

A Longitudinal Study of Child Care Workers in the United States

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I Introduction

As female labor force participation grew dramatically over the past 30 years, due to a variety of inter-related causes including rising real wages for women, stagnant real wages for men, changing social attitudes, and welfare reform, the demand for non-maternal child care has grown by comparable amounts. The child care labor market has responded relatively well to this rising demand for child care, producing rising quantities of weekday child care slots across the bulk of the United States. To the extent that pervasive child care shortages exist, they are most troublesome in off-hours care or in particularly low-income neighborhoods.

Clearly, then, the child care market “works” in the sense that it has been responsive to growing demand. Where most analysts agree that the market for child care falls short is in the provision of quality. Parents, child advocates, and educators have long been concerned about the quality of child care received by America’s children. For example, a report of the National Research Council, 1990 writes:

There is general agreement that the current U.S. system of child care is inadequate and that child care policies should promote the healthy development of children...Poor quality care more than any single type of program or arrangement threatens children’s development, especially children from poor and minority families. (Hayes, Palmer and Zaslow, vii and xii)

A more recent report prepared by Deborah Vandell and Barbara Wolfe for the Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services (May 2000) summarizes accumulated evidence on child care quality in the United States and finds that while there is a broad distribution of quality levels observed in U.S. child care settings,

the bulk of this care is of mediocre quality or worse. While many reasons for this market failure have been discussed in the literature (see for example Blau, 2002), probably the most convincing is the asymmetry of information between sellers and buyers; in other words, the supply side of the market possesses more complete information concerning quality than buyers. Mocan (2001) shows that in the selection of child care situations for their children, parents do not always use all the quality-related information at their disposal, and even when they do evaluate some of the appropriate factors, they often draw mistaken conclusions regarding the factors' implications for quality.

Although the literature concerning the importance of quality child care on child development is spotty, there is a consensus that disadvantaged children benefit from high quality care. Additionally, sufficient evidence has been produced to convince policy-makers that care quality, in conjunction with the "quality of parenting" affect several measures of child development outcomes. This conviction has led to interest on the part of policy makers in finding ways to improve the quality of care children receive. Federal block grants for child care include monies set aside for improving child care quality. Federal welfare dollars are also used to pay child care related expenses of welfare recipients and recent welfare-leavers. Many states also have initiatives to improve the quality of child care in their states, including policies to lower state mandated child/staff ratios, mandating education and training levels of child care providers.

Factors thought to be related to quality include group size, number of children per caregiver, caregiver qualifications, caregiver stability and continuity, and the structure of daily

activities and physical space (Hayes, Palmer, and Zaslow, 87-95).¹ Caregiver qualification, especially the level of general education has been shown to be itself related the effect of other quality factors. For example, Mulligan and Hoffman (1998) found that teachers with higher levels of education could handle larger groups of children as effectively as teachers with lower levels of education handled smaller groups of children. Education may also play a second indirect effect on child care quality through the relationship between education and turnover. Numerous studies have linked higher turnover to lower child care quality, for example, Whitebook and Bellm, 2002; Helburn, 1995; Howes and Hamilton, 1992; and Whitebook et al, 1990. High turnover is associated with reduced quality as children are forced to establish personal bonds frequently with new staff members, and new caregivers need to be trained and become acclimated to the new work environment. (Vandell and Wolfe, 2001) Since we find below that the education level of the provider is an important predictor of caregiver stability, the education of providers thus is expected to play both a direct and indirect role in the creation of quality in the production of child care.

In addition to concerns about caregiver stability as a component of quality, a number of policy makers more recently have also been concerned about simply meeting the demand for child care slots because of problems in recruitment and retention of the child care workforce. In the late 1990's, recruitment and retention seem to have taken on crisis proportions in some states that were experiencing extremely low rates of unemployment.² Tight labor markets both

¹Child care quality is measured in two ways: process quality refers to the actual interaction of child care provider and children, while structural quality refers to provider characteristics such as caregiver:child ratios and center accreditation.

