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# DEPARTMENT OF ECONOMICS

## Working Paper

**By What Measure? Family Time Devoted to  
Children in the U.S.**

Nancy Folbre, Jayoung Yoon, Kade Finnoff and  
Allison Sidle Fuligni

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# **By What Measure? Family Time Devoted to Children in the U.S.\***

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## **Abstract**

We argue that previous research on time devoted to child care has devoted insufficient attention to the definition and conceptualization of care time. Three separate problems are evident. First, the conventional focus on explicit *activities* with children distracts attention from the larger responsibilities of “passive” care, which ranges from time when children are sleeping to time when they are in the same room but not engaged in an activity with parents. Second, empirical analysis of activity time focuses almost exclusively on parents, overlooking the role of relatives such as grandmothers and siblings. Third, measurement of active care time typically ignores the impact of overlaps among both care providers and recipients. Our analysis of the Child Development Supplement of the Panel Study of Income Dynamics sheds light on these three problems and develops new measures of passive and active care time. Statistical analysis shows that new measures have important implications for the amount of parental care that children in single-parent and two-parent households receive.

## **By What Measure?**

### **Family Time Devoted to Children in the U.S.**

In intellectual exchange, as in properly economic transactions, numbers are the medium through which dissimilar desires, needs, and expectations are somehow made commensurable.<sup>1</sup>

Theodore Porter, *Trust in Numbers*

How much family time is devoted to the care of children in the U.S.? An accurate answer to this question could help quantify the adult effort devoted to the production of the next generation. It could also help explain why children living with single parents seem disadvantaged relative to their counterparts in two-parent households (McLanahan and Sandefur 1994). Large-scale diary-based surveys are providing more and more numbers about time use. But the validity of these numbers rests on typologies and taxonomies of care that deserve closer attention than they have yet received (Bailey 1994).

Most time diary surveys ask adults about their participation in *activities* with children, overlooking the demands of supervisory time, or “passive care.” Survey designs typically focus on parents or family members living in the same household, rather than the total amount of unpaid care provided by family members (including those living in different households). Measures of active care ignore the issue of overlap, treating an hour of adult care time the same whether it is accompanied by other adults or devoted to one or more children.

In this paper, we utilize the unique features of a child-based survey, the 1997 Child

Development Supplement of the Panel Survey of Income Dynamics (PSID-CDS), to explain these shortcomings and develop better measures of family care time devoted to children in the U.S. in 1997. We begin with a discussion of how childcare has been conceptualized that includes a review of recent research on time-diary data from nationally representative samples of the U.S. population. We offer a descriptive analysis of children's time use based on the PSID-CDS, developing a new typology of passive and active care time. We show how the data on active care time can be corrected for overlaps, and also develop an overall measure of "care density" that is relevant to considerations of the quantity, quality and cost of family time devoted to children. We use multivariate analysis to illustrate the impact of alternative definitions on estimated differences in active family care time between children in one and two-parent families.

#### **CONCEPTUALIZING CHILD CARE TIME**

The gold standard of time use data is the diary method, which asks respondents to record activities undertaken within the last 24 hours. This method generally gives more accurate results than responses to stylized questions such as "how much time did you devote to this activity in the last week?" The time diary approach was developed by Alexander Szalai in the 1960s, and utilized in a variety of national surveys (Szalai et al. 1973). Large scale time diary data has been collected in the United States by researchers at the University of Michigan, including Thomas Juster and Frank Stafford (1985) and by John Robinson and Geoffrey Godbey (1997). Special attention has recently focused on parental time spent in activities with children (Bianchi 2000; Bianchi and Robinson 1997). The Child Development Supplement of the Panel Study of Income Dynamics (PSID-CDS), administered in 1997, offers a vantage point based on experience of children, rather than parents (Hofferth 2001; Sandberg and Hofferth 2001). Despite the

proliferation of time-diary data, however, researchers have failed to clearly define or categorize “child care.”

### **Active and Passive Care**

The basic activity categories of time use surveys include paid work, housework (including child care), travel, personal care, and sleep. The purpose of the activity is considered less important than the activity itself. In terms of child care, this means that time that involves an *activity* with children is counted. But where care of young children, in particular, is concerned, “out of sight” is not necessarily “out of mind” (Leslie, L. A., E. A. Anderson, and M. P. Branson 1991). Responsibility for caring for a child often transcends particular activities, imposing constraints on adult schedules. Leaving a child under the age of nine without adult supervision, even when that child is fast asleep, can legally be construed as neglect.<sup>2</sup>

Time-use diaries can accommodate multi-tasking by allowing respondents to designate both a primary and a secondary activity. When secondary activities are included, time devoted to childcare increases dramatically. But secondary time remains “activity-based.” Furthermore, reporting of secondary activity time devoted to children varies considerably across surveys, depending on the way activities are defined (Budig and Folbre 2004). The Australian Bureau of Statistics specifies a category called “Minding Children,” defined as “caring for children without the active involvement shown in the codes above. Includes monitoring children playing outside or sleeping, preserving a safe environment, being an adult presence for children to turn to in need, supervising games or swimming activities including swimming lessons. Passive child care” (ABS 1997:37). The wording of this category seems to exclude the possibility that children require “passive care” when they are asleep, although this is obviously the case.

Similarly, the PSID-CDS asks, in addition to “Who was doing the activity with the child?” “Who (else) was there but not directly involved in the activity?” but excludes children’s sleep and personal care time from consideration. The exclusion of such categories leads to inevitable understatement of constraints on parental time.

Acknowledging this problem, many recent surveys have moved away from activity-based measures. Statistics Canada administers a national time use survey that omits consideration of secondary activities but includes stylized questions regarding care time. In its recently inaugurated American Time Use Survey, the U.S. Bureau of Labor Statistics asks each respondent to estimate how many hours during the survey day children were “in their care.” (Schwartz 2002). Yet even this approach restricts respondents to time periods in which the adult and at least one child were awake.

### **Providers of Active Care**

Not surprisingly, most studies of time devoted to activities with children focus on parents. Although it is generally recognized that grandparents and other adult relatives often help out with child care, and that older children may help supervise younger ones, it is difficult to capture these. Even if all adults living in a household are surveyed, those living outside the household (including non-custodial parents) are excluded. Only a child-centric time-diary survey can account for care provided by extra-household family and friends as well as paid care providers.

