Time Allocation of Parents and Investments in Sons and Daughters*

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Abstract:

Several studies of parental time allocation have found that fathers spend more time with sons than daughters, while mothers devote roughly equal amounts of time to boys and girls. In this paper, we use time diaries from the American Time Use Survey and the PSID Child Development Supplement to test whether this pattern, which translates into a greater investment of parental time in boys, results from gender bias in parental preferences or from boy-girl differences in child production functions. We confirm the result that boys receive significantly more paternal time than girls and that, in families with same-sex siblings, girls are not compensated by more direct time with their married mothers. The 'production function' hypothesis that boys require more parental time receives little support, relative to an explanation based on parental preferences for spending time with a same-sex child. Single mothers spend more time with daughters relative to sons, though if boys require more parental time they should be compensating for the absent parent. However, fixed-effects estimates indicate that, within families with both boys and girls, parental time is equalized in both single- and two-parent households. We also find that same-sex parent-child time in stereotypically gendered activities is pervasive and becomes increasingly evident in the teen years.

I. Introduction

In many developing countries, parental son preference is openly acknowledged and has measurable consequences for child well-being. Strauss and Thomas (1995) find that girls in South Asia are disadvantaged in their access to nutritional and health inputs and, in some countries, sex-selective abortion has substantially increased the ratio of young boys to young girls as ultrasound has become more widely available (Park and Cho, 1995). In most developed countries, however, there is little apparent gender discrimination in parental investments in children: boys and girls receive equivalent education, bequests, and transfers (Taubman, 1991). Since son preference is linked to cultural norms that place a higher value on having sons relative to daughters, such as a reliance on male children for old age support, it is not surprising that increasing economic gender equality in industrialized societies should lead to more equal treatment of sons and daughters. Meadows *et al.* (2005) survey a wide variety of quality-of-life indicators for boys and girls in the United States, and find that overall levels of wellbeing are equivalent.

However, a substantial body of research has documented consistent discrepancies between the behavior of parents of sons and parents of daughters in wealthy, non-traditional societies—child gender appears to have a significant effect on outcomes ranging from the marital status of mothers (Dahl and Moretti, 2004) and paternal happiness (Kohler *et al.*, 2004) to parents' political views (Oswald and Powdthavee, 2005). The effect of child gender on the time allocation of parents is particularly well-documented. Fathers spend more time with sons than with daughters (Yeung *et al.*, 2001; Price, 2006), and more time with their children if at least one of them is a son (Harris and Morgan, 1991; Mammen, 2005). Several recent studies (e.g., Lundberg and Rose, 2002; Choi, Joesch, and Lundberg, 2007) have also found that men in industrialized nations, including the U.S., increase their market work hours more after the birth of a son, relative to a daughter. What remains unclear is the source of these wide-ranging parental responses to child gender—they can be explained in terms of gender bias in parental preferences (e.g., fathers prefer boys) or as the result of boy-girl differences in child production functions (e.g., boys need fathers, or boys demand more time in general).[1] Different sources of

[1] These competing hypotheses, as well as the empirical evidence on child gender effects, are further discussed in Lundberg (2005b). Pabilonia and Ward-Batts (2007) examined which of these alternative hypotheses could explain

the bias will have different implications for both child outcomes and for resource allocation in households more generally. For example, if fathers prefer boys but mothers do not, then the household bargaining position (and access to resources) of mothers of sons may be greater than that of mothers of daughters.

In this paper, we use two recent sources of time-use data to investigate differences in investments of parental time in sons and daughters aged 0 to 17 years in the United States, and the possible motivations for such differences. The new American Time-Use Survey (ATUS) collects a daily time diary from one individual (aged 15 or over) in a representative sample of U.S. households beginning in 2003. These diaries allow us to document the time allocation of parents in more detail than has previously been possible with U.S. data, including not only time with children and in market work, but also in leisure and housework. The Child Development Supplement of the Panel Study of Income Dynamics (PSID-CDS) provides time diaries for children aged 0 to 12 years in 1997 and aged 6-18 in 2003, including the time spent interacting with, and in the presence of, parents for a detailed set of activities. With these data, we can examine not only the relative quantities of time mothers and fathers spend with sons and daughters, but also how this time is spent.

