

Time Allocation of Working Mothers with Preschool Children: Juggling Time between Work and Care

Jae Eun Hyun,* Jae Bok Lee,** and Hyunsub Kum***

Abstract: Mothers' labor market participation has increased significantly in Korea. This article explores how working mothers in Korea with children under the age of six allocate their time in order to spend time with children, and what substitutes they rely on when they are unable to provide childcare. Mothers who participate in the labor market have begun to narrow the gap in child-care time between themselves and mothers who are full-time homemakers; they often compensate for insufficient care time during the week by increasing care time on weekends and increasing the quality of time spent with their children. Substitute caregivers include grandparents and, to a much lesser extent, fathers, but the burden of childcare has not been effectively shared within the family, and working mothers continue to face significant time pressure.

Keywords: time use survey, working mothers, labor market participation, time pressure, childcare

INTRODUCTION

In recent years, labor market participation by married women has increased consistently. The employment of women with preschool-aged children is regarded as a "silent revolution" since "the full ramifications of this change remain unclear" (Nock & Kingston, 1988: p.55).

It is well known that marriage, childbirth, and employment require women to change their daily time allocation for housework, childcare, paid work, and leisure

* Jae Eun Hyun is a PhD student in the Graduate School of Public Administration at Seoul National University. E-mail: aile1@snu.com.

** Jae Bok Lee is a PhD student in the Graduate School of Public Administration at Seoul National University. E-mail: amytan1@naver.com.

*** Hyunsub Kum is an associate professor in the Graduate School of Public Administration at Seoul National University. E-mail: hyunsk@snu.ac.kr.

Manuscript received October 10, 2011; out for review October, 2011; review completed July 7, 2012; accepted July 16, 2012.

The Korean Journal of Policy Studies, Vol. 27, No. 2 (2012), pp. 175-201.

© 2012 by the GSPA, Seoul National University

substantially. Among these, engagement in a paid job, which naturally reduces the time they spend on childcare, has been the focus of a number of studies, because care time in early childhood is considered to be particularly important for human capital development (Smeeding & Marchand, 2004).

Many studies have suggested that mothers' labor market participation would have a negative influence on children (Belsky & Eggebeen, 1991; Baydar & Brooks-Gunn, 1991). Bianchi (2000), however, challenged the conventional wisdom that maternal employment has negatively affected the time devoted to children. She presented evidence that mothers who participate in the labor market¹ maximize care time by strategies such as taking a part-time job, decreasing time spent on housework, and increasing fathers' time caring for children. She concluded that child-care time has not been reduced significantly by women's increasing participation in the labor market.

Even though some critics have called for a cautious response to these findings,² this study takes Bianchi's idea as a starting point to examine whether married working mothers make additional efforts to maximize their time with children, and if so, how. For this, it is first necessary to see how much difference there is in care time between working and nonworking mothers. If there is a significant difference, it would be evidence against Bianchi's argument and would also raise the issue of a trade-off between women's participation in the labor market and childcare. If there is not a significant difference, then we can take Bianchi's argument as reasonable and conclude that working mothers do seem to find ways to compensate for their loss of child-care time—but we still need to understand the mechanisms of compensation. Either way, the findings will raise important policy issues regarding the rights of women and children, the social needs of women in the workforce, investment in human capital at an earlier age, and other aspects of work-life balance.

This study addresses the issue of care time from an empirical but descriptive perspective by exploring working mothers' changing patterns of time allocation between work and childcare based on the Korean Time-Use Survey (KTUS) from 1999-2009 researched by National Statistics of Korea. In particular, we focus on

-
1. We use the term of "working mothers" instead of "mothers who participate in the labor market" and "nonworking mothers" instead of "mothers who are full time homemakers" for convenience sake.
 2. Budig and Folbre (2004) pointed out that Bianchi's (2000) study was based on data with a relatively low response rate (34 percent of single mothers and 28 percent of married mothers) and included all households with children under 18 years old without separately classifying children under age six, who require more concentrated care. Furthermore, the number of parents who did not mention any child care activity in their survey diary could have distorted the result.

households with working mothers, especially those with preschool-aged children (under six years old), who need more intensive attention from parents, since those households can best help test the relevancy of Bianchi's argument. Although several studies of parental time spent in childcare have found that the parent's gender affects the outcome (Bryant & Zick, 1996)—in other words, mothers devote more their time to childcare than fathers (Bryant & Zick, 1993; Gershuny & Robinson, 1988; Kooreman & Kapteyn, 1987; Sanik, 1981)—this study focuses not on gender but on how working mothers with preschool children balance work and childcare and how they cope with time pressure.

Because there are only 24 hours in a day, any increase in working hours means a decrease in time spent on other activities, including childcare. Since childcare is so important, however, working mothers need to juggle their schedule to find time for it. Only two options are available: more intensive childcare to compensate for the reduced care time (quality approach), or some kind of substitution such as decreasing the time spent on other activities or increasing the amount of care given by other family members or by paid providers (quantity approach). Questions include whether the amount of care time is reduced, and if so, by how much, and which approach working mothers choose most often to compensate for any reduced care time. To be consistent with Bianchi's argument, we need to find that there is not much reduction in care time for working mothers compared with nonworking mothers, and then to identify changes in time spent on other activities by working mothers or care time provided by other family members.

LITERATURE REVIEW

Study of time use as an area of "new home economics" has been based on "A Theory of the Allocation of Time," an article written by Garry Becker in 1965. He assumed that self-interest-maximizing individuals would make choices that are efficient not only for themselves but also for society as a whole. For example, in the neoclassical theory of time allocation, women's role had been that of nonmarket producers within the home because of their low productivity in the labor market. The conventional division of roles that confined women to housework and men to income earning has been regarded as options representing their interests (Mincer, 1962; Gronau, 1973).

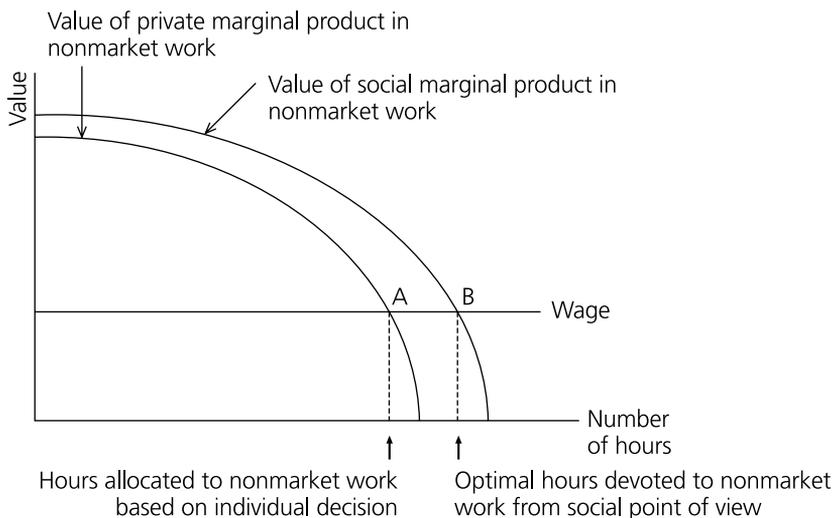
However, Folbre (2004) pointed out the prediction problems causing a systematic misallocation of time which they ignored. First of all, it is impossible to distinguish between the value of childcare and the direct utility derived from the child-care activity

itself. For instance, parents get pleasure from child-care activities such as reading books to their children and playing games with them, in addition to outputs such as children’s cognitive development. Second, a coordination problem easily occurs in family decision making. The bargaining power (that is, income) of individual family members affects decisions about their allocation of time for childcare (Folbre, 1986; Pollak, 1996). Thus, it is difficult to aggregate the preferences of individual family members. Finally, it is hard to recognize “cause and effect in family time allocation”—for example, to correctly identify the direction of correlation between more time devoted to childcare and lower productivity in the labor market. As Folbre (2004) indicated, such difficulties in making clear predictions that are empirically testable has led initial study on time excessively to women’s role in housework and childcare.

