NBER WORKING PAPER SERIES

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Working Paper 29249
http://www.nber.org/papers/w29249

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
September 2021

We thank David Blau, Jessica Brown, Liz Davis, Daniela Del Boca, Sandy Hoefferth, Lance Lochner, Taryn Morrissey, Alejandra Ros Pilarz, and Anson Zhou for helpful comments. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 29249
September 2021
JEL No. I24,J13

ABSTRACT

Using every major nationally-representative dataset on parental and non-parental care provided to children up to age 6, we quantify differences in American children's care experiences by socioeconomic status (SES), proxied primarily with maternal education. Increasingly, higher-SES children spend less time with their parents and more time in the care of others. Non-parental care for high-SES children is more likely to be in childcare centers, where average quality is higher, and less likely to be provided by relatives where average quality is lower. Even within types of childcare, higher-SES children tend to receive care of higher measured quality and higher cost. Inequality is evident at home as well: measures of parental enrichment at home, from both self-reports and outside observers, are on average higher for higher-SES children. We also find that parental and non-parental quality is reinforcing: children who receive higher quality non-parental care also tend to receive higher quality parental care. Head Start, one of the largest government care subsidy programs for low-income households, reduces inequality in care provided, but it is mainly limited to older children and to the lowest income households. Our evidence is from the pre-COVID-19 period, and the latest year we examine is 2019.

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1 Introduction

Early childhood is a unique period of human development during which care experiences lay the foundation for children's future capacities. Observed gaps in adult employment, earnings, and other economic outcomes often have some roots in the different experiences of those born into families with varying levels of socio-economic advantage [McLanahan, 2004, Duncan et al., 2010]. Given evidence that care experiences have causal effects on measured child development and later life outcomes [Heckman and Mosso, 2014, Herbst, 2017, Elango et al., 2016], the distribution of children's early care experiences is of fundamental importance to researchers and policy makers [CEA, 2016].

In this paper, we document the distribution of parental and non-parental care experienced by American children in the period before nearly all children enter formal schooling. Because no single dataset provides comprehensive information on all types of care, we combine data across multiple sources. Drawing on the unique strengths of each dataset, we generate new evidence on the differences in early care experienced by children of different socio-economic status (SES), primarily proxied by maternal education.[1] By using a consistent lens to understand information from multiple sources, we can build a holistic view unavailable in prior work. Our use of multiple quality measures and datasets recognizes that quality environments may be produced in many different ways, from stay-at-home parenting to full-time, center-based care.

Previewing our results, we find that children born to low-SES families experience lower quality care in all domains. We measure quality in several different ways, including detailed measures of activities children engage in with caregivers as well as outside observer ratings of care experiences. In particular, children from lower-SES families experience lower quality care because:

- they tend to experience lower quality care when with parents,
- they spend more time in types of non-parental care that tend to be lower quality on average,
- they tend to experience non-parental care that is lower quality for its type,
- they spend more time with parents and the SES-gap in care quality is larger in parental care than in non-parental care,
- a child's parental and non-parental care qualities tend to be positively correlated such that deficits in one tend to be reinforced in the other, and

[1] Maternal education proxies for SES and is correlated with educational attainment of others in the family and social network, income, family wealth, neighborhood, and many other factors. We focus on maternal education because it is relatively stable, whereas children's care experiences and maternal labor supply and, hence, family income are jointly determined. Maternal education is also well-measured in every dataset we use. All of our main results are robust to using family income as a measure of SES as well, as we document in the Appendix. It should be noted that household income on the other hand is the relevant consideration for program eligibility and policy reform.

- quality levels persist across early childhood such that those receiving lower quality care earlier also tend to receive lower quality care later.

Accounting for both parental and non-parental care, children from lower-SES backgrounds enter K-12 schooling having experienced substantially lower quality care in their first 5 years of life. On the other hand, we quantify how one major federal program, Head Start, reduces this inequality. Understanding these patterns is central to designing policies to address inequality in early childhood opportunity. Although our focus is on patterns in the most recent pre-COVID-19 data available, we also document some important changes that have occurred since the early 2000s, a period studied in several influential papers [Blau and Currie, 2006, Guryan et al., 2008, Ramey and Ramey, 2010].

Our analysis is child-centric where possible, focusing on characterizing the care experienced by young children, rather than on the care that parents or caregivers provide.[2] We begin by classifying children's care based on who provides the care: parents or others. We then further differentiate both parental and non-parental care time based on activities, intensity, and other dimensions to assess differences in the quality of the care time. Central to our study is the idea that child development depends on all of the care experienced by a child, so we aim to characterize children's full care experiences. This follows scholars who have argued that a focus on narrow sets of parental care activities misses much of what children experience [Bianchi, 2000, Folbre et al., 2005, Budig and Folbre, 2004, Chaparro et al., 2020], ignoring the vast majority of time that children are in parents' care and all the time they are in non-parental care.

This wider focus is essential to understanding the current degree of inequality in childcare experiences. Restricting focus to a small subset of intense parental care activities (such as parents reading to children) would suggest that there has been a convergence in care experiences over the last two decades.[3] Although children from more advantaged households do continue to receive more hours of this intense parental engagement, the gap has fallen from about 8 hours per week in the early 2000s to 3 hours by the late 2010s. However, we show that, in the most recent period just prior to the COVID-19 outbreak, higher-SES children spent substantially *less* total time with their parents than did lower-SES children. In this recent period, high-SES children spent on average about 10 fewer hours per week with their parents, about twice as many hours in non-parental care, and 3 times as many hours in regular center-based care, as did low-SES children. While high-SES parents are increasingly specializing in non-childcare activities (primarily labor market work) and making greater use of care from outside their family, the time they spend with their children continues to be of higher quality as measured by the fraction of that time in intense or education specific activities, and other observer-based measures. Therefore, the convergence in total hours of

[2] A large strand of literature uses the American Time Use Survey, as we do here as well. But because this survey covers only parental caregiving hours for one sample parent per household, it cannot deliver an accurate, holistic view of children's time, nor even just of a child's time with both parents.

[3] For example, Cha and Park [2020], Prickett and Augustine [2021] show a "converging" trend in a subset of these intense activities.

intensive parenting received across the SES distribution is accompanied by increased inequality in time spent in high-quality, non-parental care.

This fact—that higher SES parents now spend less time with their children—may be surprising given a large prior literature that often asserts the opposite. In our reading of this prior literature, one issue that seems to cause confusion is the varying meaning of the terms "child care" or "time with children." An influential paper, Guryan et al. [2008], focused on a finding from analysis of 2003-06 ATUS data that highly-educated mothers spend more time in intensive activities with their children. However, as that paper acknowledges, this subset of activities comprises only about a quarter of the total time that parents spend with their young children.[4] Guryan et al. [2008] recognized the distinction and wrote that "high-educated parents and low-educated parents spend nearly identical amounts of total time around their children," but this latter point concerning total time seems to have been subsequently overlooked.[5] Importantly, we document that much has changed since the 2003-2006 period covered in Guryan et al. [2008], and a substantial SES gap has opened in total parental time with children.

Because higher-SES families increasingly utilize non-parental care, the quality of this care has become increasingly important to documenting inequality in care experiences. Turning to data sources that record the types and quality of non-parental care children experience, we document that children from lower-SES families receive the majority of their non-parental care from relatives, while most non-parental care hours for children of higher-SES households come from centers or other non-relative home-based providers. Measures of quality from independent observers show that relative care tends to be of lower quality compared to the types of care that high-SES children experience. Even within provider type, children from lower-SES household receive lower quality than do those from higher-SES ones.[6]

These SES gaps in provider type and quality are largest for younger children and close as children age. We quantify how public investments in Head Start and K-12 schooling push against disadvantage. Excluding Head Start care, we find that the gap in average non-parental care quality

[4]This subset includes intensive activities such as reading, playing, and bathing but excludes the majority of time when the child is in the parent's care but the parent is not intensively engaged in an activity with the child, such as if the parent is eating with the child or cooking while the child plays nearby.

[5]Examples in economics and beyond include: "Guryan et al. (2008) show, using the American Time Use Survey, that more educated parents spend more time on average with their children" in the Handbook of Labor Economics (Black and Devereux [2011]); "Compared to parents with lower levels of education, parents with higher levels of education tend to spend more time with their children (Guryan et al., 2008)...." in Frontiers in Neuroscience (Brito and Noble [2014]); "...compared with higher-SES parents, lower-SES parents spend less time with their children (Guryan, Hurst, & Kearney, 2008)" in Psychological Science (Tucker-Drob et al. [2011]); and "This finding is consistent with Guryan et al. (2008), who show that highly educated mothers spend more time with their children" in the Review of Economic Studies (Lalive et al. [2014]). Many more examples exist.

[6]Two recent studies examine quality differences in non-parental care: Pilarz et al. [2019] describe how much higher the probability of using any center-based care, proxying for high-quality non-parental care, is for higher-income families and exploring other predictors of center use, such as parental employment, nonstandard work hours, and family structure. Bassok et al. [2016] describe variation in quality within and between types of non-parental care (centers, home-based, Head Start) and include analysis of how quality varies with income and other family characteristics.

between low and high-SES families would increase from about 0.4 to 0.6 standard deviations, a 50 percent increase.

Using complementary datasets with measures of parental care quality, we show that children in higher-SES families also experience higher quality parental care, reinforcing advantages from higher-quality non-parental care. Using detailed data on parent and child interactions generated from parental self-reports and outside observations, we show that, although lower-SES mothers spend more time overall with their children, parental caregiving for higher-SES children is characterized by more active engagement with children in educational activities, less screen time, and a higher-quality home environment according to various measures. We find that parental caregiving in higher-SES households involves substantially more time with two parents, and lower-SES parental caregiving is primarily mother-only, consistent with earlier findings [Folbre et al., 2005].[7] Motivating the importance of this finding, we note that a large body of research estimates strong correlations between parenting practices, child skills, and later outcomes (see Heckman and Mosso [2014], Shonkoff and Phillips [2000] for reviews). And, experimental work has shown causal effects of parenting interventions on child skills.[8]

To the extent that the data allow, we document inequality in *total* care received by U.S. children. Our analysis up to this point documents inequality in different care domains (i.e. parental, non-parental) separately. However, it is possible that inequality obtains in each domain but is mitigated when considering aggregate care experienced. We rule out two channels through which this may happen. First, we find that children who tend to experience higher quality parental care also tend to experience higher quality non-parental care. The joint distribution of parental and non-parental care qualities reinforces quality differences apparent in each type of care, rather than countervailing the differences. Second, children who experience higher quality care in the first few of years of life also tend to experience higher quality in the following years, ruling out strong dynamic compensating behavior, whereby higher quality care experiences during preschool age might compensate for lower quality experiences as infants and toddlers.

The next section briefly describes the measurement issues and the datasets that we analyze. Section 3 presents our main analysis of how much parental and non-parental care children experience, and Sections 4 - 5 analyze SES gradients in measures of care quality. In Section 6 we discuss

[7]This point, that we find strong associations between mother SES and measures of quality in parenting and the home environment, should be interpreted with some caution. These are descriptive statements based on quality measures available across a wide range of independent data-collection efforts, and not statements about the forces driving such differences. Less-advantaged households are subject to tighter resource constraints (see Votruba-Drzal [2003]), higher levels of maternal stress (see Aizer et al. [2016]), and financial and family structure instability (Lee and McLanahan [2015], Kalil et al. [2014]), all of which likely make providing quality parental care more difficult relative to higher-SES families.

[8]See for example Heidlage et al. [2020] for a meta-analysis of RCTs studying language skills and Larson et al. [2020] for a systematic review of language interventions targeting children from diverse linguistic and cultural backgrounds. Gibson et al. [2020] shows evidence of causal effects of parenting behavior on number knowledge. Cunha et al 2020 provides a recent evaluation showing positive effects of a parenting intervention for pre-K children.

what the data tell us about the *aggregate* quality of care experienced by children and its persistence across ages within early childhood. We then conclude with some discussion of how the patterns that we document relate to the broader research on child development.

2 Data

2.1 Target Population

We focus primarily on children from birth through age 4, before kindergarten eligibility, though we include 5 and 6 year olds in certain analyses to illuminate how K-12 entry affects SES disparities. As much as possible, we work to develop statistics that represent the population of U.S. children. Parents may be biological, step, adoptive, or foster. However, we exclude children living in households without a resident mother because we use mother characteristics as a concise, consistent, broadly-available marker of socio-economic status.[9] We use included sample weights, normalized within each survey year, to compute all reported statistics. We focus on describing children's recent, pre-COVID-19 pandemic experiences, with some attention to trends since the early 2000s.

2.2 Measurement Concepts

In measuring inequality in child care received we face two fundamental challenges. First, many of our measures of child care are from a single point-in-time observation, either some record of child care activities for a reference day or week, or a one-time observation by an outside observer. For an individual child, these may not be representative of all the care that child receives throughout a year, for example if the reference day represents an atypical care experience due to a brief child or parental illness.[10] Simply computing inequality using these point-in-time measures would likely mis-represent the distribution of care experienced. We therefore rely on some averaging across different households such that the differences in average care experienced by some demographic characteristic (say mother's education or income categories) is representative of the differences in care experienced throughout the year.

Second, we measure care quality using the best available measures across several datasets. Our quality measures consist of either detailed accounting of activities parents perform with children or with independent observers' measures of non-parental care quality. Ideally "quality" should be understood as producing certain child development outcomes (e.g., cognitive test scores at kindergarten entry or even later life outcomes such as years of completed schooling or adult wages). We

[9] This includes 93% of children under age 5 in the NSECE data, as described below.

[10] The analogous issue with measuring income inequality is using data on just one daily measure of income per household. Dispersion in this measure would reflect at least in part day-to-day variation in income (illness, vacations, etc.).

rely instead on these more generic but widely-used measures of care quality. In particular, our measures of non-parental care are "process" measures (measuring the quality of interactions between a caregiver and child), which have been found to be strongly correlated with developmental outcomes in a number of studies [Araujo et al., 2019, Walters, 2015, Currie and Neidell, 2007, Blau and Currie, 2006, Blau, 1999], as opposed to "structural" measure (child-to-staff ratios in daycare centers, for example) which have been found to have much weaker relationships with child outcomes.[11]

2.3 Data Sets

We draw on data from seven primary sources: the National Survey of Early Childhood Care and Education (NSECE), the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), the American Time Use Survey (ATUS), the Panel Study of Income Dynamics-Child Development Supplement (PSID-CDS), the National Household Education Survey (NHES), the October education supplement of the Current Population Survey (October CPS), and the Survey of Income and Program Participation (SIPP). We leverage categories that can be harmonized across datasets to create a consistent analytic lens across aspects of children's care experiences. This synthetic approach al-lows us to exploit the strengths and compensate for the weaknesses of each dataset. Below, we briefly describe each dataset and highlight their use in our analysis. Additional information is in the Appendix.

NSECE: the most-detailed, nationally-representative view of child care experiences is found in the National Survey of Early Childhood Care and Education. Collected in 2012, the NSECE gave the first nationally-representative view of this domain since the early 1990s. The sample includes about 11,000 households who have at least one child under age 13. Using child and parent time diaries and additional surveys, the NSECE aims to capture all sources of non-parental care for all children under 13 years old in each household. For any *regular* (used at least 5 hours weekly) non-parental providers, the NSECE includes information on the provider type, hours, and expenditures. However, the NSECE lacks direct measures of the quality of care and information on child development outcomes.

ECLS-B: With its relatively large sample size, observer-based measures of care quality measured consistently across multiple types of providers, and child development outcomes, the ECLS-B is ideal for estimating how quality varies by non-parental care type and child characteristics. It also contains information on child outcomes. The ECLS-B is a panel study starting with a nationally-representative sample of about 14,000 children born in 2001. The ECLS-B collected information on the children in several waves: at birth, when the children were approximately 9 months old, 2

[11] See Blau [1997, 2000], Early et al. [2006], Mashburn et al. [2008]. See Pianta et al. [2005] for a discussion of the association between structural features of pre-Kindergarten programs and measures of classroom quality and Burchinal et al. [2002] for evidence on the association between caregiver training, measures of caregiver-child interaction quality, and child outcomes. Some recent studies have found evidence in Europe that child outcomes are positively associated that the fraction of center staff that is male [Drange and Rønning, 2020, Gørtz et al., 2018].

years old, 4 years old, and a final data collection when the children entered kindergarten. At each survey wave, information was collected from parents regarding standard household characteristics, child care arrangements, and parental activities with children. In addition, at the 2- and 4-year-old waves, trained observers were, with permission of parents and providers, sent to the primary non-parental care providers to record several measures of care quality. Child health, cognitive, and socio-emotional assessments were conducted during all waves.

ATUS: Data from the American Time Use Survey provide information about the quantity and nature of parental engagement with their children. ATUS is the first ongoing nationally-representative time diary data collection effort in the U.S. During the ATUS interview, one randomly selected respondent per household reports their activities for the 24-hour period beginning the previous day, including information about what they were doing, who they were with, and whether they engaged in a selected set of secondary activities at the same time. Detailed activity coding allows us to differentiate between different ways parents engage with their children, both in direct care of children and co-presence of children as well as parental responsibility for children. Although the ATUS is valuable because of its large sample size and frequent surveys covering the period from 2003-2019, it is limited by the fact that it only identifies one parent's total childcare time allocation across all children in the household and cannot be used to quantify childcare provided to each child nor care provided by multiple adults in the household.

PSID-CDS: We leverage the Child Development Supplement of the Panel Study of Income Dynamics primarily to study parental care quality. The PSID-CDS was introduced in 1997 to collect more detailed information on the children in PSID respondent households. The first three waves carried out in 1997, 2002/2003, and 2007 followed roughly 3,500 children. A new cohort initiated in 2014 contained 4,311 children. PSID-CDS time diaries contain rich information on activities and caregivers when a parent is present.[12] Parents (or parents and children together) filled out a time diary for two days within a week (one weekday and one weekend) and provided information on all activities in which the child participated during the sample 24 hours, including the intensity with which co-participants engaged in each activity. Co-participants (for example, parents) could be actively participating with the child or simply present around the child but passively engaged in other activities while the child engages in the recorded activity.

NHES: Like the NSECE, the National Household Education Study (NHES) provides information on non-parental care arrangements for a nationally-representative sample of households. The NHES is less detailed than the NSECE, but allows comparisons across time. It collects information on the hours each child spends in any regular non-parental care arrangements. We use NHES data for four years: 2001, 2005, 2012, and 2016.

October CPS: In October of the monthly Current Population Survey, participants are asked

[12] In principle, the time diary captures caregivers when a parent is not present but detail is lacking and data are not reliable for this purpose.

questions about educational enrollment. Survey respondents are asked to report, for any household children aged 3 and older, attendance in "nursery," "pre-school," or "pre-k" schooling. This provides nationally-representative information on care received for some young children stretching back into the 1970s and continuing to today. However, unlike the other data we use, it does not provide information about the form of this care, such as hours attended or type of provider within the broad set.

