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Nancy Folbre
University of Massachusetts Amherst

Jayoung Yoon
University of Massachusetts Amherst



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Nancy Folbre

Jayoung Yoon

University of Massachusetts, Amherst

Economists have long recognized that nonmarket work, including time spent raising children, has economic value. Conventional measures of gross domestic product, based only on market transactions, understate the total value of goods and services produced. As women have entered paid employment and reallocated time away from the home to the market, measures of gross domestic product have increased simply as a result of this accounting convention.

The difficulties of measuring and assigning a monetary value to nonmarket work have discouraged efforts to include it within economic accounting frameworks. But many national statistical agencies are now collecting regular time-use diaries from representative samples of their populations. In 2003, the United States became a part of this trend, with completion of the first round of the American Time Use Survey, which will now be administered annually as part of the Current Population Survey. In 2004, the National Academy of Science (NAS) published the report of an expert committee considering methods of valuing nonmarket work (Abraham and Mackie 2004). This report urged economists to develop the tools needed to produce a set of satellite accounts estimating the total value of nonmarket work.

The report raises a number of important conceptual issues, among them the need to move beyond valuation of housework toward a more detailed analysis of care devoted to children as an input into the “human capital” sector of the economy. Valuation of care is more difficult than valuation of housework for two reasons. First, it is more difficult to measure the amount of time devoted to it, which includes supervision

and “on-call” time that may not involve direct interaction with a child (Budig and Folbre 2004; Folbre et al. 2005). Second, it is difficult to specify a market substitute or replacement wage rate for work that has strong emotional valence and includes valuable person-specific skills.¹

In this chapter, we use data from the ATUS to address these two issues. We build upon two recommendations made by the NAS study: that valuation for the purpose of national accounts be based on replacement cost (rather than opportunity cost), and that replacement cost be adjusted, where possible, for the quality of the services required. Because the ATUS is an adult-centric survey, we focus on the development of a measure of adult inputs into children.² We draw from a previous paper comparing three distinct measures of child care in the 2003 ATUS for married or cohabiting persons living in a household with a child under the age of 6 but no child over the age of 12 (Folbre and Yoon 2007).

The first section motivates the need to measure time devoted to children. The next section explains why time devoted to children cannot be defined simply as time engaged in primary child care activities. Moving beyond a distinction between primary and secondary child care activities, it makes the case for a “care continuum” that includes both supervisory and housework/management services. Data from the 2003 ATUS demonstrate the relative importance of these different categories of care for the average person age 18 and over. The final section addresses valuation issues and applies different wage rates to the different types of care. Even a conservative lower-bound estimate shows that the average value of time that adult women devoted to child care in 2003 exceeded the value of their average market earnings.

WHY MEASURE TIME DEVOTED TO CHILDREN?

Parents and other family members devote a substantial amount of time and energy to raising the next generation. This work is not primarily motivated by a desire for pecuniary gain, but it has important pecuniary consequences for employers, citizens, and society as a whole. If parents did not raise children, schools would be unable to educate them, and the employers would be deprived of both labor and what has come

to be termed “human capital.” Governments would be unable to borrow money based on anticipated tax revenues from the next generation.

While parental labor does not come with a price tag attached, its supply seems to be affected by shifts in relative prices. Fertility has declined along with economic development in many parts of the world, and fertility rates well below replacement levels in countries such as Italy, Spain, Japan, and South Korea have raised concerns about adverse macroeconomic consequences.

From a neoclassical perspective, one might argue that parents simply have different preferences than other adults. Some adults choose to spend money and time on children; some adults choose to spend money and time on Golden Retrievers. If children are simply consumption goods, expenditures on them are irrelevant to adult standards of living (Ferreira, Buse, and Chavas 1998). But the standard of living of children themselves is relevant (Bojer and Nelson 1999). Further, children represent public goods, since governments can levy a claim on their future earnings and retirees depend on goods and services produced by the younger working-age generation (Folbre 2008). Even if one accepts the notion that children are merely consumption goods, parents may want to know more about their time costs, and policymakers may wonder what will happen to the supply of children as the cost of raising them goes up.

The time that parents devote to children costs money. Following a recommendation made by Margaret Reid in 1934, most time-use researchers define work as an activity that someone else (a “third party”) could be paid to perform. This definition departs from the neoclassical definition of work as an activity that generates no utility apart from the income or services that it may yield. Adults in general and parents in particular often derive considerable satisfaction from child care. Yet they also derive considerable satisfaction from paid work. Time-diary studies that ask respondents to describe their effect and mood indicate that adults, on average, enjoy time with children only slightly more than paid employment. Housework is consistently ranked lower than either (Kahneman et al. 2004).

