is driving the results of this study. While the analyses presented here do not contain any measures of child care quality, previous research

on pre-school child care experiences provides evidence that quality of child care does relate to socioemotional outcomes (Votruba-Drzal et al., 2004; NICHD ECCRN 1998, 2000, 2001; Burchinal et al., 2000; Peisner-Feinberg et al., 1999).

Finally, this study has several limitations. First, the data used here are non-experimental; therefore, the estimates are susceptible to omitted variable bias. Despite the fact that I control for a wide range of parent and child background characteristics including early measures of the outcome variables, it is possible that bias remains. Additionally, this analysis relies on teacher reports of children's behavior as the way to verify the validity of these measures as the dataset does not contain any objective assessments of child socioemotional skills such as tests of attention or self regulation. Further, the results of this study change quite dramatically when imputation to the larger sample of n~14,000 children. While many of the estimates remain statistically significant, the magnitude of these estimates drop by nearly half. This suggests that multiple imputation to this largest sample might not be appropriate in this study. The key assumption of the imputation process is that the data are missing at random. Because the sample is a random sub-sample, it is not clear that this assumption is violated. However, given that the results change quite dramatically, caution should be used in interpreting these results.

Even with all of these cautions, the findings from this study add a new dimension to the existing literature on child care and child socioemotional outcomes by providing one of the first examinations of children's school-aged child care experiences. The findings indicate that further investigation of more typical child care experiences during the early school years and summer months is needed. Specifically, research examining what characteristics of center child care might lead to increases in problem behaviors and decreases in positive behaviors in school-aged children will help us understand the results shown here.

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Table 1. Descriptive Statistics of Variables of Interest for the Full Sample and Children in Kindergarten Child Care

Variable	Full Sample Mean	Full Sample Std. Dev.	Children in Summer Child Care Mean	Mode	Std. Dev.	Children in First Grade Child Care Mean	Mode	Std. Dev.	Min	Max
Spring of First Grade										
Child Outcomes										
Approaches to Learning	3.06	0.70	3.02		0.69	3.02		0.70	1	4
Self Control	3.18	0.62	3.14		0.62	3.14		0.62	1	4
Interpersonal Skills	3.12	0.64	3.08		0.64	3.08		0.65	1.2	4
Externalizing Problem Behaviors	1.65	0.63	1.71		0.65	1.72		0.65	1	4
Internalizing Problem Behaviors	1.57	0.50	1.60		0.50	1.60		0.51	1	4
Summer between kindergarten and first grade child care[a]										
Hours per week:										
Center child care	3.30	11.39	6.79	40	14.66	5.60	40	13.72	0	80
Relative child care	8.54	17.85	16.71	40	19.14	11.74	40	18.04	0	80
Non-relative child care	3.56	12.10	6.87	40	14.54	5.18	40	13.38	0	80
Proportion in child care:										
Center child care	0.10	0.30	0.22		0.42	0.18		0.38	0	1
Relative child care	0.27	0.44	0.62		0.49	0.41		0.49	0	1
Non-relative child care	0.12	0.32	0.27		0.44	0.18		0.39	0	1
First grade child care[a]										
Hours per week:										
Center child care	1.73	4.57	2.58	10	5.46	3.61	10	6.05	0	50
Relative child care	9.24	21.75	4.79	10	9.39	6.51	10	10.29	0	75
Non-relative child care	0.98	4.37	1.82	10	5.98	2.25	10	6.09	0	70
Proportion in child care:										
Center child care	0.17	0.38	0.25		0.43	0.37		0.48	0	1
Relative child care	0.22	0.41	0.36		0.48	0.51		0.50	0	1
Non-relative child care	0.09	0.28	0.15		0.36	0.21		0.41	0	1
Baseline Child Characteristics										
Race										
Black	0.13	0.33	0.17		0.37	0.18		0.38	0	1
Hispanic	0.16	0.37	0.15		0.36	0.15		0.36	0	1
White	0.59	0.49	0.56		0.50	0.57		0.49	0	1
Asian	0.04	0.21	0.04		0.20	0.05		0.21	0	1
Female	0.50	0.50	0.50		0.50	0.50		0.50	0	1

Notes. Full sample n=4,144 (varies for each variable due to missing data)
Children in summer child care n=1,818
Children in first grade child care n=2,753
Maximum and minimum are identical for full sample and children in child care samples.
[a]Children can be in more than one type of child care.

Table 2. Correlations Between Independent and Dependent Variables of Interest

	1	2	3	4	5	6	7	8	9	10	11
Spring of Kindergarten											
1. Approaches to Learning	1										
2. Self Control	0.63	1									
3. Interpersonal Skills	0.68	0.80	1								
4. Externalizing Problem Behaviors	-0.53	-0.71	-0.62	1							
5. Internalizing Problem Behaviors	-0.42	-0.33	-0.37	0.36	1						
Hours per week in summer child care											
6. Relative Care	-0.04	-0.02	-0.03	0.03	0.02	1					
7. Non-relative Care	0.00	0.00	-0.01	0.02	0.00	-0.09	1				
8. Center Care	-0.06	-0.06	-0.06	0.11	0.06	-0.07	-0.05	1			
Hours per week in first grade child care											
9. Relative Care	-0.07	-0.04	-0.05	0.04	0.04	0.34	-0.02	-0.02	1		
10. Non-relative Care	-0.03	-0.03	-0.03	0.05	0.05	-0.01	0.36	-0.01	-0.06	1	
11. Center child care	-0.05	-0.09	-0.05	0.12	0.01	-0.02	0.02	0.36	-0.11	-0.06	1

Table 3. Coefficients and Standard Errors from Regression Models Predicting Spring of First Grade Child Behavior Using Type of Child Care During the Summer and First Grade.