²See, for example, "State Initiatives to Increase Compensation for Child Care Workers" by Twombly et al (2001).

increased the demand for child care and reduced the supply of workers willing to work in this area. Wages of child care workers are notoriously low compared to other workers with the same level of education, and turnover rates are high. Centers, not surprisingly, report having trouble filling open slots with qualified applicants, with staff replacement search times exceeding four weeks for over a third of centers. (Green Book 2000) To make matters worse, staff turnover is also associated with higher rates of center director turnover. (Whitebook and Bellm, 2002)

States have responded to the concern over high turnover rates with a variety of programs, including paid apprenticeships, subsidized training opportunities and limited wage subsidies. Yet little analysis has been done on whether these sorts of interventions are appropriate remedies for the woes of child care staffing. This paper seeks to address these questions by examining women child care workers in the United States from 1991 through 1993 and comparing these workers to other employed women using data from the Survey of Income and Program Participation (SIPP).³ The advantage of the SIPP data is that we can observe the sample of workers over time in order to study stability of employment and its flip side, turnover. Our goal is to present a demographic profile of child care workers, to analyze the wage structure of child care workers compared to other women workers, and to analyze the determinants of their job stability. To the extent that low child care worker wages reflect a market failure, our empirical results will also contribute to the debate concerning the characterization of the child care labor market as a secondary labor market (a la' segmented labor market theory). Mocan and Viola (1997) argue in favor of this characterization due to their finding of low wages, low returns to

³ In this draft we have data from two SIPP panels, 1991 and 1992. Eventually we plan to have four panels 1990-1993 merged and be able to include the information from the later months of the panel. One of the disadvantages of SIPP data is long processing lags leading to a sample that is older than one would like.

human capital and high turnover. However, Cleveland and Hyatt (2002), using Canadian data, find evidence that fails to support this characterization for the child care labor market.

The rest of the paper is as follows: Section II reviews the literature on wages and turnover of child care workers, while Section III lays out the approach used in this paper. Section IV describes the survey data used in the analysis. Sections V, VI, and VII present the results of that analysis with Section V providing simple descriptive statistics, Section VI reporting on the analysis of wages, and Section VII reporting on the analysis of job stability. We conclude the paper with a brief summary of findings and policy implications in Section VIII.

II Previous Work on the Determinant of Wages and Turnover of Child Care Workers in the United States

Existing rigorous empirical analyses of the child care market includes work by Gordon Cleveland and Douglas Hyatt (2002), David Blau (1992, 1993, 2001), H. Naci Mocan (1997, 1995), and James Walker (1992). Cleveland and Hyatt (2002) analyze Canadian data to examine the child care labor market in detail and assess the applicability of the secondary labor market label as well as the importance of non-profit status in the market for child care workers. They find relatively high turnover rates for child care workers, due in part to low wages. Using a regression model, they find similar returns to education for child care workers and other workers, rejecting the characterization of the child care labor market as a secondary labor market. Finally, they find auspice (non-profit versus profit status), union status, and part-time worker status are all important differences for child care workers versus other workers.

Blau (2001) describes the process by which centers choose the quality of care to be provided, and finds that the provision of quality is highly sensitive to child care prices. He also examines the supply of child care labor, examining the importance of child care worker wages as

well as the potential wage outside the child care labor market. In this analysis, Blau uses data from the Current Population Survey from 1977 to 1998. He relies on a multinomial logit model to model a woman's choice to work either in child care, non-child care, or to not work at all. The most important explanatory variable in this analysis is the wage rate. Blau first predicts two wages for each mother (for each of the two employed states), then includes these predicted wages in the multinomial logit model of employment state along with a set of other regressors. His results show that increases in child care worker wages would lead to increases in the number of child care workers as well as increases in the hours worked for child care workers. The total elasticity estimate is 1.14. (p.100)

Blau (1992) provides a more detailed although somewhat outdated description of child care worker wages. He draws his data from the CPS in the years 1977-1987, and finds that the provision of child care subsidies or the existence of state child care regulations have no substantive impact on child care worker wages. In fact, he finds that average real wages for child care workers (as well as non-child care workers) remained fairly flat over this time period, while subsidies have grown and state regulation has increased.

Blau (1992) also examines a topic most pertinent to this project: child care worker turnover. Comparing child care worker to other female workers, Blau finds that child care workers are much more likely to turnover (i.e., change occupation or drop out of the labor force) within one year's time. Breaking child care workers down into more specific occupations, he finds that private household workers are the most likely to turnover, while teachers are the least likely, with turnover rates equaling approximately 50% and 10% respectively. However, as explained later in this paper, the occupation codes that Blau relies on to track turnover in sub-

child care labor markets might not be trustworthy.

Finally, Blau (1992) examines the structure of wages across child care sector and compares these findings to other female workers. He estimates sector-specific child care wage equations with a multinomial selection correction for each child care provider's sector. He finds some noticeable differences between the child care sectors and the other female worker sector. For example, many regressors that normally explain at least some portion of wage levels do not significantly affect these child care sector wages. These regressors include age, race, and even education for private household workers and teachers. The only child care worker sector that exhibits significant returns to education is the nonhousehold worker sector, which displays a 5% return to education.