Previous studies using ATUS (Mammen, 2005; Price, 2006) and PSID-CDS (Yeung *et al.*, 2001) have found that fathers spend more time with sons than with daughters. Our goal in this paper is to use more extensive information about parental time use and the nature of parent-child activities to examine the possible sources of child gender differences in parental time investments. We do this by: 1) estimating the effects of child gender on mothers' and fathers' non-childcare time to see who bears the cost of boys' greater parental time, 2) comparing the time use choices of single mothers and married parents, and 3) disaggregating parental time with children into distinct activities.

From both the child time diaries of PSID-CDS and the adult time diaries of ATUS, we confirm that married fathers[2] do indeed spend more time with sons than with daughters, and that much of this additional time is spent in sports and recreational activities. However, we find no

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U.S. differences in labor supply behavior by controlling for immigrant status/Asian interacted with a son indicator because immigrants are more likely to have a tradition of son preference than native born. They found some evidence that immigrant fathers, and particularly Asian fathers, work less relative to white fathers if they have a son rather than a daughter. This finding is consistent with these fathers having a greater desire to spend time with their sons.

[2] While we examine the time-use of single mothers, we will not examine the time-use of single fathers due to small sample sizes.

evidence that mothers of sons benefit in the form of increased leisure or reduced housework. Single mothers with only girls spend more time with their children than single mothers with only boys, which suggests that parental preference on the part of these mothers is more important than the time requirements of boys versus girls. In families with both boys and girls, however, a strict gender neutrality is maintained—single mothers do not favor daughters, and the increased time of married fathers with sons is offset by increased time of married mothers with daughters.

Overall, we find in child time diaries that same-sex parent-child time in stereotypically gendered activities is pervasive and becomes increasingly evident in the teen years. Mothers of young daughters in the PSID-CDS spend more direct time with daughters than sons—most of it in housework and shopping—while PSID-CDS fathers spend more time with young sons in sports and TV-watching. The same patterns appear, and are even more pronounced, in the ATUS teen diaries. It is difficult to disentangle the motives for this strong association between gender specialization in household activities and parent-child time. Parents may particularly enjoy sharing activities with a same-sex child, and this enjoyment may be reinforced by the sense that they are contributing to tastes and skills appropriate to that child's future social and economic roles. However, two key results--that mothers do not appear to share the costs of investing more parental time in boys, and that single mothers do not compensate sons for lost paternal time—suggest that parental preferences dominate gender-specific child production requirements as an explanation for fathers' increased time with sons.

II. The Effects of Sons and Daughters on Parental Behavior in the U.S.

Recent research by sociologists and economists has found significant, but generally small, differences between the behavior of parents of sons and parents of daughters in industrialized countries. Lundberg (2005) reviews the empirical evidence for child gender effects on marital and relationship stability, fertility, and the time allocation of parents. Boys are more likely to live with their father than are girls, both because their parents are more likely to marry or stay married, and because paternal custody of boys is more common following divorce. Using U.S. data, Lundberg and Rose (2003) find that an unmarried mother is more likely to marry the father of her child following the birth of a boy, and Dahl and Moretti (2004) report that a first-born son has a positive effect (2.6 percent) on the probability that his mother has ever been married. Fathers have been found to spend more time with, and to be more involved with, sons

than daughters (Harris and Morgan, 1991; Mammen, 2005; Morgan *et al.*, 1988; Yeung *et al.*, 2002). Recent studies using the Panel Study of Income Dynamics and the German Socioeconomic Panel (Lundberg and Rose, 2002; Choi, Joesch, and Lundberg, 2007) have also found differential labor supply responses by fathers in the U.S. and Germany—in general, fathers of boys increase their work hours more than fathers of girls.