Dependent Variables:	Approaches to Learning		Self Control		Interpersonal Skills		Externalizing Behaviors		Internalizing Behaviors	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Type of Summer Child Care										
Omitted category is no summer child care										
Relative Care	0.008	0.011	0.014	0.017	0.001	-0.006	0.026	0.018	0.035	0.073
	(0.042)	(0.044)	(0.045)	(0.048)	(0.046)	(0.049)	(0.041)	(0.042)	(0.047)	(0.050)
Non-relative Care	-0.059	-0.069	0.034	0.015	-0.001	-0.017	-0.018	-0.008	-0.038	-0.033
	(0.055)	(0.057)	(0.059)	(0.062)	(0.061)	(0.063)	(0.053)	(0.055)	(0.061)	(0.065)
Center Care[a]	-0.099	-0.081	-0.009	-0.005	-0.092	-0.088	0.125*	0.120*	0.168**	0.166*
	(0.058)	(0.061)	(0.063)	(0.066)	(0.064)	(0.067)	(0.056)	(0.058)	(0.065)	(0.069)
Type of First Grade Child Care										
Omitted category is no first grade child care										
Relative Care	-0.024	-0.005	-0.009	0.006	-0.019	-0.005	-0.017	-0.026	-0.026	-0.048
	(0.045)	(0.047)	(0.049)	(0.051)	(0.050)	(0.052)	(0.044)	(0.045)	(0.050)	(0.053)
Non-relative Care	0.016	0.014	-0.033	-0.046	-0.015	-0.039	0.083	0.107	-0.055	-0.069
	(0.061)	(0.065)	(0.066)	(0.070)	(0.068)	(0.072)	(0.060)	(0.062)	(0.069)	(0.073)
Center Care[b]	-0.060	-0.054	-0.094	-0.076	-0.019	-0.012	0.123*	0.065	-0.030	-0.067
	(0.050)	(0.052)	(0.054)	(0.057)	(0.055)	(0.058)	(0.049)	(0.050)	(0.056)	(0.059)
Child and Family Characteristics	X	X	X	X	X	X	X	X	X	X
Spring of Kindergarten Achievement, Socioemotional Skills, and Behaviors		X		X		X		X		X
Fall of Kindergarten Achievement, Socioemotional Skills, and Behaviors	X		X		X		X		X	
Observations	2664	2377	2650	2365	2649	2366	2653	2371	2627	2350
R-squared	0.36	0.38	0.27	0.29	0.26	0.29	0.37	0.40	0.15	0.16

Standard errors in parentheses

* significant at 5%; ** significant at 1%

Control variables include summer school, summer activities, summer camp, and number of days of summer as well as family and child background characteristics.

[a]Center child care coefficient is significantly different from non-relative child care coefficient in models (9) and (10) at p<.05.

[b]Center child care coefficient is significantly different from relative child care coefficient in models (7) and (8) at p<.05.

Table 4. Coefficients and Standard Errors from Regression Models Predicting Spring of First Grade Child Behavior Using Extent of Child Care During the Summer and First Grade Year.