Mocan's (1995) analysis focuses on the production side of the child care labor market but yields information of use to us here. His empirical results show that any examination of the role of child care workers in the production of child care should stratify the workers into education subgroups (12 years or fewer, 13 to 15 years, and 16+) because while the two more highly educated subgroups are substitutes in production, these two groups are both complements to the lowest education subgroup. (p. 22) Finally, Mocan and Viola (1997) examine child care workers' wages directly with a slant towards industry structure. They report a turnover rate of 40%.

III Research Plan for the Analysis of the Determinant of Wages and Turnover of Child Care Workers

We begin our analyses of the SIPP data with a descriptive comparison between child care workers and other workers. Then, we extend the analysis to incorporate more rigorous empirical techniques to examine both wages and turnover. First, we compare the structure of wages across

the two groups of workers by estimating wage equations separately for the two groups. We are especially interested in the rate of return to education and experience in child care wages since previous studies have found a lower return of human capital for child care workers compared to other women workers.

$$\ln \text{wage} = \text{fn}(\text{selection terms; HK, personal demographics; regional wages}). \quad (1)$$

Next, we turn to an examination of worker turnover by taking a longitudinal view of each worker. We re-visit each worker one year after the first observation to determine whether the worker remains in the original sector. To examine this empirically, we begin with simply estimating a probit on the probability of remaining in the same job a year later.

$$\text{Prob}(\text{same job in year+1}) = \text{fn}(\text{wage and benefits in month 1, job tenure in month 1, self employment status in month 1, personal demographics including education level, potential work experience, disability status, marital status, nonlabor income, number of children, and availability of health insurance}). \quad (2)$$

Subsequently, we estimate a bivariate probit model that models simultaneously being employed and working at the same job given that one is employed.

$$5) \text{ Prob}(\text{same job in year+1} | \text{employed in year+1}) = \text{fn}(\text{wage and benefits in month 1, job tenure in month 1, self employment status in month 1, personal demographics including education level, potential work experience, disability status, marital status, nonlabor income number of children, and availability of health insurance}). \quad (3)$$

IV Description of Data Used

The data used in our analyses come from the 1991, 1992, and 1993 panels of Survey of Income and Program Participation (SIPP). Since job tenure is an important variable in our analysis, we choose our sample slightly differently among the three panels. In the 1991 Panel,

the employment history topical module was asked in conjunction with the second wave of interviews. This employment history topical module includes questions on when the respondent began her current job. Thus we begin with wave 2 (month 5) of the 1991 as our base month (February.-May 1991). Employment status, which determines eligibility for the sample, is based on employment that month. Wages, occupation, health insurance status are all drawn from the information of month 5 in the 1991 Panel. The status one year later is then calculated by comparing the job and occupation in month 5 with the job and occupation in month 18. In both the 1992 and 1993 Panel, similar employment history questions were asked in conjunction with wave one. Thus, our base month is month one of the 1992 Panel, October 1991 to January 1992, and month one of the 1993 Panel, October 1992 to January 1993. For both the 1992 and 1993 panels one year later refers to month 13 in the longitudinal data file.

The sample definition was women aged 18 or older who were employed in the base month of the panel. Child care workers were identified by workers with one of three occupation codes, 155, 406, or 468. 155 is characterized as preschool teacher while 406 and 468 are child care workers. However, previous work with these categories has convinced us that the distinction among these codes is somewhat arbitrary so we use them as a single category. (See Connelly (1991) for an examination of the reliability of these occupation codes.) Because we control for education level, our analysis will account for the fact that preschool teachers typically are more highly educated.

V A Statistical Portrait of Child Care Workers in the United States

There is no single source of comprehensive data regarding the broad child care workforce, so descriptive evidence must be cobbled together from a variety of sources. The 2000

Green Book engages in just this patching together of data to develop numbers for total providers of different types of care. Considering these numbers gives one an idea of the magnitude of the market and the scope of the quality problem. From the *Green Book* evidence, it is clear that the child care labor market is extremely large. For example, for regulated family child care homes (which includes family day care homes plus large group child care homes), it reports from a study produced by the Children's Foundation, 290,667 family day care homes, with an informed guess that there are an even larger number of unregulated family day care homes. Still, Blau (2002) estimates that child care workers comprise only about 1% of the total female labor force. However, due to the linkages between their working conditions and child care quality, the vast majority of workers in today's workforce have a vested interest in solving the child care quality problem.