In general, the observed parental responses to child gender are consistent with a positive effect of sons on marital surplus, which could explain both the increase in marital stability and, as a result, greater specialization within the household. This son-induced marital surplus premium could arise from two sources: gender bias in parental preferences or boy-girl differences in child production functions. If fathers, for example, have biased preferences and receive greater utility from living with sons than daughters, and if maternal custody after separation is customary, then the birth of a son increases the value of marriage relative to separation more than does the birth of a daughter. This increase in marital surplus will make the relationships of parents of sons more stable and, if household resources are distributed between husbands and wives by bargaining, make mothers of sons better off than mothers of daughters. Sons will increase the relative bargaining power of their mothers because fathers have a greater desire to maintain contact with sons than with daughters.[3]

Alternatively, marital surplus may be greater for a couple with sons if paternal time is a more valuable input to the care of boys than of girls. This may be the case if the set of attributes or skills that parents wish boys and girls to develop differ, or because boys and girls have different developmental requirements. Morgan *et al.* (1988) refer to the "expectation that fathers will teach their sons to play and appreciate sports" and argue that "(r)esearch on child development supports the notions that fathers have a special role to play in the emotional development of sons and that marital disruption and the absence of the father are more harmful for boys than for girls" (p. 112). If sons and daughters require different care, or if paternal time is believed to be more important to the development of sons, then child gender could affect not only the total time parents spend on childcare, but also the relative quantities of paternal and maternal time and the way in which childcare time is disaggregated into specific activities such as playing, reading, and physical care. Although the 'preference' explanation for child gender

[3] In the context of a divorce-threat cooperative bargaining model (McElroy and Horney, 1981; Manser and Brown, 1980), father-son preference combined with maternal custody implies that the father of a son will have a relatively lower threat point in marital bargaining than the father of a daughter.

effects on relationship stability and other parental outcomes predicts that mothers of sons will be better off, the implications of the 'child production' story are not so clear. If mothers value the 'quality' of their sons, then they may be willing to transfer intrahousehold resources to fathers to induce them to stay in the marriage (Lundberg, 2005b). These alternative explanations imply that child gender differences in indicators of mothers' well-being, such as leisure time, may help us distinguish between preference-driven parent responses to sons and daughters and those that reflect differences in child production functions.[4]

The recent availability of the American Time Use Survey (ATUS) data has generated a flurry of studies on how parents spend their time and how their time allocation relates to gender of children. Kalenkoski *et al.* (2006) use both the 2003 & 2004 ATUS and the 2000 United Kingdom Time-Use Study data to examine parental childcare and market work time in single-parent, cohabiting, and married-couple households. They find that women spend more time in primary care than men and that single parents spend more time in primary childcare than married or co-habiting parents. Mammen (2005) uses the 2003 ATUS data to examine the effect of children's gender on time fathers spend with their children. She examines the effects of being a boy, of being the oldest boy in the household, and of having a brother, for both boys and girls, on a child's receipt of father's time. She finds that child gender as well as the gender composition of the sib-ship affects the time a child spends with his or her father. Being a boy or being the oldest boy in the household both increase the child's time with the father. Girls with brothers spend more time with their father than girls without brothers, due mainly to an increase in time watching TV with their father. Though these studies have confirmed and augmented previous results about fathers' time with sons and daughters, they do not suggest whether the source of the boy time advantage lies in parental preferences, child needs, or other factors.

III. Child Gender Differences in Parental Time: Evidence from Time Diaries

[4] An alternative explanation of differential parental treatment of sons and daughters based on evolutionary considerations is provided by a version of the Trivers-Willard hypothesis that natural selection will favor an ability to adjust child sex ratios to parental condition. This variant argues that reproductive success is increased by investing more in sons when conditions are good and more in daughters under adverse conditions. The related hypothesis that higher status parents invest more in sons is discussed by Keller *et al.* (2001), who find no evidence to support it using outcome measures from the PSID-CDS, including breast-feeding, interviewer-reported warmth, and total parental hours with the child.

Our principal goal is to use diary data on parental time with children to distinguish between the 'preference' and 'child production' explanations for excess paternal time with sons. The preference hypothesis of the parental time gap is that fathers spend more time with sons than with daughters because it yields them higher utility. The 'child production' hypothesis asserts that father's time is relatively more productive in contributing to high-quality boys and, since mothers have not been observed to spend significantly more time with girls in previous research, that more parental time is required to equalize the marginal product of time in boy production to the marginal product of time in girl production, i.e. boys 'need' more parental time.

The preference hypothesis implies, in the context of a non-unitary model of family resource allocation, that the birth of a son will increase his father's consumption opportunities within the marriage relative to his mother's, and should shift other resources in the household away from the father and towards the mother. A test of this effect requires data on private goods consumption by the two parents, and hours devoted to leisure provide an appropriate measure in time diaries.[5] We examine the effects of child gender not only on parental leisure, but also on housework time (which some studies of household bargaining treat as a private 'bad'), and hours of market work (to compare our results with previous studies which have found that sons increase specialization).