This possibility of time misallocation could produce more problems of positive externalities or spillover effects in the aspect of time allocation relevant to production of human capital. That is, as shown in figure 1, the optimal hours(A) spent on nonmarket work (including childcare) based on individual choice tend to be insufficient from the social viewpoint(B).

Time-use data that have recently become available allow us to consider this matter empirically. Substantial data on time use have been built up since the early 1990s—for instance, the American Time Use Survey, the United Kingdom Time-Use Study, the Time-Use Survey in Australia, and the Korean Time-Use Survey (KTUS). This study

Figure 1. Misallocation of Time When Social Returns Are Greater than Private Returns



Source: Folbre (2004), p. 16

uses KTUS data from 1999, 2004, and 2009 to explore how married mothers with preschool-aged children allocate their care time differently as a result of their labor market participation. One of the main questions is whether working mothers are endeavoring to maximize time with children in a more time-pressured situation than nonworking mothers, following Bianchi's argument. In addition, as Budig and Folbre (2004) suggested, this study addresses several limitations in Bianchi's analysis as follows.

1. According to Bianchi, the estimates (from the viewpoint of a child) of the average weekly amount of childcare by working mothers were only four hours less than those for nonworking mothers in 1981 and 1997; working mothers spent 86 percent as much time caring for children under age 13 as did nonworking mothers. Bianchi estimated "lifetime" care—calculated by Zick and Bryant (1996) as the time a mother spends in direct child-care activities for two children until they become 18 years old—by working mothers as 82 percent of care by nonworking mothers. However, these estimates are based on children to age 13 and even 18, while the most intensive care is required during a child's preschool years. Therefore, we restricted our research to married mothers with children under six years old. This reasoning is supported by Bianchi, Wight and Raley (2005), who demonstrated that the younger the children, the more care time is spent, based on analysis of the National Survey of Parents in 2000 and the American Time-Use Survey in 2003. Smeeding and Marchand (2004) pointed out the lack of studies on time devoted to children under the age of three.
2. Bianchi's study does not distinguish between weekdays and weekends. We think that both working and nonworking mothers exhibit significantly different patterns of time-use depending on the day of week. Therefore, we distinguish between weekdays and weekends in our comparisons of time use between working and nonworking mothers. Many studies using a regression model with child-care time as a dependent variable have included the day of week as a dummy variable (Kalenkoski, et al., 2006) or separated the data between weekdays and weekends (Kalenkoski, et al., 2007; Connelly & Kimmel, 2009).
3. We investigated the ways working mothers seek to overcome lack of care time. We analyzed time-use on other activities such as paid work, housework, and leisure as well as childcare.³ Time spent on any one activity is of course unavailable for

3. We separated time spent on sleep and personal care such as eating, dressing, and health care from time spent on "pure" leisure—discretionary and selective consumption time, such as educational, social, religious, and volunteer activities. Gershuny (2000) plotted

other activities. Hence, inspecting all the activities in a day could yield a more comprehensive understanding of how working mothers manage the dual burden of work and care.

4. Another way to address lack of time is to maximize the quality of the time that is available. In this regard, we tried to measure the quality of child care. Bittman et al. (2004) developed “a typology of parental care activity time” according to the level and degree of interaction with children.⁴ Because of the small number of activity codes available in KTUS, we used a simple two-dimensional typology to assess the quality of childcare: emotional care, requiring relatively higher-level interactions and developmental activities such as reading books and playing games, and physical care, demanding face-to-face interaction but less relevant to the development of children’s cognitive and linguistic capabilities—such as feeding, bathing, and changing diapers.
5. Lastly, as a substitute for mothers’ care, we compared childcare provided by fathers and grandparents within the households of working and nonworking married women. A number of studies on care (McLanahan & Sandefur, 1994; Fork, 1995; Bianchi & Robinson, 1997; Robinson & Godbey, 1997; Nock & Kingston, 1988; Kalenkoski et al., 2007) have analyzed the effect of family structure on childcare. Most of them focus on the disparity in time devoted to children among single, cohabiting, and married mothers. This article, however, deals only with families with married mothers, which is more relevant to the typical Korean family structure. By exploring the changing pattern of childcare provided by other family members, we try to draw policy implications for reliable care time and quality service from paid child-care providers.

time use into three categories: paid work, unpaid work, and leisure and consumption time. He considered sleep a fourth, residual category because time for sleep has remained constant over historical time, changing by only a very few minutes per day.

4. Their categories were (1) developmental child care, such as teaching, reading, telling stories, and talking with children, (2) high-contact child care, such as feeding, bathing, dressing, hugging, and soothing, (3) travel and communication, including transportation to school and music and ballet lessons, and (4) low-intensity child care, such as supervising games and monitoring children playing outside.

DATA AND METHODS

Data

This study explored how mothers have juggled their responsibilities to work and family based on data from the KTUS, provided by National Statistics of Korea, which measures the lifestyles and quality of life of Korean citizens by examining how they use their 24 hours a day. It provides basic information on the values of nonmarket goods or services which have remained outside the official system of national accounts. Smeeding & Marchand (2004, p.25) mentioned the importance of time-use data as “the last major under-explored resource in the field of household survey research in many nations.”

The KTUS was conducted three times from 1999 to 2009 at five-year intervals. It includes information on households (residence scale and status and type of living quarters), individuals (position in the household, gender, education, and marital status), and labor market participation (job type, job status, and work hours). The total number of responses⁵ has decreased over time (table 1), as has the number of respondents from households with young children. This pattern is due to the rapidly declining birth rate during the last 10 years in Korea as well as the reduction of the sample size. All the samples of three-wave data selected 15 households each from 850 districts chosen by the systematic sampling method; the response rates were 93.2 percent, 98.3 percent, and 98.1 percent, respectively. Table 1 presents the total number of responses and the number of respondents with children under six years old.

Table 1. Responses to Korean Time-Use Survey

	Total (A)	Mothers with children under age six (B)	B/A (%)
1999	85,906	6,449	7.5
2004	63,268	3,996	6.3
2009	40,526	2,256	5.6

Source: Korean Time-Use Survey, 1999-2009

5. The total number of responses means the total number of time diaries which is written by all the respondents(married women) who have young children under age of six. KTUS makes all the respondents write time diaries for two days. Therefore the number of responses(diaries) is as twice as the number of respondents.

We classified responses into two groups, weekdays and weekends, as table 2 shows.

Table 2. Survey Respondents

		Households with working mothers			Households with nonworking mothers		
		Mothers	Fathers	Grandparents	Mothers	Fathers	Grandparents
1999	Weekdays	1,252	1,252	147	1,961	1,965	159
	Weekends	1,212	1,212	157	2,024	2,020	165
	Total responses	2,464	2,464	304	3,985	3,985	324
	Total households	1,214		147	1,970		151
2004	Weekdays	936	935	130	1,463	1,460	84
	Weekends	614	615	98	983	986	41
	Total responses	1,550	1,550	228	2,446	2,446	125
	Total households	775		101	1,223		56
2009	Weekdays	515	515	37	805	805	57
	Weekends	349	349	45	587	587	31
	Total responses	864	864	82	1,392	1,392	88
	Total households	431		41	696		47

Methods

As already mentioned, working mothers' participation in the labor market reduces the time available for other activities including childcare. This study relies on descriptive analysis to demonstrate the differences in time allocation between mothers who participate in the labor market and those who do not. It also explores child-care time provided by other adult family members and paid care providers in order to shed light on the kinds of efforts working mothers make to maximize the quantity and quality of childcare.