However work is defined, it seems inconsistent to measure the amount of money that adults spend on children and to ignore the value of the time devoted to them. Money expenditures are consistently

monitored. Since 1960, the U.S. Department of Agriculture (USDA) has provided estimates of average expenditures on children from birth through age 17. A recent USDA report estimates that a middle-income, husband-and-wife family with two children spends about \$165,630 to raise each child up to age 18 (Lino 2001a). The report itself calls attention to the omission of any estimate of the value of parental time from this calculation.

Foster care reimbursement rates, child support awards of noncustodial parents, and standards of public assistance for poor families are often judged by comparison with estimates of average money expenditures on children (Folbre 2008; Lino 2001b). Both custodial parents and children may be economically penalized as a result. Estimates based on the Child Development Supplement of the Panel Study of Income Dynamics (CDS-PSID), a survey of children ages 12 and under, show that a lower-bound replacement-cost estimate of the value of parental time is higher than the value of cash expenditures (Folbre 2008). That is, direct money expenditures represent less than half of the total cost of raising children.

The United States provides substantial subsidies for parents, easily overlooked because they are embedded in a complex (and ever-changing) tax code. In 2000, the value of tax exemptions and credits was higher, on average, than the Swedish family allowance per child.³ U.S. subsidies, however, have a far more unequal impact. Unlike the family allowances provided by the social democracies of Northwest Europe—or those provided by the other major English-speaking countries, the United Kingdom, Canada, and Australia, the U.S. tax code provides its greatest benefits to affluent families. Families in the middle of the income distribution receive the lowest level of support (Battle and Mendelson 2001; Folbre 2008).

Unlike most other affluent countries, the United States fails to provide paid parental leaves from work or universal child care. These policies have a direct impact on parental time allocation, making it more difficult for families to balance paid work and family work. Levels of “outsourcing” of child care and shift work are almost certainly higher as a result (Freeman and Schettkat 2005; Presser 1994, 1995). Analysis of the value of parental child care time could have implications for the analysis of such policies.

The valuation of time could also put levels of public support for parenting in a new perspective. Tax subsidies provided in the United States in 2000 amounted to between 10 and 26 percent of the average annual parental expenditures on a child under 18 in a middle-income, two-parent family in that year (Folbre 2008). But once the lower-bound replacement value of parental time is taken into account, the public contribution appears much smaller, amounting to between only 4 and 9 percent of average costs.

HOW SHOULD TIME DEVOTED TO CHILDREN BE DEFINED?

The ATUS provides an opportunity to provide detailed estimates of the time that adults devote to children. But the measurement of child care inputs is more difficult than it may seem initially. Primary child care activities represent only a portion of the temporal burden that children impose. The ATUS asked respondents to record time that children were “in their care,” which amounts to a much larger quantity of time than care activities such as feeding, bathing, or talking to children. But how, exactly, should such time be counted? Even the sum total of primary child care activities and “in your care” time omits some important categories of supervisory time and ignores important differences in the intensity and complexity of care needs. Analysis and valuation of child care time should instead focus on a spectrum or continuum of types of care.

Beyond Activities

Most time-use surveys are categorized in terms of activities. But child care is more than a mere activity. It is also a responsibility. As Reid explained in 1934, “Even though she [the household worker] may not be on active duty, evidence of her labor is about her; she is continually on call. Much so-called leisure has a “string attached” (Reid 1934, p. 319). Supervisory responsibilities are the string that constrains both maternal labor force participation and leisure time.

Primary activities are those designated in response to a question such as, “What were you doing during this time period?” The recent Australian and UK surveys designated secondary activities in response to questions such as, “Were you doing anything else at the time?” Extensive analysis of the Australian data reveals the tremendous significance of child care as a secondary activity (Ironmonger 2004). Unfortunately, measures of child care as a secondary activity are highly sensitive to definition and survey design: the ratio of child care as a secondary activity to care as a primary activity is much higher in the 1997 Australian than in the 2001 UK survey (Folbre and Yoon 2007).

