Disparities in Child Care Availability across Communities:
Differential reflection of targeted interventions and local demand

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Public investment in early childhood education is rising rapidly. Between 1990 and 2008, the number of three to five year olds enrolled in *public* early childhood education and care programs (excluding kindergarten) more than doubled from 1.2 to 2.7 million children.[2] This rise in public investment – attributed to such factors as growth in female labor force participation, welfare reform, and an increasing understanding of early child development (Gormley, 2007; Loeb & Bassok, 2008) signals a significant expansion in the role of federal, state and local governments in the development of young children. State-level investment has grown particularly rapidly, more than doubling from $2.4 billion in 2001 to $5 billion in 2008 (Barnett, Epstein, Friedman, Boyd, & Hustedt, 2008).

This expansion of early childhood programs has been accompanied by heightened policy interest in the early childhood labor force. In part, this interest is because providing early childhood opportunities to more children necessitates recruiting substantial numbers of new care givers and teachers. In addition, as in the K-12 sector, there is strong evidence that teachers and care-givers are the key determinant of quality in early childhood classrooms (Bowman, Donovan, & Burns, 2001; Mashburn, Pianta, et al., 2008; Phillipsen, M. R. Burchinal, Howes, & Cryer, 1997; Vandell & Wolfe, 2000). In response, policy makers are employing a variety of strategies to recruit and retain higher-quality early childhood educators.

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[2] http://www.census.gov/population/www/socdemo/school.html.

Given the rapid expansion of early childhood programs, as well as the heightened focus on staffing programs with more effective teachers, policy makers would benefit both from reliable information about the current early childhood labor force and from data on changes in this labor force over time. For example, in choosing where to best target resources, it is useful to know which communities already have better access to early childhood care. Unfortunately, the highly decentralized nature of the early childhood education and care sector makes such data very difficult to find. Early childhood programs comprise a complex network of private and public programs, funded with local, state and federal resources. In addition, licensed or unlicensed individuals often offer child care in their own home. There is no single comprehensive source of data about *all* child care programs or the child care workers they employ. Further, unlike the K-12 education sector, where state data systems allow researchers to track schools and teachers longitudinally, there is no systematic way to track early childhood programs or workers over time, even within a given sector. For these reasons, researchers and policy makers have a very limited sense about the characteristics and career trajectories of early childhood workers.

This paper aims to fill this gap using restricted-access data from the U.S. Census Bureau. The paper has three primary goals. The first is to provide a national picture of the current child care labor force and changes in the labor force from 1990 to the present. We describe the rapid expansion of this industry as well as changes over time in the characteristics of the workers including their race, education levels and wages.

Second we explore how the availability of child care- as proxied by counts of child care workers- varies across communities, focusing in particular on the relationship between child care availability and the income and racial composition of communities. While we know that both

investment and enrollment in child care and early education programs have been increasing rapidly on a national level, we have very little information about how the availability of overall care and of specific care types is distributed across communities. This lack of information is of particular concern given the evidence that low-income and minority children stand to gain the most from high quality early childhood opportunities, and because prior research suggests early childhood programs are less prevalent in Hispanic communities (Magnuson, Ruhm, & Waldfogel, 2007; Bassok, 2010). To examine availability differences across communities, we aggregate individual-level data to construct a neighborhood-level (as proxied by Census tract) dataset that includes information about both the demographic characteristics of all individuals who reside within and all child care workers employed in each community. After describing community disparities in overall child care availability, we discuss differences in the characteristics of care across communities with a focus on care type (e.g. home-based care, school-based preschool), worker education, and worker pay as potential proxies for care quality. Third, in a final set of analyses, we also test whether *changes* in community-level child care availability have been particularly pronounced in some communities.

We find that between 1990 and 2009 the child care labor force grew rapidly and experienced substantial compositional changes, with a shift towards a far more educated workforce and a greater reliance on formalized, classroom-based arrangements. We show that in 2000, there was a strong relationship between a communities' median income level and the availability of care. Communities with higher income levels had lower child to worker ratios, higher percentages of degreed workers, higher wages, and lower percentages of home-based care providers. However, these relationships were non-linear, and availability and quality outcomes

were generally somewhat higher in tracts in the lowest quintile of income relative to those in the second lowest quintile.

The racial composition of communities is also strongly related to care availability and quality but the patterns differ substantially between predominantly black and predominantly Hispanic communities. In particular, Hispanic communities are characterized by relatively low levels of child care availability, college-educated workers, and wages. In contrast, in 2000 the percentage of black residents in a community is largely unrelated to child care availability and quality. We discuss the extent to which these patterns may be related to differences in preferences or differences in targeted public interventions. We also present preliminary evidence that the changes in the characteristics of the early childhood education and care labor force between 1990 and 2000 were largely concentrated in high-income communities and in communities with low-income and high proportions of black or Hispanic residents.

Background

Between 1976 and 2004, labor force participation among women with children age six and under rapidly rose, from 34 to 56 percent, with particularly pronounced growth among married mothers (Baker, Gruber, & Milligan, 2005; Juhn & Potter, 2006). In the nineties, there was also a sharp increase in the employment levels of single mothers, likely in response to the passing of the Personal Responsibility and Work Opportunity Act of 1996, which linked welfare receipt to employment. This expansion in labor force participation was accompanied by an increase in demand for child care, and in fact, the welfare reform act increased federal child care spending and created the Child Care and Development Fund which consolidated several federal child care funding streams.

While the change in women's labor force participation is one key factor in the growth of the child care sector, it is not the only one. Indeed, Bianchi (2000) shows that increases in child care participation among 3 to 5-year-old children whose mothers *were not* in the labor force largely mirrored the patterns for children whose mothers were working. In recent years, programs targeted towards young children have been seen not only as work supports for parents, but as potentially stimulating environments for young children that support their cognitive, social, and emotional development. A growing body of research highlights the strong relationship between children's experiences from birth to age five and their performance both in elementary school and beyond (Shonkoff & Deborah Phillips, 2000). In addition, the passing of the No Child Left Behind Act in 2001 made narrowing achievement gaps a top policy objective. Recent research shows that socio-economic and racial achievement gaps emerge years before children enter school, that poor and minority children show the greatest benefits from early intervention, and that early programs are more cost-effective than remediation (Bassok, 2010; Belfield, Nores, Barnett, & Schweinhart, 2006; Fryer & Levitt, 2006; Heckman, 2006; Magnuson, Ruhm, & Waldfogel, 2007). This heightened interest in child development and school readiness has led to the emergence and expansion of state pre-kindergarten programs and a variety of other policy initiatives aimed at improving the quality of early childhood settings to ensure children's early environments support learning.

Challenges in estimating child care availability

Brandon & Martinez-Beck (2006) argue that these efforts to expand early childhood programs and to improve their quality necessitate comprehensive data about child care availability but warn that conceptual and technical hurdles compromise efforts to accurately measure the size

and characteristics of this sector. One challenge is defining which types of programs and individuals should be included in estimates of the early childhood education and care sector. The broadest definition of the sector may include a diverse set of program types including both formalized classroom arrangements such as kindergarten, pre-kindergarten and Head Start and, at the other end of the spectrum, more informal arrangements such as family day care homes, baby-sitters and relatives providing child care in their home. Similarly, efforts to measure the early childhood labor force may focus exclusively on individuals identified as "teachers," or can be expanded to all individuals employed in the type of programs described above, which would include among others, directors, lead and assistant teachers, nannies, babysitters, and individuals who provide supplementary services such as health and social service consultations.

Once a clear inclusion criteria is determined, the second hurdle is identifying data sources that allow for accurate measurements either cross-sectionally or longitudinally. For instance, some datasets track *firms* that provide child care, but do not include individuals who provide child care in their own or the child's home. Other datasets provide information about individuals who provide care but do not delineate child care provided to young children from after school care for older children. Some subsectors of the early childhood education and care industry do require program-level data collections. For instance all Head Start Programs are required to submit annual Program Information Reports which include detailed information about the children they serve, workers they employ, and services they provide. Similarly, licensing and accreditation agencies keep records about programs they oversee. However, this type of information is not available for all types of programs and is particularly scarce for individuals who provide care in their homes, making them ineffective for providing a comprehensive profile of care availability (D Phillips, with Hofferth, 1987).