Table 1 compares our sample of child care workers (n=452) with non child care workers and also with elementary school teachers. Elementary school teachers are offered as comparison both as a group engaged in similar work and because many policy discussions about child care workers worry about newly trained child care workers switching to become elementary school teachers. Child care workers have slightly more education and slightly lower years of potential experience (measured as age - education - 5) than non-child care workers however child care workers have significantly less education on average than elementary school teachers. The number of years on the current job is lower for child care workers: 4.4 years compared to 6.0 years for non child care workers, and 10 years for elementary school teachers. As has been found in other studies (see, for example, The National Child Care Staffing Study) child care workers wages are substantially below average, with child care workers earning just over half of the

wages of elementary school teachers. Monthly nonlabor income, which includes the earnings of other family members, is higher for child care workers than non child care workers but highest for elementary school teachers. Perhaps this is a function the higher percent of child care workers and elementary school teachers who were married with husband present. For some married women, higher earnings of the husband “allows” them to take lower paid child care jobs over other employment. Of course, many child care workers lack high earning husbands to support their occupational choice. Also, note that many fewer child care workers have employer-provided health insurance. Again, the lack of health insurance may be remedied by health insurance provided by one’s husband’s employment but this option, like the higher family income, is not available to all child care workers.

A number of studies have tried to measure turnover in child care. Previous studies have been confined to looking at turnover at child care centers. See Bellm (1998) for data on turnover rates in child care centers from 1988-1997 from the National Child Care Staffing survey. Table 1 compares a set of turnover measures among the three groups of workers using our SIPP data. We can define turnover as being in the same job or being in the same occupation or still being in the labor force. For the child’s point of view, stability of caregiver requires being in the same job a year later.⁴ However, state programs that emphasize occupational training may be more concerned with occupational retention. The findings of Table 1 in terms of these variables are that turnover rates do not differ substantially between child care workers and non child care

⁴ It is interesting to note that centers often schedule changes in the caregiver of the child even without turnover. A child may “graduate” to a new room either on a calendar year basis or based on developmental signals. Presumably unscheduled turnover is more of the problem for the child than scheduled turnover. Turnover in family providers is also a problem for parents when turnover means a breakdown of child care arrangements. Again the unscheduled kind of turnover is the most costly from the parents perspective.

workers though the turnover rate for elementary school teachers is substantially lower. Seventy percent of child care workers, and 73% of non child care workers are in the same job one year later while 86% of elementary school teachers are at the same job one year later. Sixty-four percent of child care workers are still child care workers one year later. The lower rate for occupation retention compared to job retention may stem in part from data collection issues. Occupation can change conceptually even if a worker has not changed jobs if, for example, an assistant teacher is promoted to head teacher. But occupations can also change because the same job is coded a different occupation depending on the characteristics of the job emphasized by the respondent and the survey response enumerator. For example, some days this paper's authors are economists and other days we are college teachers and still other days we are administrators. We could loosen the definition of being in the same occupation for child care workers to allow any of the three codes but then our criteria for child care workers is looser than other occupations.

Since education levels is an important parameter in both the provision of child care quality and the wage gap between child care and non child care workers, we present further detail on the level of the education within the two samples in Table 2. (The comparison with elementary school teachers is not shown since almost all the elementary school teachers were college graduates.) We can see that 35% of the child care workers have 16 or more years of education but 40% have only 12 years of education or less. The average wage of child care workers with 12 years of education or less is only about \$5.42 an hour. Those child care workers with some college (we cannot tell if they have a two year degree and/or if they have specific training in child development) earn about a dollar an hour more than those with just a high

school diploma, but those with a four year college degree or more earn substantially more than other child care workers. However, in each education category, child care workers earn substantially less than non child care workers. Recall from Table 1 that the average wage of elementary school teachers was \$13.92 which is quite similar to the average wage of all non child care workers college graduates. Thus, college educated child care workers earn substantially less than elementary school teachers even with the same amount and similar type of education.