The ATUS did not ask respondents to report secondary time use. Rather, the U.S. Bureau of Labor Statistics decided to follow the example of Canada, which had begun administering a time use survey that asked respondents to specify the amount of time they spent “looking after children.” The U.S. Bureau of Labor Statistics devoted considerable attention to cognitive studies of the impact of alternative wording and recommended a different phrase, asking respondents to specify the amount of time that children were “in your care” (Schwartz 2001). This question was asked of respondents living in households with children age 12 or under. As might be expected from the broader wording, which reaches beyond the passive or generic care implied by “looking after” to the more diffuse responsibility of “in your care,” the ATUS measure yields significantly higher estimates of parental time commitment than the Canadian survey of 2001, even though measures of primary child care activities are quite similar (Folbre and Yoon 2007).

The ATUS “in your care” measure is often referred to as a secondary activity. Indeed, the ATUS itself refers to “secondary care” in its published tables. But this term is misleading, since “in your care” does not designate an activity but rather a responsibility. The term “passive” care is also inappropriate. Many of the most important primary child care activities are in fact rather “passive”—such as watching television with a child or driving a child to school. The ATUS “in your care” measure is best described as a measure of responsibility for children, an indicator of supervisory constraints. Some might view this as a flaw in the ATUS, since it limits comparability with other surveys. But it is also a great strength, because it tells us far more than other surveys about the larger temporal demands that children impose.

The ATUS collected additional detailed information from respondents on who else was present. When the activity was taking place in the home, the question specified, “Who else was present in the same room?” Our analysis of these data clearly demonstrates that adults could and did describe children as “in your care” even when children were not in the same room. Among married or cohabiting adults living in a household with a child under the age of 6 but no child over the age of 12, a child is listed as present for only 68 percent of all “in your care” time (Folbre and Yoon 2007). It is also important to note, however—and probably surprising to most time-use researchers—that children are frequently absent during some primary child care activities. This is especially true of the managerial/logistical activities coded in the ATUS, such as “organizing and planning for household children” (children present only 62 percent of the time) or care-related travel for household child (children present only 74 percent of the time) (Folbre and Yoon 2007).

How Should “In Your Care” Be Counted?

The difference between the amounts of time devoted to activities of child care and time that children were “in your care” looms quite large. Even for those who might be expected to spend large amounts of time in primary child care activities, such as married or cohabiting women without paid employment living in a household with a child under the age of 6, child care activities average only 3.2 hours per day. Time during which a child was “in your care” averages an additional 9.5 hours per day for this group (Folbre and Yoon 2007).⁴ In other words, “in your care” time is about three times higher.

The ratio of care activity time to “in your care” time is about the same for the broader category of all women age 18 or older living in a household with a child age 12 or under but no child over that age.⁵ Their time in child care activities averages 2.4 hours per day compared to 7 hours per day with children in their care. For men in this category, however, “in your care” time is nearly five times greater. Their care activities average only 0.92 hours per day compared to 4.4 hours with children “in their care.”

A significant portion of “in your care” time overlaps with other nonmarket work activities such as cleaning house (women age 18 or

older in a household with a child aged 12 or under average about 2.1 hours per day of such overlapped time; for their male counterparts, about 0.5 hours per day). The remainder of “in your care” time overlaps with activities that are not designated as nonmarket work, such as socializing with friends or engaging in leisure. Yet the use of this time is constrained by child care responsibilities. As several studies show, women’s leisure is structured differently than men’s for precisely this reason (Bittman and Wajcman 2004; Mattingly and Bianchi 2003).

The conceptual dilemma is painful: leaving “in your care” time out seems incorrect, but including it all can lead to double-counting of unpaid work. Furthermore, the intensity of “in your care” is obviously lower than the intensity of direct activities of care.

In a recent estimate of the total value of nonmarket work based on the 2003 ATUS, Frazis and Stewart (2004) offer a reasonable compromise. They tally only the hours of “in your care” time that did not overlap with other nonmarket work activities. Even restricted in this way, “in your care” time is substantial, amounting to about one quarter of all nonmarket work.

We modify and build on this approach in several ways, making use of the information available in the ATUS on the range of different care activities or the presence of other adults or children. We describe “in your care” time as supervisory time (conforming to 1c of the care continuum shown in Table 2.1) only if it did not take place while also performing nonmarket work (as do Frazis and Stewart). However, rather than making a sharp distinction between housework and child care, we argue that some housework represents an indirect form of child care. Children clearly increase the burden of domestic chores and household management tasks. Counting only direct expenditures of time on children would be analogous to counting only parental spending on toys and education, while ignoring the impact of children on rent, utilities, or grocery bills.