### **Overlapping Providers and Recipients**

Most adult-based time-use surveys conducted to date ignore the issue of overlaps. It is seldom possible to ascertain whether the time an adult spends with a child coincides with time spent by another adult, or whether more than one child is being cared for at a time.<sup>3</sup> As a result, it



typically remains unclear whether a reported average of 12 hours a week for mothers and 4 hours a week for fathers accounts for a total of 12 hours in which the child was in parental care (complete overlap) or a total of 16 hours (zero overlap). Nor is it typically possible to determine whether a mother who provided 12 hours of care a week was caring for one child or for three.

Children probably benefit from the additional time and attention they receive when two or more adults are participating in an activity with them, from the lower stress level on adult caregivers, and also from the opportunity to watch adults interact with one another.

Fuligni and Brooks-Gunn (2004) describe several aspects of parental overlap and sequential caregiving for young children in the PSID-CDS. Adult time overlaps are relevant to efforts to assign a value to unpaid family care. It is often easier and more enjoyable to provide care when the adult/child ratio is high. Studies of adult time-use allocation show that spouses prefer to spend time outside of paid employment together, but that the presence of young children often leads them to economize by taking turns providing care (Hamermesh 2002, 2000). Parents who work split shifts in order to reduce their child care costs are sacrificing overlap time with one another partly to reduce paid care costs (Kiser 2002; Presser 1994).

The implications of child overlaps are more difficult to interpret. On the one hand, the presence of an older child, especially one who is able to assist adults to some extent with a younger child, can increase quality of care and also reduce demands on the adult. The presence of an additional child also provides opportunities for supervised interaction with peers that are likely to have positive effects. On the other hand, the participation of a younger child increases competition for adult attention and therefore dilutes the quality of adult care the child receives. Caring for more than one child at a time is often more demanding and stressful for an adult than

one-on-one activities. But it is obviously cheaper in terms of opportunity cost (earnings or income foregone as a result of adult time devoted to child care).

Overlaps can be described as an aspect of the density of care, defined as the ratio of adults to young children participating in an activity. Density is increased by adult overlaps and decreased by child overlaps. In general, high density reduces the intensity of demands on adults, shifting their care activities more in the direction of shared interaction, perhaps even leisure. But high density is costly, because it implies higher quantities of adult time per child. The growth of paid child care services reduces the density of care, since ratios of adults to children are typically lower in public settings than in the home. As regulatory limits on adult/child ratios for paid child care providers suggest, the relationship between density and quality of care is almost certainly non-linear. Within a certain range, declines in density may actually improve quality, as children have more opportunities to interact with one another.

Still, measuring density of care a per hour (or per activity) basis provides a better indicator of quality than aggregate calculations of per capita child care time that simply add up the total amount of parental time and divide by the number of children, a common practice in the time-use literature (Bryant and Zick 1996a: 373, 386). A density measure can also be specified in nonlinear form, reflecting assumptions about potential economies of scale with multiple children (see later discussion).

### **Parental Child Care Time in the U.S.**

A closer look at the estimates of parental time provided in recent U.S. studies provides further illustration of these measurement problems and greater inspiration to solve them. We confine our attention here to results reported for two sets of time-diary surveys administered to national

samples.<sup>4</sup> The first set includes surveys designed by John Robinson in the years 1965, 1975, 1985 and a small but comparable survey conducted in collaboration with Suzanne Bianchi at the University of Maryland in 1998-1999 (Bianchi 2000; Robinson and Godbey 1997). The second consists of a small survey administered to children ages 3-12 by the University of Michigan in 1981, which Sandberg and Hofferth (2001) treat as comparable to the PSID-CDS administered in 1997.

Studies of trends in parental child care time based on these surveys have appeared in major journals and have received considerable publicity in the popular press.<sup>5</sup> Most striking is the evidence that maternal time in activities with children 18 or younger has increased despite a notable increase in maternal labor force participation over the period. Bianchi reports that mothers engaged in primary activities with their children for 12 hours and two minutes per week in 1998, compared to 10 hours and five minutes per week to primary child care in 1965, a statistically significant increase. Time devoted to secondary activities with children also increased significantly, from 15 hours and four minutes per week to 19 hours and six minutes. The broadest measure, maternal time spent with children, increased only slightly, from 37 hours and one minute per week to 38 hours and five minutes (Bianchi 2000:405; Sayer et al. 2002). Clearly, choice of the appropriate definition of “child care” affects interpretation of trends over time. Further, an increase in maternal time could be a response to a decrease in care time provided by grandmothers, sisters, or older siblings.

Child-centered survey results from the 1981 University of Michigan study and the PSID-CDS in 1997 also suggest that maternal time with children increased over this time period (Sandberg and Hofferth 2001). These comparisons, however, exclude children under the age of

three. Furthermore, Sandberg and Hofferth use a definition of parental child care time for 1997 that is not perfectly consistent with that used in 1981.<sup>6</sup> Neither Bianchi nor Sandberg and Hofferth explore overlaps in much detail.

### **A NEW TYPOLOGY OF CARE TIME**

The Panel Study of Income Dynamics is a longitudinal survey of a representative sample of U.S. men, women, and children, and the families in which they live. In 1997, the Child Development Supplement collected information on one or two randomly selected zero- to 12-year-old children of PSID respondents, both from the primary caregiver and from the children themselves. About 3,563 children were included; 2,904 completed at least one diary, yielding a response rate of 81.5%. The survey instrument asked parents, teachers, (and children themselves, where appropriate) to designate the activity children were engaged in during two 24-hour time periods, one a weekday, the other a weekend (“What did your child do?”). For each activity, 10 categories of people (e.g. mother, sibling, friend) could be listed as participating or engaged with the child in that activity (“Who was doing the activity with child?”), and one or more members of those categories could also be listed as “available” (“Who else was there but not directly involved in the activity?”) (See Appendix A for details).