Dependent Variables:	Approaches to Learning		Self Control		Interpersonal Skills		Externalizing Behaviors		Internalizing Behaviors	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Summer Child Care										
Hours per week Relative child care[a]										
No Relative child care (omitted)										
0-10 hours	0.045	0.030	-0.050	-0.030	0.060	0.046	0.022	0.002	0.033	0.078
	(0.076)	(0.080)	(0.082)	(0.087)	(0.084)	(0.088)	(0.073)	(0.076)	(0.086)	(0.091)
10-20 hours	-0.129	-0.170	0.033	0.022	-0.124	-0.116	-0.024	-0.038	0.113	0.143
	(0.082)	(0.088)	(0.089)	(0.096)	(0.090)	(0.097)	(0.079)	(0.083)	(0.091)	(0.099)
20-30 hours	0.031	0.057	-0.020	-0.063	-0.020	-0.060	0.099	0.151	0.135	0.212
	(0.090)	(0.097)	(0.097)	(0.106)	(0.099)	(0.107)	(0.087)	(0.092)	(0.100)	(0.110)
30-40 hours	0.052	0.089	0.041	0.033	0.039	0.043	0.016	-0.038	0.029	0.021
	(0.100)	(0.105)	(0.109)	(0.114)	(0.110)	(0.115)	(0.096)	(0.099)	(0.112)	(0.118)
40+ hours	-0.029	-0.024	0.024	0.030	-0.039	-0.040	-0.018	-0.037	0.016	0.041
	(0.065)	(0.069)	(0.071)	(0.075)	(0.072)	(0.076)	(0.063)	(0.066)	(0.074)	(0.078)
Hours per week Non-relative child care[a]										
No Non-relative Center child care (omitted)										
0-10 hours	-0.023	0.031	0.101	0.137	0.115	0.140	-0.021	-0.096	-0.171	-0.244
	(0.107)	(0.112)	(0.116)	(0.122)	(0.118)	(0.124)	(0.103)	(0.106)	(0.120)	(0.126)
10-20 hours	-0.029	-0.066	0.084	0.087	0.048	0.070	-0.074	-0.057	-0.034	-0.026
	(0.120)	(0.128)	(0.130)	(0.138)	(0.132)	(0.141)	(0.116)	(0.123)	(0.135)	(0.145)
20-30 hours	0.070	0.020	0.014	-0.053	-0.025	-0.088	-0.179	-0.136	0.077	0.136
	(0.124)	(0.126)	(0.134)	(0.137)	(0.136)	(0.139)	(0.119)	(0.120)	(0.139)	(0.144)
30-40 hours	0.018	0.050	-0.030	-0.092	-0.082	-0.102	-0.012	0.058	-0.148	-0.130
	(0.153)	(0.164)	(0.165)	(0.178)	(0.169)	(0.181)	(0.147)	(0.156)	(0.170)	(0.185)
40+ hours	-0.143	-0.151	0.052	0.038	-0.075	-0.085	-0.020	-0.003	0.045	0.076
	(0.089)	(0.092)	(0.096)	(0.100)	(0.099)	(0.102)	(0.085)	(0.087)	(0.099)	(0.104)
Hours per week Center child care[a]										
No Center child care (omitted)										
0-10 hours	-0.141	-0.063	-0.195	-0.134	-0.346*	-0.290	0.153	0.101	0.182	0.105
	(0.136)	(0.144)	(0.147)	(0.157)	(0.153)	(0.162)	(0.131)	(0.137)	(0.152)	(0.163)
10-20 hours	0.044	0.070	0.030	0.055	0.030	0.038	0.143	0.137	0.193	0.218
	(0.153)	(0.157)	(0.169)	(0.174)	(0.169)	(0.173)	(0.150)	(0.153)	(0.174)	(0.181)
20-30 hours	-0.093	-0.138	0.026	-0.070	0.028	-0.041	0.096	0.113	0.017	-0.075
	(0.161)	(0.170)	(0.174)	(0.185)	(0.177)	(0.188)	(0.154)	(0.162)	(0.179)	(0.192)
30-40 hours	-0.009	-0.045	0.125	0.164	-0.101	-0.101	0.071	0.047	0.234	0.215
	(0.150)	(0.164)	(0.162)	(0.178)	(0.165)	(0.180)	(0.144)	(0.155)	(0.169)	(0.184)
40+ hours	-0.126	-0.109	0.052	0.040	-0.039	-0.039	0.083	0.081	0.201*	0.231*
	(0.081)	(0.085)	(0.087)	(0.092)	(0.089)	(0.093)	(0.077)	(0.080)	(0.090)	(0.096)

Table 4. continued.

First Grade Child Care

Hours per week Relative child care[a]
No Relative child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	-0.011	0.010	0.005	0.008	0.014	0.000	-0.050	-0.043	-0.048	-0.078
	(0.061)	(0.063)	(0.066)	(0.068)	(0.067)	(0.069)	(0.059)	(0.060)	(0.068)	(0.071)
10-20 hours	0.057	0.051	0.024	0.037	-0.012	0.005	-0.006	-0.023	-0.073	-0.117
	(0.069)	(0.073)	(0.075)	(0.079)	(0.076)	(0.080)	(0.066)	(0.069)	(0.077)	(0.082)
20-30 hours	0.045	0.054	0.068	0.119	0.025	0.079	-0.035	-0.090	-0.011	0.024
	(0.101)	(0.108)	(0.109)	(0.118)	(0.112)	(0.119)	(0.097)	(0.103)	(0.114)	(0.122)
30+ hours	-0.141	-0.120	-0.107	-0.086	0.078	0.093	-0.048	0.044	-0.024	-0.064
	(0.211)	(0.218)	(0.228)	(0.237)	(0.233)	(0.241)	(0.203)	(0.207)	(0.235)	(0.246)

Hours per week Non-relative child care[a]
No Non-relative Center child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	0.145	0.140	0.035	0.031	0.111	0.101	0.012	0.023	-0.192*	-0.250*
	(0.080)	(0.086)	(0.087)	(0.093)	(0.088)	(0.095)	(0.077)	(0.082)	(0.090)	(0.097)
10-20 hours	0.015	-0.011	0.044	-0.008	0.005	-0.065	-0.000	0.046	-0.109	-0.116
	(0.107)	(0.112)	(0.116)	(0.121)	(0.118)	(0.123)	(0.103)	(0.106)	(0.120)	(0.127)
20-30 hours	-0.092	-0.004	-0.386	-0.325	-0.394	-0.392	0.154	0.138	-0.072	-0.072
	(0.193)	(0.205)	(0.208)	(0.222)	(0.213)	(0.226)	(0.186)	(0.195)	(0.221)	(0.231)
30+ hours[b]	-0.100	-0.158	-0.692	-0.640	-0.116	-0.111	1.529**	1.408**	0.735	0.619
	(0.451)	(0.448)	(0.487)	(0.486)	(0.496)	(0.493)	(0.433)	(0.425)	(0.501)	(0.504)