Indeed, the ATUS codes seem inconsistent in their effort to measure time spent organizing, planning, and traveling on children’s behalf while ignoring time spent cooking or cleaning on children’s behalf. This inconsistency could even introduce a class bias, since educated affluent parents are likely to devote more time to such managerial care—and less time to domestic work—than less-educated, low-income parents

Table 2.1 The Child Care Continuum^a

1. Supervisory Care

- 1a. Children asleep, adult “on call” but asleep (*not measured in ATUS*)
 1b. Children asleep, adult “on call” but awake (*measured in the ATUS only if children are asleep during the day, in which case it is covered by the “in your care” question*)
 1c. Children awake, adult “on call” but awake (*measured in the ATUS for children ages 12 and under by the “in your care” question. Also measured by ATUS primary activity code “looking after household children”*)

2. Indirect Care

- 2a. Housework on behalf of children (*not distinguished from other housework in the ATUS*)
 2b. Household management on behalf of children (*not distinguished from other logistical and managerial work in the ATUS, although some child-specific categories are included*)

3. Direct Care

- 3a. Physical care such as feeding, bathing, and dressing (*measured in the ATUS by primary activity codes*)
 3b. Developmental/educational care such as talking with, instructing, reading aloud, or playing with child (*measured in the ATUS by primary activity codes*)
-

^aData availability in the ATUS in parentheses; for detailed codes see Appendix 2A.

(Lareau 2003). Even a rough estimate of the proportion of housework and household management attributable to children is preferable to completely ignoring such indirect care.

Most uses of the “in your care” measure exclude time that children are asleep during the night, which represents a substantial portion of supervisory time. Children under the age of 3 spend about half their time asleep; the percentage of time they spend awake increases steadily with age (Folbre et al. 2005). Exclusion of the bulk of sleep time gives the misleading impression that young children require less care than older ones. This is not true, because young children’s sleep is often fitful and periodic. They tend to wake at regular intervals and demand brief but highly inconvenient attention.

The teenagers that are omitted from consideration by the “in your care” measure impose rather different demands. They require less direct supervision than children ages 12 or under. Yet precisely because parents spend less time in care activities with teenagers, the amount of time that they are “on call” or “available” may have an important impact on their children’s health and education outcomes. Certainly many parents feel constrained by the need to keep an eye on their teenagers.

The Care Continuum

As a first step toward exploiting the full potential of the ATUS, we move beyond the simple dichotomy between child care activities and “in your care” by describing a continuum based on the intensity of effort and potential impact of parental education and skill. This continuum ranges from supervision (which may impinge to varying degrees on adult activities) to housework and household management services to primary care activities.⁶ Each of these forms of care can be subdivided in a similar gradation (see Table 2.1). Supervision may take place while both child and adult are asleep, while the child is asleep but the adult is awake, or while both child and adult are awake. Housework involves somewhat routine activities such as food preparation and laundry, while household management services such as negotiation with teachers and doctors can require more effort and skill.

When housework and household management activities on behalf of children are combined with responsibilities for children “in your care,” they are more demanding than when children are absent (representing a form of joint production). We do not count time that adults are engaged in housework or household management for themselves in conjunction with children “in their care” as supervisory time, primarily because we want to provide a conservative lower-bound estimate of joint housework/supervision time.

Direct care ranges from physical care (such as feeding or dressing a child) to developmental care with a high level of social interaction (such as talking to, instructing, playing with, or reading aloud). In future efforts we may disaggregate further.

We use ATUS activity codes, information regarding presence of children, and estimates of the housework demands of children to pro-

vide an empirical picture of this care continuum. Most, but not all, of the primary activities coded by the ATUS fall into the third category of Table 2.1. Some of these seem out of place to us. For instance, both ATUS activity codes “Looking after Children” and “Caring for Or Helping Children Not Elsewhere Classified” seem designed to capture passive care that is largely supervisory. They consume relatively little time (less than 6 minutes a day, on average, even among married or cohabiting individuals living with a child under 6 but none over 12), but for the sake of consistency, we allocate these codes to category 1c of “supervisory” care along with measures of “in your care.”

Another reallocation concerns ATUS primary activity codes “Organization and Planning for Children,” “Activities Related to Children’s Health,” and “Activities Relating to Children’s Education,” and “Travel.” These activities add up to a larger amount of time, almost 20 minutes per day on average. In our view, if children are not present, these should not be considered primary care activities, and we reallocate these segments of time in which no child is present (about 20 percent of the total) to child-related household management.