### **The Care Continuum**

These data provide a unique opportunity to explore and develop new typologies of passive and active care time. We define passive child care, from the child’s point of view, as time in which no adult is directly participating in an activity with the child but at least one adult is playing a supervisory role. We define active child care as time in which at least one adult is directly participating in an activity with a child. We distinguish among three different types of passive

child care, which can be placed on a continuum that reflects the intensity of demands on adults providing care. Time excluded from consideration in the PSID-CD because a child is sleeping or engaging in personal care is least intensive. Next comes time young children spend alone or with another child (during which an adult must be “on call”). The third category of passive care is time in which an adult is listed as available, but no adult is participating in an activity with a child.<sup>7</sup>

Table 1 provides an overview of average weekly passive and active care time in absolute and percentage terms for all children in our sample. Figure 1 illustrates this breakdown by four age groups. Time in which children are sleeping or engaging in personal care amounts to almost half of all the time in a child’s week, more than half for children two or under. Exclusion of this category of passive care from consideration can create a misleading picture of the economic constraints on families, leading to the erroneous conclusion that infants require less time than older children simply because they are less likely to be awake at any given time.

As one might expect, children spend relatively little waking time without an adult available, on average about 5% of their time. Time in which an adult is available, but no adult is participating in an activity with a child is also relatively small, about 13% of children’s time, on average. The percentage is small primarily because time in which an adult is available is almost always time in which another adult is participating in an activity with the child. Available time in the PSID-CDS is a useful indicator of the degree of social support or “backup” available to someone participating in a care activity. However, it represents only a small proportion of the total passive care that a child receives. Table 1 also shows that active and passive care are provided in about the same proportions in both two-parent and single-parent families, suggesting

that single-parent families may draw on other family members or friends to help provide care.

### **Active Family Care Time and Adult Responsibility**

Children participate in activities with one or more adults for 59 hours per week or 35 % of their time (see Table 1). Participation time goes up as children reach the middle age groups primarily because they are sleeping less. It goes down for the 9-12 age group because they spend slightly more time alone, or with another child (see Figure 1).

In order to analyze the different categories of persons simultaneously participating in activities with children, we abstract from overlaps and assign time to the person who is likely to bear greatest responsibility. For instance, if a child participates in an activity with a parent and a non-parent at the same time, we assign that time to the parent, on the presumption that the parent has greater responsibility. In other words, time counted as participating with a relative other than a parent is time in which no parent is participating. Similarly, if a child participates in an activity with a relative and a non-relative, we assign that time to the relative.

Table 2 portrays the average time children spend participating in activities with others according to this hierarchy, and Figure 2 illustrates this breakdown across age groups. Of the average amount of time in which a child is participating in an activity with an adult (59 hours per week, as indicated in Table 1), 29 hours is spent in activities with at least one parent, and 3 hours in activities with an adult relative other than a parent. Adult non-relatives (such as paid babysitters, child care providers, and teachers) are almost as important overall as parents, at about 27 hours.<sup>8</sup>

Children in one-parent families spend less time with a parent than those in two-parent families, and more time with other adults, including relatives. About 31% of the active care these

children in one-parent families receive is provided by parents, compared to 41% for children in two parent families. Overall, children 12 and under participate in activities with relatives other than parents for more than 3 hours a week, and this source of care seems particularly important for children living in single-parent families.

Comparisons across age groups, pictured in Figure 2, show that the average percentage of time that children spend participating in activities with parents drops considerably as they reach age three and again as they reach age six, probably as a result of pre-school and school-related transitions. Children under the age of three enjoy about twice the amount of participation time with parents that 9-12 year olds do; trends in participation time for this younger age group are therefore likely to have a significant effect on average parental time. The time that children spend participating in activities with a relative other than a parent goes down after they reach age 6.

What of the time that children spend participating in activities with parents? Table 3 disaggregates this time, following the same hierarchical ordering as the previous tables, and assigning time that both parents are participating to the mother on the grounds that she is likely to assume the greatest responsibility (we examine overlap time in more detail in the next section). This provides a measure of total maternal participation time that can be compared with results from adult-based surveys such as those analyzed by Bianchi (2000). Children spend, on average about 24 hours a week participating in activities with their mothers, and almost 5 hours a week participating with their fathers alone. Children in two-parent households spend about twice the time participating with fathers alone that children in single-parent households do. As a comparison with Table 2 shows, however, time participating in activities with fathers is similar

in magnitude to time with non-parental relatives—higher in two-parent families, but lower in single-parent families.

Figure 3 illustrates differences across age groups. Contrary to what might be expected, fathers spend more time alone participating with infants and toddlers than with older children; this may reflect the greater need to provide active care for infants (e.g. to give mothers a break), and the more “social” character of time spent with older children, which is likely to take the form of family activities in which a mother is also participating. Previous research on the PSID-CDS suggests that fathers are more likely to spend time with children on weekends, partially compensating for their high hours of paid employment during the week (Fuligni and Brooks-Gunn forthcoming; Yeung et al. 2001).

The results above can also be compared with the estimates of maternal child care time published by Sandberg and Hofferth (2001). They chose to measure maternal child care time by combining hours that mothers were participating in activities with children with hours that mothers were available to children, arriving at an estimate of 28 hours and 58 minutes per week.<sup>9</sup> This measure is higher than an estimate based only on mothers’ participation in activities with children, which as Table 3 indicates is 24 hours and 4 minutes per week. Yet Sandberg and Hofferth’s measure is substantially lower than our measure of active and passive care combined.

### **Overlaps of Care Time**

Having provided an overview of the time children spend participating in activities with adults, we now examine the data from a different angle, focusing on overlaps of care time. As Table 4 indicates, about 65 % of all time that a child is participating in an activity with an adult, no other adult is participating. Two adults are participating about 14% of this time, and three or more only



2% of the time. This implies that for every 100 hours of time in which a child is receiving active care from at least one adult, at least 116 hours of adult active care time are being provided (100 plus 14 plus 2).

Table 5 focuses more specifically on overlaps with parental care, disaggregating the time children spend with at least one parent by overlaps with other types of persons. Only about 41% of the total time children spend with one parent does *not* include participation by another person. Not surprisingly, parental care is more likely to overlap than is adult care in general. Another parent is participating 26% of this time, and an adult relative an additional 4%. Non-relative time accounts for an additional 3% (the overlap is small here because non-relatives are generally paid care providers or teachers substituting for parents). In total, another adult is participating 33% of the time that at least one parent is participating in an activity with a child (for single-parent families, only 21%). This implies that, on average, for every 100 hours in which a child is receiving care from at least one parent, at least 133 hours of adult care time are being supplied.