Additionally, this study employed Tobit analysis to explore the differences between working and nonworking mothers and whether the gap in their respective care times has decreased. To discover the factors that affect time devoted to children by working and nonworking mothers, we included variables related to household characteristics, individual characteristics, and substitute care options in the model.

Time for caring for children as a dependent variable is censored at zero, because even a person who does not want to spend any time for caring children cannot spend less than zero minutes. For data with censored dependent variables, "the recorded

values do not represent the entire range of the true underlying variables” (Treiman, 2009, p. 353). OLS analysis on limited dependent variables can underestimate the effects of the true underlying parameter (Maddala, 1992, pp. 343-344). The basic model using Tobit regression is as follows:

$$t_i^* = \beta X_i + \varepsilon_i, t_i = \begin{cases} t_i^* & \text{if } t_i^* > 0 \\ 0 & \text{if } t_i^* \leq 0 \end{cases}, \varepsilon \sim \text{iid}N(0, \sigma^2)$$

where t_i^* is amount of time (in minutes) for childcare by working mothers with children under six years old, and t_i , observed amount of time in real, has a value of zero or higher. X includes (1) household characteristics such as residential district, urban vs. rural location, type of residence, ownership of house, size of house, and family structure, (2) personal characteristics such as age, education level, and number of children (based on data for paid care service only in 1999 and 2004), and (3) the existence of substitute care options such as grandparents living in the same home and paid child-care services.

RESULTS

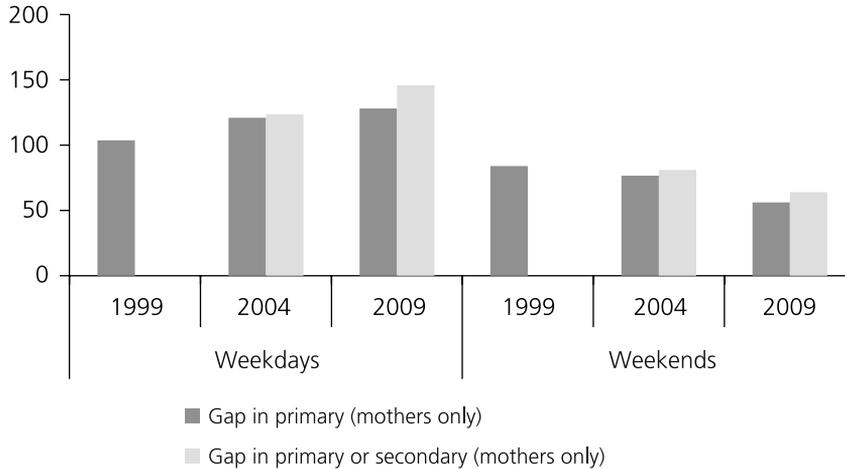
Allocation of Care Time by Working and Nonworking Mothers

Differences in time allocation can include how much time is devoted to childcare in general, and what proportion of leisure time is spent with children.

Time Devoted to Children

Figure 2 shows the gap in care time between the two groups. Although the gap in time spent on weekdays has increased, the rate of that increase has diminished.⁶ In contrast, the gap for weekends has decreased, and the rate of decrease has grown. That

6. We performed t-tests to verify the significance of the difference in care time between various groups, the difference between weekdays and weekends for working and nonworking mothers in each year, the difference between working and nonworking mothers on weekdays and on weekends in each year, and the difference in the gap between working and nonworking mothers whether the day of week is distinguished or not. All the differences except for the difference in 1999 between weekdays and weekends for working mothers are estimated to be significant.

Figure 2. Child-Care Time Gap between Working and Nonworking Mothers (minutes per day)

Note: The 1999 KTUS did not contain information on secondary activities. Care time difference for primary activities in each year is as follows: 104 minutes, 121 minutes, 128 minutes on weekdays, and 84 minutes, 77 minutes, 56 minutes on weekends. Care time difference including secondary activities is as follows: 124 minutes, 146 minutes on weekdays and 81 minutes, 64 minutes on weekends.

suggests that working mothers have allocated their care time intensively on weekends to make up for time lost on weekdays.

Because any change in time spent with children means a change in time spent on other activities, we can identify ways that working mothers maximize time for children by looking at time allocated to other activities. Activities were placed into five categories:

1. *Child-care* time includes only the time devoted to children under the age of six for the purpose of this study.
2. *Housework* time includes preparing meals, cleaning, laundering, and similar activities.
3. *Leisure* time includes only time spent on personal preferences and pleasure such as communication, study, cultural activities, sports, and hobbies.
4. *Sleeping and personal care* time includes time spent on the necessities of physical maintenance, such as sleeping, eating, and personal care.
5. *Paid work time* includes not only work in the labor market but also activities such as farming, fishing, and job searching.

The time spent on the five categories of activities may not add up to exactly 24

hours. Also, because people usually do several things simultaneously, activities are looked at as either primary or secondary. Time diaries required participants to specify the relative importance of different activities. For example, if a woman watched TV while eating fruit and she thought that watching TV was more important, watching TV was recorded as the primary activity and eating fruit as the secondary activity. In the case of childcare, researchers' choice of focus among primary childcare, secondary childcare, and time with children becomes one of the important issues in measuring parental child-care time (Budig & Folbre, 2004).

To investigate how working mothers juggle their time to increase time devoted to caring for children under age six, we compared the pattern of time allocation of working mothers with nonworking mothers. The importance of the role of parents and their time spent with children has become known recently. Therefore, looking at the way nonworking mothers (who have fewer restrictions on their schedule than working mothers) spend time can help to explain the efforts of working mothers to maximize their child-care time.

Table 3 exhibits the pattern of time allocation by nonworking and working mothers during the past 10 years. The overall pattern among nonworking mothers has included a substantial increase in the amount of time spent on childcare, a relatively minor

Table 3. Time Allocation of Nonworking and Working Mothers

		Nonworking mothers				Working mothers			
		1999	2004	2009	ROI*	1999	2004	2009	ROI*
Minutes per day, weekdays	Childcare [†]	183	205	227	23.7%	81	84	99	21.4%
	Housework	271	267	255	-6.0%	166	146	136	-18.1%
	Pure leisure	305	296	255	-16.4%	183	167	139	-24.0%
	Sleeping/personal care	600	601	619	3.1%	581	591	613	5.4%
	Paid work [‡]	-	-	-	-	381	400	395	3.5%
Minutes per day, weekends	Childcare [†]	163	171	179	10.4%	79	94	123	55.7%
	Housework	261	246	249	-4.7%	191	199	201	5.0%
	Pure leisure	321	323	280	-13.0%	234	264	249	6.4%
	Sleeping/personal care	617	648	680	10.1%	605	652	693	14.5%
	Paid work [‡]	-	-	-	-	276	189	125	-54.7%

* ROI means rate of increase. We focus more on ROI than on the absolute amount of time, considering the difference in the amount of time available to working and nonworking mothers.

[†] The differences in care time between working and nonworking mothers in each year are estimated to be significant according to the result of t-tests.

[‡] Nonworking mothers' time spent on paid work was about 11 minutes in 1999, but it decreased to insignificant levels (two minutes on weekdays and one minute on weekends) in 2009. Hence, we excluded the paid work time of nonworking mothers in the analysis demonstrated in this table.

increase in time for sleeping and personal care, and decreasing time for leisure and housework. As Gershuny (2000) pointed out, recent technical advances have lessened the time needed for housework and given more priority to childcare.