Hours per week Center child care[a]
No Center child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	-0.056	-0.029	-0.059	-0.041	0.017	0.032	0.072	-0.004	0.011	-0.046
	(0.066)	(0.070)	(0.072)	(0.076)	(0.073)	(0.077)	(0.064)	(0.066)	(0.074)	(0.079)
10-20 hours	-0.033	-0.028	-0.124	-0.088	-0.012	0.000	0.119	0.056	-0.121	-0.150
	(0.070)	(0.072)	(0.075)	(0.078)	(0.077)	(0.080)	(0.067)	(0.069)	(0.078)	(0.082)
20-30 hours	0.080	-0.039	0.024	-0.050	0.235	0.113	-0.121	-0.076	-0.258	-0.198
	(0.140)	(0.152)	(0.154)	(0.168)	(0.154)	(0.167)	(0.135)	(0.144)	(0.158)	(0.174)
30+ hours[c]	-0.465	-0.470	-0.777	-0.716	-1.153	-1.147	0.940	0.842	-0.612	-0.718
	(0.552)	(0.548)	(0.596)	(0.594)	(0.608)	(0.604)	(0.530)	(0.520)	(0.614)	(0.617)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Child and Family Characteristics	X	X	X	X	X	X	X	X	X	X
Spring of Kindergarten Achievement, Socioemotional Skills, and Behaviors	X	X	X	X	X	X	X	X	X	X
Fall of Kindergarten Achievement, Socioemotional Skills, and Behaviors		X		X		X		X		X
Observations	2526	2256	2514	2245	2513	2247	2517	2250	2490	2229
R-squared	0.37	0.39	0.28	0.30	0.27	0.29	0.37	0.40	0.16	0.17

Standard errors in parentheses
* significant at 5%; ** significant at 1%

[a]Children can be in more than one type of child care.

[b]Coefficient for 30+ hours of non-relative child care is significantly different from coefficient for 0-10, 10-20, and 20-30 hours of non-relative care in models (7) and (8), p<.05

[c]Coefficient for 30+ hours of center child care is significantly different from coefficient for 0-10 and 20-30 hours of center care in models (5) and (6), p<.05

Table 5. Coefficients and Standard Errors from Multiply Imputed Regression Models Predicting Spring of First Grade Child Behavior Using Type of Child Care During the Summer and First Grade.

Dependent Variables:	Approaches to Learning		Self Control		Interpersonal Skills		Externalizing Behaviors		Internalizing Behaviors	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Type of Summer Child Care										
Omitted category is no summer child care										
Relative Care	-0.006	-0.004	-0.005	-0.006	-0.032	-0.031	0.021	0.023	0.028	0.032
	(0.042)	(0.042)	(0.043)	(0.042)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)
Non-relative Care	-0.086	-0.089	-0.043	-0.038	-0.053	-0.049	0.022	0.013	-0.001	-0.002
	(0.065)	(0.064)	(0.059)	(0.058)	(0.066)	(0.066)	(0.052)	(0.052)	(0.054)	(0.053)
Center Care[a][b]	-0.124*	-0.116*	-0.085	-0.073	-0.143*	-0.136*	0.180**	0.164**	0.162**	0.159**
	(0.057)	(0.056)	(0.057)	(0.056)	(0.062)	(0.062)	(0.059)	(0.058)	(0.059)	(0.058)
Type of First Grade Child Care										
Omitted category is no first grade child care										
Relative Care	-0.009	-0.006	0.035	0.038	0.007	0.010	-0.022	-0.029	-0.040	-0.042
	(0.042)	(0.042)	(0.045)	(0.045)	(0.048)	(0.047)	(0.045)	(0.044)	(0.042)	(0.042)
Non-relative Care	0.025	0.019	0.017	0.010	-0.017	-0.024	0.075	0.085	0.003	0.005
	(0.065)	(0.064)	(0.059)	(0.059)	(0.064)	(0.064)	(0.063)	(0.061)	(0.064)	(0.064)
Center Care	-0.062	-0.050	-0.071	-0.061	-0.029	-0.021	0.111*	0.099	-0.025	-0.029
	(0.051)	(0.050)	(0.053)	(0.052)	(0.051)	(0.051)	(0.055)	(0.054)	(0.051)	(0.051)
Child and Family Characteristics	X	X	X	X	X	X	X	X	X	X
Spring of Kindergarten Achievement, Socioemotional Skills, and Behaviors		X		X		X		X		X
Fall of Kindergarten Achievement, Socioemotional Skills, and Behaviors		X		X		X		X		X
Observations	4144	4144	4144	4144	4144	4144	4144	4144	4144	4144
R-squared	0.27	0.28	0.21	0.22	0.20	0.21	0.27	0.29	0.09	0.10

Standard errors in parentheses
* significant at 5%; ** significant at 1%
Control variables include summer school, summer activities, summer camp, and number of days of summer as well as family and child background characteristics.
[a] Center child care coefficient is significantly different from non-relative child care coefficient in models (7), (8), (9) and (10) at p<.05.
[b] Center child care coefficient is significantly different from relative child care coefficient in models (7) and (8) at p<.05.

Table 6. Coefficients and Standard Errors from Multiply Imputed Regression Models Predicting Spring of First Grade Child Behavior Using Extent of Child Care During the Summer and First Grade Year.