SIPP: The 2018 Survey of Income and Program Participation (SIPP) includes information about the type of care each sample household child utilized. The survey asked the "reference parent" (typically the mother) to identify the child care arrangements used while the reference parent was working or in school. In this recent version of the SIPP, there is no information on hours of each care type, only the incidence of use.

3 How Much Parental Care? Inequality and Trends

We begin by documenting the time that children spend in parental versus non-parental care, focusing on SES differences. Parental care is child time spent in the presence of at least one parent, and non-parental care is the complement, when no parent is caring for the child. In this age range, children need care at all times and so some caregiver is present at all times, although the intensity of the interaction can vary. We show evidence across multiple datasets indicating that young children (under 5 years old) in higher-SES families spend substantially less time in parental care and more time in non-parental care than do children in lower-SES families. Later sections provide more detail on the specific types of care children experience and various measures of quality.

Before directly analyzing parental time received, we begin by measuring the average number of weekly hours that mothers and fathers spend in the presence of any of their children, using the ATUS. This total caregiving time is the broadest measure of caregiving time in the ATUS, and includes: (i) time in direct child care activities, (ii) time in non-direct-care activities with a child, and (iii) time responsible for a child but not engaged in an activity with a child. (i) is direct, intense caregiving activities such as reading a book to a child, playing with a child, or helping a child with a bath. (ii) includes other activities such as eating a meal or grocery shopping with a child, and (iii) is a more passive form of parental care such as when the parent is in one room and the child is playing in another.[13] Our measure of parental time in the ATUS does not include time after the

[13]Much of the previous research focuses only on (i) direct care. Focusing on these particular childcare activities misses time during which parents are responsible for a child or doing activities with a child that are not otherwise considered childcare [Folbre et al., 2005, Budig and Folbre, 2004, Bianchi, 2000]. For example, a parent making dinner while an infant is in a swing or a child is playing quietly on their own in the same room is not the most intensive form of parental caregiving. But certainly the parent in these cases is responsible for the child and is available to provide care as needed. Therefore, we include both an inclusive measure of parental care that provides an accounting of all the time that parents report caring for children as well as a more specific measure of direct parental care that is in line with much of the previous literature focusing on developmental childcare activities.

last household child goes to bed for the night or before the first wakes, but does include time during the day when children nap.

We plot the trend in average weekly total caregiving time for mothers, classifying households by maternal education (Figure 1: top-left).[14] Our sample includes all households with at least one child aged 4 or younger. We use the mother's formal educational attainment as a succinct and stable summary of family advantage.[15]

In the early 2000s, mothers with a high school degree or less spent about the same average number of hours in total caregiving time as mothers with a bachelor's degree or more, consistent with [Guryan et al., 2008]. Following this period, there is a clear divergence, and by the late 2010s, college-educated mothers spent substantially less time with their children: about 70 hours in total childcare, compared to about 80 hours for mothers with a high school degree or less.

Trends in maternal earning or learning time – hours working for pay, looking for work, or educational/training activities – are the reverse of those for total maternal care hours (Figure 1: top-right). Mothers with at least a bachelor's increased their hours in the labor market or education, while mothers with no college did not.

In the years from 2003 to 2019, the evolution of maternal direct care activity hours implies a different conclusion about the size of the SES gap and its direction of change than does the evolution of total maternal care hours. Though total hours diverged by SES, time in direct care activities converged substantially across the same period (Figure 1: bottom-left). High-SES mothers spent about 8 hours more time in direct care activities weekly than low-SES mothers in the early 2000s, but the gap shrank to about 3 hours by the late 2010s.

Like mothers, fathers in high-SES households have reduced hours with their children and increased hours in market work, education, or training activities. But fathers' changes have been smaller than mothers', and the recent SES gap in total child care is about half as large for fathers as mothers. Overall, fathers spend about two-thirds as much time in parental care as mothers. Figure B-1 reports analogous trends for fathers, dividing households using mother's education, as above.

To supplement ATUS parental time diaries, we turn to datasets focusing directly on the care that children experience, primarily the NSECE. Although the ATUS has been a workhorse in this literature and provides large samples and trends over time, it is limited by the fact that it only provides information about one adult respondent per household and for caregiving time across all of that respondent's children combined rather than that allocated to any particular child. It cannot reveal the amount of parental care when there is more than one parent in the household. And,

[14] Note that the ATUS data only provides one day of time diary information. For comparison to other datasets, we take this daily measure and multiple by 7 for a weekly measure.

[15] Family income can change dramatically after a child is born and is jointly determined with childcare and labor supply. We also show results by family income when available, and we find similar patterns as when conditioning on maternal education. See below for some discussion.

even in a household with just one parent, if there are multiple children the ATUS cannot describe the amount of parental care received by any one child. In contrast, the 2012 NSECE's child time diaries provide a comprehensive, nationally-representative view of children's time, permitting the best measure of parental versus non-parental care available by age and SES. In Section 4, we leverage the NSECE to distinguish different kinds of non-parental care.

Weekly non-parental care hours increase as children age, but do so especially quickly as children age into eligibility for more public care and education programs. In their first year of life, children average about 12 hours of non-parental care weekly (Figure 2). Non-parental care rises to an average of about 30 hours by age 6, when almost all children are in K-12 schooling.[16]

These averages mask large differences in non-parental care hours by SES. At all ages, children from higher-SES families average substantially more time in non-parental care and less time in their parents' care than do children from lower-SES families (Figure 3). For the youngest children (ages 0 to 2), those whose mothers have at least a bachelor's degree experience nearly twice as many hours of non-parental care as do those whose mothers don't have a high school degree: nearly 20 hours weekly versus just over 10 hours, respectively. All hours statistics include households that report 0 hours.[17]

As children age, the SES gap in non-parental care time diminishes, essentially disappearing when public K-12 schools become widely available. Non-parental care hours increase for all maternal education groups as children age but rise faster for those whose mothers have less education. Preschool-age children (3-4 years old) whose mothers have less than a high school degree average about 15 hours of non-parental care per week. Those whose mothers have at least a bachelor's average roughly 22 hours weekly. Beyond averages, the distributions of non-parental care hours evolve differently depending on maternal education. In the first 3 years of life, fewer than 20 percent of children whose mothers do not have a high school diploma receive full-time (31 or more hours weekly) non-parental care (Figure B-2). At the same ages, the share of children receiving full-time care among those whose mothers have a bachelor's degree is about twice as high. At ages 5 and 6, the SES difference in care hour distributions is gone.

The SES gap in non-parental care hours widened over the last two decades, echoing trends in parental care hours from the ATUS. The NHES provides multiple years of nationally-representative data on children's hours in regularly-used, non-parental care arrangements, allowing insight into trends.[18] Using the 2001 and 2019 NHES surveys, the widening SES gap in non-parental care hours

[16]The NSECE survey took place in the winter and spring, and so it does not represent children's experiences in the summer or fall.

[17]We also measure family advantage using family income, and the results are largely unchanged. See Figure B-4. Children from low-income families (<$25,000 USD2012) spend almost half as many hours weekly in non-parental care at the youngest ages as those from high-income families ($\geq$ $75,000). This gap gradually diminishes as children age and disappears at school age, just as we see when using mother's education.

[18]While the NSECE comprehensively measures children's hours in all non-parental care, the NHES only measures hours in regularly-used non-parental care arrangements. However, the NSECE provides only a 2012 cross-section. Data from a 2019 NSECE wave will be available in the near future.

is clear (Figure 4). For both age groups (0-2 and 3-4), the average number of hours of non-parental care for children of mothers with less than a high school degree actually fell from 2001 to 2019, while the hours for children of mothers with a college degree grew. In fact, by 2019, children of the highest educated mothers received over three times the number of weekly hours in regular center-based care as did children with mothers who did not complete high school (see Appendix Figure B-5). Finally, Figure 5 plots the (Bachelor's minus No College) gap in maternal total hours computed from ATUS data relative to that same gap in non-parental care hours computed from NHES data. As this figure makes clear, after the early 2000s, SES gaps in children's experiences with parental versus non-parental care widened.

The PSID-CDS also provides child time diaries and tells a very similar story (Figure B-3) pooling together multiple waves and cohorts, surveys conducted from 1997 to 2015. We see a similar SES gradient for children age 3 and up using a more-limited measure available in the October CPS. It tracks the extensive margin for a subset of non-parental care types: "pre-school," "nursery school," or "pre-K." Appendix Figures B-6 and B-7 report results. There is little change between 2003-2006 and 2015-2018 in these values or relationships. Similarly, recent data from the SIPP show comparable educational gradients in the incidence of using any non-parent care and non-parent-non-relative care (see Appendix Figures B-8 and B-9).

4 Non-Parental Care Quality

The broad category of non-parental care described above covers many heterogeneous kinds of care. In this section, we describe patterns of non-parental care quality by SES, leaning heavily on an observer-based measure of care quality from the ECLS-B that is valid across all non-parental care types and conducted in the early 2000s.[19] To relate these measures to more-recent children's experiences, we create a harmonized classification of non-parental care types across the ECLS-B and NSECE that divides non-parental care into five care types, where types are defined by caregiver and setting in which care occurs:

1. Relative: grandparents, siblings, or any non-parental relative in any setting,
2. In Child Home: sitter or nanny in the child's home,
3. Public Center: publicly funded program such as Head Start, school-based pre-kindergarten, or K-12 school,

[19]This paper aims to leverage the best-available data as well as possible. Its conclusions rest on the validity of available measures, though concerns about potential racial, ethnic, and class bias in conceptualizing and measuring parental and nonparental care quality remain [Lareau, 2011, Cunha, 2015, Doepke and Zilibotti, 2017]. Special concerns arise when policy makes quality measures high stakes [Jenkins et al., 2021, Butrymowicz and Mader], and work to improve measures is ongoing [Curenton et al., 2020, Jensen et al., 2020].

4. Private Center: for-profit or nonprofit center without direct public funding, though attending children may receive public vouchers, and

5. In Provider Home: in any other setting, primarily in provider's home, sometimes referred to as "family child care" or "home-based care."

For some analyses, we also consider Head Start centers separately and pool the remaining public and private centers into a single category. With this classification, we can leverage the ECLS-B measures of average quality by care type to interpret more-recent NSECE and comprehensive information on children's time spent in different care types.[20]

4.1 Average Quality Differences by Non-Parental Care Type

We use observer-based measures of child care quality in the ECLS-B. For each child's primary non-parental caregiver (the one that regularly provides the most hours of non-parental care and regularly lasted at least 10 hours per week), the ECLS-B also sent observers to caregiving sites to observe and rate the quality of care. We focus on the Arnett Scale of Caregiver Behavior, an ECLS-B modified version of an instrument used in several previous studies. The Arnett scale was designed specifically to be reliable across all types of non-parental care, and focuses on caregiver-child interactions.[21] We age-standardize (Z-score) Arnett scores within the full sample, for each child's year of age.

Figure 6 provides the average standardized Arnett Z-score by care type, for children from birth through age 4. The non-parental care type with the lowest average quality is relatives, averaging about 0.2 standard deviations below the mean. The highest-quality type is care in the child's home (nannies), at about 0.5 standard deviations above mean. Care in the provider's home (home-based care) averages just below the sample mean and center-based care tends to score better than average. Here, center care includes any private or public centers, preschools, and pre-K arrangements. The average quality of Head Start care exceeds the average quality of non-Head Start centers, of non-Head Start home-based care, and of relatives.[22]

[20] Ruzek et al. [2014] describe relationships between SES, non-parental care types and quality, and child outcomes in the ELCS-B 2001 cohort alone. By combining ECLS-B quality measures with more-recent NSECE data on care type and hours, we provide a more-updated, but similar view. Blau and Currie [2006] summarizes research on quality from data collections in the 1980s and 90s.

[21] Other observer-based measures are specific to particular types of non-parental care, such as center care or in-provider home care and so cannot be compared across children with different types of primary providers.

[22] Many prior studies report similar rankings. Bassok et al. [2016] analyze quality differences across and within non-parental care types using the ECLS-B data. They control for family characteristics in explaining the association of non-parental care, quality, and child outcomes but do not describe SES gaps in care quality by family SES. Bernal and Keane [2010] found relative care to be of especially low quality for children's cognitive development.

4.2 Non-parental Care Quality Differences by SES

Given the context of average quality differences by type from the ECLS-B, we examine SES differences in usage of different types of non-parental care in the NSECE. The NSECE describes type and hours for for each regularly-used, non-parental care arrangement for each child.

Children from lower-SES families receive a far higher share of their non-parental care from relatives than do children from higher-SES families, particularly at younger ages. Figure 7 displays the distribution of non-parental care types by child age group and mother's education level.[23] In the first three years of life, relatives provide about 75 percent of non-parental care for children whose mothers don't have a high school degree but only about 39 percent for children whose mothers have at least a bachelor's. As shown above, relative care tends to be of the lowest developmental quality. Lower-SES children also get more of their care from public programs than do higher-SES children, but the shares of such care and the differences by SES are much smaller than with relative care. In contrast, higher-SES children get a much larger share of their non-parental care in the first three years of life from private centers and other providers. The share of time with nannies or sitters is very small, even among those whose mothers have a college degree.

The role of public providers (Head Start and school-based prekindergarten) expands substantially once children reach preschool age (3-4 years old) and the share of care provided by relatives declines. By K-12 age, public programs (kindergarten and first grade) are the dominant form of care for all children.

Differences in the source of non-parental care by SES are not explained by SES differences in mother employment. For children aged 0-2, shares of care from different provider types are very similar within maternal education group, whether or not the mother is employed (Figure 8: left panel). However, for each maternal education group, maternal employment is associated with a larger quantity of non-parental care (Figure 8: right panel)[24]

SES differences in quality within care type further reinforce differences in quality across types. Figure 9 plots average Arnett scores by mother's education within broad categories of care types and age group. For children ages 0-2, those whose mothers have at least a bachelor's experience much higher quality care within care type. The SES gap in care quality is substantial for center-based care (0.4 standard deviations) but even larger still for relative care (0.8 standard deviations). For older children, ages 3-4, we see a similar pattern. The gap for center care is 0.3 standard deviations

[23] To measure public providers, we follow Goerge et al. [2015]. We describe small differences between the NSECE and ECLS-B care arrangements samples for detail-oriented readers. Though the NSECE tracks all non-parental care through a time diary as discussed in the prior section, it measures quantity of time by care type only in each child's "regular" care arrangements, those in which the child usually spends at least 5 hours a week. So, we do not know about the types for arrangements that are not regular. The ECLS-B quality measures are available for each of a respondent child's primary non-parental care provider, the one who provides the most care weekly if the child regularly gets at least 10 hours a week of care there. So the ECLS-B quality measures pertain only to primary arrangements. For more detail see Appendix Section **??**.

[24] See Appendix Figure B-11 for ages 3-4.

but over 0.9 standard deviations for relative care. Care environments experienced by children in high-SES households are above average quality within care type, regardless of type.[25]

Figure 10 presents average quality for the primary non-parental care arrangement, regardless of type, within maternal education level but aggregating across ages and reveals a 0.4 standard deviation difference in non-parental care quality between children of mothers with a bachelor's and those without a high school degree. This SES gap in non-parental care quality gets smaller as children age, as older children from lower-SES backgrounds experience a higher proportion of center-based and Head Start care, which tends to be of higher quality. For children from lower-SES households, those in center-based care experience a much higher level of care quality than those in other kinds of non-parental care.[26]

4.3 Head Start

We next explore the quantitative importance of a leading government child care program, Head Start, in raising the quality of care experienced by children from low-SES families and reducing the SES gap in non-parental care quality. The federal Head Start program provides direct funding primarily for child care centers to provide free (or highly subsidized) care to eligible children, primarily 3 and 4 years old, from low-income households.[27] In 2019, Head Start served about 1 million children, at an outlay of about $10 billion in federal government funding. This level of funding allows it to serve only 11% of eligible children under 3 and 36% of 3 and 4 year olds [NHS, 2020].

Despite Head Start serving far less than the majority of eligible children, the program plays a large role in lifting the average quality of non-parental care quality for disadvantaged American children.[28] Alongside average observed non-parental care quality by SES, Figure 10 presents average quality excluding households who report using a Head Start care arrangement. The importance of

[25]This result echoes those in Chaudry et al. [2021]. They also use the ECLS-B but split the sample by family income rather than maternal education. They use two different measures of quality – the Family Day Care Rating Scale for care in the provider's home and the Infant-Toddler Environment Rating Scale for center-based care, whereas we continue to focus on the single Arnett scale of its ability to compare across non-parental care types.

[26]Although not necessarily a direct measure of quality, the price of care can provide another measures of quality. Using NSECE data, Appendix Figure B-14 displays median and mean price *paid* per hour for center-based care, conditioning on maternal education and child age. The center-based care that children whose mothers have a bachelor's degree experience is significantly more expensive per hour than that of children whose mother do not have a high school degree: the ratio of average prices paid is roughly three to one. This adds evidence that children of mothers with a bachelor's degree experience higher quality center-based care, though this difference is almost certainly partially attributable to other factors: price discrimination, subsidies, differences in the valuation of non-quality attributes, and the effectiveness of search.

[27]About 25% of the Head Start participants were younger than 3 and served by Early Head Start [ACF, 2021]. In addition to child care, Head Start also provides an array of services to enrolled children and their families, including children's health services and home visiting.

[28]Among families eligible for public child care subsidies, the quality of care received from Head Start tends to exceed that received either using Child Care and Development Fund vouchers or in unsubsidized care [Johnson et al., 2012].

Head Start to children from low-SES households is evident here.[29] Especially among the lowest-SES children, those not utilizing Head Start experience non-parental care arrangements of much lower average quality. Excluding Head Start pushes the lowest-SES children's average non-parental care quality down by more than 0.2 standard deviations, doubling the disadvantage relative to the sample mean, from -0.2 to about -0.4 standard deviation.[30] For the highest-SES children, there is little difference in care quality when including or excluding Head Start care because they are mostly ineligible for Head Start.

5 Parental Care Quality

The results above show that higher-SES children spend more time with (higher-quality) non-parental caregivers and, consequently, less time with their parents than do other children. In this section, we document how children's experiences during parental care also differ by SES. We draw on three types of data: information about parent activities while with kids from the ATUS, child-specific time diaries in the PSID-CDS, and outside-observer based measures of parental engagement and home environment from the PSID-CDS. In the next Section, we also use information from the ECLS-B on parental activities with children.

5.1 Quality of Parental Care Given (ATUS)

We begin with an analysis of parent time recorded in the ATUS. Although it enjoys a large sample size and annual surveys covering the past 20 years, the ATUS is limited for some purposes because it only records the total time allocation of one respondent parent, and does not allow an assignment of time to specific children in the household. We exploit additional information in the survey about the numbers and ages of all children in the household, allowing us to make comparisons across households with similar family structures. Maternal education differences in these data will not necessarily reflect the gradient in care *received* by children if parents allocate care among their children differently across the education spectrum. However, we show below that conclusions drawn from the ATUS are consistent with those from datasets which allow for a child-specific care time assignment.