An interesting finding regarding time allocation by nonworking mothers in the last 10 years is that they have sacrificed more of their own discretionary leisure time and spent it instead on childcare. This changing pattern may be due to increasing knowledge of the importance of spending time with children, especially during early childhood. A number of studies have suggested the benefits of time spent with children as an investment in human capital (Wolfe & Zuvekas, 1997; England & Folbre, 2000; Milligan et al., 2003). Considering Korean mothers' passion for their children's education, it is easy to understand the increase in child-care time at the expense of mothers' leisure time.

Based on analysis of the pattern of time allocation by nonworking mothers, we can also detect how working mothers have balanced work and child-care time. As table 3 shows, the pattern of time allocation for working mothers is significantly different from that for nonworking mothers, with a clear distinction between weekdays and weekends. Generally, working mothers have drastically increased the time devoted to children under the age of six, and the rate of increase has been high as well. However, the source of the increase varies depending on the day of the week. Time for childcare has mainly been gained, on weekdays, by a decrease in time spent on housework and leisure activities, and on weekends by a decrease in time spent on work.

The time spent by working mothers on leisure activities on weekends is an encouraging change despite the low absolute amount of leisure time. However, housework time has increased on weekends for working mothers, unlike for nonworking mothers. The continued existence of overtime work, although at significantly decreased amounts, and the delay of housework to the weekends, means that working mothers continue to

Table 4. Market and Nonmarket Labor by Working and Nonworking Mothers

		1999		2004		2009	
		Working	Nonworking	Working	Nonworking	Working	Nonworking
Minutes per day,	Paid work	381	9	400	2	395	1
	Unpaid work*	247	454	230	472	235	482
	Total work	628	463	630	474	630	483
Minutes per day,	Paid work	276	10	189	4	125	2
	Unpaid work*	270	424	293	417	324	428
	Total work	546	434	482	421	449	430

* Unpaid work includes both housework and childcare.

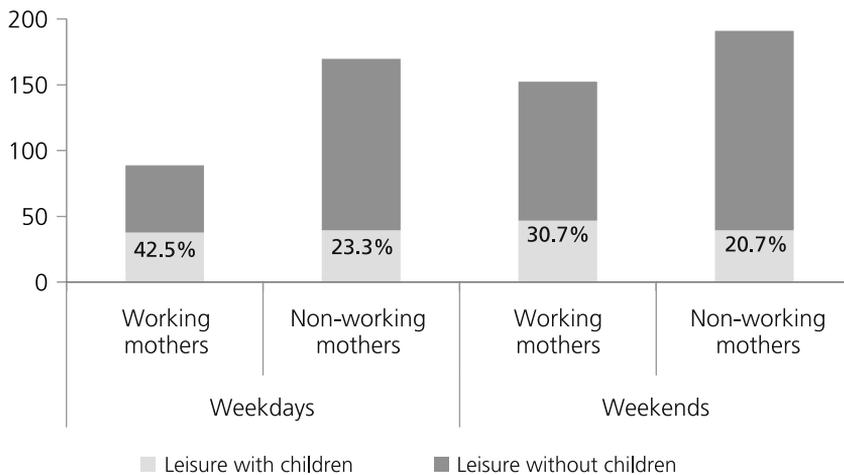
face time pressure even on the weekends. Based on Bittman (2004), who calculated household workload by adding the time spent on paid and unpaid work as a measure of time pressure, we calculated the sum of paid work, housework, and childcare as a measure of time pressure on working mothers. As table 4 demonstrates, this pressure has always been more intense for working mothers than for nonworking mothers.

Leisure Time

One difference between working and nonworking mothers is the way they spend their leisure time. Working mothers have decreased their leisure time to secure time to devote to their children on weekdays, while increasing leisure time on weekends. In contrast, nonworking mothers have consistently decreased their leisure time regardless of the day of the week. Of course, in absolute terms, working mothers generally have much less leisure time than nonworking mothers, hence the increase in working mothers' leisure time during the past 10 years is encouraging in terms of their well-being.

To study working mothers' leisure time more closely, we used information about passive care, which can be extracted from the KTUS data for 2009. Passive care is a concept proposed by Kalenkoski et al. (2007). They measured a more moderate

Figure 3. Time Spent with Children as a Portion of Total Leisure Time (2009, minutes per day)



Note: Pure leisure includes time for communication, watching TV, listening to radio, Internet surfing, going to the theater, taking part in religious activities, walking, playing sports and games, and going on picnics. It excludes time for sleeping and self-maintenance. The rate of time with children to total pure leisure is 38 minutes and 89 minutes on weekdays and 47 minutes and 152 minutes on weekends for working mothers, and 40 minutes and 170 minutes on weekdays and 39 minutes and 191 minutes on weekends for nonworking mothers.

concept of care time that encompasses all time spent with children except for the time spent sleeping, doing paid work, and taking care of other people. Even though mothers have spent leisure time with their preschool-aged children, they might have spent a significant amount of hidden time caring for their children.

Figure 3 shows the differences between working and nonworking mothers in percentage of leisure time spent with children under the age of six. Working mothers spent less leisure time, in absolute terms, on both weekdays and weekends, than nonworking mothers. Meanwhile, the proportion of that time spent with children appeared to be consistently higher for working mothers than for nonworking mothers. This indicates that working mothers try to increase time with their children by sharing their own discretionary leisure time with their children. For instance, working mothers spent 38 of 89 minutes of leisure time with children on weekdays (42.5 percent) and 47 of 153 minutes of leisure time on weekend days (30.7 percent), in contrast to 23.3 percent and 20.7 percent for nonworking mothers respectively.

Although working mothers have made serious efforts to maximize their time with children under six years old, they have spent less time in absolute terms than nonworking mothers have. Working mothers' strategies include trying to improve the quality of childcare time to compensate for the lack of quantity, and trying to find good substitute caregivers. The following section investigates the feasibility of the first strategy.

Quality of Childcare

It is difficult for working mothers to substantially increase the time they devote to their children because of their work obligations. Therefore, they seek other ways to compensate their children for this time deficit (Bittman et al., 2004).

Parents in general, and mothers in particular, may set a minimum amount of time for interaction with their children, and allocate time to other activities accordingly. One way to explore this possibility is to shift the emphasis from quantity of time to quality of time. Bittman et al.'s (2004) typology divided parental care into four categories according to the degree of interaction and importance:

1. *Developmental childcare*: the most important activities for children's intellectual and mental growth, such as teaching, reading, telling stories, playing, and talking with children
2. *High-contact childcare*: activities requiring intimate physical care, such as feeding, bathing, putting children to sleep, soothing, and hugging
3. *Travel and communication*: activities that are less interactive but require close attention, such as transporting children to school, visits, and music and ballet

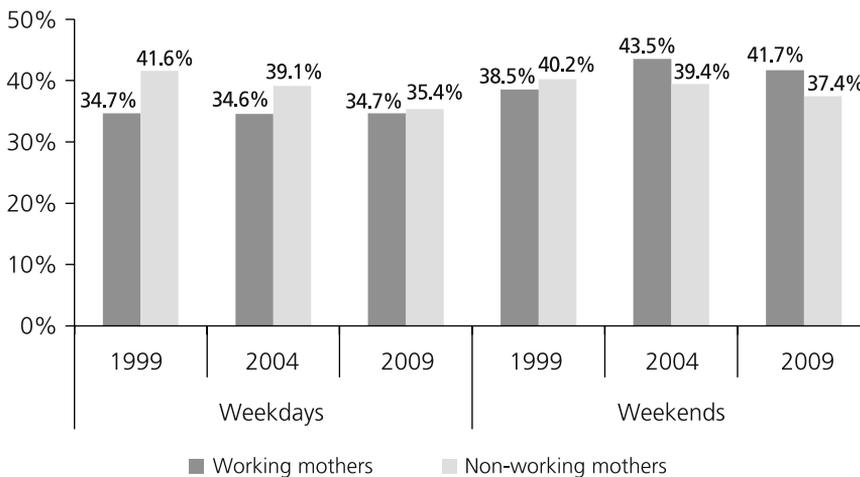
lessons, and time spent waiting

4. *Low-intensity childcare*: activities that involve supervising and monitoring children such as supervising games and recreational activities and monitoring children playing outside

All “engaged” primary activities are not equal in terms of quality (Budig & Folbre, 2004), so researchers should focus on explicitly developmental activities (Bittman et al., 2004). Therefore, we categorized time devoted to children into emotional care and physical care. *Emotional care* involves activities that are more important for the development of children’s cognitive and linguistic abilities, and *physical care* includes activities relevant to children’s health and maintenance such as feeding, dressing, and bathing them and getting them to sleep. Even though physical care relates to children’s health and emotional well-being, we classified it as less developmental. This classification was partially driven by the limitations of the child-care activity classifications in KTUS. We excluded nursing of sick children, and other care activities occupying less than 15 percent of total child-care time, to simplify categorization.