VI Determinants of Child Care Worker Wages

Costs associated with child care workers comprise over 70% of total center costs, and an even higher percentage of costs in regulated family day care homes. Because of this high labor cost share of total production costs, adjusting child care worker wages in an effort to increase child care quality would be quite costly, implying that one should rely on clear evidence that these wage stimuli will have the desired effect. Some literature does make this precise claim. For example, Scarr et al (1994—via Vandell and Wolfe) report that the wages of child care teachers were the single best predictor of process quality. As our discussion makes clear later in the paper, there is some reason to dispute this finding. If research were to show that other, less costly margins produce the desired boost to quality, then the solution to the child care quality problem might actually be less costly than policy-makers believe. Even if the better solutions are not less costly, still the public's dollars would be devoted to those policies with the greatest chance of achieving the desired outcome. Additionally, if better solutions have a more direct impact on parents' willingness to pay for care, then some of the cost can be passed on to them.

What is the evidence concerning average child care worker wages? The 2000 Green Book (from Whitebook et al 1998) shows that there is variability in child care worker wages

based on teacher “rank.” For example, the lowest-ranked child care assistant was paid \$6.00 an hour on average, while the highest-ranked teachers were paid on average \$9.53 an hour. Perhaps more interesting is the rate of growth of these average wages over time. The lowest-paid assistant’s wage grew only 1.5 percent in real terms during the 1990s, while the most-skilled teachers’ wages grew by 5.0 percent in real terms during the same time period.

Table 3 compares the determinants of wages for child care workers and other workers using levels of educations with high school graduate or less as the omitted category. These are the same categories Mocan (1995) used. Initially, we estimated this model with continuous years of education and found that the rate of return to education was positive and significant for both child care workers and non-child care workers. However, the nature of the child care occupation is such that having a college degree is a prerequisite for certain jobs within the profession. Additionally, given the difference in wages of those child care workers with some college and those with a college degree, and the much smaller difference in wages of child care workers with some college and those with just a high school diploma, we have selected the specification of education categories presented in Table 3. The results in Table 3 indicate that child care workers and non-child care workers receive similar rates of return for some college and for a four year degree, and the return to graduating from college is substantially more than simply attending some college. These results seem at odds with Mocan’s (1995) finding discussed above that workers with some college and those with a college degree are substitutes. Our results seem to indicate that the group with at least four years of school is quite different in terms of compensation from the other two educational categories.

In terms of the return to work experience we also that the rates of return between child

care workers and non child care workers are similar. This result differs from that of Blau (1992), Hartmann and Pearce (1989), and Walker (1992) who each found no significant rate of return to work experience for child care workers. We also have the information to include length of time at one's current job in the wage equation. Including this variable does not change any of the qualitative results presented in Table 3. The rate of return to potential years of work experience is reduced somewhat for child care workers but is still significant. Length of time at current job is significant for both groups, with about a 3% increase in wages for every year at the current job for child care workers and about a 2% increase for other workers. Thus, we must conclude from Table 3 and subsequent analyses that the shape of the age/education profile of child care work and non-child care work is similar but the entire schedule of wages is shifted down for child care workers.

Note also the implication of this finding for the characterization of the child care labor market as a secondary labor market. According to segmented labor market theory, the labor market is divided into a primary sector (with relatively high wages, high returns to education, and low turnover rates) and a secondary sector (with the opposite features). Mocan and Viola (1997) results support this dual labor market theory, while ours reject it for college educated child care workers. Workers with less than four years of college may well be characterized as in the secondary sector. Cleveland and Hyatt (2002) rejected this characterization as well.

VII Determinants of Job Stability

The low wages that child care workers face relative to other female workers with the same levels of education and experience are thought to be a contributing factor to the high

turnover rates faced by child care centers. As we argued above, turnover is particularly a concern in child care because of its potential harmful effects on children. It is also of concern when unemployment rates are low, since economic expansion requires pulling nonworkers into the labor force. Since many of the potential labor market entrants are women, more child care slots are needed in a tight labor market, yet fewer will be available if child care workers cannot be found.

Table 4 column 1 considers the determinants of being at the same job one year later. Row 1 shows that child care workers are no less likely to be at the same job one year later than other workers controlling for wages and other characteristics.⁵ Most of the other variables, with the exception of the self employment dummy and the number of young children, are significant predictors of staying at the same job. There is no significant difference across the panels in the probability of being at the same job one year later.

As has been found in many other studies of turnover, higher wages are significantly related to staying at the same job. (Blau and Kahn, 1981, Donohue, 1988) Having controlled for wages, workers with high levels of education, older workers, and workers who have been at their current job longer when first observed are more likely to be on the job a year later. Having health insurance from one's job is positively related to staying at the same job but so is having a spouse with health insurance so it is possible that health insurance is serving as a proxy for other workplace attributes. Being married is also positively related to being at the same job one year later while controlling for marriage, having higher nonlabor income (which includes husband's

⁵ In a similar analysis where the dependent variable was being at the same job two years later, child care workers are significantly more likely to be on the job two years later, 6% more likely when evaluated at the mean.

earnings) reduces the chances of being at the same job. Being disabled is negatively correlated with staying at the same job.