Estimation of the amount of time devoted to housework and household management on behalf of children is less straightforward. To some extent, these activities provide a household public good. All household residents presumably benefit from vacuuming the living room, cleaning the toilets, or preparing common meals. Other activities, such as doing children’s laundry or picking up their toys, are child-specific, but the survey does not record “for whom” the activities were performed. Multivariate analysis can be used to estimate the impact of children on the amount of time devoted to housework (Craig 2005), and we plan to explore this approach at a later date.

However, parents may reallocate their housework and household management time to meet the needs of children rather than adults. Even if they spend the same amount of time as nonparents in these activities, their individual standard of living may suffer as a result. For instance, parents may prepare peanut butter sandwiches instead of adult meals, or they may pick up toys rather than vacuum their own bedrooms.

One simple approach, mimicking the approach the Department of Agriculture takes with money expenditures (Lino 2001a), is to allocate housework and household management time on a per capita basis. The

total amount of time devoted to these activities, divided by the number of household members, times the number of children, could be interpreted as the amount of indirect care time devoted to children. Since children represent about half of all household members in households in which adults are living with children, we assign 50 percent of household and household management activities to children. Our estimates show that about 30 percent of this time is combined with children “in your care,” which is tabulated separately because this joint production is more demanding.

Table 2.2 shows amounts of time devoted to different categories in the care continuum for adults (individuals over 18) in three different types of households, those with children under 13 but none older, those that include children ages 13–18, and those with no children. Not sur-

Table 2.2 Average Adult Time Devoted to Children and Paid Employment in the United States in 2003 (hours per day)

	Households with child <13 but none older		Households with child >12		Households with no children	
	Men	Women	Men	Women	Men	Women
Supervisory care (partial measure) ^a	4.0	5.1	0.5	0.8	0.2	0.3
Indirect care	0.6	1.5	0.5	1.3	—	—
Housework (not combined with supervisory care)	0.2	1.1	—	—	—	—
Housework combined with supervisory care	0.1	0.3	—	—	—	—
Household management (not combined with supervisory care)	0.2	0.3	—	—	—	—
Household management combined with supervisory care	0.1	0.1	—	—	—	—
Direct care	0.9	2.3	0.2	0.4	0.0	0.0
Physical care	0.4	1.3	0.1	0.2	0.0	0.0
Developmental care	0.5	1.0	0.1	0.2	0.0	0.1
Average total time devoted to child care	5.5	8.8	1.1	2.5	0.2	0.5

^a Based on category 1c in Table 2.1.

prisingly, adults living in households with young children devote substantially more time to caregiving than those without. The conventional measure of time devoted to child care activities suggests only a modest time commitment: less than an hour a day for men and about 2.3 hours a day for women. Indirect care time in the form of housework and household management services on behalf of children is slightly smaller for both men and women, at 0.6 and 1.5 hours per day. Supervisory time is much greater in magnitude: small amounts are provided by households with older children because younger children are present; even adults living in households without children provide some supervisory care.

Taking all three large categories of care into account offers a somewhat different picture of the gender division of labor. Men's contributions to household management and supervisory care partially compensate for their relatively small contributions to direct care. In households with young children, women spend about 2.5 times more than men in direct care activities. Inclusion of less intensive forms of care yields a lower ratio of 1.6.

A closer look at variations in the care continuum by other dimensions of household structure (such as marital vs. nonmarital, single vs. two-parent) could yield further insights. We do not disaggregate further because our purpose here primarily is to illustrate this methodological approach and to provide an aggregate picture of the total amount of time devoted to unpaid child care.

ESTIMATING THE MARKET VALUE OF CHILD CARE TIME

The care continuum is well-suited to the application of a range of wages reflecting the replacement cost of different types of care. Supervisory care, often combined with other activities, is less demanding than indirect care, which in turn is less demanding than direct care. However, the choice of specific wage rates to value inputs of care time is, at best, a rather crude exercise, one that can offer only a lower-bound estimate of the value of family time. A number of caveats deserve careful consideration.

Care Provided vs. Care Received

Valuing time devoted to care is not the same as valuing actual inputs of care. Apart from the obvious point that quality of care may differ by individuals and circumstances, differences in the density of care are relevant. An adult who reports spending an hour of time engaged in child care may be the only person in charge of three children, or may be assisted by two other adults in caring for one child. An adult-centric survey that simply tallies hours supplied will show the same result: one hour of care time. However, a child-centric survey will show that three hours of child care are consumed in the first case, but only one in the second case.