Figure 4 shows time spent on emotional care as a proportion of total care time. The difference between working and nonworking mothers has narrowed for weekdays (from 6.9 percent in 1999 to 0.7 percent in 2009). On weekends, the relative time spent on emotional care has been higher for working mothers than for nonworking

Figure 4. Ratio of Emotional Childcare to Total Childcare



Note: The rate of emotional care to total care appears as follows in each year: for working mothers, 25mins/72mins, 25mins/73mins, 30mins/86mins on weekdays and 29mins/74mins, 39mins/89mins, 47mins/112mins on weekends and for nonworking mothers, 71mins/171mins, 73mins/186mins, 72mins/205mins on weekdays, 62mins/154mins, 65mins/164mins, 64mins/170mins on weekends.

mothers since 2004. The gap has widened slightly, from 4.1 percent in 2004 to 4.3 percent in 2009. Thus, in terms of activities believed to be most relevant to children's cognitive growth, working mothers are catching up with nonworking mothers on weekdays and outstripping them by increasing amounts on weekends. Working mothers are juggling the limited amount of available time to use it more effectively for their children's cognitive development and to improve the quality of childcare—by spending more time with children on weekends and by increasing the proportion of weekend child-care time devoted to developmental activities.

Other Child-Care Resources

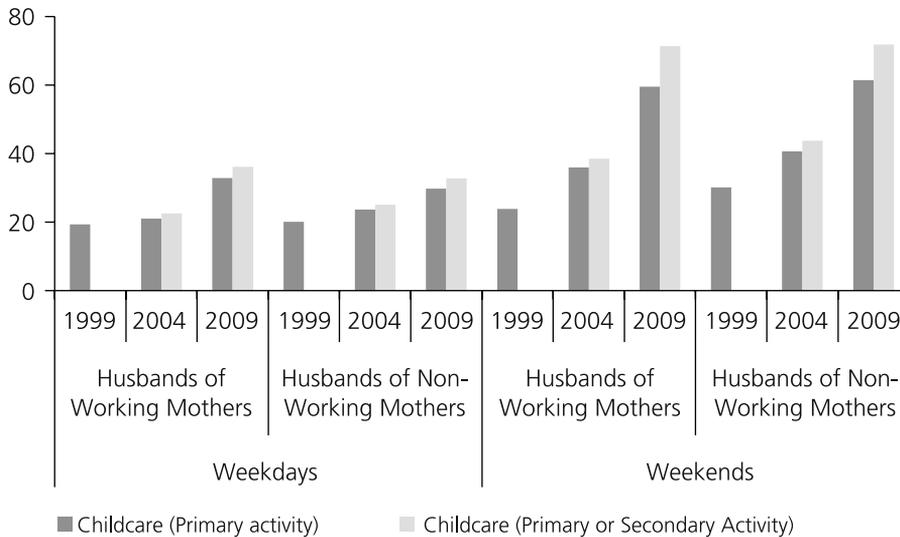
Despite working mothers' efforts to maximize their child-care time, the absolute amount of time that they can spend with their children under six years old is significantly less than for nonworking mothers. Even if working mothers concentrate more on the quality of childcare than nonworking mothers do, the quantity of high-quality child-care time also still matters. Therefore, working mothers may try to find another reliable person to spend time on childcare, and are likely to be more aggressive in this search than nonworking mothers. Alternate providers of childcare include fathers, grandparents, and paid child-care providers.

Fathers

Many studies have observed that fathers share a considerable portion of childcare. Bianchi (2000) argued that in spite of maternal employment, total child-care time by parents has not decreased as a result of the increase in father's child-care time. Those results commonly imply the possibility of substitution of childcare by co-resident fathers. Another interesting finding is that single mothers spend more time with children than married or cohabitant mothers because single mothers are conscious of their lack of child-care substitutes (Sandberg & Hofferth, 2001). We divided fathers of preschool-age children into two categories: husbands of working mothers and husbands of nonworking mothers (figure 5).

Unlike many other studies, our analysis suggests that the husbands of working and nonworking mothers have shown no significant difference in the time devoted to children. On weekdays, husbands of working mothers have increased the time devoted to children (as a primary activity) about 69.8 percent (from 19 minutes to 33 minutes) during the past 10 years. Husbands of nonworking mothers show an approximately 48.2 percent increase (from 20 minutes to 30 minutes) for the same period. On weekends, care time spent by husbands of working mothers has increased about 149.7

Figure 5. Husbands' Time Spent on Childcare (minutes per day)



Note: The KTUS did not have information on secondary activities for 1999. Father's care time as primary activities in each year is as follows; 19 mins, 21 mins, 33 mins on weekdays and 24 mins, 36 mins, 60 mins on weekends for husbands of working mothers, 20 mins, 24 mins, 30 mins on weekdays and 30 mins, 41 mins, 61 mins on weekends for husbands of nonworking mothers. Care time including secondary activities is as follows; 23 mins, 36 mins on weekdays and 38 mins, 71 mins on weekends for husbands of working mothers and 25 mins, 33 mins on weekdays and 44 mins, 72 mins on weekends for husbands of nonworking mothers.

percent (from 24 minutes to 60 minutes), while husbands of nonworking mothers increased child-care time about 103.6 percent (from 30 minutes to 61 minutes).

Even though the husbands of working mothers have shown a bigger rate of increase than husbands of nonworking mothers, the absolute quantity of time they have devoted is too small to have a significant meaning for their children. The pattern remained similar even when we included secondary activities. Contrary to our expectations, the husbands of working mothers have not been more helpful in caring for children than the husbands of nonworking mothers.⁷ This result implies the possibility of another “mother substitute” within the household who can be more devoted to caring for children under six years old: grandparents.

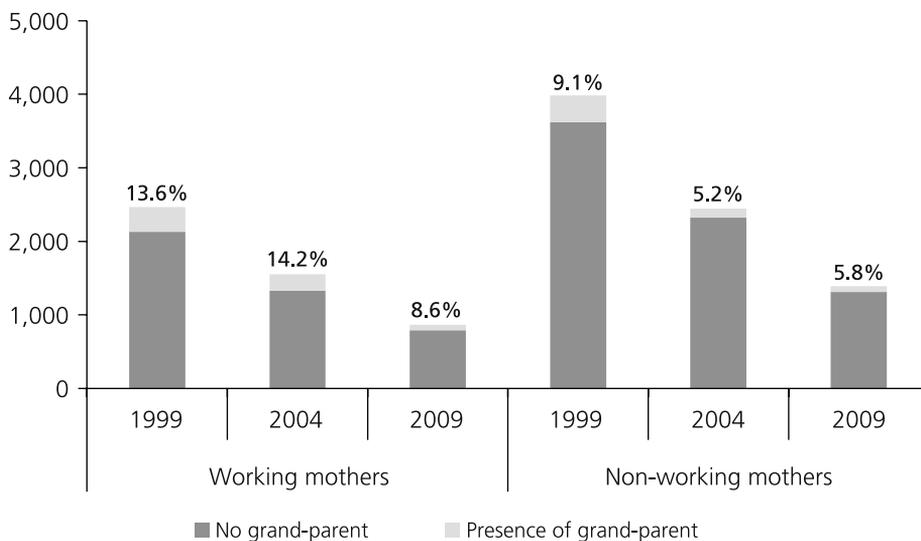
7. To examine whether the husbands of working mothers spend more time on passive care than the husbands of nonworking mothers, we compared the time spent on care by the two groups. That is, we tried to track fathers' time devoted to children, which is hidden inside of mothers' care time. However, the gap between husbands of working and nonworking mothers varied only in the insignificant amount of one to six minutes.