The number of young children a woman has is not related to turnover but having had a baby during the year significantly reduces the probability of being at the same job after one year. On the other hand, more older children increases the likelihood of staying at one's job. This result may reflect the extra income needed by families with more children so that once one finds a job that works with the school day schedule, one is less likely to change jobs.

Being at the same job one year later requires that one has elected to stay in the labor force one year later and that given being in the labor force, one has elected to stay at the same job. It also requires that one's employer is still in business and still supports the job match. Some of the effects observed in Column 1 may be related to the choice to be employed rather than the choice to stay with the same employer given that one is still employed. Column 2 estimates the probability of being employed one year later. Again, child care workers are no less likely to still be employed compared with non child care workers. Column 3 presents the results for the probability of being at the same job one year later given that one is still employed one year later. These conditional marginal effects come from the bivariate probit model discussed above which accounts for the correlation between being at the same job and still being employed (because we can only observe the decision to stay with the same job if one is still employed one year later).

Comparing Columns 2 and 3 with Column 1, we find that having higher levels of education make one more likely to be employed one year later, but given that one is employed, having four years of college decreases the probability that one is still at the same job. Work experience does not affect the probability of being employed but it does positively affect the

probability of being at the same job given that one is employed. Higher wages and longer job tenure increase both the probability of being employed and the probability of being at the same job given that one is employed. Most of the effect of disability, nonlabor income, number of older children and having had a baby comes from the probability of being employed while the effect of being married, having health insurance provided by one's job at the time of the first observation, and having a spouse who has health insurance at the time of the first observation is split fairly evenly between the two probabilities.

The results of Column 1 from Table 4 can be used to calculate predicted probabilities of being at the same job one year later. We use Column 1 because from the child's or the parents' perspective, the cost of turnover is the same whatever the reason for leaving. Table 5 shows the mean value of the predicted probabilities for various groups within our sample. Comparing Columns 1 and 2 we find that while the average predicted probability for other workers and child care workers who are college graduates is essentially the same (77.3% compared with 77.2%), the average probability of non-college graduate child care workers is lower than non-college graduate other workers. In part, this reflects the lower wages of the non-college graduate child care workers. Column 3 simulates the predicted probability for child care workers if they received the mean wage in their education category instead of their child care wage. This is the equivalent of simulating a wage subsidy for all child care workers. The average probability of being at the same job goes up but only a little. It is still less than the average probability of non-college graduate other workers.

Note that the average probability for college graduates is more than 10 percentage points above the probability for non college graduates. These findings indicate that if one's goal is to

reduce turnover of child care workers, increasing the percent of that labor force that is college-educated would be substantially more effective than increasing wages across the board for child care workers. Given other findings on the value of caregiver education on the quality of care in the classroom (see Whitebook, Burton, Montgomery Kikido and Chambers, 1996 and Center for Career Development 1993 as cited in Bellm 1998 and Blau (2001), a strong case for standards that increase the level of education of caregivers can be made.⁶ Since we have found that college-educated caregivers do get paid more than caregivers with lower levels of education, increasing teacher qualifications will increase cost. Parents may be willing to pay the higher costs, public funds may be allocated to pay these extra costs or parents may be willing to trade off group size for education level, something that no current state regulation permits.

VIII Summary and Policy Implications

The SIPP data, like many of the other data sources that have been used to study child care worker wages, find that child care workers do indeed earn wages substantially less than other women workers with similar levels of education and experience. Previous research had found a lack of return to education and experience for child care workers. Our analysis finds that the rate of return for child care workers' education is similar to that of non child care women workers. The rate of return to experience and job tenure is also positive and significant for child care workers. However, the entire schedule of wages is significantly lower for child care workers than non child care workers.

⁶ Blau (1999) finds that "assistant teachers do not actually do very much." (p.814) by which he means they do not add much to the production function of quality in child care. Similarly, Mocan and Viola (1997) write, "In other words, it is a better strategy for the center to have a small group size and one teacher rather than a large group size coupled with a teacher and an aide. Given the implied lack of marginal productivity of aides presented by the studies cited above, it is not surprising that aide education is not rewarded by centers." (p. 24) This is further evidence to support the increased use of college educated teachers in the production of quality child care.