Table 1 presents coefficient estimates from regression analyses using different measures of parental time as the dependent variable. The studied sample consists of all households with at least one child under age 5, and we pool the most recent ATUS surveys from 2016-2019. The regression models include indicator variables for all possible ages and number of children in the household,

[29] Appendix Figure B-15 displays the analogous statistics conditioning on family income instead of mother education. The same conclusion holds.

[30] Equivalently, this statistic can be constructed by assuming that Head Start is replaced by care with the quality level equal to the sample average of non-Head Start users. This statistics does not necessarily indicate the policy counterfactual effect of de-funding Head Start.

along with fixed effects for the survey year and month, and an indicator for whether the sample day was a weekday. Conditional on these household characteristics and other variables, mothers with a bachelor's degree averaged nearly 14 fewer hours weekly of total child care (time at least one child was in their presence) than mothers who did not have a high school degree (Panel A: Column 1). Following Guryan et al. [2008], we examine the components of child care that are most intensive ("direct" child care activities), and find the opposite gradient: mothers with a college degree spend about 5.7 more hours per week in direct child care than mothers without a high school degree, a difference equal to 26 percent of the sample mean. Finally, for each mother, we construct the share of total child care spent in direct child care activities, considering this fraction as a measure of parenting intensity. If direct care activities lead to better outcomes for children than the other uses of time parents spend caring for their children, then fraction direct gives a measure of parental-care quality. Conditional on household composition, mothers with a bachelor's degree spend about 15.6 percentage points more of their parental-care time in these activities. This is a substantial difference: nearly 50 percent of the overall sample fraction of 32 percent of maternal care time.[31]

Panel B of Table 1 repeats the analysis for fathers. For father's hours of total child care, there is no evidence of a gradient by SES, unlike maternal total child care hours. But we see a similar pattern for hours of direct care: fathers of highest-SES children provide almost 5 more hours per week of direct care activities even conditional on household composition.

Overall our findings are consistent with inequality in parental care experiences between children in families of different SES. Higher-SES parents spend more time and larger shares of their time with their children in direct care activities. This is the case even though higher-SES mothers spend less time overall caring for their children than do lower-SES mothers.

5.2 Quality of Parental Care Experienced (PSID)

Although we are able to condition on family composition in the ATUS, allowing us to compare parenting time given among caregivers with the same number and ages of children in the household, the results above do not map perfectly into a concept of care experienced by children. To directly study the parental care experienced by children across the SES distribution, we turn to the PSID time diaries, trading smaller samples of children in exchange for more-detailed information on the *child's* time and activities with parents.

In the PSID, we focus on three dimensions of parental care quality experienced by the child:

[31] In Appendix Table B-3, we repeat this analysis including additional variables for the mother's labor supply, marital status, age, and the presence of a father. Unsurprisingly, conditional on these variables, the education gradient in total care time for mothers is much smaller and no longer statistically significantly different between groups, reflecting that the total amount of time mothers are around their children is largely determined by labor supply and adult household composition. However, the gap in hours of direct care activities provided and the fraction of maternal care time in direct-care activities remains about the same. This indicates that, even among mothers with the same labor force and marital status, parental care quality differences remain between mothers of different education levels.

the number of parents with the child, the activities in which the child is engaged, and the intensity with which present parents are participating. First, we classify each entry in a child's time diary according to the number of parents present, either zero, one, or two. Total parental child care time is then defined as all hours in which at least one parent is present. The premise of this as a measure of quality is that two parents present in a moment increases the probability of responsive parent-child interactions during parental care. This measure provides one (imperfect) piece of evidence.[32] Second, time during which at least one parent is reported as "actively" participating is classified as *active parenting* time. Third, we identify a subset of activities that may be considered *educational*, including reading or being read to, homework, conversation, attending a cultural event, or receiving lessons (such as music). Finally, we measure if the child is engaged in screen-based leisure time (television or recreational computer time). Further details are given in the Appendix Section A.2.

Results from the PSID reinforce those from the ATUS: children with higher-educated mothers experience higher quality parenting time on average. Children of higher-education mothers spend a larger share of their parental care time with both parents and less with mother only at every child age group (Figure 11). On average, children spent about 36 percent of parental care time with both parents. With basic controls (child age, ages of all children in the household, and survey year), children whose mothers have no college education average over 7 percentage points less of their parental care time (about 20% of the mean) with both parents than do children whose mothers have at least a bachelor's degree (Table 2: Panel A).

Beyond spending more time with both parents, children of higher-education mothers spend a larger fraction of their parental care time in activities that are often considered to better promote child development (Table 2: Panel B).[33] Relative to children of mothers with no college education, children whose mothers have a bachelor's degree spend more of their parent time in direct care (4.5%), with a parent actively engaged (4.5%), and in educational activities (1.6%). Although this marginal difference in educational time share in particular seems small in magnitude, it is 40% of the mean fraction of time spent in these activities. Finally, children in high-SES families spend almost 5% (roughly 35% of the mean) less of their parental time in screen time.[34]

[32] It omits non-parent caregivers present and the number of other children present.

[33] Why use the fraction of parental care hours in direct (or educational) care activities to measure parental care quality rather than just using the amount of time in such activities, which is more conventional? Consider two children who each spend 10 hours a week getting direct care from their parents. However, child H spends 60 hours a week in parental care (quality = 10/60) and 60 hours in nonparental care while child L spends 110 hours a week in parental care (quality = 10/110) and 10 hours in nonparental care. Delivering the same amount of direct care time in a smaller quantity of parental care time reflects higher parental-care quality, under this measure. Focusing just on the level of direct care time conflates the quantity of parental-care time with its quality. Increasing direct-care time versus increasing the quantity of parental care time implies different tradeoffs than increasing it via quality [Chaparro et al., 2020], and it obscures the fact that children have a time budget such that any child hours not in parental care crowds out nonparental care time, which has its own quality level. It lumps together parental care time in non-direct activities with nonparental care time as an excluded category.

[34] Appendix Table B-4 contains analogous estimates including additional control variables, and Appendix Table B-5 presents estimates using levels as the outcome variable rather than shares.

5.3 Observer Ratings of Parental Care and Home Environment Quality (PSID)

The PSID contain several measures of parental care and home environment characteristics from both parents' self-reports and from direct observation of parent-child interactions and the home environment by trained observers during a home visit. With these, we build additional measures of parental care quality. Our primary measures of parent and home environment quality come from the Home Observation for Measurement of the Environment (HOME) Inventory [Caldwell and Bradley, 1984]. The HOME Inventory is a set of items that aim to measure the quality of a child's home environment, including interactions with the primary caregiver (almost always the mother). We partition the HOME items into three sets: observer-based measures of the primary caregiver and interactions between the caregiver and child, observer-based measures of the home environment, and self-reported survey items. The Data Appendix describes how we construct Z-score indices from the HOME score items.

By each measure, higher-SES children have higher quality care experiences at home than do lower-SES children (Table 3). When pooling all items of the HOME inventory, children of mothers with a bachelor's have an average score of over 0.85 standard deviations higher than that of those without a high school degree (Column 1). The education gradients in each subscale range from 0.59-0.70 standard deviations (Columns 2-4).

6 Aggregate Care Quality

The analyses above show that lower-SES children experience, on average, lower quality parental care and non-parental care. However, the total experience of a child depends on the quality of each type as well as the allocation of time between types. Computing maternal education gradients in total child care received therefore requires observations from the joint distribution of parental and non-parental care hours, measures of the quality of each, and a way to compare and aggregate quality across types.

6.1 Correlation of Parental and Non-Parental Care Quality

We first show that children who receive higher quality parental care also tend to receive higher quality non-parental care, implying that care across types reinforces, rather than compensates for, quality differences. We use the ECLS-B data to provide evidence on the joint distribution of parental and non-parental care qualities. We plot average non-parental care quality as measured by the age-standardized Arnett score in the primary non-parental care arrangement against parental

care quality as measured by parents' reported frequency of reading to the child (Figure 12).[35] For younger (age 0-2) and older (3-4) children, quality of non-parental care is on average higher for children whose parents read to them more, with the gradient more pronounced for younger children. We repeat this analysis in a regression format (Table 4) and find a positive correlation in measures of parental and non-parental quality, both overall and within sub-samples by mother's education.

Next we turn to additional evidence on the correlation of parental and non-parental care quality. Although the ATUS data do not provide any information on non-parental care, we can use these data to see if gaps in parental quality remain, even conditional on the total time parents spend with their children. As we have documented from other data, children from low-SES families tend to receive lower quality non-parental care. Do their parents compensate for this through higher quality, more intensive care at home? Figure 13 plots our two measures of parental quality for mothers, fraction of mother's total hours in "direct care" and in "educational" activities, where we divide the sample into 3 groups based on total hours of mother care. We see gaps by mother's education in each quality measure and for each bin of total hours. The largest gaps are for mothers providing fewer than 40 hours of weekly care (and presumably most are using full-time non-parental care) and the gaps are smallest for the mothers who are full-time, stay-at-home parents (providing over 75 hours of total weekly care). Rather than showing evidence that parental care is compensating for lower average non-parental care, we see evidence of reinforcement. Parenting inequality is lowest in families in which the mother provides the most hours of care, and highest when families rely on more non-parental care.

6.2 Indices of Aggregate Quality

To measure overall care experiences incorporating both parental and non-parental care, we construct an index of average care quality given by

$$Q = \frac{\tau_p}{T} Q_p + \frac{\tau_n}{T} Q_n \tag{6.1}$$

where $T = \tau_p + \tau_n$ is the total care time for a given child, τ_p is parental hours with this child, τ_n is non-parental hours, and Q_p and Q_n are the average quality of this time. We use age-standardized measures of non-parental and parental quality to measure Q_n and Q_p. In this framework, an aggregate score $Q = 0$ implies that a child's overall care experiences are equal to those of the average child, and a score $Q = 1$ implies that a child's overall care experiences are 1 standard deviation higher than the average child's.[36] A limitation of this approach is the implicit equivalence in age-

[35] We adapt a commonly used parental activity measure, the number of times parents report reading to their child over a week (e.g. Cunha et al. [2010], Todd and Wolpin [2007], Blau [1999]). See Ece Demir-Lira et al. [2019], Price and Kalil [2019] and the studies cited therein for evidence on the developmental effects of reading.

[36] In this framework, an aggregate quality score of $Q = 0$ from (6.1) could be accomplished through various

standardized units of our measures of parental and non-parental care. Ideally, we would anchor each separately in some outcome, allowing us to estimate the productivity of each.[37]

Our index allows us to quantitatively assess the importance of two kinds of potential compensating behaviors: first, parents choosing higher quality care in one domain to compensate for lower quality care in the other domain, and, second, parents choosing low numbers of hours of the lower quality care in favor of more hours of the higher quality care. Figure 14 plots the gaps in average quality between the children with college educated mothers versus those whose mothers have a high school degree or less (we omit the some college group entirely). We construct this figure using the ECLS-B data, with age-standardized frequency parents read to their child per hour of parental care, age-standardized Arnett scores, and the number of weekly hours in non-parental and parental care to measure Q_p, Q_n, and τ_n and τ_p, respectively.[38]

Analysis of these child-level, aggregate care quality indices reveals several patterns about overall the overall quality of care experienced. The key finding is that, as would be suggested by the positive correlation of parental and non-parental quality and by the SES gaps in both non-parental and parental care quality, the aggregate measure shows a similar SES gradient: there is about a 0.6 and 0.5 standard deviation gap by mother's education, for ages 0-2 and 3-4, respectively. At both age groups (0-2 and 3-4), the gap in age-standardized parental care quality is largest, and incorporating the quality of non-parental care tends to moderate the inequality, for younger children especially (reducing the gap from about 0.6 standard deviations considering only parental care to about 0.5 standard deviations considering both parental and non-parental care). In Figure 14, we also construct an equally-weighted measure of aggregate quality (parental and non-parental care are both given a weight of 0.5), and we find a similar gap as using hour-weighted measures, indicating that hours allocated across care types are not greatly influencing the pattern of inequality. We conclude that aggregate measures incorporating both parental and non-parental care experiences also show substantial inequality in care experienced, with a larger degree of inequality for the youngest children.

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combinations of parental and non-parental quality. For example with 50 percent of time in parental care, $Q = 0$ occurs with $Q_p = Q_n = 0$ or with $Q_p = +0.5$ and $Q_n = -0.5$.

[37] Chaparro et al. [2020] estimate this kind of relationship using experimental data from the late 1980s. These types of additive indexes implicitly assume that quality in the two types of care are perfects substitutes, up to the respective weighting. In general, there may in fact be some sort of complementarity across care types in producing particular developmental outcomes (say measures of cognitive skills at kindergarten entry). In particular, there may be strong complementarities (say even approaching perfect complements/Leontif-type relationships) in the sense that very low quality environments can have scarring effects. See Caucutt et al. [2020] for recent estimates of complementarities across several childhood investments.

[38] To measure parental quality per hour of care, we divide reading frequency by total parental care hours. Reading frequency is recorded as the midpoint of each categorical bin, with 0 recorded for "never", 1.5 for "1-2 times", and 4.5 for "3-6 times", and 7 for "every day." Frequency per hour is then age-standardized for each child age (in years) to create a Z-score measure of Q_p.

6.3 Persistence

Finally, we briefly explore the persistence of inequality in care quality. Much as we might be concerned that year-to-year fluctuations in income may not represent life-time income inequality, we can ask whether the inequality we document at different ages persists. Or is it the case that low quality care environments in early period for a given child are compensated with higher quality environments later?

Table 5 exploits the longitudinal data in the ECLS-B to regress the quality of care in the earlier wave of the ECLS-B (period t, when most children are between 1.5 and 3 years of age) and the next wave of the ECLS-B (period $t+1$, when most children are between 3 and 4 years of age). We see a statistically significant positive correlation between measures over child age. Column 1 for example shows that a child who experienced non-parental care 1 standard deviation above sample average quality in the earlier wave would be expected to receive care 0.14 standard deviations above the sample average in the next period. Similar, and in many cases even higher levels of persistence are evident for parental care quality and overall quality constructed using the hours-weighted index described above.

Although these findings do not indicate perfect persistence (with a caveat that classical measurement error in any of these measures would tend to attenuate findings toward 0), these results do seem to rule out strong dynamic compensating behavior, whereby higher quality care experiences later compensate for lower quality experiences earlier.

7 Conclusion

This paper documents inequality in the quality of care experienced by American children. Recognizing that quality environments can be produced in many different ways, ranging from stay-at-home parenting to full-time center-based care, we combine the best evidence from several sources to document children's comprehensive care experiences. We find that prior to age 6, at which age almost all American children are enrolled in public or private schooling, higher-SES children experience higher quality non-parental and parental care. And we document an important trend over the past two decades: mothers with a college degree are increasingly specializing their time in activities other than maternal care, and at the same time increasingly using high quality non-parental care, particularly care provided by non-relative caregivers. Children in lower-SES families spend more time with their parents (mostly mothers) and tend to receive lower quality care by available mea-sures, and when they do experience non-parental care it is also of lower quality. Programs such as Head Start, although limited in funding, seem to partially ameliorate this gap, but mainly for the older children, aged 3-4.

Three important limitations of this paper motivate future research. First, our focus is explicitly

on care experienced by children rather than parental time allocation. Other work can illuminate how the non-parental childcare market and policies subsidizing this care influence parental time-use decisions. Second, although we document care quality using several different measures, both survey and observer-based, we defer to existing experimental and quasi-experimental evidence to demonstrate causal relationships between measures of quality and child outcomes.[39] To the extent that existing quality measures are biased [Lareau, 2011, Curenton et al., 2020], our analysis reproduces such biases. Finally, although care experiences influence children's skill formation and a clearer understanding of children's experiences help predict the impact of new programs, our descriptive analysis is no substitute for study of the causal effects of policies.

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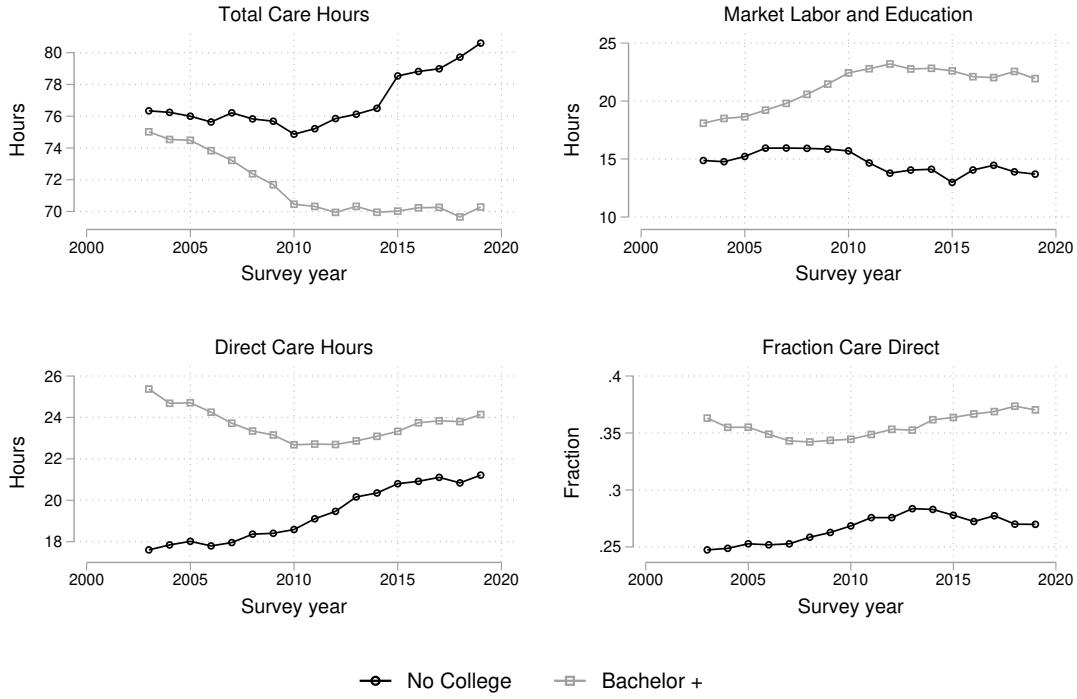
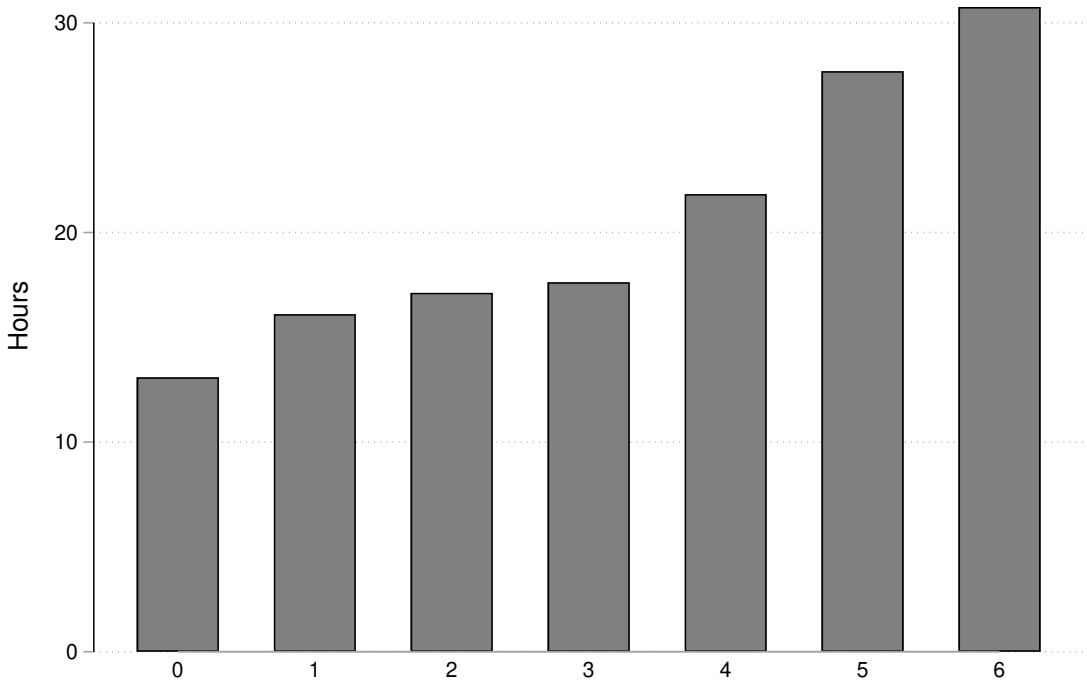
Tables and Figures