Another child is participating about 25% of this time, typically a sibling (which accounted for 22%). Since these descriptive statistics do not take the number of other participants into account, they provide only a rough indicator of density: the ratio of time in which there is more than one adult divided by the time in which there is more than one child is 1.33 to 1.22 or about 1.1. Before constructing a more detailed measure of density of participation time, however, we need to examine another set of overlaps: time when someone else is listed as “available.”

Table 6 duplicates Table 5, but examines time spent participating with at least one parent in terms of time that others were “available.” Interestingly, another parent is “available” only

13% of this time. In other words, a parent is about twice as likely to participate with another parent and child together (the 26% overlap described in Table 5) than simply to be “available.” About 59% of the time that a parent is participating, no one else is “available.” In other words, overlaps in participation time between parents and others are greater than overlaps between participation time and available time.

“Available time,” like other kinds of passive care time, seems to be primarily a background activity. The measure offered in the PSID-CD is unsatisfactory because its meaning is unclear. The survey question “who else was there?” does not specify whether “there” means in the same room, in the same house, or in the larger vicinity. Further, the measure excludes other forms of passive care (as when children are asleep). We believe that the greatest potential contribution of further analysis of the PSID-CD lies in closer consideration of active care.

### **Care Density**

We define density of active family care time as the number of parents or adult relatives participating in an activity with a child divided by the number of children participating.<sup>10</sup> Similarly, we define density of active parental care time as the number of parents participating in an activity with a child divided by the number of children participating. This allows us to calculate the average density of active family and parental care time for an individual child. Our measure of the number of individuals participating is approximate because the data do not provide a count of individuals participating, only a categorization. For instance, if a sibling is recorded as participating, this may indicate that one, two, or more siblings are participating.

This measurement problem would be particularly serious for an estimate of the overall density of adult time with children, since non-relatives such as teachers and child care workers

often participate in activities with large numbers of children, who would go uncounted. But it is less serious where family and parental care are concerned, since the numbers of adults and children involved are smaller. The measurement problem reduces the overall variation of the index, but still provides a better picture than the conventional reporting of hours without any consideration of overlaps.

The average active family care density for time in which someone is participating in an activity with a child is 0.46. That is, there is about one adult family member per two children on average.<sup>11</sup> The active parental care density index is lower, at 0.39.

## **MULTIVARIATE ANALYSIS**

We use ordinary least squares regression to illustrate the implications of different measures of active parental care time, not to provide a detailed analysis of the factors determining its allocation.<sup>12</sup> Our models employ a standard list of independent variables often used to predict parental time with children, including a dummy variable for the number of parents, the number of children under 18 in the household, the age of the child at time of the interview, a dummy variable for whether a child is the youngest or not, three dummy variables for race/ethnicity (Black, Hispanic, and other; the omitted variable is White, non-Hispanic), family income (average for the previous year, adjusted for family size), maternal paid working hours per week and maternal education (in years). To this standard list, we add the weekly time that relatives spend with children (with no parents present). We predict that this has a negative effect on parental time; alternatively, the time that relatives spend with children could simply diminish time children spend in non-relative care.

While our descriptive analysis above includes a total of 2,817 children who have

completed diaries for the two days, the universe for the multivariate analysis is restricted to children whose relationship to head is son/daughter, stepson/stepdaughter, son or daughter of wife but not head so that the information on head and wife in the PSID-CDS demographic file can be interpreted as information on mothers and fathers of the children. We exclude children living in father-headed single-parent families, because of lack of information regarding mothers' characteristics.<sup>13</sup> We also exclude all children with missing values for our independent or dependent variables, leaving us with a total of 2,392 children in 1625 families.

We compare the effects of our independent variables on three different dependent variables representing different measures of active care: total parental hours per week participating in activities with a child, parental hours per week excluding overlaps, and the parental care density index. We predict that the signs of all coefficients should remain the same across these specifications, but that magnitude and significance will differ, depending on whether and how time overlaps are considered.

As can be seen from Table 7, the signs and significance of most independent variables are almost completely consistent across all three models. The striking exception is the effect of living with a single parent (in this universe, always a mother). This dummy variable has a significant negative effect on the amount of total time spent in an activity with a parent, amounting to a reduction of 7.5 hours per week. In contrast, this variable has an insignificant positive effect on non-overlapping parental hours. In other words, after controlling for other possible factors, such as race/ethnicity and maternal working hours, children in mother-only families spend no less time with at least one parent than do children in two-parent families. The temporal advantages of living with two parents rest largely on the value of spending time with

both parents at once.

We also call attention to the impact of “time with relative,” a variable seldom included in models of determinants of parental care time. Its coefficient is small, but consistently negative across all three models. An hour that a child spends in activities with an adult relative (and no parent present) has a larger negative effect than maternal employment on time a child spends in activities with a parent, reducing it by slightly less than a third of an hour, or about 17 minutes.<sup>14</sup> It seems clear that time children spent with adult relatives is a partial substitute for time with parents (we discuss the implications for racial-ethnic differences below).

Other results are not surprising, and consistent with other studies reviewed above. The number of children under 18 in the household has a significant negative effect on the amount of parental time in activities with any given child. Parental time declines with the age of child, and the youngest child receives slightly more than older children (though this latter difference is not statistically significant). Adjusted family income has a very small negative effect but this is statistically insignificant in two of the three models. Mothers’ education has a significant positive effect: an additional year of schooling is associated with the increase in total parental time of .44 hour, or about 25 minutes per week. Maternal working hours have a small but significant negative effect across all three models. An additional hour of paid maternal employment per week reduces total parental activity time with children by less than ten percent of one hour, or about four minutes.

Many of the independent variables (including the effect of living with a single parent, the number of children under 18, the age of the child, the effect of Black and Hispanic, maternal working hours and maternal education) have a larger impact on total parental hours than on non-

overlapping parental hours. This supports the intuition that underlies much of the recent attention to shift work. Time that both parents spend together with a child is a “luxury” good, subject to more discretionary adjustment (Presser 1994).

The effects of race and ethnicity on active family care deserve closer consideration. As can be seen from Table 7, the effect of being Black in all three models is small, but insignificant (similar for Other Races) and negative, while the effect of being Hispanic is large, positive, and significant: Hispanic children receive about 5.6 more hours per week of active parental care than their non-Hispanic white counterparts. However, the effects of being Black are highly sensitive to the inclusion of “time with relative.” When this variable is omitted from the model, the negative effects of being Black increase in size and become statistically significant. In other results not presented here, inclusion of an interaction term (single parent \* Black) renders the effect of being Black, as well as the interaction term, significant across all three models. These findings support our claim that studies of family time devoted to children should devote more attention to typologies of care.