The turnover rate among child care workers in our sample (measured as reporting a job change one year later) is 30%, which is comparable to the rates calculated from other sources. (The National Child Care Staffing Study reported a 26% turnover rate in 1991.⁷) Interestingly, we find that the turnover rate for women who are not child care workers is also 27%. In our multivariate analysis, child care work is not found to be a significant predictor of job leaving. From this we must fundamentally revise the way we think about the problem of turnover in child care. Child care workers are no more likely to turnover than other workers with the same level of education but turnover is thought to have more serious consequences in the childcare quality production process than for other employment situations.

Simulations showed that increasing the level of education of child care workers (and paying them accordingly) is much more effective at lowering turnover than simply increasing wages of all child care workers to match the mean level of wages for that level of education. The policy implications of these findings are that states may want to rethink investing in child care training that does not require a college degree. For a child care worker to increase her compensation substantially she must have a college degree. At the same time the most effective way to reduce turnover is to increase the percent of the workforce with a college degree. Increasing the general level of education would thus increase quality directly and indirect through the reduction in turnover.

Finally, in light of these findings and in conjunction with Mulligan and Hoffman's findings about the relationship among quality, group size and education and Mocan and Viola (1997)'s findings on the small effect of classroom aides in the production of quality, states may

⁷ Page 19.

want to provide some flexibility in their mandated child staff ratios by linking these ratios to the education level of providers. A mandated child staff ratio that allowed caregivers with four years of college to be responsible for more children than caregivers with fewer than four years of college could do much to encourage the professionalization of child care providers at the same time that turnover was reduced. The net effect on quality would depend on the gain from reduced turnover and increased education of the caregiver compared to the loss from the larger group size.

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Table 1: Descriptive Statistics of the Non Child Care Workers, Child Care Workers and Elementary School Sample of Employed Women, 1991, 1992, and 1993 SIPP Panels

Sample Means:	Non child care workers	Child care workers	Elementary School teachers
Years of Education	13.36 (2.80)	13.68 (3.15)	16.76 (1.75)
Years of Experience	20.06 (12.81)	19.16 (13.55)	18.93 (9.96)
Years at Current Job	5.99 (6.97)	4.42 (6.61)	10.00 (8.62)
Self employed wage	13.22 (28.47)	9.77 (10.45)	NA
Non SE Wage in month 1	9.94 (6.95)	7.13 (5.23)	13.93 (11.34)
Wage in month 1	10.71 (17.77)	7.28 (5.51)	13.93 (11.34)
Monthly Nonlabor income	2236.20 (2397.52)	2484.26 (2199.42)	2969.31 (2893.80)
Number of Kids 0-2	0.11 (0.35)	0.11 (0.37)	0.10 (0.32)
Number of Kids 3-5	0.12 (0.36)	0.16 (0.43)	0.10 (0.32)
Number of Kids 6-12	0.30 (0.64)	0.50 (0.83)	0.40 (0.71)
Number of Kids 13-18	0.24 (0.56)	0.26 (0.57)	0.33 (0.62)
Age of Youngest Child	3.33 (5.26)	3.85 (5.08)	4.36 (5.64)
Sample Percents:			
Self employed	7.34%	2.65%	NA
Disabled	10.17%	11.28%	5.83%
Nonwhite	14.92%	14.16%	12.62%
Have Employer Provided Health Insurance	58.32%	34.73%	71.84%
Married	58.22%	62.61%	71.00%
% married whose husband has Health Insurance	69.71%	78.09%	70.60%
Same Job after 1 year	72.77%	69.69%	86.04%
Same Job after 2 years	59.60%	59.07%	79.24%
Same occupation 1 year	66.46%	63.94%	81.92%
Same occupation 2 years	52.20%	51.77%	73.91%
Still in the LF after 1 year	83.08%	81.86%	91.38%
Number in Sample	27250	452	824

Note: Standard Deviations in parentheses. Sample drawn from the longitudinal file of 1991 Panel month 5, 1992 Panel month 1, and 1993 Panel month 1 women aged 18 or older who were employed.

Table 2: More Descriptive Statistics of the Child Care Workers and Non Child Care Worker Sample of Employed Women, 1991, 1992, and 1993 SIPP Panels

	Non Child Care Worker	Child Care Workers
Education:		
HS Grad or Less	47.20%	40.49%
Some College	26.96%	24.12%
College Grad	25.84%	35.40%
Avg. Wage of HS Grad or Less	\$8.40 (22.40)	\$5.42 (3.80)
Avg. Wage of Some College	\$9.64 (6.97)	\$6.41 (6.31)
Avg. Wage of College Grad	\$14.20 (15.19)	\$10.00 (5.54)

Note: Standard Deviations in parentheses. Sample drawn from the longitudinal file of 1991 Panel month 5, 1992 Panel month 1, and 1993 Panel month 1, women aged 18 or older who were employed.