Figure 1: Trends in Mother's Time Allocation by Maternal Education



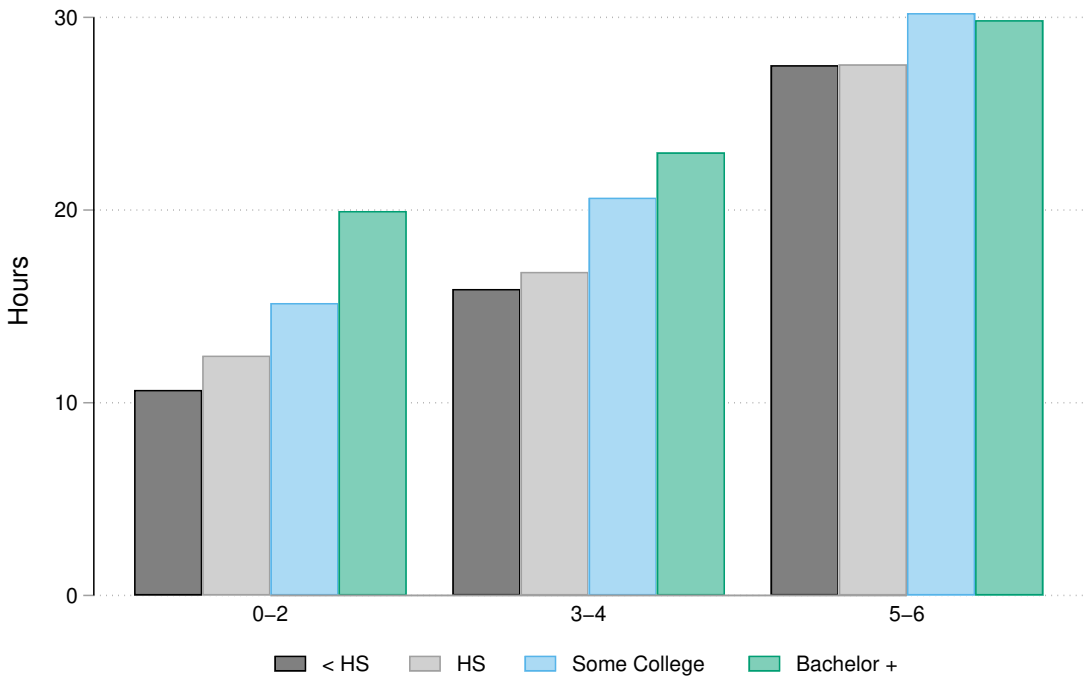
Notes: Sample includes all households with at least one child under the age of 4. Five-year moving averages plotted. "Total Care Hours" includes all time the mother is around a child. "Direct Care Hours" is the subset of Total Care Hours in intense childcare activities. "Market Labor and Education Hours" is the mother's market labor and education/training hours.
Source: ATUS 2003-19.

Figure 2: Average Weekly Non-Parental Care Hours by Child Age



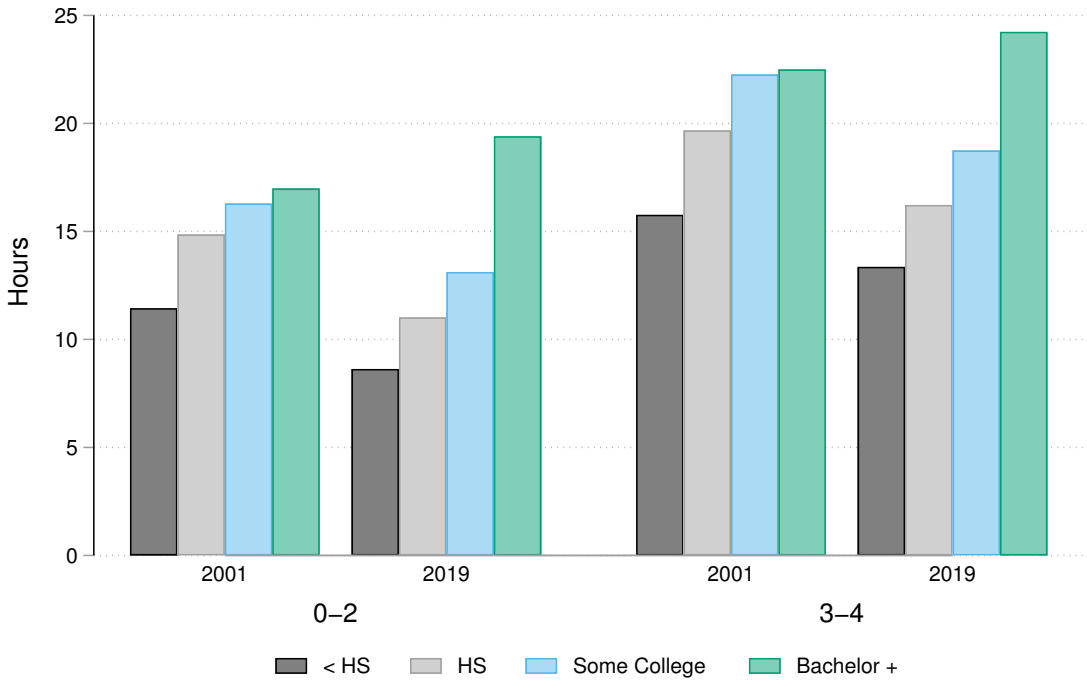
Notes: Comprehensive non-parental care hours for each child.
Source: NSECE 2012.

Figure 3: Average Weekly Non-Parental Care Hours by Child Age and Maternal Education



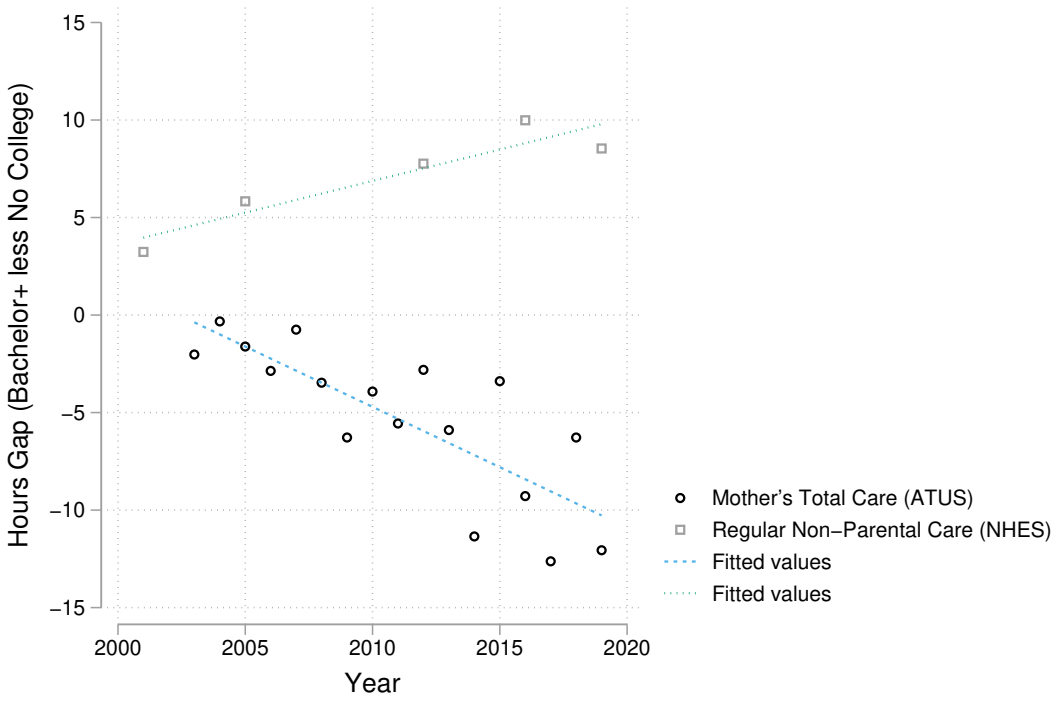
Notes: Comprehensive non-parental care hours for each child.
Source: NSECE 2012.

Figure 4: Trend in Non-Parental Hours by Child Age and Maternal Education



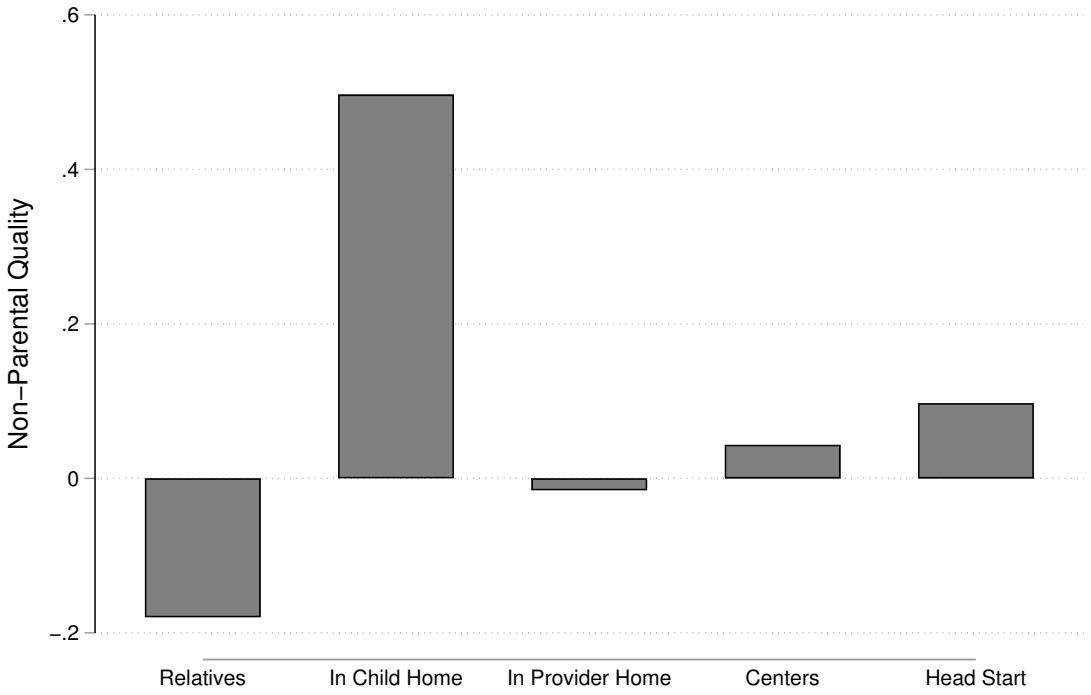
Notes: Average weekly hours in "regular" non-parental arrangements, provided by relatives, centers, or any other non-relative care providers.
Source: NHES 2001, 2019.

Figure 5: Trends in SES-Gap in Non-Parental Hours and in Maternal Care Hours



Notes: Non-parental is weekly hours in "regular" non-parental arrangements, provided by relatives, centers, or any other non-relative care providers.
Source: ATUS 2003-19: maternal care. NHES 2001-19: non-parental care.

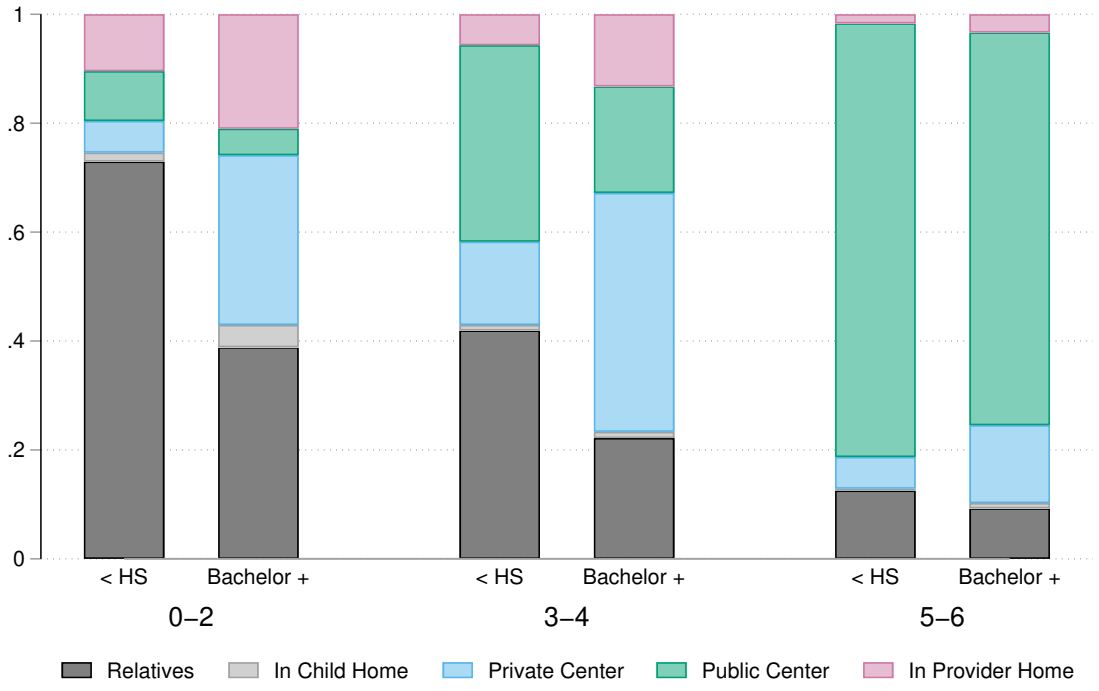
Figure 6: Average Quality by Non-Parental Care Type (Ages 0-4)



Notes: Average quality measured using Arnett Z-scores. "Centers" are non-Head Start centers.

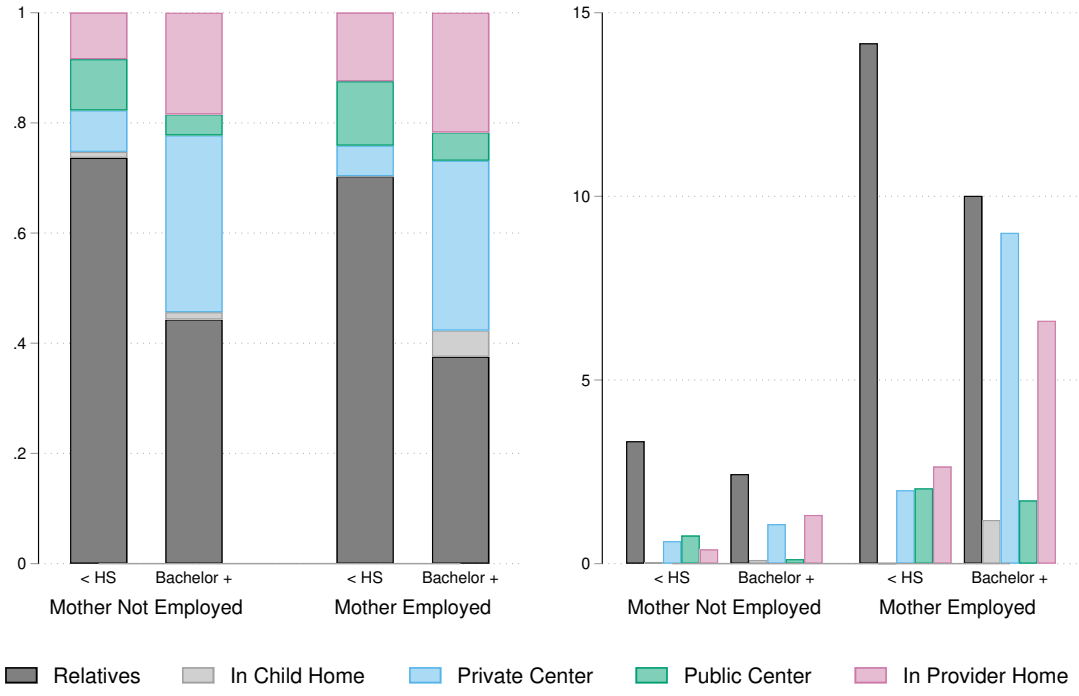
Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B).

Figure 7: Distribution of Hours in Non-parental Care Types by Maternal Education



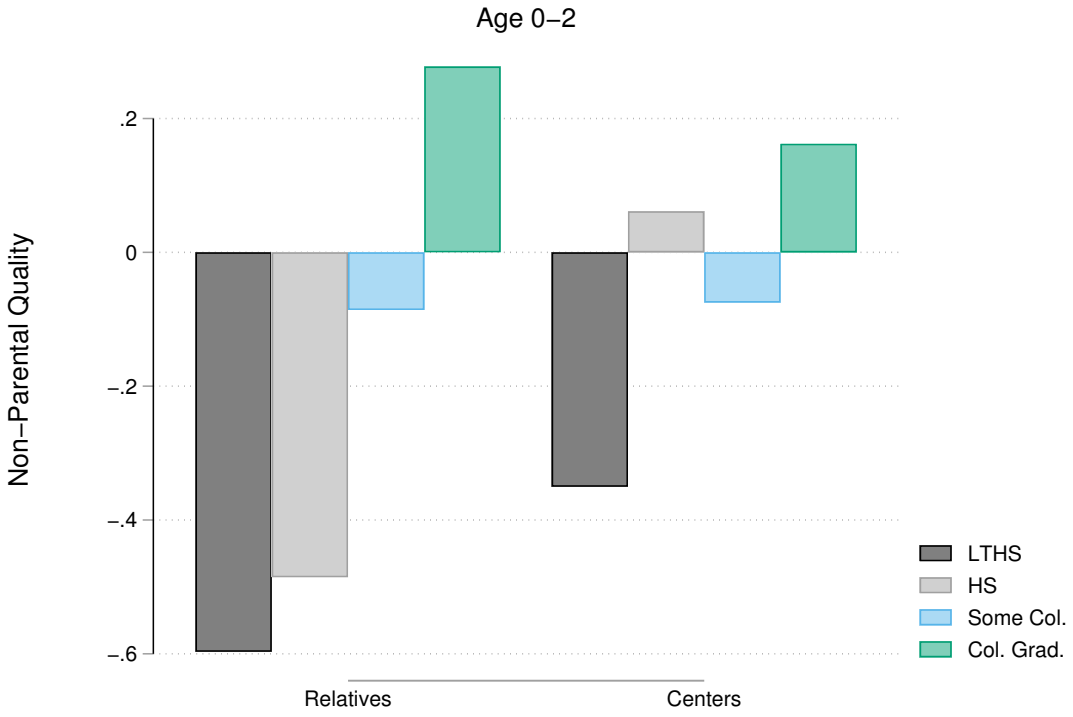
Notes: Distribution of hours in "regular" non-parental arrangements. Public Center includes Head Start, school-based preschool, and K-12. Source: NSECE 2012.