Grandparents

We assume that parents or parents-in-law of working mothers could spend a good amount of time caring for children instead of mothers or fathers. In spite of an obvious trend toward nuclear families, there still exists a noticeable proportion of three-generation households in Korea.⁸ Figure 6 demonstrates the number of households of working and nonworking mothers living with and without grandparents. Considering the disparity between households with nonworking and working mothers, we focused on the relative rate of big families rather than on their absolute number.

As suggested in figure 6, the proportion of extended families has decreased for both types of household, except for a slight (0.6 percent) increase in 2009 for the households of nonworking mothers. In spite of this trend, the proportion of households with grandparents is always higher for working mothers' families than nonworking mothers' families. That implies the possibility that working mothers need grandparents to live in the same household to provide care for their children more than nonworking mothers do, or that living with grandparents allows mothers to work in a paid job by

Figure 6. Households with and without Grandparents (1999-2009)



Note: The numbers of diaries reported in the households with : without grandparents in each year are as follows: 335:2129, 220:1330, 74:790 for households with working mothers and 363:3622, 126:2320, 81:1311 for households with nonworking mothers.

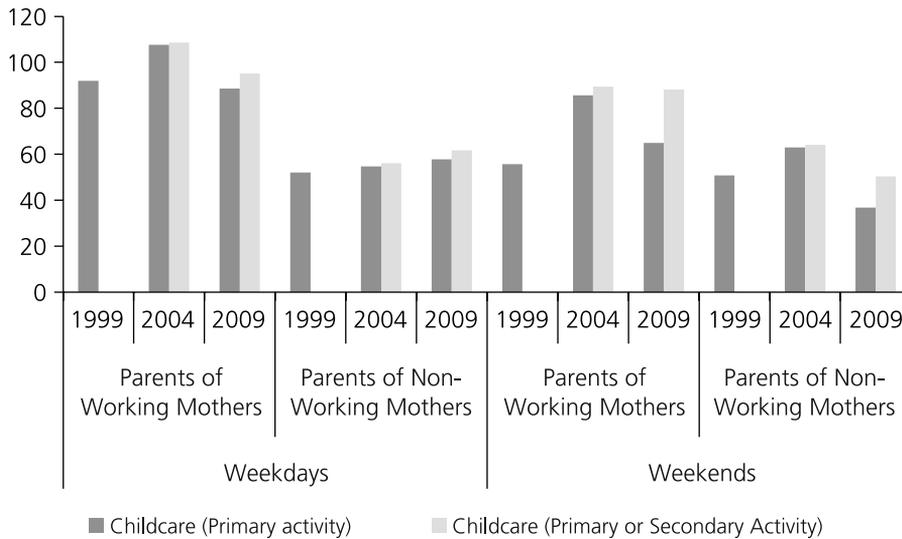
8. Many grandparents live nearby in order to help care for their grandchildren. But in this study, they were excluded from analysis if they did not live in the same household.

reducing the burden of childcare or housekeeping.

Figure 7 presents the amount of care time spent by grandparents in households with working and nonworking mothers according to the day of week. Despite fluctuations during the past 10 years, care time provided by grandparents has always been greater in households with working mothers than in households with nonworking mothers.⁹ The gap between the two groups widened to 53 minutes maximum for weekdays in 2004. This suggests that working mothers seek the help of grandparents as reliable mother substitutes.

However, the analysis so far has demonstrated that working mothers need more support from family members. In this regard, fathers in households with working

Figure 7. Grandparents' Time Spent on Childcare (1999-2009, minutes per day)



Note: The KTUS did not have information on secondary activities for 1999.

Grandparents' care time as primary activities in each year is as follows: 92 mins, 108 mins, 89 mins on weekdays and 56 mins, 86 mins, 65 mins on weekends for grandparents in the households of working mothers, 52 mins, 55 mins, 58 mins on weekdays and 51 mins, 63 mins, 37 mins on weekends for grandparents in the households of nonworking mothers. Care time including secondary activities is as follows: 109 mins, 95 mins, 62 mins on weekdays and 89 mins, 88 mins on weekends for grandparents in the households of working mothers and 56 mins, 62 mins on weekdays and 64 mins, 50 mins on weekends for grandparents in the households of nonworking mothers.

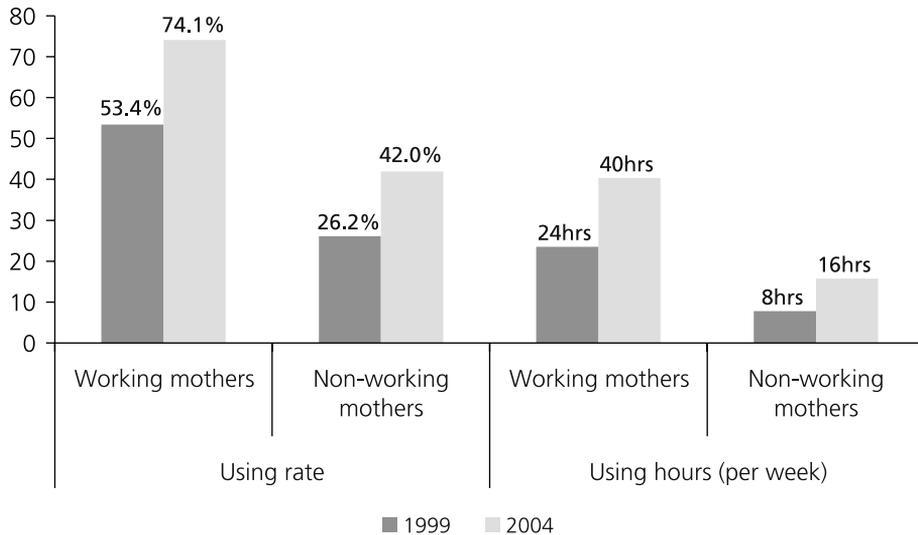
9. Grandparents living in households with working mothers have always spent more time on child care than grandparents in households with nonworking mothers. Even though the issue of grandparents' time-use patterns is far removed from our study question, it would be worth further investigation. For example, a time analysis including grandparents who are not living in the household might give a clearer picture of their help in child care.

mothers have not shared the burden of childcare much, and grandparents have decreased the time spent with their grandchildren over the last five years.¹⁰ This implies that the time pressure on working mothers has not been alleviated by family members and has even intensified.

Paid Child-Care Providers

Other child-care strategies for working mothers include hiring a babysitter or sending their children to a day care center. Both of these options cost money. Figure 8 shows that the use of paid child-care providers appears to be higher among working mothers than among nonworking mothers—in terms of absolute quantity as well as the rate of increase. However, this option is becoming common in both groups and is expected to play an important role in the near future.¹¹ If family policy is to enhance work-family

Figure 8. Use of Paid Child-Care Providers (1999-2004)



Note: The 2009 KTUS contains no information on whether the respondents leave their children in the care of an individual or an institution. Thus, this figure shows the results for 1999 and 2004 only.