The lack of reliable data tracking the size and characteristics of the full child care industry creates substantial challenges for designing and evaluating early childhood education and care initiatives. For instance, we know that roughly half of children who are eligible for the targeted, federal Head Start program are served, and that only three percent of children eligible for the Early Head Start program actually participate; however, it is unclear to what extent the unserved, eligible children have access to other forms of child care in their communities. As a second example, many states are currently expanding their pre-kindergarten programs. While we know enrollment in these programs is rapidly rising, we have no way of systematically assessing whether the emergence of state pre-kindergarten programs has led to an overall expansion in the availability of early childhood slots or whether the new programs have supplanted or "crowded out" existing programs.

Measuring variation in care availability

In the absence of comprehensive data sources, researchers have generally employed two strategies to estimate the overall availability of child care and early education services and measure variation in this availability across communities. The first involves backing out supply based on parents' reports of their children's formal and informal care arrangements (Burton et al., 2002). For instance, Bainbridge, Meyers, Tanaka, & Waldfogel (2005) use the October supplement of the Current Population Survey, a national household survey, to track changes to parent-reported "school attendance" information for three-to-five year olds from 1968 to 2000. They find that throughout this period, family income is positively tied to children's participation in formal care arrangements such as child care centers, pre-kindergarten and kindergarten. However, they show that the disparities in use across income groups are most pronounced for

three-year-olds, for whom very few targeted programs are available, and least pronounced for five-year-olds, who typically have access to public kindergarten programs in their local schools. Unfortunately, the CPS does not provide information about trends in the utilization of less formal care arrangements or care utilization among children younger than three, so it is unclear how overall care use is related to family income. Nonetheless, the authors suggest that given the positive evidence about the potential impacts of preschool participation on school success, the observed disparities in utilization across socioeconomic groups—and particularly among three-year-olds—imply a problematic lack of access to care in poor communities and an important role for public intervention.

A second approach to measuring child care supply mirrors our strategy in the current paper, and involves aggregating administrative data on child care centers or individual workers up to geographic units such as zip codes or counties, and measuring availability as the ratio of these counts to some measure of population size, typically the number of children five and younger {Citation}(Fuller, Coonerty, Kipnis, & Choong, 1997; Fuller, Loeb, Strath, & Carrol, 2004; Gordon & Chase-Lansdale, 2001). Researchers then examine the extent to which these measures of care availability correlate with demographic community characteristics.

The earliest studies of this nature used administrative data from individual states. For instance, Fuller & Liang (1996) consider differences in child care availability in Massachusetts zip codes in the nineties and show that availability is strongly related to median family income levels. In the poorest quartile of zip codes, they report 170 child care center slots per 1000 children aged 0-5 compared with 241 spaces in the highest quartile. The authors also find that in zip-codes with income levels just above the highest-poverty zones- the zip codes with the highest concentrations of working-class families- the availability of child care slots is even lower.

Evidence of this type of "u-shaped" relationship between socio-economic resources and child care availability has also been reported in national studies of child care availability and likely reflects the targeting of public child care programs towards very low-income families. The more recent studies have used federal datasets such as the Economic Census, the ZIP Code Business Patterns and the Decennial Census which provide data for the nation. These studies highlight similar trends, and also show particularly low availability in poor, rural communities as well as communities with high percentages of Hispanic residents (Fuller et al., 2004; Gordon & Chase-Lansdale, 2001).

Characteristics of the Labor Force

While some of these studies employ data that tracks child care *firms*, others make use of data on child care *workers,* which is the strategy we pursue in the current study. The child care industry is labor-intensive, and for this reason estimates of care availability based on workers and firms are highly correlated.[3] In addition to tracking the *number* of child care workers, which provides a strong proxy for overall child care supply, researchers have also described the characteristics of the labor force - specifically teachers' education, wages, and sub-sector - as these measures can provide suggestive evidence about how the type and quality of early childhood opportunities children receive differs based on community characteristics (Fuller, et. al., 2004).

Many states, as well as the federal government, have recently introduced heightened education requirements for early childhood educators, based on the assumption that more highly-educated workers will provide higher quality and more stable experiences for children. Eighteen states currently require all teachers in their pre-kindergarten programs to hold a Bachelor's

[3] Note however, that formal, classroom-based arrangements such as Head Start or pre-kindergarten allow for significantly higher child-to-teacher ratios so that communities with higher ratios of children to workers may have lower overall levels of supply or may rely more on classroom based arrangements.

degree (BA) (Barnett et al., 2008) and the federal Head Start program requires that by 2013 50 percent of all teachers hold a BA. The number of postsecondary degrees awarded in Early Childhood Education and related fields has grown tremendously from 14,248 to 35,560 from 1990 to 2007, an increase of over 150 percent (Bassok, 2009).

Although the relationship between workers' education and program quality is unclear (Early et al., 2006) the heightened policy interest in teacher education and the pressures programs are facing to recruit and retain educated workers, creates a need for reliable data about the education levels of the current work force, and changes in child care workers' education over time. Further, to the extent that worker education does proxy for quality, it is worthwhile to examine how access to a more educated early childhood workforce varies across communities based on their demographic composition.

Wages provide another proxy of care quality. Prior research shows that in both center and home-based care settings, worker wages are correlated with higher observed quality and with lower levels of turnover (Sakai, with Whitebook, 2003; Shonkoff & Phillips, 2000). Using data from the 1990 Decennial Census, Fuller et al. (2004) report that the education levels of child care workers were actually negatively associated with communities' median household income, and that child care wages were highest in communities with the highest proportions of black residents, a result they attributed to the targeting of highly-regulated subsidized care opportunities in poor, black neighborhoods.

Along with the education levels and wages of workers, type of care provides a third potential proxy for care quality. While quality of care varies substantially *within* care settings, there is some evidence that preschool programs tend to be of higher quality than family care settings because preschool centers typically face more stringent quality regulations. Indeed,

Kontos, Hsu, & Dunn (1994) compared the quality of child care centers and family day care homes, and found that while group size and child-staff ratios were lower in family day care homes, centers employed workers with more specialized training in early childhood, and these workers were more actively engaged in developmentally appropriate practices and cognitive stimulation. Preschool programs linked to public schools typically face the most stringent regulations, require teachers to hold a BA and pay them based on the K-12 salary schedule. There is some evidence that these programs are of particularly high quality. For example, while participation in center-based care is sometimes associated with negative behavioral outcomes, recent evidence suggests that children who attend pre-kindergarten in a school experience the positive academic benefits without any negative behavioral outcomes (Magnuson et al., 2007).

Fuller et al. (2004) show that "sector formalization" defined as the percentage of child care workers employed in centers (rather than home-based settings) is strongly linked to community characteristics. The degree of sector formalization is positively related to the percentage of zip-code residents who are black and negatively related to the percentage who are Latino. The authors also report a u-shaped relationship between sector formalization and the education level of residents, with greater levels of formalization in neighborhoods with the lowest and highest levels of education. These findings are again consistent with the notion that targeted interventions in low-income, black communities alter overall availability patterns.

Interpreting availability data

Differences in the size and characteristics of the child care labor force across communities may reflect systematic shortages in availability or market failures. However, variation in availability may also capture differences in preferences and needs for child care across communities.

Several studies have modeled the relationship between family characteristics and child care use and have shown that income, race, maternal education and family structure are all strongly related to child care use (Huston, Chang, & Gennetian, 2002; Liang, Fuller, & Singer, 2000; NICHD Early Child Care Research Network, 1997; West, 1995). However, the extent to which these relationships are the results of differences in preferences in comparison to differences in availability is not clear. For instance, we know that only 43 percent of Hispanic children attend preschool compared to 59 percent of white children and 66 percent of black children (Rooney et al., 2006). Studies have suggested that differences in cultural norms and beliefs about family and child-rearing are a potential explanation for the lower rates of participation by Hispanic families (Fuller, Eggers-Pierola, S. Holloway, & Liang, 1996; Liang et al., 2000). However, there is also evidence that the lower rates of participation among low-income and Hispanic families are related to lack of program availability (Hirshberg, Huang, & Fuller, 2005). For instance, interviews with 117 Hispanic mothers in Chicago show that the majority of mothers would prefer to use formal child care arrangements over kith and kin care (Illinois Facilities Fund, 2003). The mothers interviewed noted lack of availability, transportation challenges, and high prices as barriers to their use of center-based child care use. In addition, research shows increases in child care utilization in response to the introduction of free or subsidized care, which is consistent with a scenario in which low utilization is driven by a shortage of affordable care options rather than a lack of interest (Baker et al., 2005; Fitzpatrick, 2010; Witte & Queralt, 2003).