Care has many of the features of a household public good. It is not perfectly rivalrous in consumption. In other words, when one adult cares for two children, the care each receives is surely more than half what they would receive if cared for alone. Yet economies of scale, or improvements in efficiency achieved by caring for more than one child at a time, are limited. Care quality is almost certainly diluted as the ratio of children to adults increases. Many time use surveys, including the ATUS and the Child Development Supplement of the Panel Study of Income Dynamics, include questions about who else was present that make it possible to calculate the density of care, or the ratio of adults to children (Folbre et al. 2005). The implications of density, however, are difficult for economists to interpret.⁷ Developmental psychologists need to tell us more about the production function for the creation of happy, healthy, productive adults.

Market Substitutes?

The economic logic of the “third-person principle” is easily misapplied. Families are often willing to purchase child care as a substitute for their own time, but only up to a certain point. Developmental psychologists emphasize infants’ needs to form attachments with primary caregivers. Some studies of the impact of long hours of institutional care on infants suggest that it can have adverse implications on children’s abilities for self-regulation (Brooks-Gunn, Han, and Waldfogel 2002). While these studies are limited by the difficulty of controlling for either

the quality of parental or institutional care, most researchers (and surely most parents) would agree that there is a level of institutional care that is “too high.” Care is an input not only into the capabilities of a child, but into the quality of an adult’s relationship with that child.

The person-specific nature of many care tasks means that no market replacement is a perfect substitute. The hypothetical exercise nonetheless demands consideration of the quality of replacement time. Most estimates of the time cost of parenting—unlike most estimates of the value of housework—rely on opportunity cost—the value of the time that parents reallocate from paid employment in order to care for children, normally proxied by their actual or estimated wage rate (Calhoun and Espenshade 1988; Robinson 1987). Recent estimates focus on the impact of maternal reductions in labor supply not merely on current but on lifetime wages (Budig and England 2001; Joshi 1990; Waldfogel 1997).

Calculation of opportunity cost of time withdrawn from paid employment is an interesting and important exercise, but it is typically used only to capture an estimate of foregone earnings, with no consideration of foregone leisure or household production time diverted from adult consumption. It also provides a better estimate of the value that individual parents place on their own time with children than its social value. In more technical terms, it includes the value of utility a parent derives from a child—a consumers’ surplus. National income accounting is based on market prices, not “willingness to pay.” (For more discussion of this point, see Abraham and Mackie [2004].)

One way to motivate calculation of the “social” rather than the “individual” value of family care time is to consider the metaphor of a family strike. If parents, grandparents, and other family members decided to withhold their care services from children for one day, what would it cost to provide replacement services of comparable quality?

Comparable Quality

Three factors are particularly relevant to the specification of “comparable quality”: density of care, skills of caregivers (partly a function of education and experience), and emotional attachment (partly a function of length and continuity of the care relationship). Comparable den-

sity implies care services at approximately the same level of density currently provided. That is, children could not simply be moved into institutional facilities with a low ratio of adults to children. This condition is easily satisfied by calculation of existing inputs of adult care time.

Comparable skills imply that where skill is likely to make a difference to child outcomes, as in the provision of developmental care, the replacement wage should be calibrated to represent services of similar quality. Parental education has a positive and significant impact on outcomes for children (Grossman 2003; Leibowitz 1973). Parental education does not, however, operate in isolation. Comparable attachment implies that wages should be sufficiently high to elicit a long-term commitment with low turnover rates. High turnover rates of employees in paid child care facilities are generally considered an indicator of low quality (Whitebook and Sakai 2003).

Neither of these conditions of comparable skill and comparable attachment is easily satisfied. While it is clear that parental education benefits children, matching the educational level of parent and parent-replacement for a subset of care tasks offers only illusory precision. It is virtually impossible to estimate the wage that would elicit the desirable level of attachment. As a result, we settle for estimates of replacement cost that do not fully meet the comparable quality criterion, simply assigning different values to forms of care that are in different places on the care continuum.

Table 2.3 lists the wage rates that we assign to different types of care, along with a brief description of the rationale behind each wage rate. These are conservative estimates, ranging from a low of \$5.15 per hour (the federal minimum wage) for supervisory care to about \$25.00 for developmental care. These wage rates are low compared to the average for all paid work in 2003 of \$17.41 per hour.

The Value of Child Care Services

We focus on the valuation of time provided by individuals living in households with children 12 or under, since measures for other categories are even more incomplete.