Figure 8: Distribution of Child Hours in Non-Parental Care Types by Maternal Education and Labor Supply (Ages 0-2)

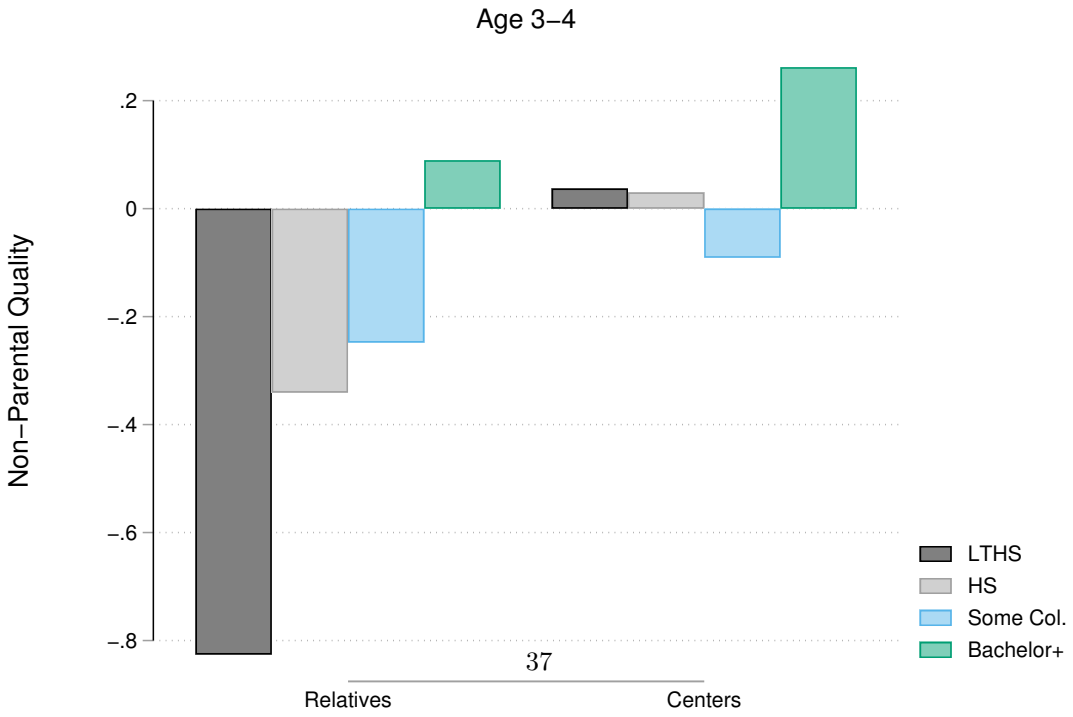


Notes: Distribution of hours in "regular" non-parental arrangements. Source: NSECE 2012.

Figure 9: Average Quality of Non-Parental Care by Mother Education, Child Age, and Care Type



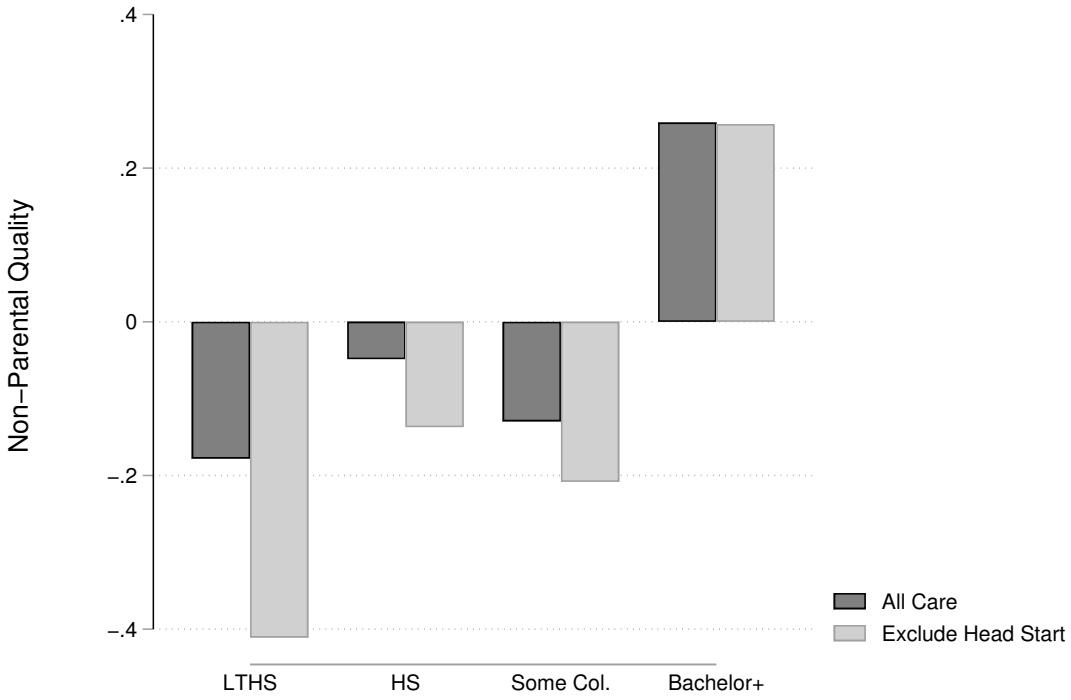
Age 0-2



Age 3-4

Notes: Average quality measured using Arnett Z-scores. "Centers" is all centers, including Head Start.
Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B).

Figure 10: Average Non-Parental Care Quality with and without Head Start, by Mother Education



Notes: Average quality measured using Arnett Z-scores. "Exclude Head Start" uses only non-Head Start arrangements.
Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B).

Table 1: Relationships Between Parental Care Hours and Maternal Education

Panel A: Mother Time

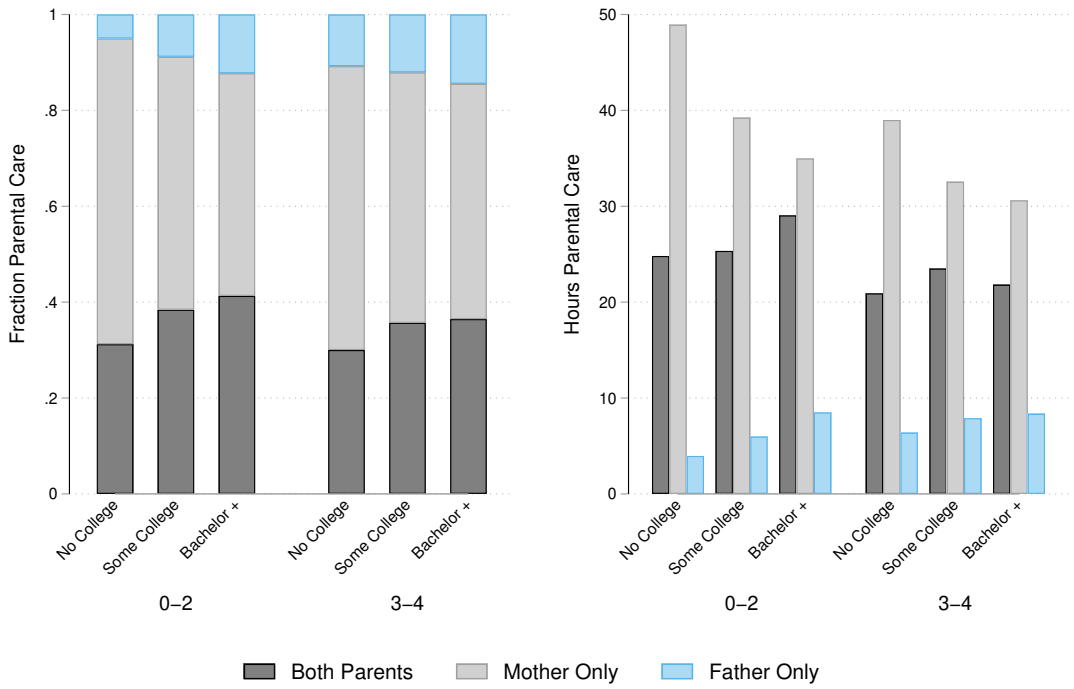
	Total Care Hours	Direct Care Hours	Fraction Direct	Educ. Care Hours	Fraction Educ.
High School	-5.622*	4.356**	0.080***	-0.307	-0.002
	(2.821)	(1.535)	(0.019)	(0.465)	(0.006)
Some College	-9.798***	2.596	0.082***	-0.496	-0.004
	(2.698)	(1.468)	(0.018)	(0.441)	(0.006)
Bachelor Plus	-13.916***	5.678***	0.156***	-0.004	0.008
	(2.519)	(1.329)	(0.017)	(0.449)	(0.006)
Observations	2794	2794	2751	2794	2751
Dep Var Mean	74.14	21.92	0.318	1.803	0.0254

Panel B: Father Time

	Total Care Hours	Direct Care Hours	Fraction Direct	Educ. Care Hours	Fraction Educ.
High School	0.855	0.984	0.042	-0.076	-0.007
	(4.026)	(1.612)	(0.035)	(0.280)	(0.011)
Some College	0.929	2.449	0.056	0.158	0.000
	(3.755)	(1.396)	(0.030)	(0.297)	(0.011)
Bachelor Plus	0.918	4.928***	0.136***	0.306	0.007
	(3.631)	(1.361)	(0.029)	(0.267)	(0.011)
Observations	2082	2082	1987	2082	1987
Dep Var Mean	48.34	11.60	0.290	0.984	0.0271

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Sample is families with at least one child aged 4 or younger. Education level refers to maternal education in both panels with Less than High School as the omitted category. Each panel-column reports estimates from a separate regression with the outcome listed in the column head. All specifications include fixed effects for survey year and month, weekday indicator, and a full set of fixed effects for the age of each child in the household. Missing covariates recoded and a full set of dummy variables for missing covariates is included.
Source: ATUS 2016-19.

Figure 11: Distribution of Parents Present by Child Age and Mother Education



Notes: Parent considered present if actively participating or present but not participating.
Source: PSID-CDS.

Table 2: Relationships between Quality of Parental Care Received and Maternal Education

Panel A: Parents Present

	Both Parents	M Only	F Only
Some College	0.062*	-0.091**	0.029
	(0.028)	(0.033)	(0.019)
College Grad Plus	0.073**	-0.123***	0.051**
	(0.026)	(0.030)	(0.019)
Observations	1375	1375	1375
Dep Var Mean	0.358	0.533	0.109

Panel B: Activities and Intensity

	Direct Care	Active	Educational	Screen Time
Some College	0.032*	0.021	0.010*	-0.034**
	(0.013)	(0.019)	(0.005)	(0.012)
College Grad Plus	0.045***	0.045*	0.016**	-0.048***
	(0.013)	(0.020)	(0.005)	(0.013)
Observations	1375	1375	1375	1375
Dep Var Mean	0.231	0.621	0.0404	0.139

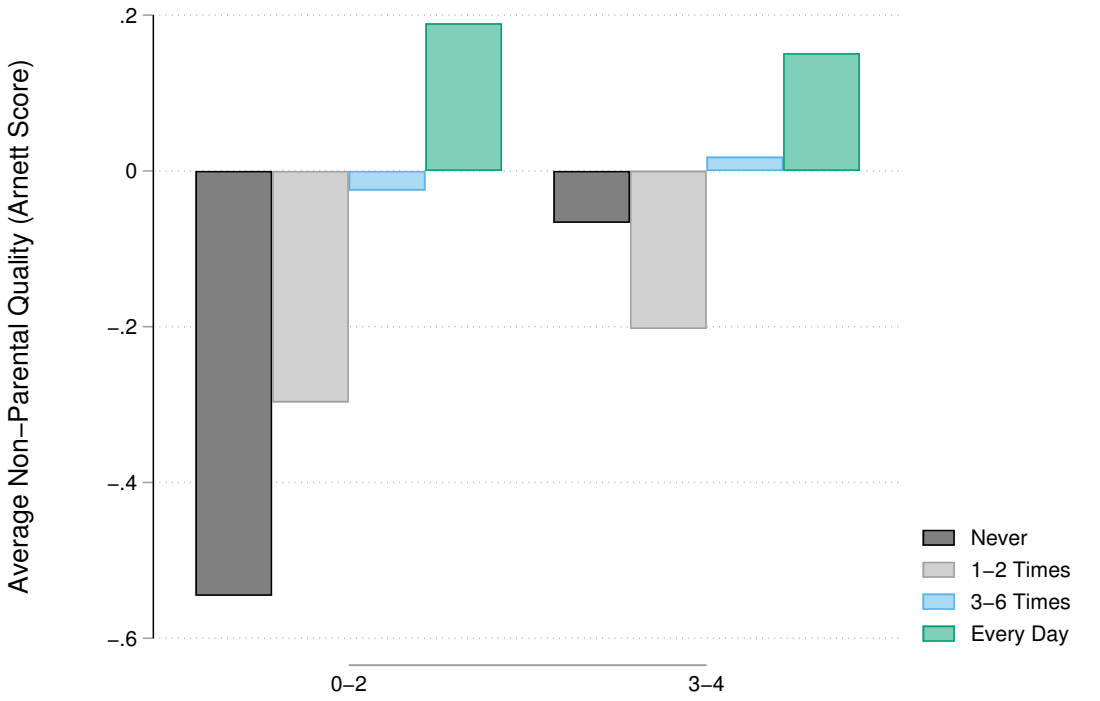
Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Education level refers to maternal education with High School or Less as the omitted category. Each panel-column reports estimates from a separate regression with the outcome listed in the column head. Outcomes are average weekly hours in select time category dived by average weekly parental care hours. Sample limited to children ages 0-4. All specifications include fixed effects for child age and survey year.
Source: PSID-CDS.

Table 3: Relationships between Quality of Parental Care Received and Maternal Education, HOME Score-Based Measures

	Total HOME Score	Caregiver-Child Observe	Environment	Survey
Some College	0.502***	0.393***	0.328***	0.417***
	(0.074)	(0.082)	(0.082)	(0.081)
College Grad Plus	0.852***	0.594***	0.627***	0.698***
	(0.069)	(0.076)	(0.079)	(0.071)
Observations	2186	1943	1887	2186

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Education level refers to maternal education with High School or Less as the omitted category. Each column reports estimates from a separate regression with the outcome listed in the column head. Outcomes are standardized within age and survey year; standardized scores are mean 0 and standard deviation 1. All specifications include fixed effects for child age, survey year, and indicators for whether interviewer observed child-caregiver interactions or observed home.
Source: PSID-CDS.

Figure 12: Average Non-Parental Care Quality by Parental Care Quality and Child Age Groups



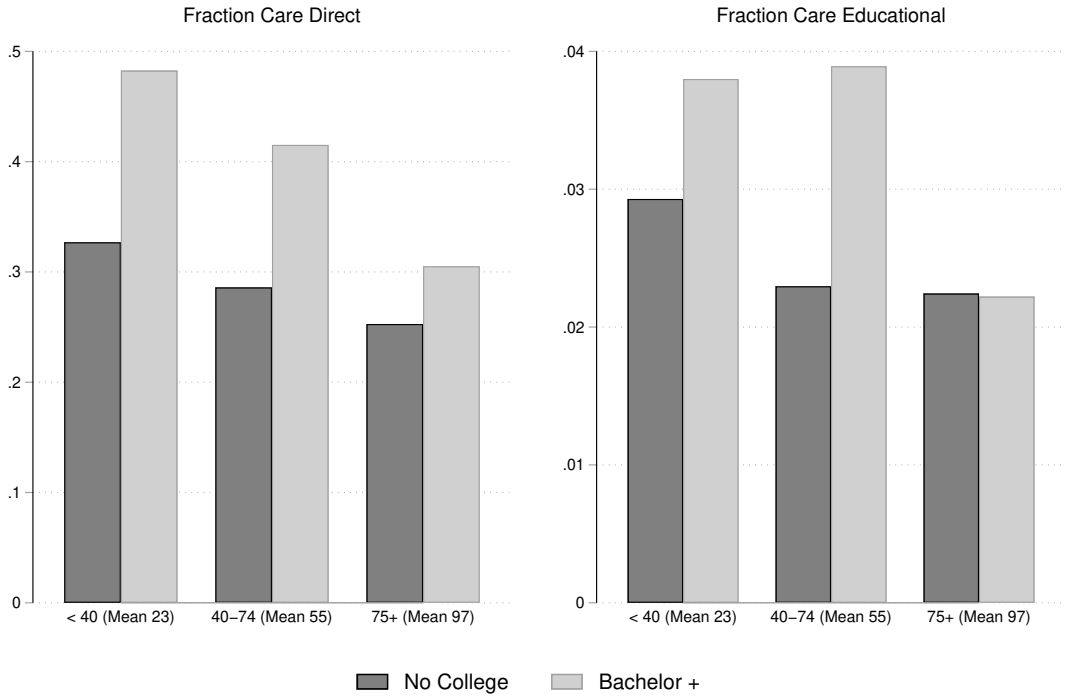
Notes: Non-parental care quality measured using Arnett score of primary non-parental care arrangement (vertical axis). Parental care quality measured using frequency parents read to the child (horizontal axis). Each category represented by a bar is a weekly frequency of reading: never, 1-2 times, 3-6 times, every day.
Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B).

Table 4: Within-Child Correlation of Non-Parental and Parental Care Quality, Overall and By Maternal Education Subsample

	(1) Parental Quality	(2) Parental Quality	(3) Parental Quality	(4) Parental Quality
Non-Parental Quality	0.121***	0.093*	0.079*	0.075*
	(0.022)	(0.044)	(0.039)	(0.035)
Observations	3050	900	1150	1000
Sample	All	No College	Some College	College+

Notes: Non-parental care quality measured using Arnett score of primary non-parental care arrangement. Parental care quality measured using frequency parents read to the child. Each column reports estimates from a separate regression. Observation numbers are rounded to nearest 50 to satisfy disclosure rules.
Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B).