The Current Study

This study adds to the existing literature in several ways. First, previous national studies of child care supply were conducted using administrative data from the early nineties. Our paper updates

this work looking at the characteristics of the child care labor force from 1990 to 2009, a period in which investment and participation in out-of-home early childhood programs grew substantially. In addition, we use restricted-access data to measure child care availability and community characteristics and this data offers several improvements over previously available sources. First, the restricted-access Decennial data are generally a 1-in-6 sampling of the U.S. population. This improves the precision of our measurement of both workers and residents, particularly in less densely populated areas. Second, unlike the data used in earlier examinations of this topic, the restricted-use data provides tract-level information about place of work and place of residence. This allows us to better classify relevant markets for child care. Prior studies have used zip codes and counties to define communities, which may be too large to accurately identify the markets. Finally, unlike previous studies that have used a single cross-section of data we provide a picture of not only how markets for child care look at a particular point in time, but also how the landscape for early childhood care and education has changed over time.

Data Description

We use 1990 and 2000 restricted-access Decennial Census Long Form data to measure child care availability, both nationally and at the community level. We focus our discussion on the 2000 data as this is the most recent wave of available micro-data on workers. Note that there was no Long Form for the 2010 Decennial Census. In order to extend our estimates as close as possible to the present, we supplement our national trend analysis with data from the recently-released U.S. Census Bureau's American Community Survey (ACS) 2009 1-year estimates. Below we describe how we define communities and how we construct community-level measures of demographic characteristics and child care availability.

The Geography of a Market

A key strength of the restricted-access Decennial Census data is that it provides researchers access to a 1-in-6 sample of households, and therefore allows for flexible definitions of communities or markets for child care. We chose to define communities based on census tracts which are relatively small with, on average, 4,000 residents. While there is no consensus on the best way to define a local market for child care, based on consultation with personnel from a child care resource and referral agency, Queralt & Witte (1998), argue that tracts offer the best approximation of neighborhoods and child care markets. Tracts have the advantage of being substantially smaller than average zip codes or counties, and of being defined based on homogeneous groups of individuals.[4]

Like zip code boundaries, Census tract boundaries change over time, which poses a challenge for tracking changes in child care availability over time. We use the boundaries of Census tracts in 2000 to define communities in both the 1990 and 2000 Decennial Censuses. The use of a single set of geographic boundaries that remain consistent over time allows us to compare market characteristics without concerns that the area of the market is also changing.

For the 2000 data, this involved using the recorded tract of work or tract of residence for a respondent (see below for more information). The 1990 data was recorded with information about 1990 geography measures, including the 1990 Census tract rather than the 2000 Census tract. We use the best methods available for placing residents and workers in the 1990 data into

[4] The U.S. Census Bureau defines tracts in the following way: "Census tracts are small, relatively permanent statistical subdivisions of a county...Census tracts usually have between 2,500 and 8,000 persons and, when first delineated, are designed to be homogeneous with respect to population characteristics, economic status, and living conditions. Census tracts do not cross county boundaries. The spatial size of census tracts varies widely depending on the density of settlement. Census tract boundaries are delineated with the intention of being maintained over a long time so that statistical comparisons can be made from census to census. However, ... census tracts occasionally are split due to large population growth, or combined as a result of substantial population decline."

the relevant 2000 Census tracts. For residents, the restricted access data include information on the exact geographic coordinates of the Census block of the residence. We use this latitude and longitude information to place each resident in the 1990 data into the appropriate 2000 Census tract of residence. For child care workers, the finest level of geographic information about the place of work is the Census block (not latitude and longitude, but block number). We place workers into the 2000 Census tract that contains their recorded place of work 1990 Census block.

Characteristics of a Market's Residents

To measure the characteristics of a market or community, we aggregated the characteristics of its residents. We created four measures of the population's characteristics: the percent of the population that is black, the percent that is Hispanic, the percent that lives in rural Census blocks and the median income of households in the tract. We inflate both the 1990 and 2000 measures of median household income up to 2010 dollars using the Consumer Price Index for urban consumers (CPI-U).

Characteristics of Childcare Workers within a Market

To quantify and describe the supply of childcare in a market we measure the number and characteristics of child care workers who are employed in the relevant Census tract. We identify childcare workers based on their industry and occupation codes and employ a purposefully inclusive definition of the sector. Specifically, we include workers who provide care to children in any of a wide range of settings including the child's home, family day care homes, child care centers, Head Start programs, preschool programs as well as pre-kindergarten and kindergarten classrooms. Our definition includes workers employed in private and public organizations,

including public schools. This broad definition leads us to include workers in a wide range of positions ranging from babysitter and child care assistant to teacher and program directors. Operationalizing the sector broadly allows us to provide a complete picture of child care supply and also allows us to most accurately link data across the 1990 and 2000 decennial data, as the surveys use somewhat different industry and occupation classifications.[5] Throughout our analysis we use the ratio of children to workers as a proxy for availability. This ratio is the number of children aged zero to four who live in the tract divided by the total number of childcare workers in the tract.

In addition to creating the aggregated measure of the size of the child care sector, we also created several measures of worker characteristics as proxies of childcare market quality. First, we measured the highest level of educational attainment of the worker, i.e. has she attended college (some college) or obtained a BA. Second, we measured the childcare worker's wages per hour. To do this we divided her annual earnings in the previous year by the number of hours and weeks she worked in the previous year.[6] Third, we used the variable 'means of

[5] In 1990, the census classified workers based on the 1980 Standard Occupation Classification (SOC) and the 1987 Standard Industrial Classification (SIC). By the 2000 census, both classification systems underwent major revisions, and the SIC was replaced with the North American Industrial Classification System. Crosswalks are provided to match classifications across the two datasets. For instance, in 1990 "Child Day Care Services" and "Family Child Care Homes" were classified as two distinct industries, whereas in 2000 the two were collapsed into a single industry. Based on the crosswalk recommendations, we define our sector as follows: In 1990 child care workers are any people who were employed in the week before the survey *and* whose recorded industry was either 'child day care services' (862) or 'family child care homes' (863) or whose occupation was recorded as 'child care workers, private household' (406), 'family child care providers ' (466), 'early childhood teachers' assistants' (467), 'child care workers, n.e.c.' (468) or 'teachers, prekindergarten and kindergarten' (155). In 2000, child care workers are any people who were employed in the week before the survey *and* whose recorded industry was either 'child day care services' (847) or whose occupation was recorded as 'child care workers' (460) or 'preschool and kindergarten teachers' (230). Our coding decisions were made to create the most comparable definitions across waves of data and to avoid attributing changes to the industry over time that are artifacts of changes in the classification system. Further, our sample construction should not be sensitive to these changes in classification because in both time periods individuals who completed the census long form never saw the list of industry and occupation classifications. Rather, they answered open-ended questions such as "what kind of work was this person doing?" "what were this person's most important activities or duties?" Responses were then coded into appropriate industry/occupation codes.

[6] A small fraction of workers do not have valid recorded wages in the year before the survey. Most of these workers are missing earnings information despite responding that they were employed at some point during the year and

transportation to work' to determine whether the childcare worker worked at home or worked outside of the home. Note that our measure of home-based child care will underestimate the full size of this subsector as we are only including individuals who are providing child care in their own home, and not those who provide care in other people's homes.[7]

Fourth, we grouped childcare workers into three sectors of employment: preschool teachers who work in schools, preschool teachers who work outside a school and all other child care workers. *Preschool teachers who work in schools* are workers whose occupation is recorded as teacher ('prekindergarten and kindergarten' 155 in 1990 or 'preschool and kindergarten' 230 in 2000) and whose industry is recorded as 'elementary and secondary schools' (842 in 1990 or 786 in 2000). *Preschool teachers who work outside a school* are those whose occupation is teacher ('prekindergarten and kindergarten' 155 in 1990 or 'preschool and kindergarten' 230 in 2000) and their recorded industry is anything other than the elementary or secondary schools. Finally, *child care workers* are the remainder of workers we describe. In other words child care workers are those who do not identify themselves as teachers.

American Community Survey

The 2010 Decennial Census data did not include a Long Form and therefore cannot be used to track occupational trends. In order to get a more recent description of the early childhood

having a valid recorded number of hours of work in that year. We impute wages for these childcare workers using information about their own characteristics (race, educational attainment, etc.) and the characteristics of the communities in which they lived and worked at the time of the survey. We present results here including these workers for whom we imputed wages, but the results using only the sample of workers whose recorded information is complete are qualitatively similar. Results are available from the authors upon request.