Application of the wage rates in Table 2.3 to the average hourly amounts of different types of care provided by men and women pro-

Table 2.3 Hourly Replacement Wage Rates for Different Categories of Care (matched with similar occupations)

Type of care	Wage rate (\$ per hr.)	Similar occupation: avg. wage (\$ per hr.)
Supervisory care	5.15	Federal minimum wage
Indirect		
Housework (not combined with supervisory care)	8.00	Maid/janitors: 7.98
Housework combined with supervisory care	12.00	Maid/janitors: 7.98 + 50%
Household management (not combined with supervisory care)	15.00	Mgr. in social and community service: 23.77 – 30%
Household management combined with supervisory care	20.00	Mgr. in social and community service: 23.77
Direct		
Physical care	10.00	Child care worker: 9.00
Developmental care	25.00	Kindergarten teacher: 24.78
Avg. hourly wage across all occupations	17.41	

SOURCE: Pay estimates are from the Bureau of Labor Statistics, 2003.

vided in Table 2.2 are multiplied by 365 to yield annual estimates. The value of the child care time that women in these households provide comes to about \$33,000 per year; the value that men provide to about \$17,100 per year. Since women in these households tend to perform more intensive forms of child care, the average hourly value of their care services is higher than that of men: \$10.27 per hour compared to \$8.61.

One way to assess the validity of these estimates is to compare them with the market value of the closest approximation of the entire package of child care services—a nanny. The Bureau of Labor Statistics does not collect information for this occupational category, but a survey conducted by the International Nanny Association (2004–2005) collected 671 responses.⁸ Since respondents were largely self-selected, the results were probably biased upward. Nonetheless, it is interesting to note that

the average annual pay reported for nannies that did not “live in” and receive part of their pay in the form of rent earned about \$30,680 per year. Considering that employers, for the most part, offered Social Security benefits in addition to wages, and that parents continue to spend considerable time with children even with a nanny on the job, this estimate seems reasonably close to the estimate we offer above of the value of women’s unpaid child care services.

The range of activities that nannies reported among their “duties and responsibilities” also seems consistent with the range included in estimates here: child care (99 percent); driving (78 percent); organization of children’s toys, clothing, and other belongings (77 percent); taking children to play dates (75 percent); laundry (70 percent); and meal preparation (64 percent). The survey also indicates the relevance of a form of supervisory time omitted by the ATUS: 85 percent of surveyed nannies who “lived out” reported that they were paid extra if they were required to stay overnight.

Most women living in households with children ages 12 and younger combine their care work with paid employment but are working for pay on average only 2.7 hours per day (compared to 5.2 hours a day for men). At an average pay of about \$15.56 per hour, women earn, on average \$15,335 per year. The value of their child care services is more than twice as high. The combined value of their paid work and unpaid care services comes to \$48,335. Adding in the value of their non-child-related housework and household management at the same wage rates indicated in Table 2.3 yields an additional value of about \$5,402 per year (far less than the value of their child care services). The total average value of work they perform comes to about \$53,737 per year. Adding men’s average annual earnings of about \$43,198 plus \$2,519 of non-child-related housework and household management to the value of their child care services yields about \$62,817.

Women living in households with children under age 12 are devoting 70 percent of their total work hours to children. Since the replacement value of most of this work is quite low, the overall market value of their total work is low. Inclusion of supervisory care also gives a boost to estimates of the value of men’s total work, since they devote about half of their total work hours to this activity. Again, supervisory care makes men look good. This may be a misleading result, since men are

probably more likely to report children “in their care” when many other adults are present at the same time. Other studies show that fathers are much less likely than mothers to spend time alone with children (Folbre et al. 2005).

DIRECTIONS FOR FURTHER RESEARCH

The concept of a “care continuum” provides a better way of measuring and valuing child care than a simple distinction between primary and secondary care. The ATUS provides an invaluable tool for exploring supervisory and both indirect and direct activities of care. But this tool needs to be sharpened carefully before moving toward efforts to assign a value to unpaid child care as a whole. While some aspects of supervisory care are omitted (such as time that children are sleeping at night), the intensity of supervisory care may be relatively low. We believe that the highest priority for further research is the analysis of the density of care (ratio of adults to children) and its implications for care quality. Other determinants of quality also require concerted interdisciplinary attention.

Probably the most important message of this chapter is that efforts to assign a market value to nonmarket work in the United States should not rely simply on measures of time devoted to housework, household management, and child care. Supervisory child care is quantitatively and qualitatively significant, and the constraints that it imposes on adults’ activities are crucial to any analysis of the interaction between the market and nonmarket sectors of the economy.