Figure 13: SES Gradient in Maternal-Care Quality by Mother's Total Child Care Hours



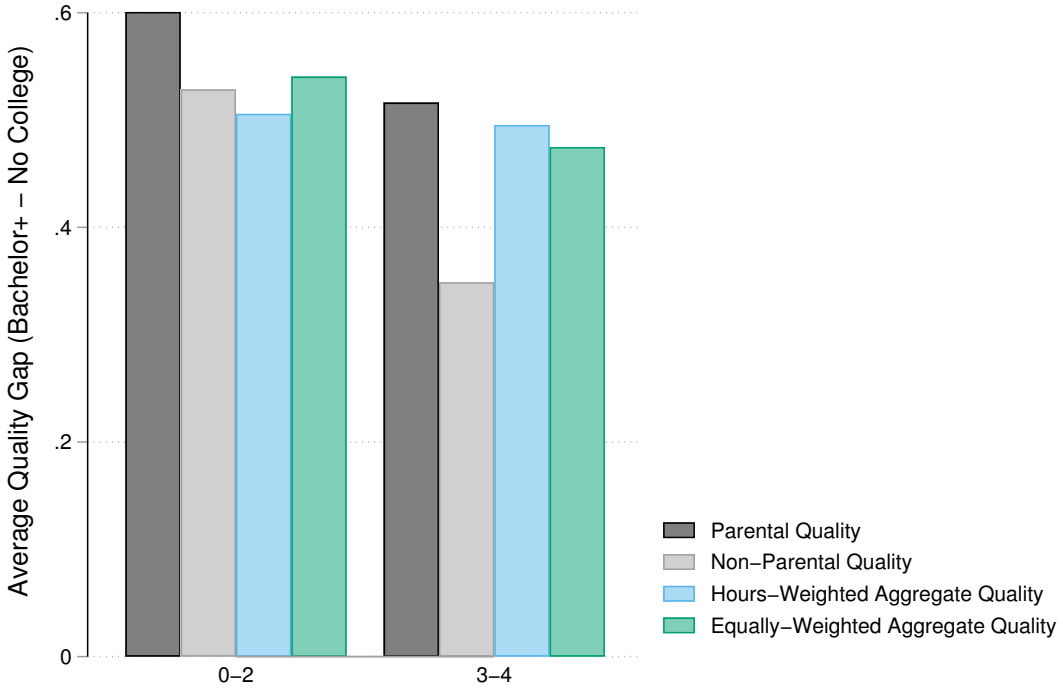
Notes: Mother's total child care hours extrapolated from single diary day account for low values of total maternal care hours.
Source: ATUS 2016-19.

Table 5: Within-Child Persistence in Parental, Non-Parental, and Aggregate Care Quality

	(1) QN(t+1)	(2) QN(t+1)	(3) QN(t+1)	(4) QP(t+1)	(5) QP(t+1)	(6) QP(t+1)	(7) AG(t+1)
QN(t)	0.139**		0.141**	0.131***		0.075**	
	(0.045)		(0.045)	(0.032)		(0.029)	
QP(t)		0.065*	-0.011		0.293***	0.291***	
		(0.030)	(0.040)		(0.028)	(0.055)	
AG(t)							0.391***
							(0.019)
Observations	600	1650	600	1200	8350	1250	3500

Notes: QN, QP, and AG are nonparental, parental and aggregate care quality, respectively. Longitudinal measures from the second wave of the ECLS-B survey when most children are between 1.5 and 3 years of age are referred to by t and from the third wave when most children are between 3 and 4 years of age by $t+1$. Observation numbers are rounded to nearest 50 to satisfy disclosure rules.
Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B).

Figure 14: Parental, Non-Parental, and Aggregate Quality



Notes: The vertical axis measures average age-standardized (z-score) difference in quality. Gap of 0 represents no difference, gap of 1 represents 1 standard deviation difference. Parental care quality measured using frequency parent reads to child. Non-parental care quality measured using Arnett score for primary non-parental care arrangement. Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B).

Appendices

A Data Appendix

A.1 ATUS

The American Time Use Survey (ATUS) is the first ongoing, nationally-representative, and federally funded time diary data collection effort in the United States. Data have been collected annually by the U.S. Census Bureau for the Bureau of Labor Statistics since 2003. The ATUS is a repeated cross-sectional survey that includes about 10,000 respondents ages 15 and older per year. ATUS respondents are only in the survey once, and they report their activities for a single 24-hour period. ATUS respondents are sampled from the outgoing rotation group of the Current Population Survey (CPS). One person per household leaving the CPS rotation is selected to participate in the ATUS. ATUS interviews are conducted two to five months after the final CPS interview.

During the ATUS interview, respondents report their activities for the 24-hour period beginning yesterday at 4am and provide rich information about what they were doing, where they were, who they were with, and whether they engaged in a selected set of activities at the same time. For the purposes of this study, we focus on secondary care of children as the only secondary activity of interest; this entails supervision of children under 13 while the respondent was doing something else. Primary activities are coded in a six-digit activity coding scheme containing over 400 detailed activities. Information about who the respondent was with is very specific for household members, allowing researchers to know whether a child of a certain age was with the respondent and, for example, whether a spouse was also present for the activity.

Leveraging the activity, who with, and secondary childcare information from the ATUS time diary, we create a measure of parental time investment in children per day. Note that these data provide information about parental time investment from the parents' perspective. We are unable to partition parental time investments in distinct children because parents do not always report who they were doing childcare for or for which child they were providing secondary care. Furthermore, we have one parent's total childcare per day even if there are two parents in the household.

Weekly Parental Care: Weekly parental care is a measure of hours per week that parents care for their children. Recall that we use a broad measure of parental care which captures all of the time parents spend with children rather than just the time the spend directly caring for children. Our measure is the sum of three mutually exclusive components multiplied by seven to inflate daily care to weekly care: 1) intense child care, which are child care specific activities; 2) activities reported with children; and 3) reports of secondary child care during which they were responsible for a child while they were also doing something else. Activities that are considered intense child care include activities such as reading to the child, performing physical care such as bathing or feeding, waiting for or with the child, and playing with the child. Note that we also differentiate

between educational and other child care activities. Educational child care activities specifically include reading to the child, talking with or listening to children, helping or teaching children, and engaging in school-related activities with children.

Activities reported with children are not specifically coded as child care but include those activities where the parent reported being with the child. Examples might include eating dinner with the child or going for a walk with the child. For some analyses we also differentiate between time parents spend with a child watching television versus doing something else with the child. Secondary child care implies parental responsibility for the child though the child need not be in the same room as the parent to be considered secondary child care. An example of secondary childcare might a child may be playing in the yard while the parent is making dinner.

Note that while a parent may report being with a child and providing secondary care of another child, we count such activities only once in our measure of parental care. We first generate the sum of time in child care activities, then the sum of time in activities with children that do not include child care activities, followed by the amount of time in secondary child care that has not already been coded as child care. Note that all parental care time occurs after the first household child wakes and before the last household child goes to bed.

A.2 PSID

The Panel Study of Income Dynamics (PSID) is a nationally-representative longitudinal study of families in the United States. Beginning in 1968, the PSID has followed respondents and the children of respondents. In 1997, a new survey supplement, the PSID Child Development Supplement (CDS), was introduced to collect more detailed information on the children in PSID respondent households. The first three waves of the CDS (CDS I-III) were carried out in 1997, 2002/2003, and 2007. CDS I contained 3563 children (up to two per family), and 2907 children were followed up with in CDS II. 1608 children were re-interviewed in CDS III, the youngest being 10. A new cohort of the CDS was initiated in 2014. These 4314 children consist of all children ages 0-17 in 2014 PSID families. 1314 of these children were under the age of 6 at the time of the interview.

Time Diaries The CDS collected time diaries from a subset of respondent children. Parents (or parents and children together) filled out a time diary for one weekday and one weekend. This survey instrument collected information on all activities in which the child participated during the sample 24 hours. This includes the location, start, and stop times of each activity, who else was participating with the child ("active" participation), and who was present but not participating ("passive" participation). In waves I-III, up to two children per family were eligible for the time diary. Starting in 2014, all PSID children were eligible.

Interpolated Caregivers Respondents were instructed not to record "[w]ho was doing the activity with the child?" for certain activities, including sleeping, getting diaper changed, using the bathroom, or time in school/daycare. It is unattractive to ignore these activities, as such activities make up a large portion of a young child's day and require a caregiver. We therefore "interpolate" caregivers according to the algorithm described below, but we omit nightly sleep in all analyses.

1. To night sleep beginning the diary day (i.e. starting from midnight the day of the diary and ending when the child wakes in the morning), we assign the first recorded caregiver of the day.

2. To continuous blocks of "bedtime-related" activities adjacent to first and last night sleep of the day, we assign, respectively, the first and last recorded caregiver. "Bedtime-related" activities include waking-up, getting in bed, bathing, personal hygiene and dressing, being read to, passively receiving child care (e.g. hair being braided), singing, meals, and receiving medical care. We also include night sleep and naps that are occur in continuous blocks of time with bedtime-related activities.

3. To naps, long spells of sleep during the day (not coded as naps), transitions in and out of these sleep spells, and select activities of with no recorded caregiver,[40] we assign (if no assignment has been made in steps 1-3) the last caregiver listed before the activity if available. If there is no listed last caregiver, we use the next listed caregiver.

4. Entries indicating the child was with a babysitter or at a daycare before or after school are assigned to a non-relative caregiver if the caregiver is missing. If the child is recorded as being in school but no caregiver is listed, a non-relative caregiver is assigned if the activity is taking place at a school, daycare, church, indoor recreation center, someone else's home, non-retail business, or unspecified other location. For the few records in which the activity is listed as "school" but taking place in the child's home or the parent's workplace, the modal parent caregiver entry for that day is assigned.

5. The treatment of school (daycare for younger children) varies across surveys. In 2007 and 2014, families were explicitly instructed not to fill in a caregiver when recording time in school.

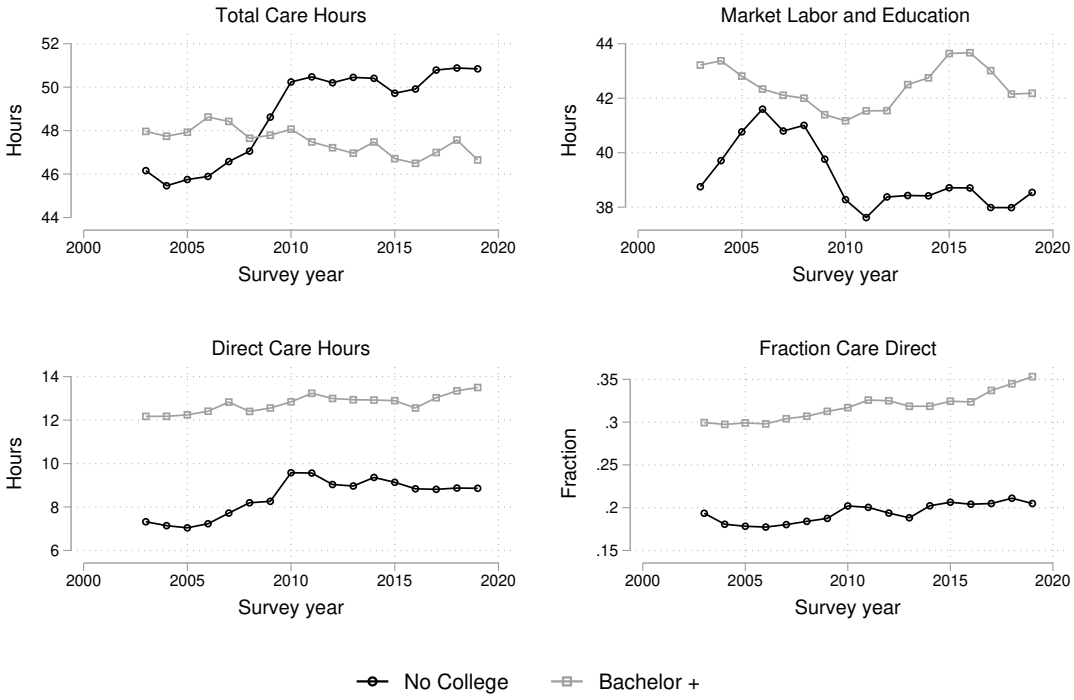
HOME Scores To generate an index from the age-varying items of the HOME inventory, we transform every response into a score between 0 and 1. For all items which are reasonably considered "negative," such as the primary caregiver showing annoyance with the child during the interview, we reverse all responses. We partition the HOME items into three sets: observer-based measures of the primary caregiver and interactions between the caregiver and child, observer-based measures

[40] Select activities include travel with adult when not clear if child participated in purpose of errand, doing nothing/wasting time, and all "bedtime-related" activities described above.

of the home environment, and self-reported survey items. For each of these subsets, we compute a respondent's average scaled score across all items of that subset. We then standardize each set's sub-scale within child age and use these standardized scores as measures of parental care quality.

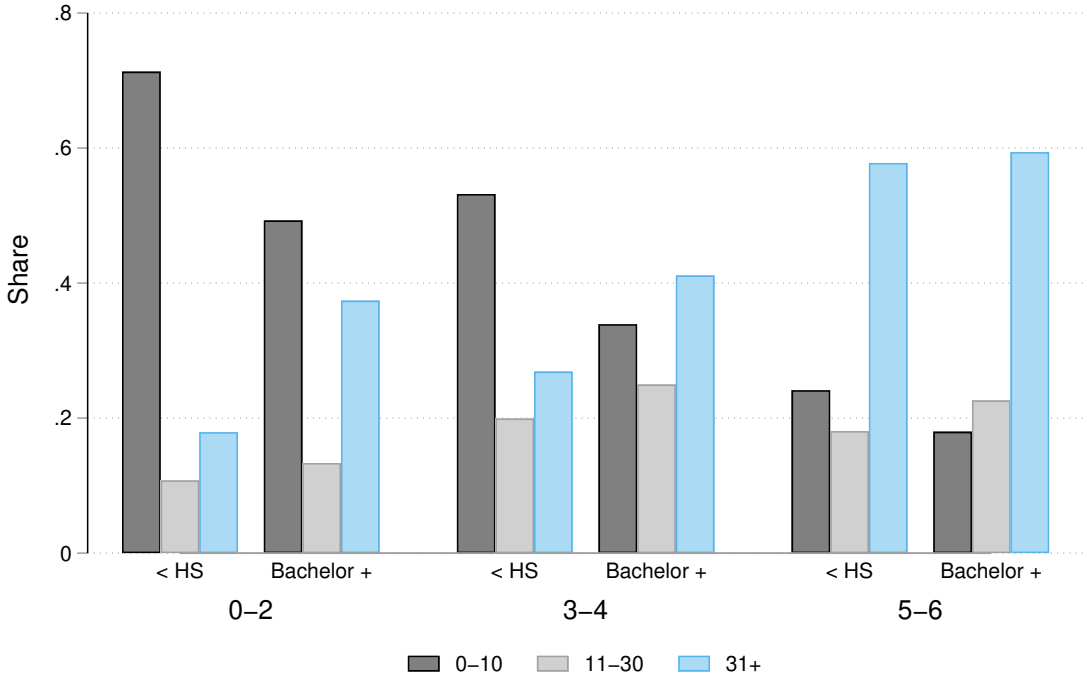
B Additional Tables and Figures

Figure B-1: Trends in Father's Time Allocation by Maternal Education



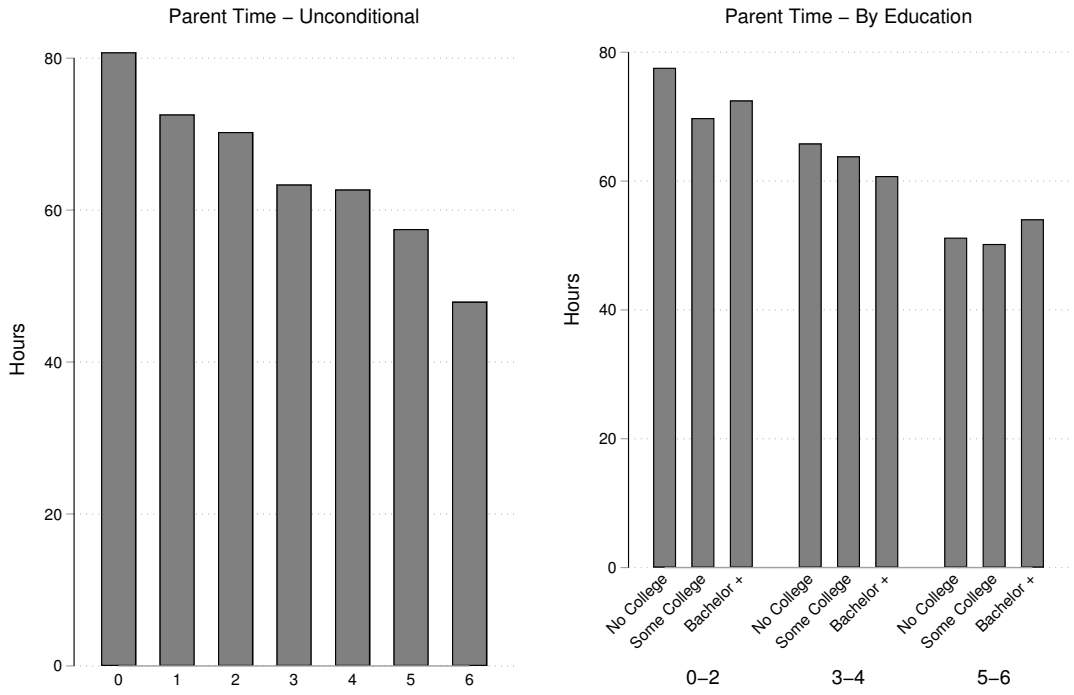
Notes: Sample includes all households with at least one child under the age of 4. Five-year moving averages plotted.
Source: ATUS 2003-19.

Figure B-2: Distribution of Non-Parental Care Hours by Child Age and Maternal Education



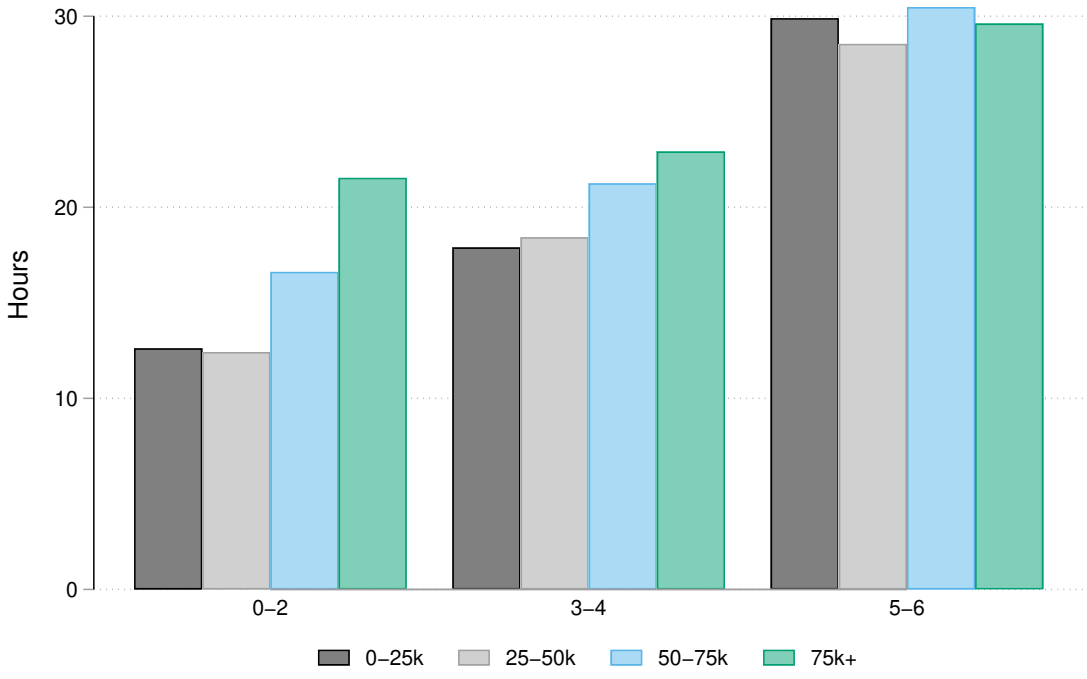
Notes: Comprehensive non-parental care hours for each child.
Source: NSECE 2012.