[7] For example, Herzenberg, Price, & Bradley (2005) who track changes in the child care industry over time use a much broader definition of home-based care including individuals who are classified as "child care workers in private households, " individuals classified as working in the "family child-care homes" industry, and individuals classified as being self employed and working in the "child day care services." Changes in the classification systems between 1990 and 2000, make it impossible to consistently compare this broader classification system over time. An advantage of our more restrictive definition is that consistent comparisons between 1990 and 2000 are feasible.

education and care workforce than 2000, we use the ACS for the most recent year available, 2009. The ACS is an ongoing annual survey conducted by the Census to provide more timely information about the social and economic needs of communities, than are available through the Decennial Census which happens every ten years. However, the ACS involves much smaller samples than the Decennial Census and is therefore not appropriate for use in describing child care availability across very small geographic areas such as census tracts. While we cannot use the ACS to extend our examination of community differences, we make use of this data to provide information about the education levels and subsectors of child care workers in 2009.[8]

Results

National trends in the child care labor force

Table 1 shows key characteristics of the child care labor force in 1990, 2000 and 2009. The first thing to note is that between 1990 and 2000 the size of the child care labor force nearly doubled from about 1.2 to 2.3 million workers, an 89 percent increase.[9,10] Appendix 1 shows some comparative population statistics and highlights that the rapid growth in the child care industry far outpaced the 4 percent increase in the population of children age zero to five over this same period. Similarly, while the number of child care workers nearly doubled, the percentage of all workers age 16 and above only increased by 15 percent. Over the same period the number of social workers in the United States remained constant, elementary and secondary teachers

[8] Unlike the Decennial Census, the ACS survey is not appropriate for estimates of sector count. In addition, differences between the Decennial Long Form and the ACS with respect to sampling and survey questions prevent us from making comparisons about wages. We therefore limit our use of the ACS data to look at characteristics of the child care labor force in 2009 (e.g. education levels, race, sub-sector, etc.)

[9] Recall that the ACS does not allow for comparable data on sector size and wages in 2009.

[10] Note that these numbers differ from those presented by Herzenberg, S., Price, M., & Bradley, D. (2005). Using the Current Population Survey (CPS), they report a change from 1.7 million ECE workers in 1990 to 2.1 million in 2000. Our calculations with the CPS are similar, going from 1.6 million to 2.2 million over this time period. The Decennial Census is a far larger sample and differs from the CPS in design and data collection.

increased by approximately 8 percent, and the number of food service employees went up by 18 percent. That the child care industry grew at a far higher rate than both the population and other industries is likely due to the purposeful policy efforts over this time period to increase early childhood education and care availability.

Growth varied substantially across sub-sectors of the labor force defined by worker education and care type. For instance, while the industry experienced expansion at all educational attainment levels, growth was particularly pronounced among workers with some college attendance and those with a BA or more. The percentage of workers in these two categories grew from 46.7 to 55.4 (an increase of about 19 percent) between 1990 and 2000. Over the same period, the percentage of workers with less than a high school diploma fell from 20.4 percent to 13.4 percent. Part of this increase in education levels among child care workers reflects an overall increase in education levels in the population. For instance, Appendix 1 shows that between 1990 and 2000 the percentage of women 16 and older with some college education or above increased by about 14 percent. However education rates increased at a higher rate among child care workers, and far outpaced the increases in other industries characterized by relatively low levels of education. For instance, among food service workers, the percentage with some college or above increased from 29 to 32 percent (an increase of about 10 percent) and among cosmetologists it increased from 40 to 43 percent (an increase of about 8 percent).

Comparable data from the ACS, presented in the final column of Table 1, show that earlier trends continued in more recent years as states have expanded pre-kindergarten programs and heightened education requirements for preschool teachers have been introduced. In 2009, 63 percent of child care workers had some college experience or higher, indicating an increase of approximately 14 percent from the 2000 level. Here too the growth has meaningfully outpaced

overall changes in the population. Among all US women 25 and older, the percentage with this level of education grew by about 10 percent from 51 to 56 percent between 2000 and 2009.

In addition to the changing educational attainment of the ECE workforce, there has also been a staggering shift away from home-based child care and into more formal settings. In 1990, approximately a third of child care workers provided care in their home (33.5 percent) compared to 18 percent in 2000 and 13 percent in 2009.

The wages of ECE workers rose from 1990 to 2000 by approximately 21 percent, with the greatest increase for teachers in school-based preschools (44 percent) and the smallest increase for other preschool teachers (11 percent). On average, wages for child care workers were approximately $10 per hour in 2000, with BA-level workers earning about $13 per hours, about $4 more than workers without a high school diploma.[11] Preschool workers in a school settings earned substantially more than workers classified as child care workers ($17 compared to approximately $10), perhaps a reflection that public school kindergarten as well as many school-based pre-kindergarten teachers are paid based on the K-12 teacher salary schedule.

Table 2 shows that the education levels of child care workers differ substantially across settings but also that they rose across all sectors. In 2000 among school-based preschool teachers, 70 percent held a BA or higher and only one percent had less than high school. In contrast, among child care workers who provided services in their homes, the distribution of educational attainment was substantially lower with only 10 percent of workers holding a BA and 18 percent with less than a high school diploma. *Changes* in the educational composition of the workforce, while positive overall, also differed across settings. For example, while the percentage of workers with less than a high school diploma dropped rapidly from 1990 to 2009, among individuals providing home-based care the share of these workers stayed almost constant.

[11] All wages are converted to 2010 dollars.

Among early childhood teachers working in schools, the percentage with a BA or above rose by approximately 25 percentage points from 53 to 79 percent, while the percentage of workers with only "some college" actually dropped by about 13 percentage points. In contrast, among preschool teachers working outside of schools the reverse pattern holds. For this group, the overall increase in educational attainment was driven by a rise in the percentage of teachers with some college (from 40 to 48 percent), while the percentage of these teachers with a BA dropped slightly.

Finally, Table 3 shows the racial composition of the child care labor force, both across sub-sectors and over time. The percentage of Black and Hispanic workers increased steadily over the study period, a trend that holds both for the overall sample and across all levels of education and all sub-sectors of the industry. This finding goes counter to the claim that efforts to increase the educational levels of child care workers would lead to a "whitening" of the field. In fact, the share of BA-level workers who are Hispanic nearly doubled over the study period, as did the share of workers with some college education.

In summary, the early childhood workforce changed dramatically over the past two decades. The number of workers almost doubled, while the population of children remained relatively constant. This increase was connected at least in part to a shift away from workers working at home, a drop from 34 percent to 13 percent over the same period. The education level of workers also increased markedly with the percent of workers with a BA increasing from 14 percent in 1990 to 16 percent in 2000 to 21 percent in 2009. At the same time, the workforce became more racially and ethnically diverse with the percent of black workers increasing by approximately 50 percent (from 10.3 to 15.2 percent) and the percent of Hispanic workers increasing by 70 percent (from 9.5 to 16.3 percent).

Differences in availability across communities

In this section we describe how overall child care availability and characteristics vary across communities. We present our results in a series of figures. Each figure includes three separate graphs which show how a particular measure of child care availability (e.g. number of children per worker, percent of workers with a BA) varies by a communities' median household income, by the percentage of black residents and by the percentage of Hispanic residents.[12]

Figure 1 presents overall availability trends as measured by the ratio of children to all child care workers in a given tract. The top graph shows how availability varies with family income. In the highest-income communities there are approximately 8.5 children for every child care worker. In contrast, in tracts at the 15th to 20th percentile of the income distribution, the rate is approximately 10.7 child care workers per child, a difference of about 25 percent. Note, however, that availability is somewhat higher in the very poorest communities, at just under ten children per worker.

The second graph in Figure 1 shows that there is a strong positive relationship between the percentage of black residents in a community and the child to worker ratio. Similarly, the third graph shows that the percentage of Hispanic residents in a community is also strongly linked with lower levels of availability. While the general trends are comparable, a careful examination of the ranges for each of the graphs shows that the predominantly Hispanic communities have meaningfully lower levels of supply than do predominantly black communities. The ratio of children to workers is approximately 9.5 in the lowest percent black tracts and approximately 8.5 in the lowest percent Hispanic tracts. In contrast, the ratio is

[12] In each graph the x-axis measures the community characteristic. Median income is measured at the tract-level and presented as percentiles. Both measures of racial composition are measured as the percentage of the tract that is a particular race (i.e. communities with 0 percent black residents to 100 percent black residents).

approximately 11.5 children per worker in the highest percent black tract and 16 in the highest percent Hispanic tract. Compared to non-black and non-Hispanic communities, the children-to-worker ratios are approximately 21 percent larger for all black communities and 88 percent larger for all Hispanic communities.