10. Unfortunately, the reason for the recent decrease cannot be found in the data of KTUS.
11. Bianchi (2000) pointed out the change in the standards for good mothering and the change in the percentage of children ages three to five enrolled in preprimary educational programs. The rapid increase in preprimary-school enrollment has appeared not only in families with working mothers but also in those with nonworking mothers. In Korea, as well, the interest of parents with children under six years old in preprimary educational program has

compatibility and balance, it will need to focus more on improving the quality of childcare provided by paid providers. The problem is whether the quality of paid childcare can be guaranteed.

Results of Tobit Analysis

We used Tobit analysis to show which factors influenced mothers’ allocation of time to childcare, based on the time diaries kept by working and nonworking mothers for the KTUS (table 5). Despite several changes in the variables researched in each

Table 5. Tobit Analysis Regression on Child-Care Time (1999-2004)

Variable	1999		2004		2009	
	Nonworking mothers	Working mothers	Nonworking mothers	Working mothers	Nonworking mothers	Working mothers
Intercept	494.82***	287.67***	440.53***	220.08***	314.79***	260.15
Age	-7.56***	-6.42***	-7.02***	-3.30***	-5.86***	-2.78***
High school	-23.72***	-14.50**	-28.08***	-18.07***	-34.51***	-15.91
Middle school	-28.15**	-22.37**	-62.12***	-34.74**	-88.33**	28.56
Elementary school	-16.27	16.69	-14.97	-40.22	-34.01	-52.14
Mother’s income				-4.00**		-7.79***
Number of children					53.12***	36.08***
Number of 1- to 3-year-olds	3.24	9.65	-12.52	23.24**		
Number of 4- to 6-year-olds	-3.14	0.17	3.24	9.93		
Weekends	-21.89***	-2.61	-34.42***	10.69	-50.93***	23.81***
Paid care service	-27.83	-9.26	-42.17***	-47.74***		
Father’s income			-2.65	2.36	-0.75	1.15
Grandparents	24.84**	-13.50	30.10	-21.17**	26.66	22.06
Log likelihood	-24,035	-12,785	-15,108	-8,732	-8,529	-4,946
Number of observations	3,985	2,464	2,446	1,550	1,392	864

Notes: Table reports selected coefficient estimates from Tobit regression on child-care time. Estimates of the remaining coefficients are reported in the Appendix. The numbers for 1- to 3-year-olds and 4- to 7-year-olds only include children using paid care service. Data researched in 2009 do not include information on the use of paid care service for preschool children. Data researched in 1999 have no information on respondent’s income.

*p < 0.01; **p < 0.005; ***p < 0.001

increased rapidly, so various kinds of preprimary institutions have sprung up. This trend could be one of the reasons that nonworking mothers are using institutional care at a more rapidly increasing rate than working mothers.

survey, the overall pattern of differences in time allocations between the two groups supports the results discussed in the previous sections.

First, table 5 shows that the sign of weekend estimate of working mothers is positive while that of nonworking mothers is negative. This implies that working mothers intensified child-care activity on weekends compared to weekdays consistently and significantly in 2009. On the contrary, nonworking mothers reduced the time devoted to children on weekends. This changing pattern is consistent with the finding that working mothers tend to compensate for lack of care time on weekdays by spending more time with their children on weekends.

Second, this table shows how fathers and grandparents, two possible child-care substitutes, have influenced mothers' child-care time for 10 years. It indicates that grandparents living in the household substituted significantly for working mothers in childcare until 2004. However, grandparents have increased child-care time in families with nonworking mothers. The fact that both estimates became insignificant in 2009 indicates that grandparents are losing their role as child-care substitutes within the household.

Another interesting result is that fathers take a similarly insignificant part in taking care of their children regardless of the amount of money they earn. Even fathers who have no means of economic support and plenty of free time do not spend more time on childcare. In contrast, mother's income is negatively related to the time devoted to children.

Paid care service replaced working and nonworking mothers' care time significantly in 2004. From this result, we can expect the role of paid child-care providers to be more important in the future despite the lack of relevant information in the 2009 survey.

Age, education, number of children, and age of children served as control variables. Curiously, the education level variable, for which the reference group is people with a university diploma, shows that the more educated mothers are, the more time they tend to spend with their children. Also, mothers' child-care time increases as the number and age of the children increases.

CONCLUSION

This paper was influenced by Bianchi's (2000) study, which suggests that with the dramatic rise in mothers' labor market participation, mothers, especially married women with young children, have sought ways to compensate for lost child-care time. However, unlike that study, which focused on evidence that maternal employment has insignificant effect on the total amount of childcare time, we focused on how working

mothers have juggled their time to increase time devoted to preschool children, using KTUS data from the period 1999-2009. Moreover, as Budig & Folbre (2004) pointed out, Bianchi's dataset had a relatively low response rate, and she focused on children up to the age of 18. We organized the KTUS data more systematically, restricting our research to married mothers with children under six years old, and distinguishing between time allocation on weekdays and weekends. We not only analyzed the overall pattern of activities within a day but also measured the quality of childcare as evidence of working mothers' efforts to maximize care time.

This analysis demonstrated that working mothers make various efforts to compensate for the reduced time they have to care for their children under the age of six. They decreased time spent on housework and leisure activities on weekdays and decreased time spent on paid work on weekends. They increased the time spent with their children on weekends in terms of both quantity and quality.

The child-care burden has not been effectively shared with other household members. Time spent on childcare does not appear to differ significantly between husbands of working and nonworking mothers. That is, fathers are sharing the burden of childcare unequally with working mothers. Furthermore, grandparents living with working mothers have decreased their time spent with children since 2004.

These results suggest that as married women's participation in the labor market has increased dramatically, the time pressure they face is growing. Despite working mothers' efforts to increase the quantity and quality of their child-care time, the support of their family members does not seem to be sufficient. Considering the child-care costs of married women, time devoted to children would be under-produced at the social optimal level from the perspective of time misallocation theory. In addition, quite a number of married women could misallocate their time negatively by delaying childbirth, not having another baby, or even leaving the job market.

In this respect, policy makers should be concerned about the time use patterns shown in this paper. Children need a mother's care more when they are young. Substitute care has been insufficiently provided by family members but is being gradually replaced by paid care services. For family policy to alleviate time pressure on working mothers and enhance work-family compatibility, it has to assist not only working mothers but also their family members by improving the quality of childcare by paid providers, whose role has been consistently increasing.

More studies on the determinants of child-care time and time patterns, including housework, paid work, and leisure activities, are required in the near future. Moreover, successive studies based on further accumulating data will be a key to informing family policy decisions.