Dependent Variables:	Approaches to Learning		Self Control		Interpersonal Skills		Externalizing Behaviors		Internalizing Behaviors	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Summer Child Care										
Hours per week Relative child care[a]										
No Relative child care (omitted)										
0-10 hours	0.003	-0.003	-0.047	-0.048	0.021	0.022	0.027	0.028	0.031	0.038
	(0.069)	(0.069)	(0.079)	(0.078)	(0.085)	(0.085)	(0.074)	(0.075)	(0.079)	(0.079)
10-20 hours	-0.118	-0.115	0.003	0.015	-0.099	-0.090	0.007	-0.010	0.078	0.075
	(0.076)	(0.075)	(0.078)	(0.078)	(0.083)	(0.084)	(0.085)	(0.085)	(0.083)	(0.082)
20-30 hours	0.038	0.026	-0.002	-0.020	-0.003	-0.016	0.029	0.057	0.142	0.147
	(0.091)	(0.090)	(0.104)	(0.104)	(0.106)	(0.104)	(0.085)	(0.085)	(0.087)	(0.087)
30-40 hours	0.068	0.075	0.021	0.023	-0.009	-0.003	-0.007	-0.010	0.045	0.043
	(0.101)	(0.100)	(0.114)	(0.111)	(0.101)	(0.101)	(0.093)	(0.091)	(0.105)	(0.104)
40+ hours	-0.071	-0.078	0.007	-0.002	-0.115	-0.121	0.018	0.033	0.029	0.034
	(0.065)	(0.064)	(0.061)	(0.060)	(0.065)	(0.065)	(0.062)	(0.062)	(0.063)	(0.063)
Hours per week Non-relative child care[a]										
No Non-relative Center child care (omitted)										
0-10 hours	-0.023	-0.014	0.022	0.042	0.014	0.034	0.020	-0.015	-0.107	-0.119
	(0.110)	(0.110)	(0.117)	(0.118)	(0.114)	(0.115)	(0.121)	(0.120)	(0.105)	(0.105)
10-20 hours	-0.033	-0.041	-0.007	-0.007	-0.053	-0.045	0.005	0.004	-0.033	-0.034
	(0.117)	(0.118)	(0.135)	(0.133)	(0.124)	(0.123)	(0.128)	(0.128)	(0.120)	(0.120)
20-30 hours	-0.056	-0.075	-0.078	-0.085	-0.159	-0.171	-0.061	-0.055	0.066	0.076
	(0.143)	(0.143)	(0.122)	(0.121)	(0.136)	(0.135)	(0.127)	(0.126)	(0.115)	(0.114)
30-40 hours	0.009	0.014	-0.028	-0.033	-0.111	-0.119	-0.011	0.008	-0.131	-0.145
	(0.151)	(0.150)	(0.155)	(0.155)	(0.152)	(0.152)	(0.146)	(0.146)	(0.148)	(0.148)
40+ hours	-0.146	-0.139	0.009	0.019	-0.057	-0.048	0.024	0.011	0.049	0.043
	(0.091)	(0.091)	(0.090)	(0.090)	(0.098)	(0.099)	(0.093)	(0.091)	(0.089)	(0.088)
Hours per week Center child care[a]										
No Center child care (omitted)										
0-10 hours	-0.174	-0.161	-0.230	-0.210	-0.306	-0.285	0.229	0.206	0.146	0.140
	(0.135)	(0.134)	(0.136)	(0.135)	(0.165)	(0.164)	(0.134)	(0.131)	(0.137)	(0.137)
10-20 hours	0.063	0.070	0.048	0.073	-0.064	-0.044	0.005	-0.032	0.099	0.098
	(0.145)	(0.145)	(0.192)	(0.189)	(0.175)	(0.174)	(0.148)	(0.147)	(0.165)	(0.163)
20-30 hours	-0.178	-0.174	-0.017	-0.023	-0.072	-0.072	0.175	0.176	0.173	0.165
	(0.154)	(0.154)	(0.162)	(0.161)	(0.165)	(0.164)	(0.151)	(0.149)	(0.162)	(0.161)
30-40 hours	0.036	0.032	0.048	0.052	-0.022	-0.025	0.050	0.043	0.144	0.137
	(0.139)	(0.140)	(0.146)	(0.146)	(0.141)	(0.141)	(0.139)	(0.138)	(0.137)	(0.137)
40+ hours	-0.176*	-0.160	-0.069	-0.056	-0.129	-0.117	0.177*	0.160	0.202*	0.200*
	(0.083)	(0.084)	(0.084)	(0.084)	(0.089)	(0.088)	(0.088)	(0.086)	(0.086)	(0.085)

Table 6. continued.

First Grade Child Care

Hours per week Relative child care[a]
No Relative child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	0.030	0.030	0.046	0.044	0.056	0.058	-0.080	-0.082	-0.035	-0.033
	(0.056)	(0.055)	(0.076)	(0.075)	(0.072)	(0.074)	(0.061)	(0.059)	(0.061)	(0.061)
10-20 hours	0.043	0.041	0.006	0.009	-0.021	-0.020	0.045	0.038	-0.037	-0.037
	(0.062)	(0.061)	(0.069)	(0.069)	(0.077)	(0.077)	(0.068)	(0.067)	(0.072)	(0.072)
20-30 hours	0.130	0.138	0.177	0.181	0.116	0.120	-0.070	-0.081	-0.101	-0.105
	(0.099)	(0.098)	(0.110)	(0.109)	(0.098)	(0.098)	(0.092)	(0.089)	(0.109)	(0.110)
30+ hours	0.008	-0.001	0.109	0.123	0.155	0.188	-0.141	-0.171	-0.074	-0.090
	(0.201)	(0.197)	(0.181)	(0.181)	(0.193)	(0.193)	(0.171)	(0.167)	(0.182)	(0.184)