The education level of workers also varies by the income and racial/ethnic composition of the communities. The top panel in Figure 2 shows that in the top quintile of communities based on income, approximately 25 percent of workers have a BA compared to about 11 percent in the bottom quintile. The top quintile also has the lowest shares of workers with either a high school diploma or less.

The second panel of Figure 2 shows that, in contrast, the percentage of black residents in a tract is not strongly related to teacher education levels of workers. However, as seen in the third panel, there is a strong relationship between the percentage of Hispanic residents and worker education. In communities with the lowest percentages of Hispanic residents (0-20 percent), nearly 16 percent of workers are not high school graduates and about 14 percent have a BA. In contrast, in predominantly Hispanic communities (80 to 100 percent) the proportion of workers who have less than a high school diploma is twice as high and the proportion who hold a BA is about half as high.

In additional analyses, not shown, we considered differences in the ratio of children ages 0-4 to BA-level workers. The same patterns hold. In communities with the lowest percentages of Hispanic residents there are approximately 60 children per worker with a BA, compared to 225 children per worker with a BA in the predominantly Hispanic communities. The proportion of black residents in a community is also linked to lower availability of degreed workers, however, the relationship is far less pronounced. Communities with very low percentage of

Black residents have about 70 children per BA-level worker, compared to slightly more than 90 children per BA-level worker in predominantly black communities.

Both the number and educational attainment of workers are positively related to median tract income, with a small increase at the very lowest income levels. Wages of workers are another possible proxy for worker quality. Figure 3 shows a more pronounced, u-shaped relationship between tract-level income and child care workers' wages, with higher hourly earnings for workers in the bottom and top quintile of the distribution relative to those in the middle. Both the highest and lowest income tracts pay workers more than 13.5 dollars per hour, compared with approximately 11.5 dollars per hour in the middle income tracts. When looking by race and ethnicity, we find that higher proportions of black residents in a tract are associated with higher wages for child care workers, while the reverse pattern holds in Hispanic communities. Further, average wages in predominantly black communities are approximately three dollars higher than in predominantly Hispanic communities.

Finally, Figure 4 shows how the composition of the child care type varies across communities. Once again we find a u-shaped relationship between care type and tract income such that compared to the middle quintiles, the bottom and top quintiles have lower levels of both home-based care and workers who classify themselves as child care workers rather than preschool teachers. There is not a strong relationship between the proportion of a tract that is black and the types of care that are provided, however in Hispanic communities we again observe a strong relationship with nearly 40 percent of workers classifying themselves as child care workers in predominantly Hispanic neighborhoods compared slightly more than 10 percent of workers in communities with the lowest proportions of Hispanic residents.

Taken together, the four figures tell a consistent story and two themes emerge. First, there is a u-shaped relationship between tract-level measures of income and most of our measures of care availability and quality. In general, the highest levels of both availability and quality are seen in communities with the highest level is income, but the relationship is non-linear with somewhat higher quality in the lowest quintile of income relative to the middle quintiles. This pattern, which echoes earlier findings, suggests that targeted interventions in the lowest-income communities may have had a meaningful impact on care availability and quality in low-income communities.

The second and perhaps most striking finding from the figures is that care availability and quality differ substantially between predominantly black and predominantly Hispanic communities. Predominantly Hispanic communities have the highest child to teacher ratios and have a much higher number of children per BA-level worker than do black communities. The proportion of workers who classify themselves as care providers rather than teachers is almost 30 percentage points higher in predominantly Hispanic communities than in black communities, and the hourly wages are similarly lower. To some extent, care availability is delinked from the proportion of a community who is black. Predominantly black communities do have somewhat lower levels of care availability relative to non-black communities as well as a slightly lower percentage of workers with a BA. However, there is not a strong relationship between the proportion of a community who is black and particular types of care. Further, wages in predominantly black communities tend to be higher than in areas with low percentages of black residents.

Changes in the child care labor force 1990-2000

So far our results show that nationwide the child care labor force expanded substantially between 1990 and 2000 and that over that time there was also a shift towards a more educated workforce and a workforce who increasingly was providing care in settings outside of their homes. We have also shown that, in 2000, both the availability and the characteristics of care differed based on the demographic characteristics of communities. In a final stage of analyses we run exploratory regressions predicting changes in the child care labor force between 1990 and 2000 based on 1990 community characteristics. Table 4 presents these results. We consider changes in four child care characteristics; the ratio of children to workers, the percent of workers in the home, the percent of workers with a BA and the average hourly wages of workers.[13] For each outcome we show two regression models.

The first column within each pair shows the results from models that predict changes in some child care outcome controlling for the 1990 median household income, our two measures of racial composition and a measure of rurality. The first thing to note is that the greatest changes in child care availability and quality over this period were in lower income communities. Our results indicate that relative to poor communities, higher-income communities experienced smaller drops in child to worker ratios as well as smaller increases in both the proportion of college-educated workers and the in average worker wages. Next we explore how the racial composition of tracts relates to these changes. Tracts with higher proportions of Hispanic residents experienced significantly greater drops in the number of children per child care worker than did those with no Hispanics. In contrast, there is no relationship between the percentage of black residents in a community and changes in the overall

[13] In addition to including the controls for the 1990 levels of community characteristics we describe in this section, we also include controls for changes in community characteristics from 1990 to 2000. We do this so that our interpretation of how growth of child care relates to community characteristics is not contaminated by changes in community characteristics. For example, we want to be sure that the more rapid declines in children-to-worker ratios seen in low-income neighborhoods (relative to higher-income neighborhoods) were not the byproduct of these neighborhoods becoming wealthier over time.

availability of workers over this time period. Relative to tracts with low percentages of Hispanic residents or low percentages of black residents, communities with larger shares of minorities saw less of a decrease in the percent of child care workers working at home and less of an increase in the wages of child care workers. The difference for the change in the percent of workers working at home is meaningful in size, while the wage change difference is quite small. For tracts with just 10 percentage points more Hispanic residents or ten percent more black residents, the percent of child care workers who work at home decreased just over two percentage points less. For a similar increase of ten percentage points in the Hispanic or black tract representation, wages increased only one cent less. Finally, the racial composition of tracts in 1990 is not related to changes in the percentage of childcare workers with a BA.

The second column for each child care characteristic used as a dependent variable in Table 4 introduces interaction terms between racial/ethnic composition and median household income. These models also control for the outcome measure in the tract in 1990. The purpose of these models is to examine whether the relationship between income and changes in child care is different across communities based on racial composition.

We find no interaction between Hispanic composition and income when the outcomes are the change in the number of children per child care worker or the change in the hourly wages. However, we do find that black communities experienced different changes in these outcomes depending on their income levels. We find that low-income communities experienced greater improvements in childcare availability relative to higher income communities and that communities with higher proportions of black residents also saw greater improvements relative to communities with lower percentages of black residents. The significant and positive interaction between percent black and median income indicates that the relationship between

income and availability was particularly pronounced in communities with larger fractions of residents who were black. Increases in the wages of child care workers from 1990 to 2000 were significantly higher in communities with larger proportions of black residents, and this pattern was most pronounced in lower-income higher-proportion black communities.

The table also shows a positive and statistically significant coefficient on the interaction terms between both Hispanic and black composition and median household income when the dependent variable is the change in the percent of child care workers working at home. This result signals that while higher income all-white tracts saw a greater decrease in home workers than did lower income all-white tracts, this was not the case for all-Hispanic or all-black tracts. In fact, for non-white tracts, the decrease in home workers was significantly less in higher income than in lower income communities.

Finally, the results reported in the table also suggest a negative and statistically significant interaction between racial/ethnic tract composition and median household income for the change in the percent of child care workers with a BA. Again, while in all white tracts, the percent of BA workers increased more in higher income areas, in all-Hispanic and all-Black tracts, the percent of BA workers increased more in lower income areas.

Overall we observe that between 1990 and 2000 there was an increase in the availability of workers, with a shift towards higher educational attainment and greater pay. These changes were seen across community types but to varying extents. In particular, increases in the educational attainment of workers were greater in high-income, high-percent-white communities, as well as low-income, high-percent black communities. Similarly, the wages of workers grew rapidly in high-income, high-white communities as well as in low-income, high-black communities. The percent of workers working at home dropped most in high-income, high-

white and in both low-income black and low-income Hispanic communities. The differences for the availability of workers followed a somewhat different pattern with less of an increase in high-income communities, particularly high-income, black communities.