Appendix 2A

Detailed ATUS Codes

Corresponding to Table 2.2

1. Supervisory Care

The total amount of in-your-care minus the time overlapped with the following activities:

- 0201 housework
- 0202 food and drink preparation
- 0209 household management
 - 07 consumer purchases
- 0801 child care services
- 0901 household services (not done for self)
- 160103 telephone calls to/from education services providers
- 160107 telephone calls to/from paid child or adult care providers
- 030109 cooking after household children
- 030199 caring for and helping household children, n.e.c.

These are duplicated for nonhousehold children.

2. Housework and Household Management Related to Children

2a. Housework

- 0201 housework
- 0202 food and drink preparation, presentation, and clean-up

2b. Household Management

- 0209 household management
 - 07 consumer purchases
- 0801 child care services
- 0901 household services (not done for self)

The following activities if child is not present:

- 030110 attending household children's event
- 030202 meeting and school conference
- 030203 home schooling of household children

- 030204 waiting associated with household children's education
- 030299 activities related to household child's education, n.e.c.
- 030301 providing medical care to household children
- 030302 obtaining medical care for household children
- 030303 waiting associated with household children's health
- 030399 activities related to household child's health, n.e.c.
- 030108 organizing and planning for household children
- 030111 waiting for/with household children
- 030112 picking up/dropping off household children
- 170301 care-related travel for household child

These are duplicated for nonhousehold children.

- 160103 telephone calls to/from education services providers
- 160107 telephone calls to/from paid child or adult care providers

3. Direct Care

3a. Physical Care

- 030101 physical care for household children
- 040101 physical care for nonhousehold children

The following activities if child is present:

- 030301 providing medical care to household children
- 030302 obtaining medical care for household children
- 030303 waiting associated with household children's health
- 030399 activities related to household child's health, n.e.c.
- 030111 waiting for/with household children
- 030112 picking up/dropping off household children
- 170301 care-related travel for household child

These are duplicated for nonhousehold children.

3b. Developmental Care

- 030201 homework
- 030102 reading to/with household children
- 030103 playing with household children, not sports
- 030104 arts and crafts with household children
- 030105 playing sports with household children
- 030106 talking with/listening to household children
- 030107 helping/teaching household children (not related to education)

These are duplicated for nonhousehold children.

The following activities if child is present:

030108 organizing and planning for household children

030110 attending household children's event

030202 meeting and school conference

030203 home schooling of household children

030204 waiting associated with household children's education

030299 activities related to household child's education, n.e.c.

These are duplicated for nonhousehold children.

Notes

1. A replacement wage estimate is based on what it would cost to hire someone to do comparable work. The NAS report recommends a replacement cost approach rather than an opportunity cost approach based on what the person performing the work potentially could have earned.
2. An example of a child-centric survey is the Child Development Supplement of the Panel Study of Income Dynamics (CDS-PSID), which is analyzed in Folbre et al. (2005). Some estimates of the value of adult time received by children are provided in Folbre (2008).
3. The Swedish per-child family allowance, according to laws implemented in 1999, came to 950 Kronor per child per month. At the exchange rate of \$1 = 7.31 kronor, this comes to \$1,559.50 per year per child (U.S. Social Security Administration 2004). For level of U.S. tax benefits see later discussion, especially Table 2.1.
4. This represents a weighted average of weekdays, Saturdays, and Sundays. Note also that "in your care" time, as defined by the ATUS, excludes time that an adult was engaged in an activity of child care. The two categories are nonoverlapping.
5. Adults living in households with children over the age of 12 are excluded because primary activities of child care could be devoted to these children but "in your care" could not be.
6. In a previous presentation at the American Time Use Early Results Conference in Bethesda, Maryland, in December 2005, we provided a somewhat different characterization of the care continuum, dividing it into two parts, direct and indirect care.
7. A nonlinear transformation of the density of care, such as the square root of the child-adult ratio, could provide a reasonable way of weighting inputs of time, paralleling the economies-of-scale parameters applied in household equivalence scales. But the relationship between density and care inputs probably varies with social context and age of children.
8. International Nanny Association, INA Nanny Salary and Benefits Survey, available on line at http://www.nanny.org/INA_Salary_Survey2.pdf, accessed December 30, 2005.

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Jean Kimmel
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W.E. Upjohn Institute for Employment Research
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