The results using the parental care density index are more difficult to interpret, since the dependent variable is a ratio. At first glance, it might seem odd to include a right-hand side variable for number of children, while number of children also appears in the denominator of the left hand side. But the two variables are perfectly correlated only if the presence of more children does not elicit an increase in the number of parents present. The relationship between the two offers an insight into economies of scale. The sample mean of the parental care density index for children is 0.4.<sup>15</sup> The approximate effect of decreasing the number of children by one is to increase the average parental care density index by about 19%.<sup>16</sup> By contrast, a “back of the

envelope” calculation of per capita care time (see for instance, Bryant and Zick 1996a, 1996b) based on a simple average of 40 hours of parental time divided by the number of children (40/3 compared to 40/2) yields an estimated increase in per capita parental time of about 50%. We believe that direct estimates of care density are superior to such aggregate calculations, but the implications of economies of scale for both care providers and recipients require more detailed study.

## **CONCLUSION**

This analysis points to the limitations of previous definitions and measures of family care. Passive care has been largely neglected, with most attention devoted to time spent in activities with children. Analysis of active care has focused too narrowly on total quantities of parental time. Our analysis of the PSID-CD shows that adult relatives are important providers of active care, especially in Black families. Parents often engage jointly in activities with more than one child at a time. Children living with a single parent enjoy less time in activities with two parents at once, but only slightly less time in activities with at least one parent. Trends in average parental time spent with children may give a misleading impression of the overall quantity and quality of family time.

These complexities have important implications not only for understanding processes of child development, but also for estimating the monetary value of family time devoted to children (Folbre 2004). Estimates of the opportunity cost of parental time should be based on the total number of hours that parents spend with children, since both parents are sacrificing potential market income or leisure. On the other hand, estimates of the replacement cost of parental time should be based only on non-overlapping time, because in most cases children do not require the

supervision of more than one adult at a time. The monetary value of unpaid relative care deserves more attention than it has yet received.

These results also help explain the apparently puzzling finding that the time that mothers spend in activities with children change relatively little as they increase their hours of employment. First, the time that mothers spend in such activities represents only a small share of the total supervisory responsibilities and time constraints that should be considered “care.” These activities are more flexible than basic supervisory responsibilities because they can be shifted to evenings and weekends.

Second, mothers and fathers can reallocate their time in ways that reduce overlap, thus spreading their hours out in more efficient ways. This is a less cheerful result, suggesting that cost-saving may come at the expense of more stress for parents. A possible decline in the availability or willingness of other relatives to engage in activities with children may put pressure on mothers (and fathers) to increase their efforts to compensate for what would otherwise represent a decline in total family time (McDonald and Armstrong 2001). Such a trend could also help explain why mothering is perceived as an increasingly demanding task. When it comes to child care, quantity and quality are less than perfect substitutes.

Time-use researchers welcome the forthcoming results of the first annual time-use survey conducted by the U.S. Bureau of Labor Statistics in the spring of 2003 (Schwartz 2002). However, this survey will collect data from only one person per household, and therefore shed little light on the issues discussed above. Time-use surveys should be redesigned to include more specific attention to the definition *and* measurement of the several different kinds of time devoted to the care of children and other dependents.





## NOTES

1. Theodore Porter, *Trust in Numbers* (Princeton, NJ: Princeton University Press, 1995), p. 86.
2. According to the National Child Care Information Center website, accessed in June 2002, ([www.nccic.org/faqs/homealone.html](http://www.nccic.org/faqs/homealone.html)) there is no simple answer to the question, “at what age may a child be left alone and for how long? However, many states and municipalities have guidelines that stipulate that children under the age of eight should not be left alone for any period of time. U.S. Army guidelines require direct supervision onsite by an adult or an adult-designated teenager 13 years or older for all children 10 years and younger.
3. While the 1998 Bianchi/Robinson survey includes the question “who else was participating?” results from these questions have not yet been analyzed with respect to overlaps.
4. For discussion of problems with other studies, see Budig and Folbre (2004).
5. See, for instance, Jacqueline L. Salmon, “Study Sees No Change in Mothering Time,” *Washington Post*, March 26, 2000, and “Kids Seeing More of Mom and Dad,” *Washington Post*, May 9, 2001.
6. The 1981 survey asked “Who was with child?” while the 1997 survey asked “Who was doing the activity with CHILD? and “Who (else) was there but not directly involved in the activity?” Answers to both questions in 1997 were combined and compared with answers to the single question in 1981. While this comparison is logically plausible, the 1997 survey invites a more detailed answer, calling the respondents’ attention to the possibility that more than one person was with the child. This difference in wording could have biased responses for 1997 upward relative to 1981.

7. The coding nomenclature used by the PSID-CDS sometimes makes it difficult to ascertain whether persons designated as “relatives” and “non-relatives” are adults or children. We assume that mothers, step-mothers, fathers, step-fathers, and grandparents are adults. We also assume that “other non-relatives” are adults, since child “friend” is a separate category among non-relatives, and because most “other non-relatives” seem to involve market transactions such as babysitting after school, appointments with doctors or public events. The most ambiguous category is “other relative” which may include cousins (children) as well as aunts and uncles (adults). In order to construct a reasonable estimate, we assumed that the “availability” of an adult during time that a child spent participating in an activity with an “other relative” was an indicator that the “other relative” was likely to be another child. However, if no adult was available, we assumed that the “other relative” was likely an adult. Using these assumptions, about 25% of the time children spent participating in activities with “other relatives” was with adults (27% for one-parent families, and 23% for two-parent families).

8. We assume that non-relatives are adults unless they are specified as a sibling or friend of the child. Time children spend with non-relatives is likely to include time with other children (e.g. classmates), but this is time that an adult non-relative is also likely to be present.

9. When we apply their definition to our data set, but exclude children under the age of three for conformity with their approach, we arrive at an estimate of 41 hours and 53 minutes per week. When we contacted the authors to explain our inability to replicate their results, John Sandberg informed us of possible coding errors in their published estimates. We are currently awaiting further communication from them.