Discussion

This paper provides the first national picture of changes in the child care industry over a period with substantial changes in maternal labor supply and welfare law as well as heightened interest in the role of early childhood education as a potential strategy for narrowing of achievement gaps. We show that between 1990 and 2000 the child care labor force doubled in size, and that from 1990 to the present there was nearly a 20 percentage-point increase in the proportion of the labor force with some college education or higher. Our analysis also shows a substantial shift in the settings where care is provided. Whereas in 1990 about a third of workers provided care in their own homes, by 2009 that figure fell to 13 percent. Overall, early childhood education and care in this country has shifted towards more formalized, classroom-based arrangements.

Our results tell a very different story than a recent report which used data from the Current Population Survey and reported declining education levels in the industry between 1979 and 2004 (Herzenberg et al., 2005). A likely explanation for this discrepancy is the difference in sector definition across studies, as we use an inclusive definition of child care while that study focuses on center-based care providers and excludes home-based care providers as well as child care workers, pre-kindergarten teachers, and kindergarten teachers working with schools.[14]

[14] In the current study we do find drops between 1990 and 2009 in the percentage of workers with a BA among preschool teachers working in non-school settings. Although this category does not perfectly align, this provides some evidence that definitional differences explain the lack of consistency between the studies.

Our study also explored whether the demographic composition of communities is related to care availability. We find a strong, positive relationship between tract-level measures of income and various measures of both availability and quality. However, the relationship is non-linear. While the wealthiest communities appear to have the greatest availability, very poor communities tend to have higher availability and quality of care than do communities with somewhat higher median incomes. Differences in care availability and type across communities may be the product of differences in availability and may reflect market failures. However, disparities may also capture differences in demand for care, which may be explained by differences in families' needs or preferences. The u-shaped patterns we observe in our data are likely related to public interventions targeted towards individuals and communities with high-levels of poverty. This suggests that public policies may be successfully addressing shortages, although it also raises concerns about working-class communities who do not benefit directly from targeted interventions and may struggle to find affordable care options.

Our analyses of changes in the early childhood education and care workforce from 1990 to 2000 also suggest the combined forces of market demand and targeted intervention. We find that the greatest increase in our proxies for quality (the percent of workers working outside of the home, the percent of workers with a BA, and the hourly wages of workers) occurred in both high-income predominantly-white communities and in low-income predominantly-black communities.

Care availability and quality differs by the racial and ethnic composition of a community, but this relationship is far more pronounced when considering predominantly Hispanic communities than predominantly black ones. The ratio of children to child care workers in Hispanic communities is higher relative to other communities, and there appears to be

particularly low numbers of workers who hold a BA or classify themselves as teachers rather than caregivers. One explanation for this pattern may be differential rates of public targeting. It may be that targeted interventions for poor young children have traditionally been implemented in predominantly black communities. Fuller, Holloway, & Liang (1996) argue that the historical growth of the Head Start program in black communities as one possible explanation for lower participation rates among Hispanic families. However, the authors also suggest that differences in cultural preferences and norms may be an important part of the explanation.

In addition, higher rates of limited English proficiency in Hispanic communities may make families more reticent to seek out non-relative care arrangements. For instance, a recent GAO report showed that parents with limited English proficiency faced multiple challenges when trying to access subsidized care opportunities (Government Accounting Office, 2006). Many parents did not know programs existed or feared that enrolling in these programs would expose their undocumented status. Others met challenges when trying to enroll their child due to the lack of bilingual staff.

While differences in demand may be part of the explanation, differential access and unique barriers to access seem to play an important role. A recent survey of Hispanic parents showed that most were in favor of pre-kindergarten programs and felt that these programs gave children in school (Pérez & Zarate, 2006). The top two reasons family provided for not enrolling their child pre-kindergarten were "they don't know about programs in their community" or "they cannot afford it." There have been active efforts in recent years to improve access to quality programs in Hispanic communities and to provide families better information and support about the availability and potential benefits of participation (Collins & Ribeiro, 2004; E. Garcia & Gonzales, 2006).

We know that Hispanic children are enrolling in early childhood programs at increasing rates. For instance, between 1994 and 1999, Latino enrollment in Head Start increased by over 50 percent, while black and white enrollment rose by 8 and 3 percentage respectively (G. Garcia & Levin, 2001). Our current exploration of changes in the child care industry over time also suggests that both quality and availability increased at higher rates in communities with high proportions of poor, Hispanic and black residents. This is encouraging evidence that the link between neighborhood characteristics and care availability is weakening. Ideally, future work will extend the current analysis to explore how the availability of care in poor, black and Hispanic communities has improved between 2000 and the present. Some analysis of this issue may be possible using the American Community Survey, although that data is not meant for describing the characteristics of small geographic areas such as census tracts on an annual basis. It would also be helpful to use more direct measures of care quality that go beyond workers' education and wages, and examine how more nuanced measures of quality and child interactions vary across communities. Doing so will require improved data on worker quality at the community level across sectors than what currently exists.

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Table 1: National Child Care Labor Force 1990 & 2000

	National Child Care Availability, 1990				***National Child Care Availability, 2000***				***Child Care 2009***
Group	*Count*	*Percent*	*Median Hourly Wages*	*SD Hourly Wages*	*Count*	*Percent*	*Median Hourly Wages*	*Standard Deviation*	*Percent*
All Child Care Workers	1,231,886		7.6	9.5	2,329,481		9.8	10.6	
Education Level									
BA	176,253	14.3%	11.2	11.8	381,405	16.4%	13.2	12.3	21.2%
Some College	399,364	32.4%	7.6	8.9	908,718	39.0%	9.8	10.1	42.1%
High School Diploma	405,229	32.9%	7.0	8.3	728,063	31.3%	9.1	9.9	27.3%
Less than High School	251,040	20.4%	7.1	9.4	311,295	13.4%	8.7	10.4	7.3%
Sector									
Works outside home	819,771	66.5%	8.5	10.5	1,906,375	81.8%	10.3	11.0	87.2%
Works at home	412,115	33.5%	6.6	6.4	423,106	18.2%	8.6	8.3	12.8%
Child Care	990,433	80.4%	7.2	9.1	1,943,129	83.4%	9.6	10.4	80.2%
Preschool (Non-school)	197,730	16.1%	9.4	10.1	300,546	12.9%	10.4	10.2	15.1%
Preschool (School)	43,723	3.5%	12.1	11.7	85,806	3.7%	17.4	13.2	4.7%

Table 2: Educational Composition of the Child Care Sector 1990-2009 (Row percentages)

Sector	Less than High School	High School Diploma	Some College	BA
		1990 Child Care Labor Force		
Overall	20.40%	32.90%	32.40%	14.30%
Works outside home	21.80%	29.20%	32.60%	16.50%
Works at home	17.60%	40.30%	32.10%	10.00%
Child Care	24.10%	36.10%	31.00%	8.90%
Preschool (Non-school)	5.60%	21.20%	40.10%	33.10%
Preschool (School)	3.00%	13.70%	30.50%	52.80%
		2000 Child Care Labor Force		
Overall	13.40%	31.30%	39.00%	16.40%
Works outside home	12.30%	30.30%	39.60%	17.70%
Works at home	18.00%	35.60%	36.20%	10.20%
Child Care	15.30%	34.10%	38.70%	11.90%
Preschool (Non-school)	4.60%	20.00%	45.50%	30.00%
Preschool (School)	1.30%	6.40%	22.30%	70.00%
		2009 Child Care Labor Force		
Overall	9.39%	27.27%	42.12%	21.22%
Works outside home	8.27%	26.61%	42.87%	22.26%
Works at home	17.00%	31.78%	37.03%	14.19%
Child Care	11.22%	30.47%	42.32%	15.99%
Preschool (Non-school)	2.45%	17.52%	48.56%	31.46%
Preschool (School)	0.43%	3.92%	17.87%	77.78%

Table 3: Demographic Characteristics of Child Care Workers by Education Level & Sector 1990-2009