Table 3: Predicted Marginal Effects of Determinants of Ln Wage

	Non Child Care Worker	Child Care Workers
Some College	.207 (.009)***	.239 (.084)***
College Grad	.564 (.009)***	.695 (.076)***
Years of Experience	.040 (.001)***	.034 (.008)***
Exp Squared	-.0007 (.0002)***	-.0006 *** (.0002)
Disabled	-.167 (.012)***	-.394 (.100)***
Non labor	.014 (.002)***	.003 (.015)
NonWhite	-.017 (.010)	.110 (.092)
Self-employed	-.351 (.014)***	-.409 * (.196)
Number of Kids	-.038 (.004)	-.029 (.030)
Married	.028 (.009)***	.043 (.078)
Panel 92	-.030*** (.009)	-.050 (.078)
93	.037 (.009)***	-.080 (.079)
Constant	1.514 (.013)	1.168*** (.105)
N	27250	452
R ²	18.69	24.39

Note: Model estimated OLS. *** indicates P value < .005, ** indicates P value < .01, * indicates P value < .05

Table 4: Marginal Effects of Determinants of Being at the Same Job One Year Later and Being Employed One Year Later

	Same Job 1yr later	Employed 1yr later	Job 1yr/ Employed 1yr=1
CC Worker	0.010 (0.021)	0.004 (0.017)	0.005 (0.014)
Some College	0.020 (0.007)**	0.028 (0.005)**	-1.007 (0.005)
College Grad	0.038 (0.007)**	0.055 (0.006)**	-0.013 (0.005)**
Work Experience	0.002 (0.000)**	0.000 (0.000)	0.002 (0.000)**
Wage in Month1	0.003 (0.000)**	0.001 (0.000)**	0.001 (0.000)**
Job Tenure	0.008 (0.000)**	0.003 (0.000)**	0.008 (0.000)**
Disabled	-0.087 (0.011)**	-0.070 (0.009)**	-0.018 (0.006)**
Non Labor Income (in Thousands # per month)	-0.003 (0.001)*	-0.003 (0.001)**	0.001 (0.001)
Nonwhite	-0.038 (0.009)**	-0.048 (0.007)**	0.005 (0.005)
Married	0.049 (0.009)**	0.021 (0.007)**	0.024 (0.006)**
Own Health Insurance in Month 1	0.145 (0.007)**	0.075 (0.005)**	0.068 (0.004)**
Spouse Health Insurance in Month 1	0.050 (0.010)**	0.033 (0.008)**	0.017 (0.006)**
Self Employed	0.025 (0.013)	0.014 (0.011)	0.006 (0.007)
Num. of Children aged 0-2	0.003 (0.008)	-0.007 (0.006)	0.006 (0.005)
Num. of Children aged 3-5	0.004 (0.008)	-0.007 (0.006)	0.007 (0.005)
Num. of Children aged 6-12	0.033 (0.004)**	0.023 (0.004)**	0.009 (0.003)**
Num. of Children aged 13-18	0.050 (0.005)**	0.046 (0.005)**	0.004 (0.004)
Had a newborn during the year	-0.403	-0.454	0.052

	(0.011)**	(0.015)**	(0.015)**
92 panel	0.001 (0.009)	-0.007 (0.008)	0.005 (0.005)
93 panel	-0.001 (0.009)	-0.011 (0.008)	0.009 (0.005)
Observations	26817	26817	22384

Standard errors in parentheses

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

Note: Columns 1 and 2 estimated from probit model, evaluated at the means except for dichotomous variables. Column 3 estimated from a bivariate probit model with selection.

Table 5: Mean Predicted Probabilities

Mean of the Predicted Probabilities of Being at the Same Job One Year Later

	Non Child Care Workers	Child Care Workers	Child Care Workers if they received mean wage in their education category
Total	72.99%	69.76%	70.71%
By Education Level:			
HS Grad or Less	71.16%	65.92%	66.75%
Some College	71.97%	64.81%	65.74%
College Grad or More	77.31%	77.20%	78.30%

Note: All probabilities were estimated from probit model reported in Column 1 of Table 4