10. Since children could be either recipients or providers of care, we looked at the frequency with which children participated in activities together without a parent present. This amounted to only 15% of their time (See Table 2); we treated this as an upper-bound estimate of baby sitting time and assigned 85% of children's time to their receipt of care. Overlap effects may not be linear. In particular, one might argue that the presence of additional children does not "dilute" adult attention in a linear fashion. We experimented with another version of the care density index, placing the square root of the number of children, rather than simply the number of children, in the denominator (an adjustment is similar to one often used to take into account economies of scale in household production). We refer to this in subsequent notes as the "nonlinear" care density index.

11. Note that the fact that family members are categorized in more detail than non-relatives makes an accurate count more feasible. There is only one "mother," one "father," one "step-mother" etc. Even though there are theoretically two grandmothers and two grandfathers it seems unlikely that both members of such a category would be engaging in an activity with children without the parents present.

12. Since most of the children in the sample are living with parents, our dependent variables seldom have zero values (less than 1% of the sample). Since children in the sample may come from the same family, standard errors were adjusted for the clustered nature of the sampling using the Huber-White method as described in Stata User's Guide, Release 7, 2000.

13. These households may include adult women who are not listed as mothers but nonetheless provide substantial child care. The specific characteristics of these households deserve closer consideration that we can provide here.

14. Results not reported here show that inclusion of this variable reduces the size of the coefficients for African-American and increases the size of the coefficients for Hispanic, suggesting that racial/ethnic differences in the participation of relatives in child care may help explain differences in parental time, an issue that we hope to explore in more detail in future research.

15. The average nonlinear parental care index for children was slightly larger, at 0.45.

16. The impact of a similar change on estimates using the nonlinear parental care index is about a 16% increase.

## **APPENDIX A. The 1997 Child Development Supplement of the Panel Income of Survey Dynamics (PSID-CDS).**

Respondents to the Child Development Supplement have already been included in at least one PSID interview. The majority of respondents come from long-time PSID respondent families. Eligibility for the Child Development Supplement is based on the ages of the PSID family's children. See <http://psidonline.isr.umich.edu/CDS/researchdesign.html> for details. Our analysis uses child-level weights from the CDS demographic file to adjust for family selection and nonresponse factors.

*Time Diary Data.* The time diary data has a unique case ID and multiple observations per child, each referring to activities over a 24-hour period. Almost every child has two 24-hour time diaries, one during a weekday and one during a weekend. Weekly averages are constructed by weighting the weekday data by a factor of five and the weekend data by a factor of two.

Each activity associated with a child has an activity code and a time duration for an activity, who is participating in the activity, and who else is available. Our examination of the data revealed that participating and available categories are not always mutually exclusive. There are 104 segments of child time in which a mother or a father is coded as “participating” but also coded as “available but not participating.” We believe this represents a coding error, and recoded these activities as time “participating.”

In most cases, missing values are coded as zeros so as not to reject child-level observations that lack only a small amount of information about specific activities. However, we

found 16 cases in which no activity is listed for a child (code 481) for an entire day (over a span of 24 hours). In those cases, time that anyone spent participating in any activity with a child summed to zero for an entire day. We excluded these day-length records from consideration. Two children have both sample days excluded and were therefore removed from our data set.

The exclusion of activities of sleeping and personal care from consideration of participation or availability of other persons is apparent from the survey instrument itself, which explicitly states in the heading above the participation and availability columns in capital letters DO NOT ANSWER IF SLEEPING OR PERSONAL CARE. These activities comprised seven specific activity codes.

*Family/Household Structure.* Ten categories of individuals could be coded as “participating” or “available”: mother, father, sibling, step-mother, step-father, step-sibling, child’s friend, grandparent, other relative, or other non-relative. Of these ten, only four (mother, father, step-mother and step-father) refer to unique individuals. The other six categories could potentially include more than one person. We include step-mothers in the mother category, step-fathers in the father category, and step-siblings in the sibling category.

In the PSID, each family unit has one and only one current head. The head must be at least 16 years old and the person with the most financial responsibility for the family unit. If this person is female and she has a husband in the family unit, then he is typically designated as head. If she has a boyfriend with whom she has been living for at least one year, then he is typically head. However, if the husband or boyfriend is incapacitated and unable to fulfill the functions of head, then the family unit will have a female head.

The ‘other non-relative’ category may include a cohabiting partner such as a live-in boyfriend. An adult cohabiter is labeled a boyfriend or girlfriend (code 88) the first time he or she appears in the sample. But if the cohabiter remains in the family unit at the next interview, the label is switched to either “Wife” or “Head.” Thus cohabiters “disappear”. Since the PSID-CDS is based on families who have already been interviewed at least once, it includes few cohabiters (only a cohabiter who joined a family unit since its last interview would show up as such).

*Family Income Distribution.* Since the PSID defined unmarried couples as family members, the concept of family income in the PSID resembles the concept of household income in the Current Population Survey. It is, however, not perfectly comparable to household income, because when a grown child comes back to live with their parents this child (and his or her spouse and children) continue to be treated as separate families. The median family income of children in the sample, adjusted for family size by dividing by the square root of family members, is \$19,412.50. Approximately 24% of all families have adjusted family incomes below 50% of the median, and 29% have family incomes over 150% of the median, with about 47% in the middle income group. Data for income and hours worked pertain to the previous year, 1996. Only three observations were deleted due to missing values for family income.



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**Table 1. A Typology of Passive and Active Care Time**  
(in hours and minutes)

	All Children (N=2,817)		Two-Parent (N=1,947)		One-Parent (N=809)	
	Mean	% of Total	Mean	% of Total	Mean	% of Total
<b>PASSIVE CARE</b>						
Excluded from consideration	79:05	47	79:22	47	78:02	46
Alone or with another child (no adult available)	8:19	5	7:38	5	10:20	6
Adult available but not participating	21:31	13	21:35	13	21:54	13
<b>ACTIVE CARE</b>						
At least an adult participating	59:05	35	59:24	35	57:42	34
<b>Total</b>	167:59	100	167:59	100	167:59	100

Note: See the endnote 7 for further explanation of categories.