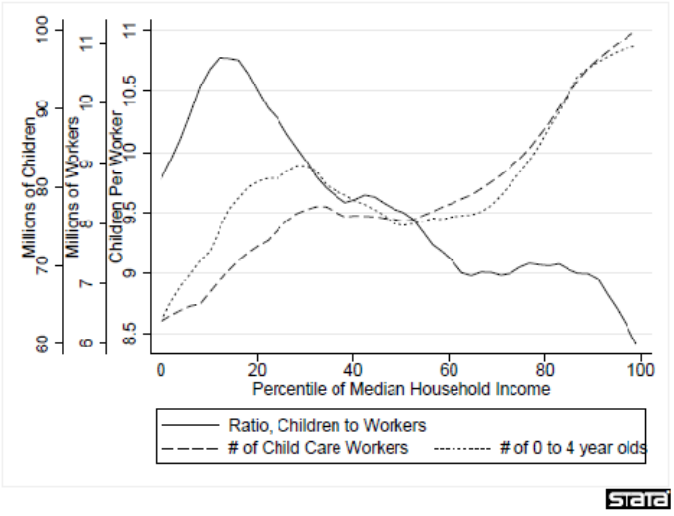
	1990			*2000*			*2009*		
Group	***%Black***	***%Hisp***	***%Immig***	***%Black***	***%Hisp***	***%Immig***	***%Black***	***%Hisp***	***%Immig***
All Child Care Workers	10.3%	9.5%	9.6%	13.4%	11.8%	11.3%	15.2%	16.3%	15.2%
Education Level									
BA	6.3%	5.0%	8.9%	7.9%	5.9%	11.3%	10.0%	10.0%	14.9%
Some College	10.4%	7.5%	7.4%	14.3%	10.9%	9.1%	17.4%	15.4%	11.1%
High School Diploma	9.7%	7.9%	7.3%	13.8%	10.7%	9.1%	16.2%	15.2%	14.7%
Less than High School	13.7%	18.4%	17.2%	16.4%	24.6%	23.1%	14.0%	38.3%	36.2%
Sector									
Works outside home	12.7%	10.1%	9.8%	13.7%	11.9%	11.0%	15.5%	15.5%	14.0%
Works at home	5.4%	8.2%	9.2%	11.7%	11.7%	12.7%	12.9%	21.9%	24.0%
Child Care	9.9%	10.1%	10.3%	13.5%	12.7%	12.0%	14.8%	17.6%	16.6%
Preschool [Non-school]	11.9%	6.8%	6.6%	14.1%	7.5%	8.1%	17.8%	11.1%	10.0%
Preschool [School]	9.6%	7.3%	7.3%	8.7%	7.7%	6.3%	13.0%	12.8%	8.6%

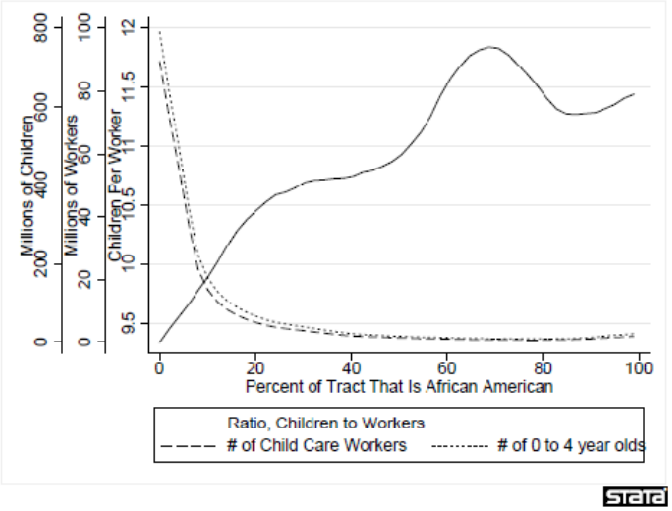
Table 4: Changes in the child care labor force 1990-2000

	Change in Ratio of Children to Workers 90-00		Change % CC Workers Working at Home (90-00)		Change % CC Workers with a BA (90-00)		Change in Avg. Hourly Wages of CC Workers, (90-00)	
% Hispanic	-0.0483***	-0.0672	0.209***	-1.444***	-0.0152	1.750***	-0.000933***	-0.00128
	(0.004)	(0.068)	(0.016)	(0.282)	(0.012)	(0.206)	(0.000)	(0.004)
% Black	-0.0093	-0.132***	0.236***	-1.796***	-0.00134	1.176***	-0.000986***	0.0220***
	(0.003)	(0.047)	(0.013)	(0.192)	(0.009)	(0.140)	(0.000)	(0.003)
% Rural	0.0080***	0.0214***	0.116***	0.154***	-0.00623	-0.0598***	-0.000336***	-0.00096
	(0.002)	(0.001)	(0.007)	(0.005)	(0.005)	(0.004)	(0.000)	(0.000)
Median Hshld Income 1990	1.378***	0.777***	-0.469	-4.765***	-4.153***	10.29***	-0.0704***	0.185***
	(0.144)	(0.134)	(0.620)	(0.553)	(0.463)	(0.414)	(0.009)	(0.008)
% Hispanic X		0.011		0.150***		-0.183***		0.000343
Median Inc 90		(0.007)		(0.028)		(0.021)		(0.000)
% Black X		0.0161***		0.180***		-0.120***		-0.00192***
Income 90		(0.005)		(0.019)		(0.014)		(0.000)
1990 Level of		-0.794***		-0.834***		-0.908***		-0.916***
Outcome		(0.006)		(0.006)		(0.006)		(0.006)
Constant	-18.80***	-4.363***	-8.709	63.99***	44.65***	-90.64***	0.947***	0.261***
	(1.569)	(1.424)	(6.752)	(5.887)	(5.043)	(4.366)	(0.101)	(0.084)
Observations	24610	24610	24610	24610	24610	24610	24610	24610
R-squared	0.027	0.432	0.034	0.481	0.005	0.492	0.006	0.51

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. All models also account for *changes* in all four demog characteristics (e.g. tract level changes in % Black between 1990 and 2000)

Figure 1: Overall child care availability by community composition, 2000





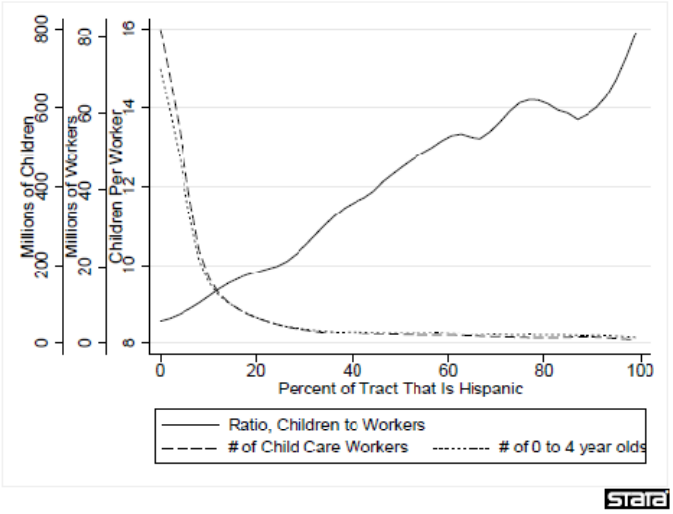
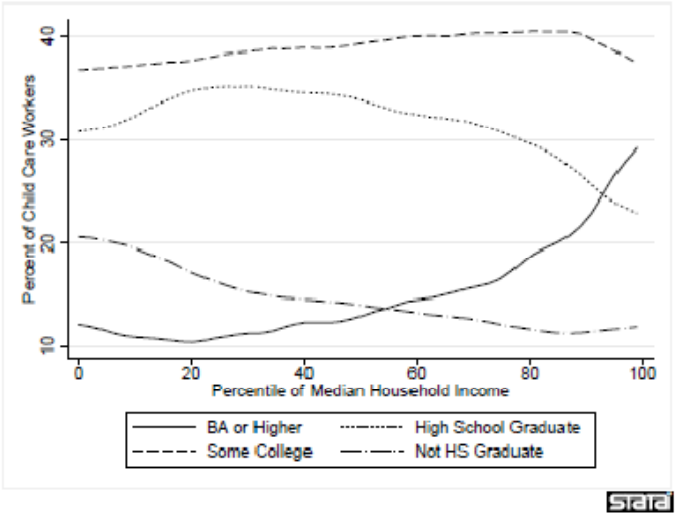
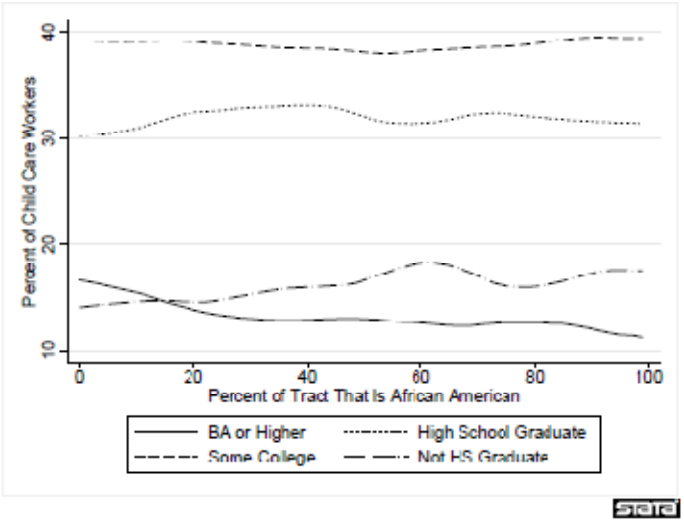