Hours per week Non-relative child care[a]
No Non-relative Center child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	0.086	0.079	0.037	0.029	0.052	0.049	0.025	0.034	-0.109	-0.110
	(0.094)	(0.093)	(0.085)	(0.084)	(0.089)	(0.089)	(0.084)	(0.083)	(0.084)	(0.083)
10-20 hours	0.091	0.074	0.100	0.078	0.007	-0.012	-0.026	0.001	-0.013	-0.003
	(0.107)	(0.108)	(0.110)	(0.111)	(0.107)	(0.108)	(0.110)	(0.107)	(0.117)	(0.115)
20-30 hours[b]	-0.212	-0.218	-0.560**	-0.550**	-0.485*	-0.474*	0.338	0.322	0.049	0.056
	(0.175)	(0.176)	(0.185)	(0.184)	(0.193)	(0.192)	(0.192)	(0.193)	(0.171)	(0.171)
30+ hours[c]	-0.054	-0.055	-0.279	-0.230	0.108	0.137	1.096*	1.001*	0.545	0.550
	(0.389)	(0.385)	(0.518)	(0.516)	(0.485)	(0.486)	(0.469)	(0.465)	(0.443)	(0.440)

Hours per week Center child care[a]
No Center child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	-0.053	-0.047	-0.075	-0.070	-0.053	-0.050	0.102	0.097	0.085	0.084
	(0.065)	(0.064)	(0.072)	(0.072)	(0.071)	(0.071)	(0.071)	(0.069)	(0.069)	(0.069)
10-20 hours	-0.027	-0.013	-0.083	-0.071	0.009	0.021	0.080	0.065	-0.112	-0.120
	(0.066)	(0.066)	(0.069)	(0.068)	(0.075)	(0.074)	(0.068)	(0.067)	(0.075)	(0.075)
20-30 hours	0.048	0.051	-0.057	-0.043	0.090	0.096	0.055	0.037	-0.144	-0.137
	(0.124)	(0.124)	(0.134)	(0.133)	(0.145)	(0.144)	(0.159)	(0.159)	(0.167)	(0.167)
30+ hours	-0.463	-0.458	-0.732	-0.744	-1.176	-1.207	0.907	0.925	-0.570	-0.638
	(0.597)	(0.595)	(0.628)	(0.624)	(0.640)	(0.637)	(0.590)	(0.581)	(0.633)	(0.631)
Child and Family Characteristics	X	X	X	X	X	X	X	X	X	X
Spring of Kindergarten Achievement, Socioemotional Skills, and Behaviors	X	X	X	X	X	X	X	X	X	X
Fall of Kindergarten Achievement, Socioemotional Skills, and Behaviors		X		X		X		X		X
Observations	4144	4144	4144	4144	4144	4144	4144	4144	4144	4144
R-squared	0.29	0.30	0.22	0.23	0.21	0.22	0.28	0.31	0.11	0.12

Standard errors in parentheses
* significant at 5%; ** significant at 1%

[a]Children can be in more than one type of child care.

[b]Coefficient for 20-30 hours of center care is significantly different from the coefficient for 0-10 hours and 10-20 hours of center care for models (3), (4), (5), and (6), $p<.05$

[c]Coefficient for 30+ hours of non-relative child care is significantly different from the coefficients for 0-10 hours and 10-20 hours of non-relative child care in models (7) and (8), $p<.05$

Table 7. Coefficients and Standard Errors from Multiply Imputed Regression Models Predicting Spring of First Grade Child Behavior Using Type of Child Care During the Summer and First Grade.

Dependent Variables:	Approaches to Learning		Self Control		Interpersonal Skills		Externalizing Behaviors		Internalizing Behaviors	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Type of Summer Child Care										
Omitted category is no summer child care										
Relative Care	0.012	0.012	0.011	0.011	0.003	0.002	-0.019	-0.017	-0.005	-0.004
	(0.020)	(0.020)	(0.029)	(0.030)	(0.024)	(0.025)	(0.027)	(0.028)	(0.020)	(0.019)
Non-relative Care	-0.024	-0.024	-0.013	-0.011	-0.014	-0.013	0.015	0.013	0.003	0.002
	(0.031)	(0.032)	(0.047)	(0.047)	(0.037)	(0.038)	(0.033)	(0.032)	(0.036)	(0.037)
Center Care[a]	-0.052	-0.049	-0.037	-0.035	-0.049	-0.047	0.064*	0.062*	0.051	0.050
	(0.037)	(0.036)	(0.035)	(0.034)	(0.034)	(0.033)	(0.029)	(0.029)	(0.040)	(0.039)
Type of First Grade Child Care										
Omitted category is no first grade child care										
Relative Care	-0.025	-0.027	-0.003	-0.004	-0.016	-0.017	0.014	0.015	-0.016	-0.015
	(0.027)	(0.026)	(0.024)	(0.023)	(0.030)	(0.029)	(0.021)	(0.020)	(0.023)	(0.022)
Non-relative Care	-0.046	-0.047	-0.034	-0.035	-0.041	-0.042	0.057	0.057	0.040	0.040
	(0.033)	(0.032)	(0.036)	(0.035)	(0.028)	(0.028)	(0.040)	(0.040)	(0.028)	(0.028)
Center Care[a]	-0.019	-0.016	-0.072*	-0.070*	-0.057	-0.055	0.103**	0.101**	0.038	0.038
	(0.031)	(0.031)	(0.029)	(0.028)	(0.030)	(0.032)	(0.023)	(0.024)	(0.027)	(0.027)
Child and Family Characteristics	X	X	X	X	X	X	X	X	X	X
Spring of Kindergarten Achievement, Socioemotional Skills, and Behaviors	X	X	X	X	X	X	X	X	X	X
Fall of Kindergarten Achievement, Socioemotional Skills, and Behaviors		X		X		X		X		X
Observations	14166	14166	14166	14166	14166	14166	14166	14166	14166	14166
R-squared	0.19	0.19	0.14	0.15	0.12	0.13	0.18	0.19	0.05	0.06

Standard errors in parentheses
* significant at 5%; ** significant at 1%
Control variables include summer school, summer activities, summer camp, and number of days of summer as well as family and child background characteristics.
[a]Center child care coefficient is significantly different from relative child care coefficients in model (8) at p<.05.