**Table 2. Children’s Average Weekly Activity Time by Type of Person Participating**  
(in hours and minutes)

	All Children (N=2,817)		Two-Parent (N=1,947)		One-Parent (N=809)	
	Mean	% of Total	Mean	% of Total	Mean	% of Total
<b>Total Time in Activity with Another Child, but No Adult</b>						
Child Friend	3:50	5	3:29	5	5:03	7
Child Sibling	11:05	15	11:04	15	11:33	15
Other Child Relative	2:03	3	1:41	2	2:55	4
<b>Total Time in Activity with Adult</b>						
Adult Non-relative	26:53	35	25:58	34	29:41	39
Adult Relative other than parent	3:06	4	2:24	3	3:45	5
Parent	29:00	38	31:02	41	24:01	31
<b>Total Time in Activity with Others</b>	<b>76:00</b>	<b>100</b>	<b>75:41</b>	<b>100</b>	<b>77:00</b>	<b>100</b>

Note: See the endnote 7 for further explanation of categories.

**Table 3. Children’s Average Weekly Time in Activities with Mothers and Fathers**  
(in hours and minutes)

	All Children (N=2,817)		Two-Parents (N=1,947)		One-Parent (N=809)	
	Mean	% of Total	Mean	% of Total	Mean	% of Total
Mother	24:04	83	25:16	81	21:33	90
Father	4:56	17	5:46	19	2:29	10
<b>Total</b>	<b>29:01</b>	<b>100</b>	<b>31:02</b>	<b>100</b>	<b>24:02</b>	<b>100</b>

Note: In this table, time with both parents is assigned to mother.

**Table 4. Children’s Average Weekly Activity Time with at Least One Adult, by Type of Other Persons Participating**  
(in hours and minutes)

	All Children (N=2,817)	Two-Parents (N=1,947)	One-Parent (N=809)
	Mean % of Total	Mean % of Total	Mean % of Total
No other adult (only one adult participating)	38:30	65 37:21	63 41:37 72
Child Sibling	8:35	15 8:27	14 9:03 16
Child friend	2:15	4 2:13	4 2:27 4
One additional category of adult	8:15	14 9:35	16 4:04 7
Two additional categories of adults	1:27	2 1:40	3 0:46 1
<b>Total</b>	59:04	100 59:18	100 57:58 100

Note: We indicate “categories of adults” because respondents do not designate the number of participants. If they report a mother and a father were participating, or a mother and a grandmother, we know that two categories of adults are participating. However, in some cases more than one person can be in one category (e.g. two grandmothers, or several non-relatives).



**Table 5. Children’s Average Weekly Time in Activity with at Least One Parent, by Types of Other Persons Participating**  
(in hours and minutes)

	All Children (N=2,817)		Two-Parents (N=1,947)		One-Parent (N=809)	
	Mean% of Total		Mean% of Total		Mean% of Total	
No other person (only one parent participating)	11:57	41	12:26	40	11:07	46
Child friend	0:19	1	0:18	1	0:21	2
Child Sibling	6:18	22	6:21	21	6:36	28
Other Child Relative	0:38	2	0:31	2	1:04	4
Adult Non-relative	1:00	3	0:53	3	1:25	6
Adult Relative other than parent	1:13	4	0:54	3	2:17	10
Other parent (both parents participating)	7:33	26	9:35	31	1:08	5
<b>Total</b>	29:00	100	31:01	100	24:01	100

**Table 6. Children’s Average Weekly Time in Activities with at Least One Parent, by Types of Other Persons Available**  
(in hours and minutes)

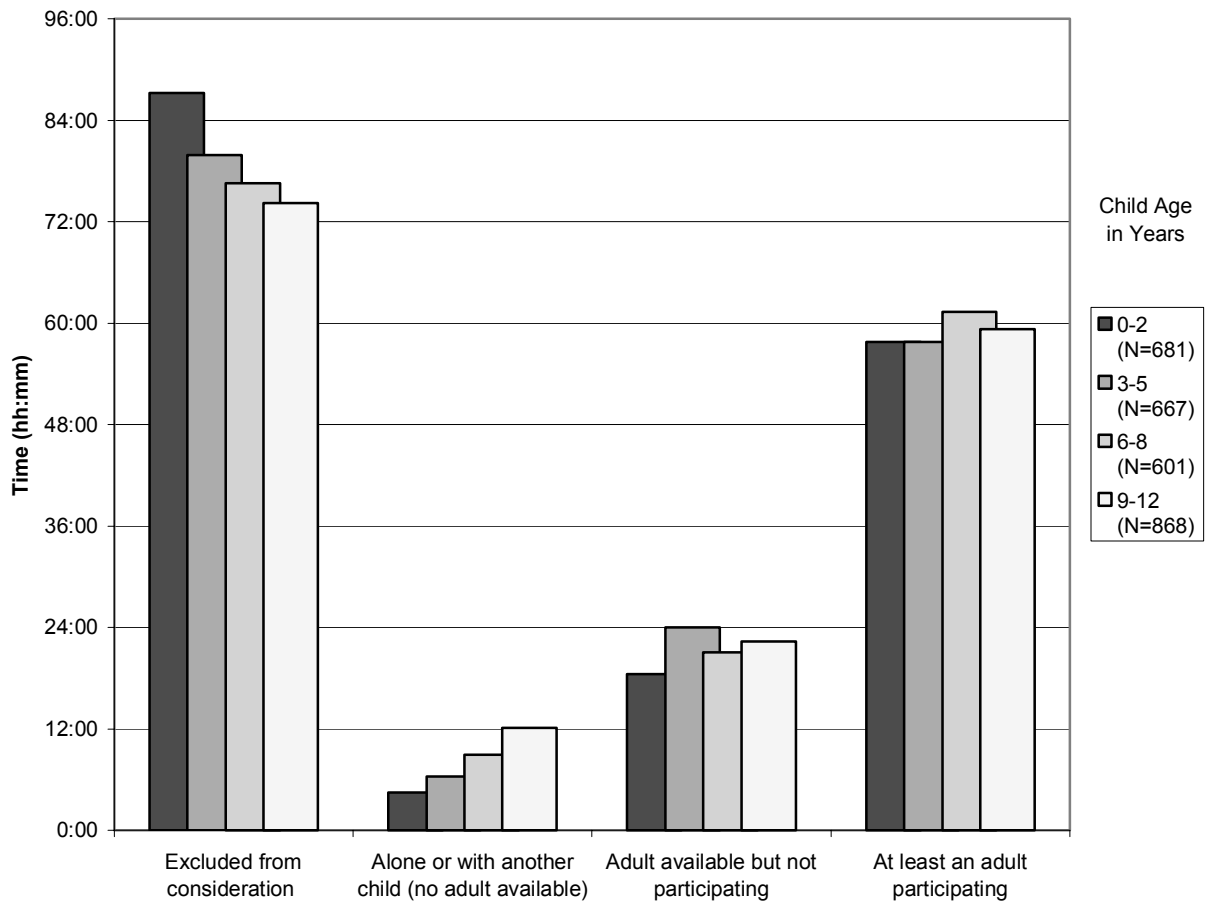
	All Children (N=2,817)		Two-Parents (N=1,947)		One-Parent (N=809)	
	Mean%	of Total	Mean%	of Total	Mean%	of Total
No one available (only one parent participating)	17:07	59	17:58	58	15:24	64
Child friend available	0:07	0	0:06	0	0:10	1
Child Sibling available	2:20	8	2:24	8	2:16	9
Other Child Relative available	0:18	1	0:16	1	0:28	2
Adult Non relative available	4:21	15	4:42	15	3:26	14
Adult Relative other than parent available	0:50	3	0:33	2	1:48	8
Other parent (one parent participating, another available)	3:54	13	5:00	16	0:26	2
<b>Total</b>	<b>29:00</b>	<b>100</b>	<b>31:02</b>	<b>100</b>	<b>24:01</b>	<b>100</b>