Figure 2: Education levels of child care workers by community composition, 2000





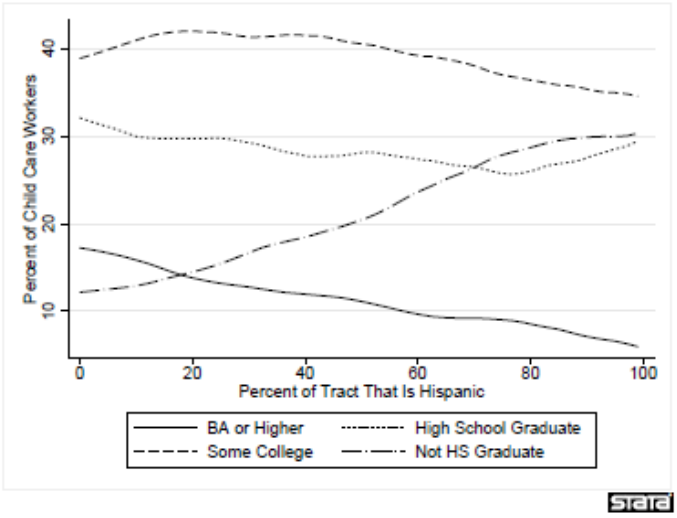
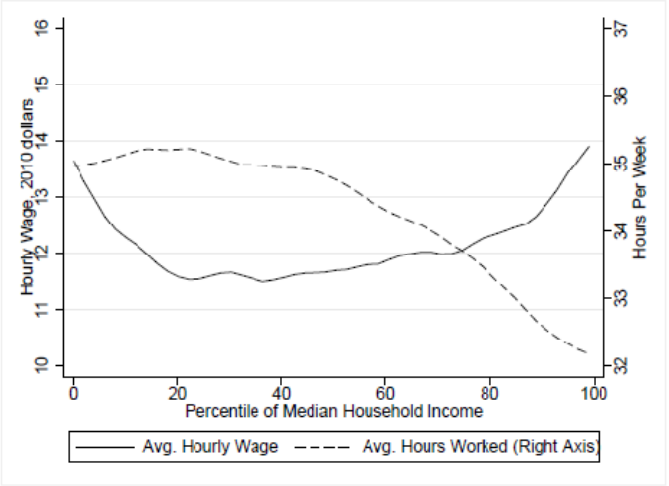


Figure 3: Avg. Child Care Wages & Hours, by community composition, 2000



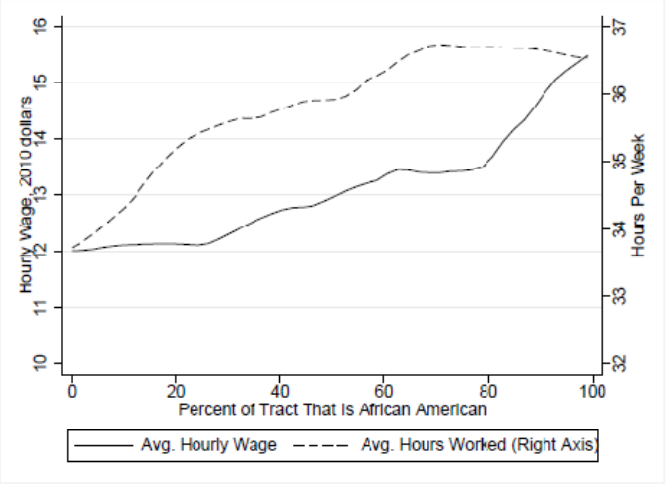
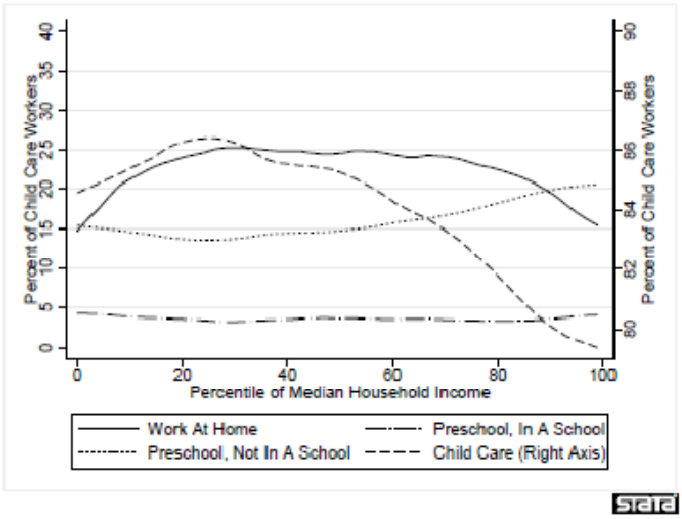
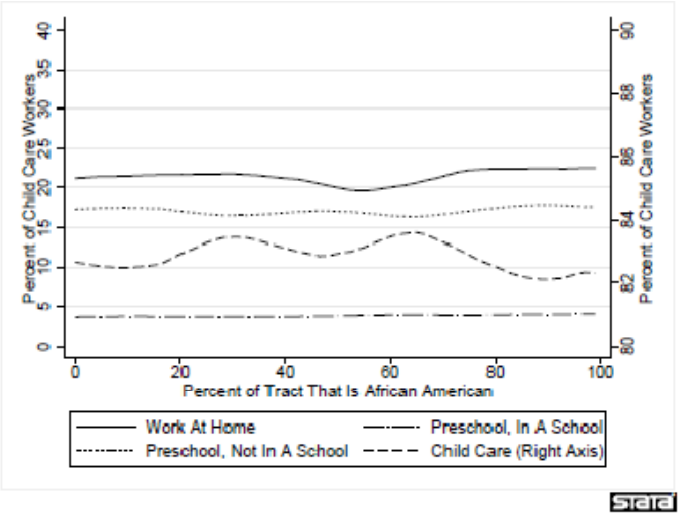
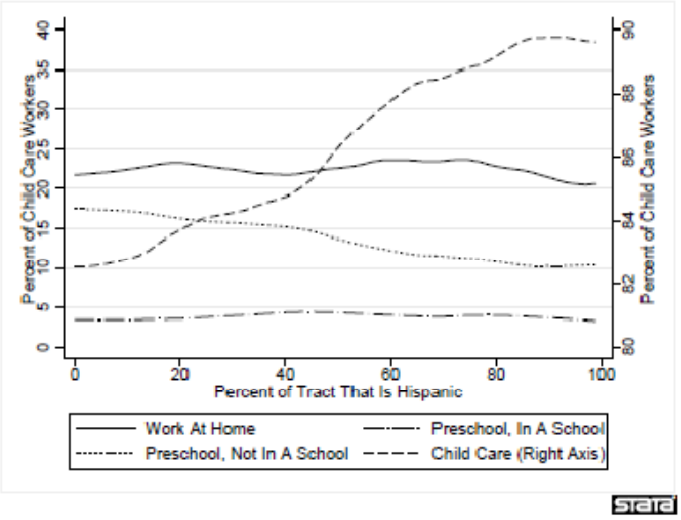


Figure 4: Child care type by community composition, 2000







Appendix 1: Population and education changes 1990 to 2000, child care workers and comparison populations

	Population Count			Percentage of workers with "some college" or above, 1990		
	1990	2000	Ratio	1990	2000	Ratio
Child Care Workers	1,313,561	2,572,630	1.96	46%	55%	1.18
Children < 5	18,201,472	19,046,165	1.05	--	--	--
Women 25+	41,700,000	49,100,000	1.18	55%	63%	1.15
Women 16+	51,300,000	58,700,000	1.14	55%	62%	1.14
Food Service Workers	5,010,884	6,093,604	1.22	29%	32%	1.10
Elem/Sec Teachers	3,517,192	3,781,164	1.08	95%	100%	1.05
Cosmetologists	698,695	639,146	0.91	40%	43%	1.08
Social Workers	630,998	620,056	0.98	86%	91%	1.05

Authors' calculations using publicly available IPUMS data.