Table 8. Coefficients and Standard Errors from Multiply Imputed Regression Models Predicting Spring of First Grade Child Behavior Using Extent of Child Care During the Summer and First Grade Year.

Dependent Variables:	Approaches to Learning		Self Control		Interpersonal Skills		Externalizing Behaviors		Internalizing Behaviors	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Summer Child Care										
Hours per week Relative child care[a]										
No Relative child care (omitted)										
0-10 hours	0.054	0.050	-0.080	-0.074	0.057	0.062	0.014	0.006	-0.048	-0.035
	(0.156)	(0.142)	(0.136)	(0.133)	(0.179)	(0.184)	(0.147)	(0.136)	(0.173)	(0.164)
10-20 hours	-0.103	-0.102	0.107	0.119	0.011	0.023	-0.100	-0.113	-0.096	-0.096
	(0.237)	(0.214)	(0.174)	(0.160)	(0.175)	(0.158)	(0.199)	(0.178)	(0.151)	(0.149)
20-30 hours	0.024	0.019	0.014	0.003	0.016	-0.001	0.063	0.075	0.100	0.104
	(0.280)	(0.271)	(0.161)	(0.148)	(0.264)	(0.245)	(0.240)	(0.235)	(0.154)	(0.148)
30-40 hours	0.146	0.156	0.071	0.073	0.121	0.124	-0.043	-0.042	-0.184	-0.180
	(0.318)	(0.310)	(0.224)	(0.218)	(0.248)	(0.241)	(0.133)	(0.129)	(0.143)	(0.142)
40+ hours	-0.079	-0.072	-0.068	-0.072	-0.088	-0.094	0.038	0.050	0.024	0.027
	(0.119)	(0.120)	(0.095)	(0.091)	(0.067)	(0.074)	(0.110)	(0.102)	(0.070)	(0.068)
Hours per week Non-relative child care[a]										
No Non-relative Center child care (omitted)										
0-10 hours	0.094	0.131	0.132	0.172	-0.084	-0.043	-0.119	-0.174	-0.194	-0.216
	(0.205)	(0.200)	(0.137)	(0.140)	(0.246)	(0.220)	(0.179)	(0.181)	(0.174)	(0.178)
10-20 hours	0.037	0.042	0.084	0.078	0.117	0.116	-0.088	-0.067	-0.091	-0.096
	(0.192)	(0.184)	(0.187)	(0.201)	(0.166)	(0.165)	(0.145)	(0.168)	(0.246)	(0.249)
20-30 hours	-0.068	-0.069	-0.139	-0.136	-0.160	-0.160	-0.098	-0.108	0.241	0.243
	(0.364)	(0.338)	(0.181)	(0.163)	(0.182)	(0.188)	(0.246)	(0.228)	(0.287)	(0.265)
30-40 hours	0.112	0.111	-0.046	-0.058	-0.030	-0.041	-0.037	-0.022	-0.185	-0.195
	(0.260)	(0.265)	(0.226)	(0.227)	(0.200)	(0.187)	(0.161)	(0.153)	(0.182)	(0.160)
40+ hours	-0.111	-0.119	0.062	0.060	0.102	0.091	0.024	0.026	-0.057	-0.047
	(0.383)	(0.374)	(0.289)	(0.288)	(0.252)	(0.248)	(0.353)	(0.353)	(0.230)	(0.228)
Hours per week Center child care[a]										
No Center child care (omitted)										
0-10 hours[b]	-0.446	-0.434	-0.391	-0.384	-0.424*	-0.419*	0.454**	0.446**	0.296	0.296
	(0.338)	(0.340)	(0.205)	(0.227)	(0.177)	(0.186)	(0.118)	(0.137)	(0.170)	(0.167)
10-20 hours	0.097	0.100	-0.002	0.022	-0.099	-0.087	0.024	-0.011	0.110	0.109
	(0.209)	(0.212)	(0.168)	(0.184)	(0.152)	(0.163)	(0.163)	(0.179)	(0.244)	(0.258)
20-30 hours	-0.202	-0.164	-0.083	-0.061	0.058	0.103	0.209	0.193	0.028	-0.004
	(0.249)	(0.255)	(0.145)	(0.134)	(0.373)	(0.387)	(0.260)	(0.248)	(0.249)	(0.265)
30-40 hours	-0.015	-0.032	-0.115	-0.104	-0.217	-0.214	0.010	-0.008	0.066	0.071
	(0.173)	(0.166)	(0.080)	(0.085)	(0.172)	(0.167)	(0.130)	(0.138)	(0.156)	(0.155)
40+ hours	-0.110	-0.092	-0.087	-0.077	-0.056	-0.046	0.237**	0.221**	0.095	0.091
	(0.095)	(0.092)	(0.080)	(0.081)	(0.081)	(0.082)	(0.081)	(0.085)	(0.121)	(0.121)