**Table 7. OLS Coefficients from the Regression of Children’s Weekly Hours Participating in Activities with Parents on Selected Independent Variables, and Three Distinct Dependent Variables, for Children in All families**

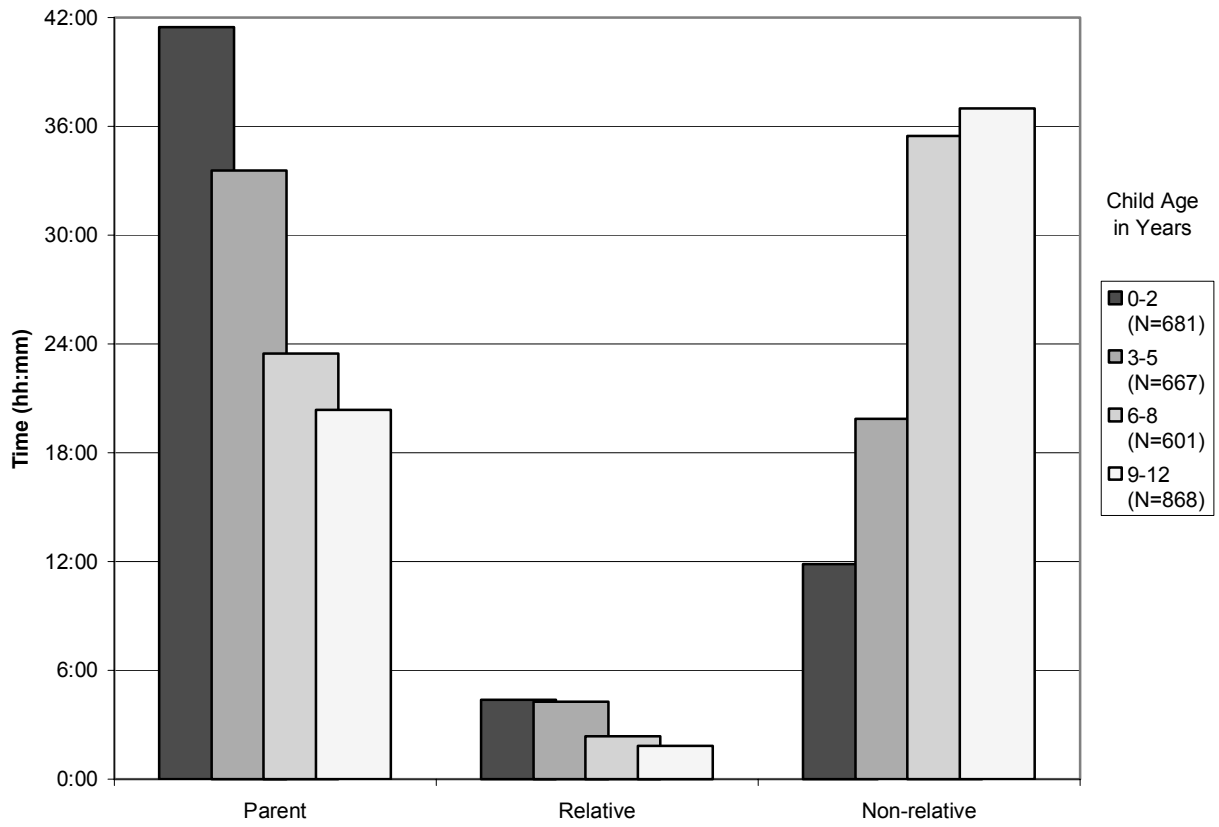
Independent Variable	Means	Dependent variable= Total Parental Hours	Dependent variable= Non-overlapping Parental Hours	Dependent variable= Parental Care Density Index
Constant		60.207**	47.320**	0.808**
Single Parent	0.18	-7.562*	0.410	-0.125**
Time with relative	4.09	-0.280**	-0.240**	-0.003**
# children < 18	2.39	-3.959**	-3.216**	-0.077**
Age of child	6.12	-2.225**	-2.036**	-0.034**
Youngest	0.60	1.059	1.477*	0.070**
Black	0.14	-1.898	-1.407	-0.003
Hispanic	0.11	5.602*	4.773*	0.071*
Other Races	0.08	-0.750	-1.681	0.016
Family income (adjusted for family size)	25349	-0.000	-0.000	-0.000**
Maternal working hours	25.64	-0.071*	-0.069*	-0.001*
Maternal education	10.54	0.435*	0.416*	0.000
F		60.34	61.42	87.28
Df		2380	2380	2380
R <sup>2</sup>		0.312	0.348	0.444

\* p<.05, \*\*p<.001 with robust standard errors clustered by family

**Figure 1 Passive and Active Care Time by Age**



**Figure 2 Active Care Time by Type of Person by Age**



**Figure 3 Active Care by Mothers and Fathers by Age**