REFERENCES

- Baydar, N. & Brooks-Gunn, J. 1991, Effects of Maternal Employment and Child-Care Arrangements on Preschoolers' Cognitive and Behavioral Outcomes: Evidence From the Children of the National Longitudinal Survey of Youth, *Developmental Psychology*, 27(6):932-945.
- Belsky, J. & Eggebeen, D. 1991 Early and Extensive Maternal Employment and Young Children's Socioemotional Development: Children of the National Longitudinal Survey of Youth. *Journal of Marriage and the Family*, 53(4):1083-1098.
- Becker, G. S. 1965. A Theory of the Allocation of Time, *The Economic Journal*, 75: 493-517
- Bianchi, M. S. 2000. Maternal employment and time with children: Dramatic change or surprising continuity? *Demography*, 37(4): 401-414.
- Bianchi, M. S., & Robinson, J. 1997. What did you do today? Children's use of time, family composition, and the acquisition of social capital. *Journal of Marriage and the Family*, 59: 332-344.
- Bianchi, M. S., Wight, V., & Raley, S. 2005. *Maternal employment and family caregiving: Rethinking time with children in the ATUS*. Paper presented at the American Time Use Survey Early Results Conference, Washington, DC, December 8-9, 2005. Retrieved from August, 2011. <http://www.atususers.umd.edu/papers/atusconference/authors/Bianchi.pdf>.
- Bittman, M. 2004. Family time. In N. Folbre (ed.), *Parenting and employment: What time-surveys show* (pp. 152-170). New York: Routledge.
- Bittman, M., & Wajcman, J. 2000. The rush hour: The character of leisure time and gender equity. *Social Forces*, 79(1): 165-189.
- Bittman, M., Craig, L. & Folbre, N. Family time. In N. Folbre (ed.), *Packaging care: what happens when children receive nonparental care?* (pp. 133-151). New York: Routledge.
- Bryant, W. K., & Zick, C. D. 1993. Trends in time spent caring for children: 1924-31 vs. 1981. *Proceedings of the American Statistical Association's 1993 Winter Conference*, 401-409.
- _____. 1996. An examination of parent-child shared time. *Journal of Marriage and the Family*, 58: 227-237.
- Budig, M. J. & Folbre, N. 2004. Family time. In Folbre, N. (ed.), *Activity, Proximity, or Responsibility? Measuring Parental Childcare Time* (p. 51-68). New York: Routledge.
- Connelly, R., & Kimmel, J. 2009. Spousal influences on parents' non-market time choices. *Review of Economics of the Household*, 7 (4): 361-394.

- England, P. & Folbre, N. 2000. Reconceptualizing Human Capital, In W. Raub and J. Weesie (eds), *The Management of Durable Relations*, Amsterdam: *Thela Thesis Publishers* (pp. 126-128)
- Folbre, N. 1986. Hearts and Spades: Paradigms of Household Economics, *World Development*, 14: 245-255.
- _____. 2004. Family times. In Folbre, N. (ed.), *A theory of the misallocation of time* (pp. 7-24), New York: Routledge.
- Folk, K. F. 1995., Single Mothers in Various Living Arrangement: Differences in Economic and Time Resources, Working Paper No. 1075-95., Institute for Research on Poverty. Madison, WI: University of Wisconsin-Madison.
- Gershuny, J., & Robinson, J. 1988. Historical changes in the household division of labor. *Demography*, 25: 537-552.
- Gershuny, J. (2000), *Changing Times: Work and Leisure in Postindustrial Society*, New York: Oxford.
- Gronau, R. 1997. Leisure, home production, and work—the theory of the allocation of time revisited. *The Journal of Political Economy*, 85(6): 1099-1124.
- Kalenkoski, C. M., Ribar, D. C, & Stratton, L. S. 2006. Parental Child Care in Single Parent, Cohabiting, and Married Couple Families: Time Diary Evidence from the United States and the United Kingdom. The Levy Economics Institutes Working paper no.440. Annandale-on Hudson, NY: The Levy Economics Institutes of Bard College, February.
- _____. 2007. The effect of family structure on parents' child care time in the United States and the United Kingdom. *Review of Economics of the Household*, 5(4): 353-384.
- Kooreman, P., & Kapteyn, A. 1987. A disaggregated analysis of the allocation of time within the household. *Journal of Political Economy*, 95(2): 222-249.
- Lundberg, S. & Pollak, R. A. 1996. Bargaining and Distribution in Marriage. *Journal of Economics Perspectives*, 10: 139-158
- Maddala, G. S. 1992. *Introduction to econometrics*, 2nd edition. New York: Macmillan.
- McLanahan, S., & Sandefur, G. 1994. *Growing up with a single parent*. Cambridge, MA: Harvard University Press.
- Milligan, K., Moretti, E., & Oreopoulos, P. 2003. Does Education Improve Citizenship? Evidence from the U.S. and the U.K. NBER working paper no.9584. Cambridge, MA: National Bureau of Economic Research, March.
- Nock, S. L, & Kingston, P. W. 1988. Time with children: The impact of couples' work-time commitments. *Social Forces*, 67(1): 59-85.
- Robinson, J. P., & Godbey, G. 1997, *Time for Life: The Surprising Ways Americans*

- Use Their Time*, University Park, PA: The Pennsylvania State University Press.
- Sandberg, J. F. & Hofferth, S.L. 2001. Changes in Children's Time with Parents: United States, 1981-1997. *Demography*, 38: 423-436.
- Sanik, M. M. 1981. Division of household work: A decade comparison—1967-1977. *Home Economics Research Journal*, (10): 175-180.
- Smeeding, T. M., & Marchand, J. T. 2004. Family time. In Folbre, N. (ed.), *Family time and public policy in the United States* (pp. 25-48). New York: Routledge.
- Treiman, D. J. 2009. *Quantitative data analysis: Doing social research to test ideas*. San Francisco: Jossey-Bass.
- Wolfe, B. & Zuvekas, S. 1997. Nonmarket Outcomes of Schooling, *International Journal of Educational Research*, 27(6): 491-502.
- Zick, C.D. & Bryant, W.K. 1996. A New Look at Parents' Time Spent in Child Care : Primary and Secondary Time Use. *Social Science Research*, 25(3): 260-280.

APPENDIX

Table A1. Additional Coefficient Estimates from Tobit Regression

Variable	1999		2004		2009	
	Nonworking mothers	Working mothers	Nonworking mothers	Working mothers	Nonworking mothers	Working mothers
Region 1	-1.61	-7.44	-21.07	27.01	-6.78	5.09
Region 2	-10.37	-2.85	-15.30	5.08	7.77	-2.01
Region 3	-10.46	-0.63	-32.72	17.48	-9.56	12.94
Region 4	-5.91	-28.64	-13.54	-2.75	-14.96	-5.36
Region 5	-16.30	-16.76	-26.89	-1.09	-15.43	-55.21
Region 6	-19.59	10.64	-29.79	11.37	-6.71	-6.76
Region 7	-5.24	17.95	-41.46	-17.81	33.44	-20.67
Region 8	-7.73	9.27	-21.93	5.25	2.61	11.90
Region 9	8.02	5.29	-8.62	8.83	-28.51	-28.56
Region 10	-13.47	2.86	0.71	19.67	-8.01	4.98
Region 11	-12.48	9.33	7.74	13.89	5.97	-18.30
Region 12	1.41	1.81	-10.76	-5.60	39.86	-33.24
Region 13	6.09	-1.04	-59.57	0.43	11.16	-16.62
Region 14	-1.38	2.79	-2.93	-7.44	23.65	-14.88
Region 15	-21.01	0.63	-13.94	-8.60	27.09	1.94
Urban household	9.86	5.16	-5.02	34.09**	34.69	-28.37
Size of house	-0.29**	0.11	0.01	-0.23	0.03	-0.01
Detached house	-31.16	-31.29**	24.83	-21.23	-34.71	-60.50
Apartment	-27.05	-52.22***	33.54	-10.25	-24.55	-42.88
Row house	-33.80	-50.47***	27.62	-25.01	-21.38	-74.22
Multiplex house	-21.69	-43.13**	27.52	3.61	21.86	-64.04
Lease	15.67**	12.06	16.21*	0.04	15.16	8.43
Monthly rent	5.23	-11.01	9.09	-12.40	-0.77	-7.27
Free housing	17.01	21.54	-8.28	20.86	11.46	-14.13

Notes: The numbers for 1- to 3-year-olds and 4- to 7-year-olds only include children using paid care service. Data for 2009 do not address the use of paid care service for preschool children. Data for 1999 have no information on respondent's income. The reference group of house type is the others, one of ownership of house is own house group, and one of education level is university diploma group.

*p < 0.01; **p < 0.005; ***p < 0.001