Figure B-3: Parental Care Hours Received



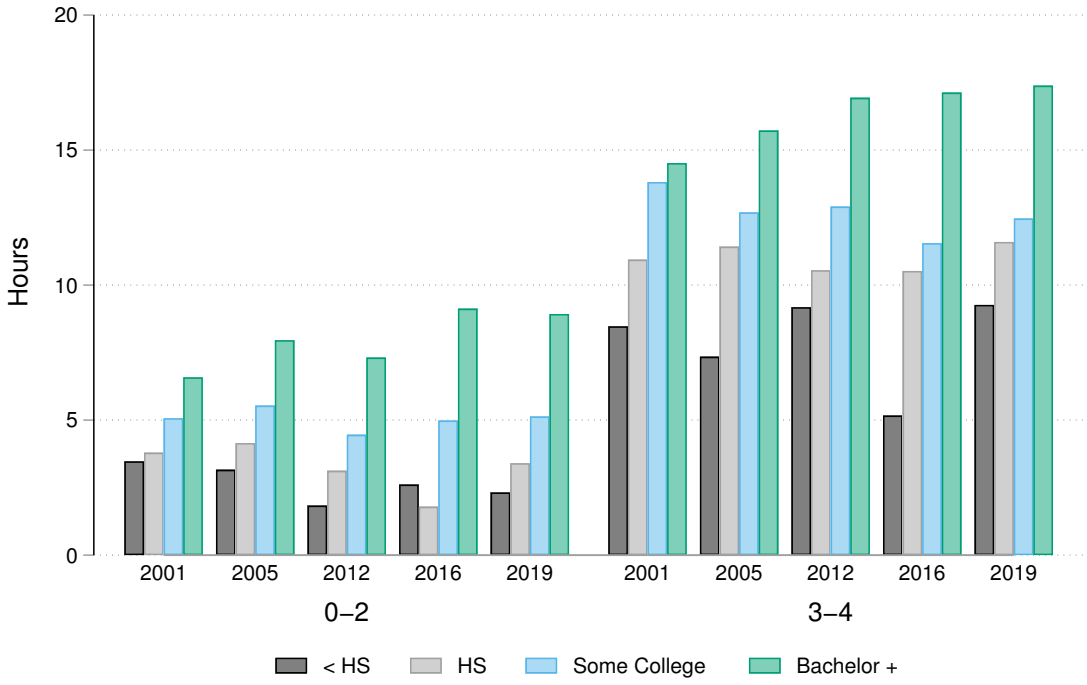
Source: PSID-CDS.

Figure B-4: Average Weekly Non-Parental Care Hours by Child Age and Family Income



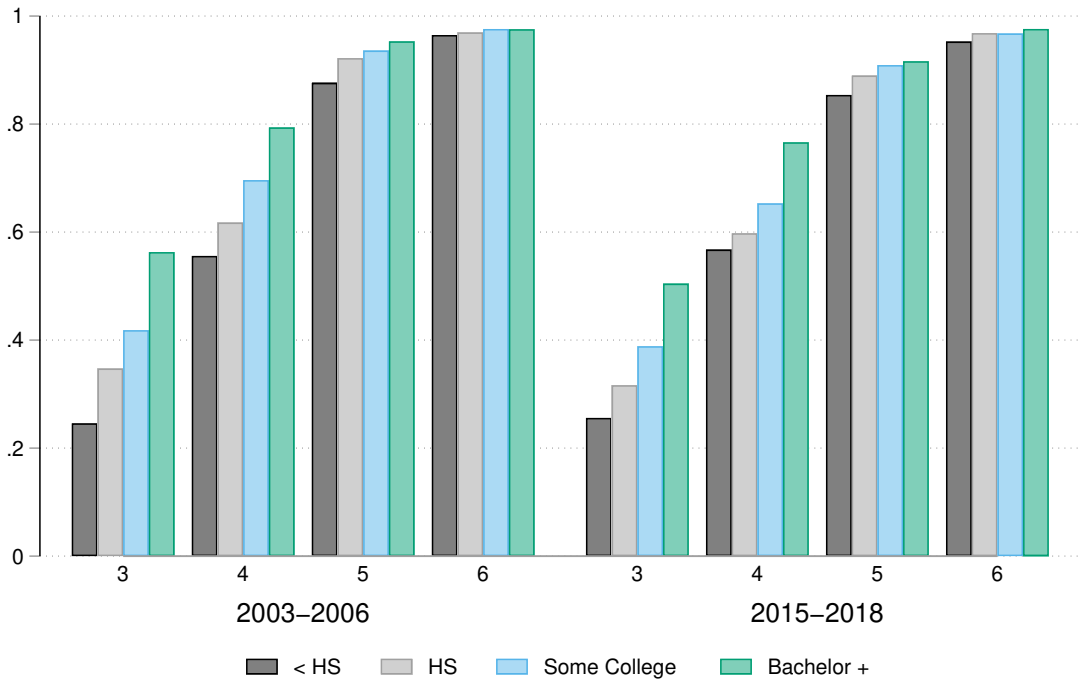
Notes: Dollar figures in 2012 dollars.
Source: NSECE.

Figure B-5: Trend in Center Hours



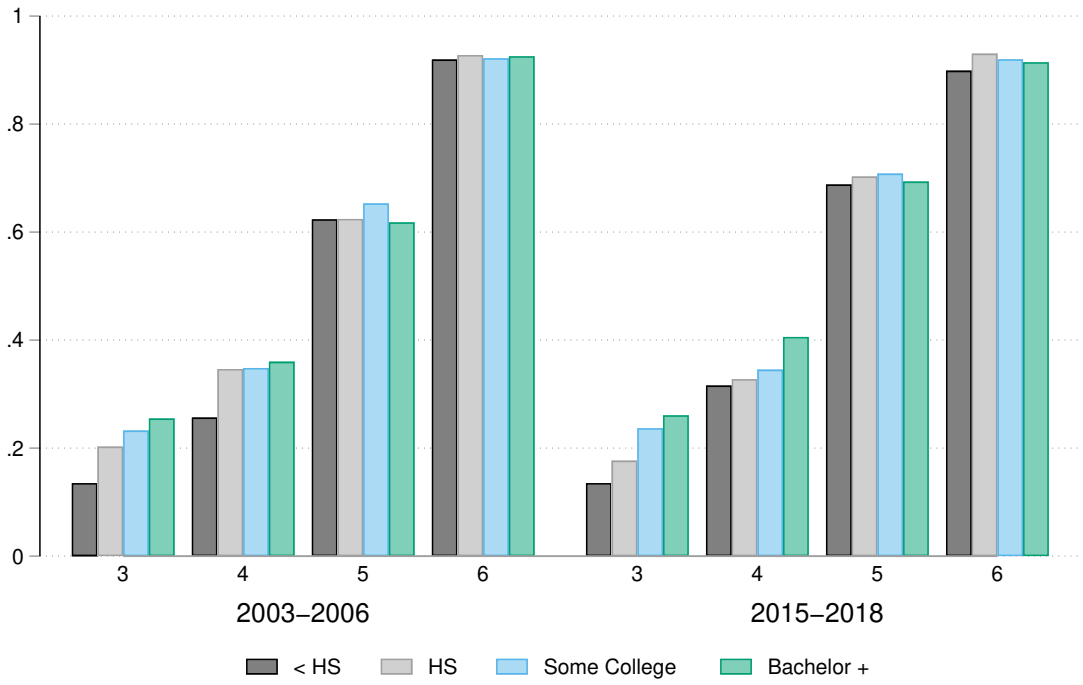
Notes: Average weekly hours in "regular" childcare arrangements provided by centers.
Source: NHES.

Figure B-6: Enrollment in Any Nursery, Pre-K, or Higher Schooling



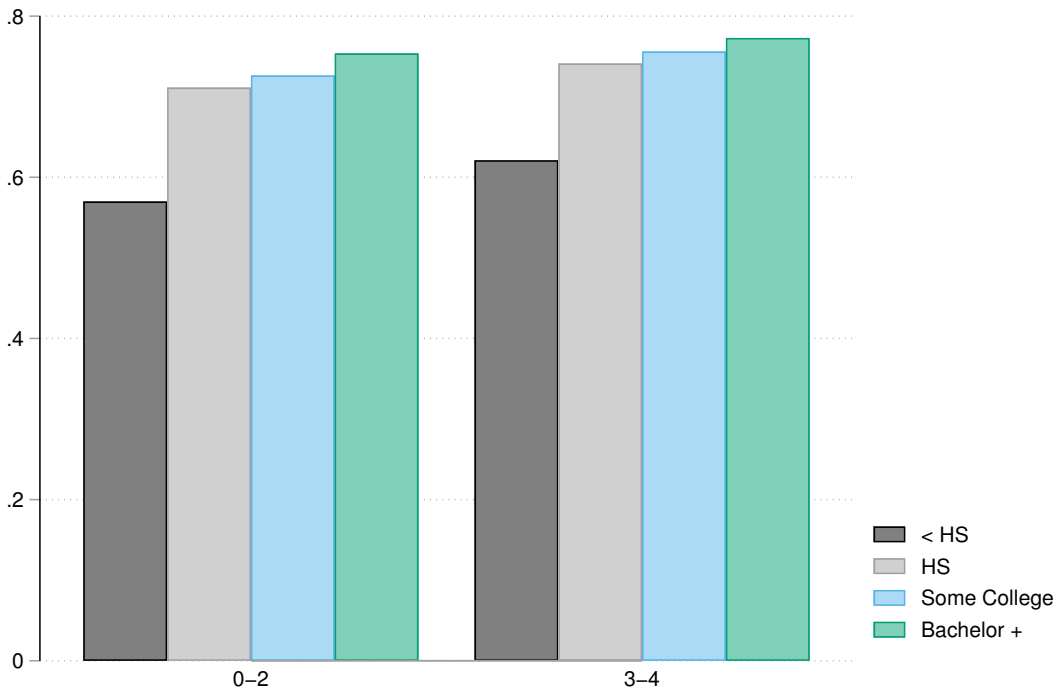
Source: October CPS.

Figure B-7: Enrollment in Full-Day Nursery, Pre-K, or Higher Schooling



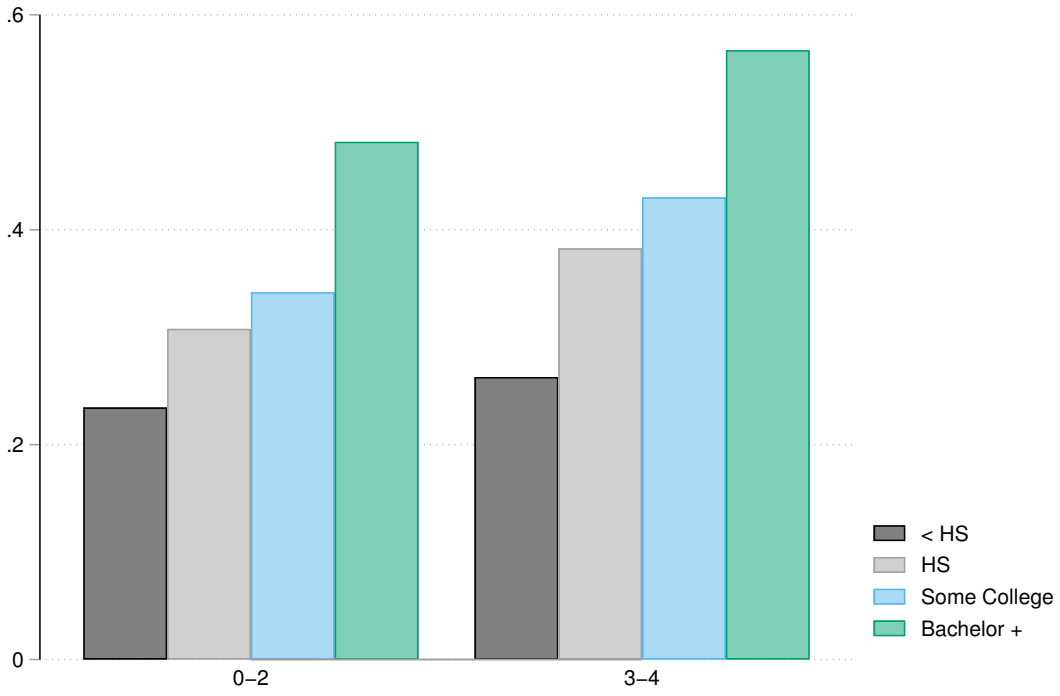
Source: October CPS.

Figure B-8: Usage of Any Non-Parental Care, by Mother's Education and Child Age



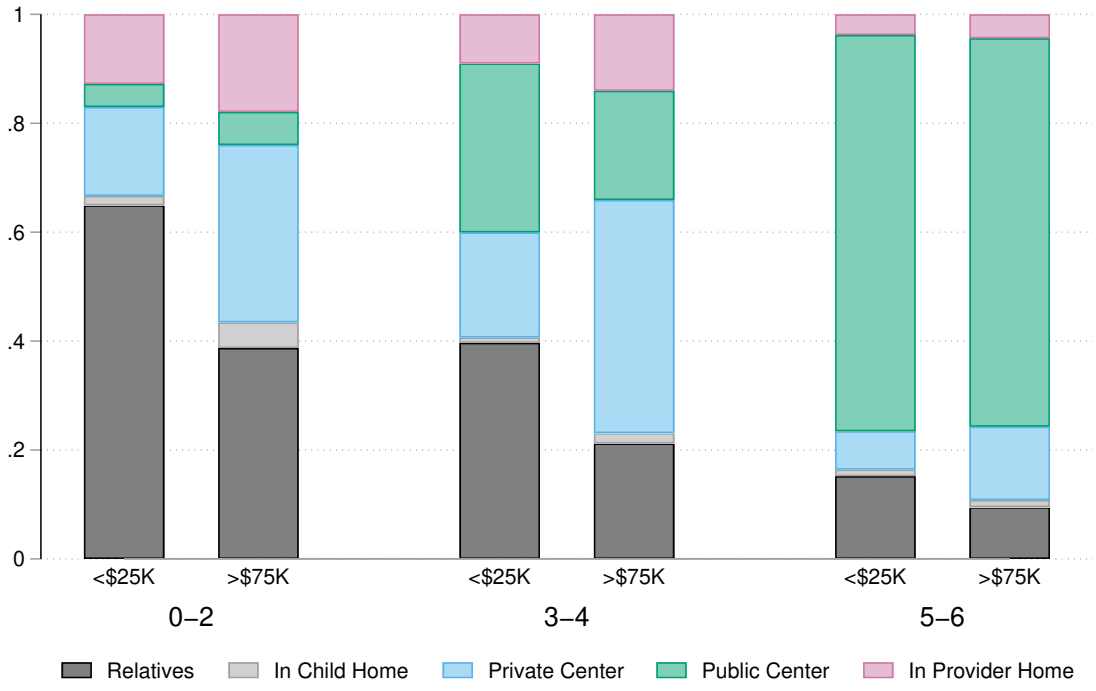
Source: SIPP 2018.

Figure B-9: Usage of Any Non-Relative Care, by Mother's Education and Child Age



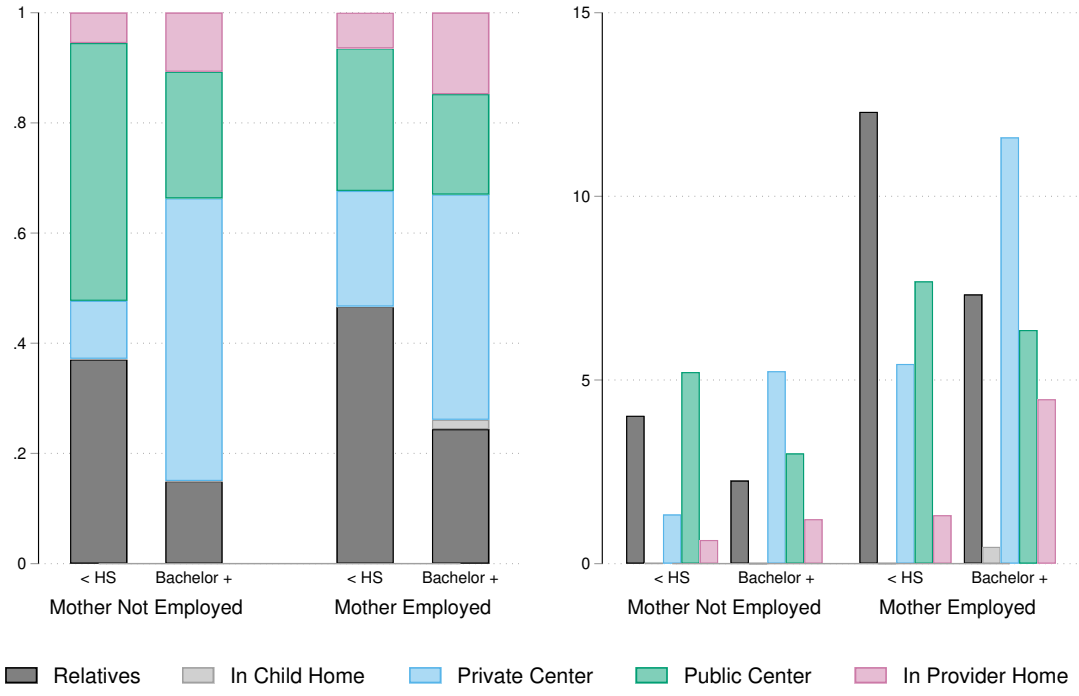
Notes: Non-Relative Care includes center-based, in-provider home ("family day-care"), Head Start, and any other non-relative provider care.
Source: SIPP 2018.