Table 8. Continued.
    First Grade Child Care

Hours per week Relative child care[a]
No Relative child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	-0.084	-0.085	-0.017	-0.022	0.021	0.018	0.033	0.034	-0.059	-0.062
	(0.069)	(0.067)	(0.087)	(0.083)	(0.065)	(0.063)	(0.139)	(0.136)	(0.048)	(0.050)
10-20 hours	-0.073	-0.071	-0.042	-0.039	-0.044	-0.041	0.040	0.033	0.036	0.030
	(0.116)	(0.106)	(0.050)	(0.050)	(0.084)	(0.082)	(0.099)	(0.095)	(0.088)	(0.085)
20-30 hours	-0.167	-0.152	-0.008	-0.001	-0.115	-0.105	0.075	0.067	0.202	0.187
	(0.436)	(0.417)	(0.198)	(0.186)	(0.150)	(0.140)	(0.268)	(0.252)	(0.368)	(0.360)
30-40 hours	-0.060	-0.067	0.007	0.018	0.022	0.026	-0.033	-0.048	-0.200*	-0.200
	(0.230)	(0.231)	(0.237)	(0.238)	(0.320)	(0.314)	(0.371)	(0.376)	(0.102)	(0.103)

Hours per week Non-relative child care[a]
No Non-relative Center child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	-0.062	-0.063	-0.077	-0.073	-0.077	-0.077	0.107	0.100	0.037	0.038
	(0.245)	(0.244)	(0.152)	(0.151)	(0.161)	(0.160)	(0.180)	(0.180)	(0.263)	(0.262)
10-20 hours	-0.155	-0.170	-0.268	-0.273	-0.285	-0.297	0.186	0.182	0.380	0.391
	(0.544)	(0.557)	(0.314)	(0.316)	(0.258)	(0.260)	(0.368)	(0.363)	(0.403)	(0.412)
20-30 hours	-0.177	-0.155	-0.014	-0.027	-0.135	-0.111	0.097	0.079	0.237	0.198
	(0.446)	(0.418)	(0.216)	(0.189)	(0.165)	(0.130)	(0.280)	(0.254)	(0.374)	(0.360)
30-40 hours	-0.693	-0.712	-0.746	-0.731	-0.184	-0.156	0.907	0.892	0.694	0.707
	(1.067)	(1.085)	(0.556)	(0.606)	(0.445)	(0.540)	(0.593)	(0.630)	(0.876)	(0.909)

Hours per week Center child care[a]
No Center child care (omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0-10 hours	-0.047	-0.049	-0.007	-0.012	0.018	0.011	0.002	0.008	0.027	0.033
	(0.085)	(0.087)	(0.053)	(0.050)	(0.077)	(0.080)	(0.088)	(0.085)	(0.050)	(0.052)
10-20 hours	-0.033	-0.020	-0.091	-0.082	-0.070	-0.061	0.055	0.044	0.025	0.024
	(0.229)	(0.224)	(0.137)	(0.136)	(0.085)	(0.083)	(0.160)	(0.158)	(0.155)	(0.150)
20-30 hours	-0.012	-0.056	0.029	-0.004	0.152	0.111	-0.066	-0.031	-0.203*	-0.178
	(0.179)	(0.186)	(0.163)	(0.145)	(0.127)	(0.121)	(0.245)	(0.227)	(0.083)	(0.099)
30-40 hours	0.294	0.293	-0.076	-0.080	-0.699	-0.695	-0.183	-0.174	0.354	0.336
	(1.362)	(1.364)	(0.794)	(0.801)	(0.932)	(0.923)	(1.162)	(1.173)	(0.721)	(0.709)
Child and Family Characteristics	X	X	X	X	X	X	X	X	X	X
Spring of Kindergarten Achievement, Socioemotional Skills, and Behaviors	X	X	X	X	X	X	X	X	X	X
Fall of Kindergarten Achievement, Socioemotional Skills, and Behaviors		X		X		X		X		X
Observations	14166	14166	14166	14166	14166	14166	14166	14166	14166	14166
R-squared	0.27	0.29	0.28	0.30	0.31	0.32	0.33	0.37	0.18	0.19

Standard errors in parentheses
* significant at 5%; ** significant at 1%

[a]Children can be in more than one type of child care.

[b]Coefficient for 0-10 hours of center child care is significantly different from coefficients for 10-20 and 20-30 hours of center child care in models (7) and (8), p<.05

Appendix A. Means and Standard Deviations for Child and Family Background Characteristics

	Mean	Std. Dev.	Min.	Max.
Summer School Hours/week	2.42	7.54	0	40
Length of Summer in Days	78.32	10.70	15	110
Summer School	0.11	0.32	0	1
Summer Camp/ Summer Activity	0.58	0.49	0	1
Half-day Kindergarten	0.44	0.50	0	1
Kindergarten Child Care				
Center Care	0.16	0.36	0	1
Relative Care	0.19	0.39	0	1
Non-relative Care	0.10	0.30	0	1
Preschool Child Care				
Center Care	0.45	0.50	0	1
Non-relative Care	0.09	0.28	0	1
Relative Care	0.13	0.34	0	1
Head Start	0.08	0.27	0	1
Child and Family Characteristics				
Child Age in Months	68.58	4.36	56.9	79
Child Health	1.67	0.83	0	5
Child Part of Multiple Birth	0.02	0.15	0	1
SES	0.10	-1.01	5.62	3.35
Number of Siblings	1.49	1.17	0	10
Single Parent Household	0.20	0.40	0	1
Mother's Age at First Birth	24.03	5.50	13	46
Mother's Age at Child's Birth	27.94	6.67	12.74	76.79
Received WIC	0.44	0.50	0	1
Number of Books in the Home	76.26	59.74	0	200
Mother Worked between Child's Birth and Kindergarten	0.73	0.44	0	1
Four or More Moves Pre-K	0.11	0.31	0	1