Figure B-10: Distribution of Hours in Care Type by Family Income



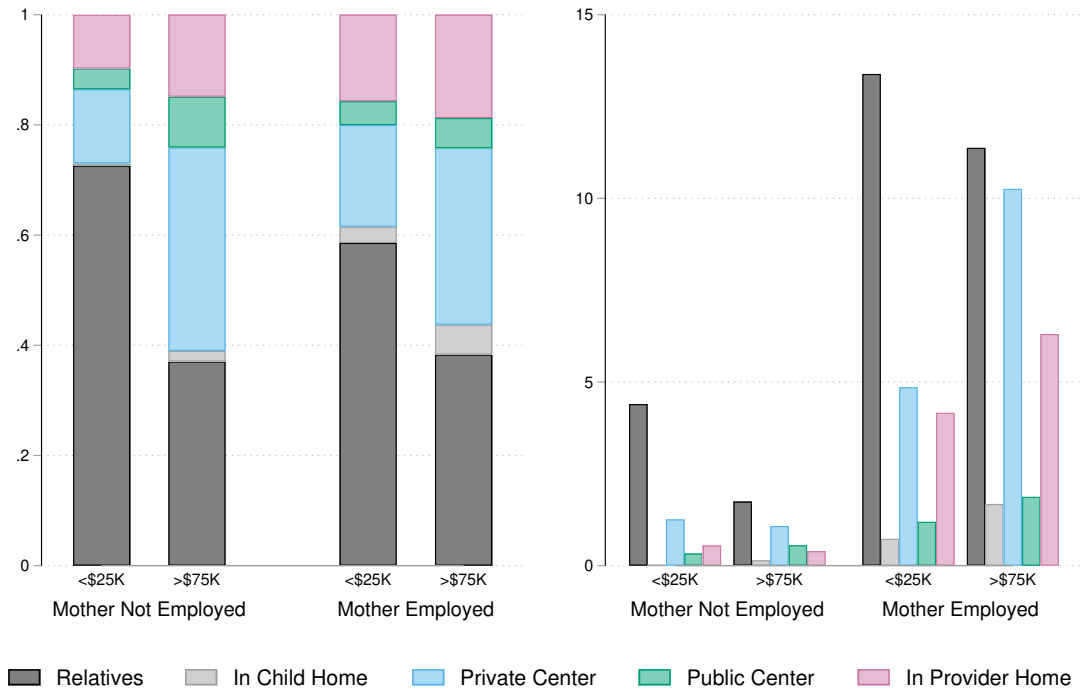
Notes: Distribution of hours in "regular" childcare arrangements. Dollar figures in 2012 dollars.
Source: NSECE.

Figure B-11: Distribution of Child Hours in Non-Parental Care Types by Maternal Education and Labor Supply (Ages 3-4)



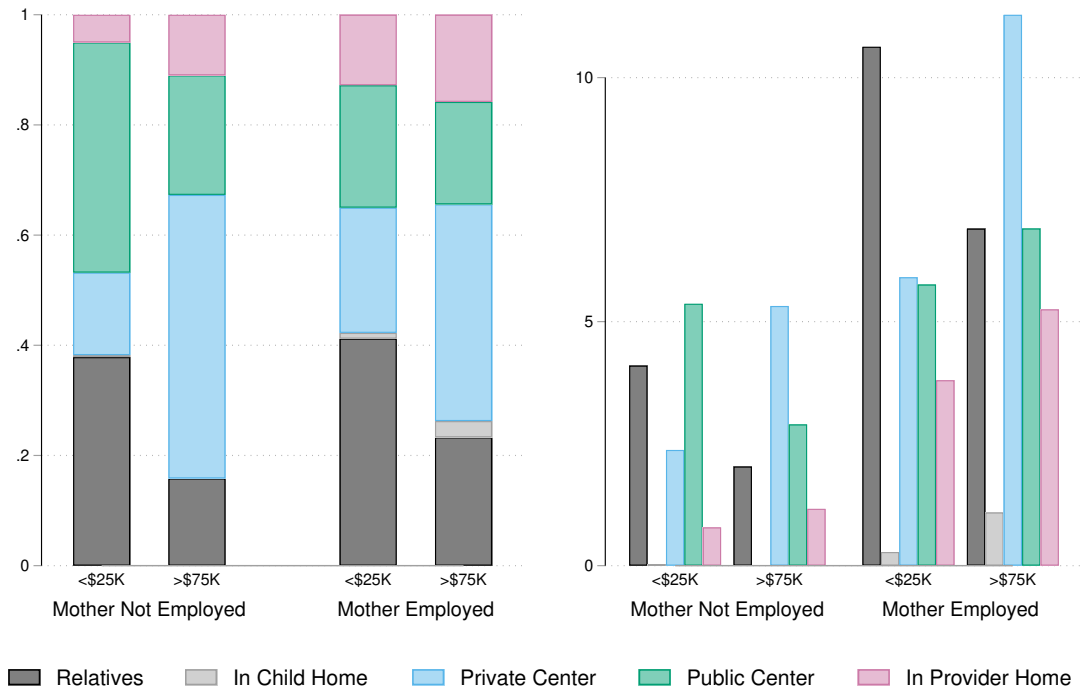
Notes: Distribution of hours in "regular" non-parental arrangements. Source: NSECE 2012.

Figure B-12: Distribution of Hours in Care Type by Family Income and Maternal Labor Supply (Ages 0-2)



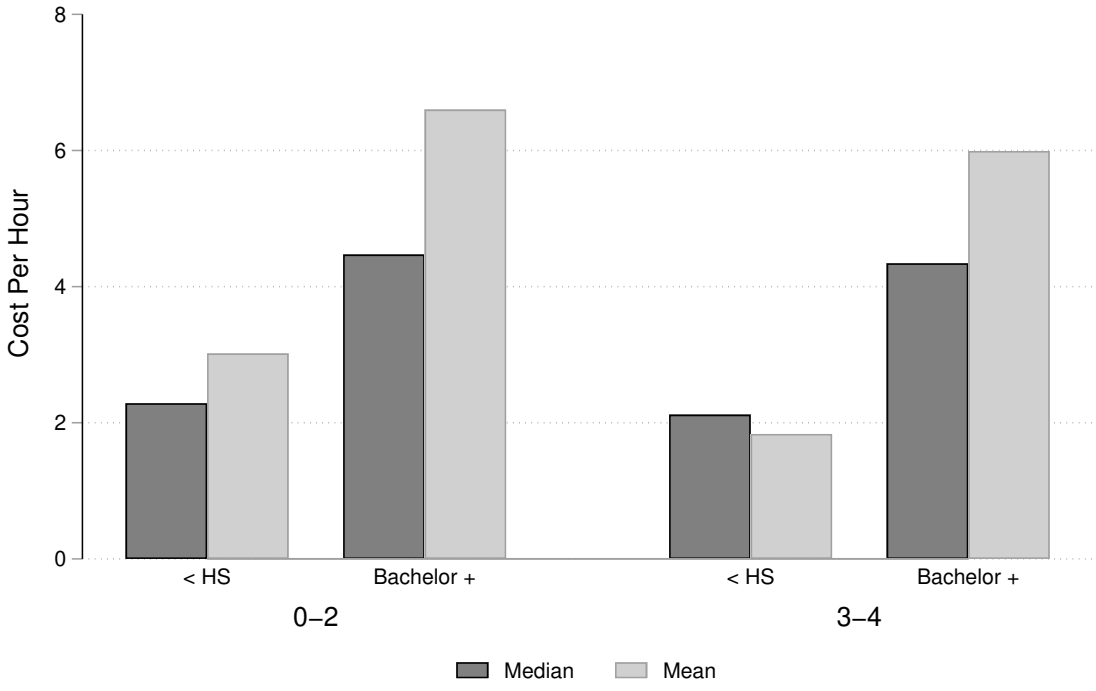
Notes: Distribution of hours in "regular" childcare arrangements. Dollar figures in 2012 dollars.
Source: NSECE.

Figure B-13: Distribution of Hours in Care Type by Family Income and Maternal Labor Supply (Ages 3-4)



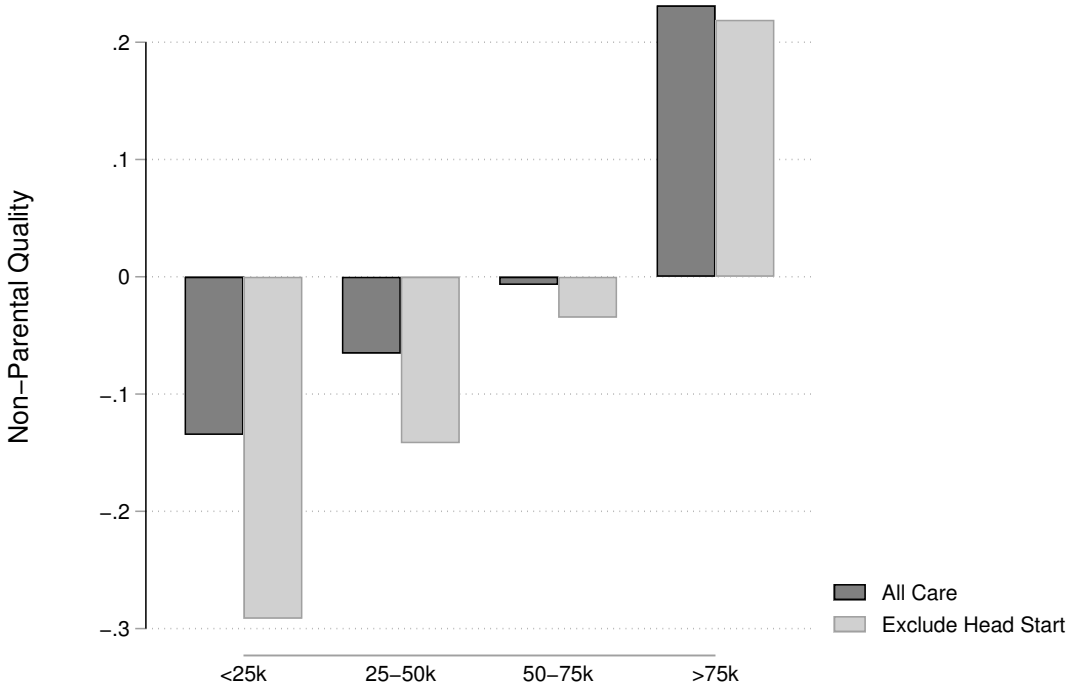
Notes: Distribution of hours in "regular" childcare arrangements. Dollar figures in 2012 dollars.
Source: NSECE.

Figure B-14: Cost Per Hour of Center-Based Care (Ages 0-4)



Notes: Dollar figures in 2012 dollars.
Source: NSECE 2012.

Figure B-15: Average Arnett Score With and Without Head Start by Family Income



Notes: Average Arnett score computed using primary care arrangement. Average excluding Head Start is computed as average Arnett score for each cell excluding respondents whose primary care arrangement is Head Start.
Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B).

Table B-1: Components of Mother Care Hours - Time Trend

Panel A: 2003 - 2006

	Educ. Care Hours	Recr. Care Hours	Physical Care Hours	Travel Care Hours	Secondary Care Hours	Proximity Hours
High School	0.357	1.508***	1.458*	0.087	0.128	-4.767**
	(0.203)	(0.386)	(0.689)	(0.186)	(1.060)	(1.593)
Some College	0.563**	1.726***	2.053**	0.451*	-0.911	-9.269***
	(0.193)	(0.353)	(0.656)	(0.183)	(1.026)	(1.537)
Bachelor Plus	1.234***	3.250***	3.947***	0.545**	0.004	-10.984***
	(0.191)	(0.359)	(0.664)	(0.173)	(0.999)	(1.461)
Observations	5387	5387	5387	5387	5387	5387
Dep Var Mean	1.678	4.551	12.46	1.880	15.74	38.38

Panel B: 2016 - 2019

	Educ. Care Hours	Recr. Care Hours	Physical Care Hours	Travel Care Hours	Secondary Care Hours	Proximity Hours
High School	-0.307	1.542	2.624*	0.497	-2.870	-7.108**
	(0.465)	(0.826)	(1.044)	(0.382)	(2.441)	(2.518)
Some College	-0.496	0.595	2.094*	0.403	-3.183	-9.211***
	(0.441)	(0.727)	(1.039)	(0.345)	(2.422)	(2.497)
Bachelor Plus	-0.004	2.001**	2.743**	0.938**	-4.500	-15.094***
	(0.449)	(0.662)	(0.932)	(0.334)	(2.447)	(2.331)
Observations	2794	2794	2794	2794	2794	2794
Dep Var Mean	1.803	5.274	12.73	2.111	14.76	37.46

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Sample limited to families with at least one child aged 4 or younger. All specifications include fixed effects for survey year and month, weekday indicator, and a full set of fixed effects for the age of each child in the household.
Source: ATUS.

Table B-2: Components of Father Care Hours - Time Trend

Panel A: 2003 - 2006

	Educ. Care Hours	Recr. Care Hours	Physical Care Hours	Travel Care Hours	Secondary Care Hours	Proximity Hours
High School	-0.052	1.591***	1.922***	0.078	2.286*	-1.991
	(0.187)	(0.441)	(0.484)	(0.142)	(1.098)	(1.662)
Some College	0.064	2.010***	2.804***	0.292*	2.968**	-2.352
	(0.191)	(0.464)	(0.480)	(0.143)	(1.069)	(1.494)
Bachelor Plus	0.364*	1.877***	4.111***	0.422**	3.163**	-4.983***
	(0.179)	(0.346)	(0.444)	(0.144)	(1.012)	(1.430)
Observations	3738	3738	3738	3738	3738	3738
Dep Var Mean	0.763	3.376	4.824	0.845	10.79	26.48

Panel B: 2016 - 2019

	Educ. Care Hours	Recr. Care Hours	Physical Care Hours	Travel Care Hours	Secondary Care Hours	Proximity Hours
High School	-0.076	0.555	0.371	0.134	1.961	-2.090
	(0.280)	(1.177)	(0.940)	(0.261)	(2.211)	(3.151)
Some College	0.158	0.668	1.427	0.197	0.692	-2.213
	(0.297)	(0.942)	(0.849)	(0.246)	(2.085)	(2.847)
Bachelor Plus	0.306	0.522	3.372***	0.729**	1.493	-5.504*
	(0.267)	(0.876)	(0.891)	(0.263)	(2.007)	(2.735)
Observations	2082	2082	2082	2082	2082	2082
Dep Var Mean	0.984	4.298	5.278	1.037	10.56	26.18

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Sample limited to families with at least one child aged 4 or younger. All specifications include fixed effects for survey year and month, weekday indicator, and a full set of fixed effects for the age of each child in the household.
Source: ATUS.

Table B-3: Parental Care Hours - Additional Controls

Panel A: Mother Time

	Total Care Hours	Direct Care Hours	Fraction Direct	Educ. Care Hours	Fraction Educ.
High School	-1.279	5.087***	0.068***	-0.198	-0.001
	(2.393)	(1.509)	(0.019)	(0.506)	(0.007)
Some College	-2.042	4.529**	0.068***	-0.376	-0.005
	(2.370)	(1.513)	(0.018)	(0.502)	(0.007)
Bachelor Plus	-4.618	7.085***	0.126***	0.087	0.005
	(2.380)	(1.502)	(0.019)	(0.501)	(0.007)
Observations	2794	2794	2751	2794	2751
Dep Var Mean	74.14	21.92	0.318	1.803	0.0254

Panel B: Father Time

	Total Care Hours	Direct Care Hours	Fraction Direct	Educ. Care Hours	Fraction Educ.
High School	1.552	0.989	0.044	-0.193	-0.011
	(3.505)	(1.472)	(0.034)	(0.286)	(0.012)
Some College	3.756	3.378*	0.056	0.083	-0.005
	(3.249)	(1.375)	(0.030)	(0.305)	(0.012)
Bachelor Plus	4.763	5.915***	0.125***	0.194	0.000
	(3.235)	(1.381)	(0.029)	(0.287)	(0.012)
Observations	2082	2082	1987	2082	1987
Dep Var Mean	48.34	11.60	0.290	0.984	0.0271

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Sample limited to survey years 2016-2019 and families with at least one child aged 4 or younger. All specifications include fixed effects for survey year and month, weekday indicator, and a full set of fixed effects for the age of each child in the household. Additional controls consist of respondent age, presence of father, marital status, maternal and paternal employment, and an indicator if mother is in school.
Source: ATUS 2016-19.

Table B-4: Quality of Parental Care Received - Additional Controls

Panel A: Parents Present

	Both Parents	M Only	F Only
Some College	0.021	-0.033	0.013
	(0.025)	(0.028)	(0.018)
College Grad Plus	-0.017	-0.021	0.039*
	(0.026)	(0.029)	(0.018)
Observations	1375	1375	1375
Dep Var Mean	0.358	0.533	0.109

Panel B: Activities and Intensity

	Direct Care	Active	Educational	Screen Time
Some College	0.022	0.004	0.010*	-0.019
	(0.012)	(0.018)	(0.005)	(0.012)
College Grad Plus	0.030*	0.026	0.011*	-0.024
	(0.012)	(0.020)	(0.005)	(0.012)
Observations	1375	1375	1375	1375
Dep Var Mean	0.231	0.621	0.0404	0.139

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Outcomes are average weekly hours in select time category dived by average weekly parental care hours. Sample limited to children ages 0-4. All specifications include fixed effects for child age and survey year. Additional controls include indicators for whether the child lives with both parents, mother marital status, labor force participation of mother and father, and a full set of fixed effects for the ages of each child in the household.
Source: PSID-CDS.

Table B-5: Quality of Parental Care Received - Levels

	Both Parents	M Only	F Only	Direct Care	Active	Educ	Screen
Some College	2.322	-14.542**	4.170	1.563	-0.351	0.966***	-3.437***
	(4.265)	(4.593)	(2.337)	(0.963)	(1.682)	(0.293)	(1.007)
College Grad Plus	11.587**	-23.904***	7.017**	2.160*	0.712	1.298***	-4.914***
	(4.116)	(4.358)	(2.278)	(0.868)	(1.526)	(0.294)	(0.940)
Observations	1383	1383	1383	1383	1383	1383	1383
Dep Var Mean	48.94	72.96	13.76	15.05	41.04	2.810	11.26

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Sample limited to children ages 0-4. All specifications include fixed effects for child age and survey year.
Source: PSID-CDS.

Table B-6: Caregiver and Environment Quality - HOME Score - Additional Controls

	Total HOME Score	Caregiver-Child Observe	Environment	Survey
Some College	0.443***	0.321***	0.258***	0.401***
	(0.074)	(0.084)	(0.074)	(0.079)
College Grad Plus	0.697***	0.448***	0.484***	0.589***
	(0.072)	(0.081)	(0.074)	(0.073)
Observations	2186	1943	1887	2186

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Heteroskedastic robust standard errors in parentheses. Outcomes are standardized within age and survey year; standardized scores are mean 0 and standard deviation 1. All specifications include fixed effects for child age, survey year, and indicators for whether interviewer observed child-caregiver interactions or observed home. Additional controls include indicators for whether the child lives with both parents, mother marital status, labor force participation of mother and father, and a full set of fixed effects for the ages of each child in the household.
Source: PSID-CDS.