The child production hypothesis assumes equal concern for boys and girls on the part of both parents, but gender-specific production functions for child quality. In this framework, the full impact of child gender on the time allocation of parents will depend upon market wages and the prices of market inputs to child quality, but in general we would expect both parents to 'pay' for the extra father time required by boys through reduced leisure. We also expect father's extra time with sons to be allocated to activities that increase child quality. The time allocation of single mothers also permits an examination of the child production explanation for the boy premium in father's time—in the absence of a resident father (or a significant contribution of time from a non-resident father), single mothers should allocate more time to boys in compensation even if mother time is an imperfect substitute for father time.

There are two basic methods of documenting the time parents spend with children—collecting time diaries for adults in which childcare is one possible activity, or collecting time

[5] Alternatively, data on household expenditures may show that mothers of sons rather than daughters are better off in terms of material goods.

diaries for children, recording who is with them or engaged in activities with them. Parental time diaries allow us to measure parental leisure and other uses of time, while child diaries permit a detailed examination of the activities that children engage in with their parents. The time diary method of documenting time use has been found to be more accurate than other methods such as asking questions about the time devoted to a fixed set of activities (Juster, 1985). In this paper, we use parent diaries from the 2003 - 2006 ATUS data and child diaries from the 1997 and 2003 PSID-CDS data to examine the time use of married parents and single mothers of minor children aged 0-12. ATUS also provides time diaries for an older group of children, and we examine the time that ATUS respondents aged 15 to 17 spend with their parents in various activities.

A. Parent Time Diaries from the American Time Use Survey

In 2003, the ATUS began collecting 24-hour time diaries from one respondent aged 15 and older in the sample of households exiting the Current Population Survey.[6] The response rate in each year (2003-2006) ranged from 55-58 percent. Respondents were asked to report their own activities from 4:00 AM the previous day to 4:00 AM the day of the interview as well as who they were with and the location of the activity. Respondents were also asked to report secondary childcare time when they were involved in another primary activity but still had responsibility for their children.

We analyze the effects of child gender on parental time use using samples of married parents and single mothers with own household children under the age of 13 from pooled 2003-2006 ATUS data.[7] Parental time use may depend upon the gender composition of all children in the household, and there are many possible ways to specify child gender in families with both boys and girls (e.g., birth order may matter, and parental behavior may depend upon the presence of at least one boy or girl, rather than the sex ratio). We focus on a comparison of married-couple and single mother households with same-sex children. First, we use samples of parents with only one child aged 0 to 12 in their household (2,114 married mothers, 1,847 married fathers, and 1,152 single mothers). The second set of samples includes parents with two children

[6] These diaries cover every day of the year, except for days before significant holidays.
[7] The sample is restricted to exclude parents with additional older children living with them, so there are unlikely to be additional non-resident children.

aged 0 to 12 in their household who are of the same gender (1,243 married mothers, 1,120 married fathers, and 373 single mothers).[8]

Choosing samples with only same-sex children simplifies the analysis, but may introduce selection bias if the parents' decision to have additional children (conditional on the gender composition of those they already have) is correlated with attitudes and preferences that influence their parenting. For example, it is possible that parents with two girls (i.e. who have to date not had a third child) may be more (or less) child-oriented than parents with two boys. Angrist and Evans (1998) do not find any difference between the average propensity to have a third child for parents with two boys and two girls, but this does not rule out such a correlation of unobservables.[9] Thus, we also examine households with one or more children under age 13, irrespective of gender, and use the sex of the eldest child as a more exogenous child gender measure (5,908 married mothers, 5,162 married fathers, and 2,231 single mothers). Restricting samples by marital status may also result in selection bias if child gender affects marital stability, but these effects appear to be small for recent cohorts (Dahl and Moretti, 2004) and will be limited in our regression analysis by controls for parental characteristics.

We examine several measures of parental time with children, as well as hours of market work, leisure, and household work. 'Childcare' is the time that a parent reports childcare as the parent's main activity. 'Secondary childcare' is the time a parent reports that they are responsible for a child(ren) under age 13, but this is not their main activity. Secondary childcare time may be nurturing and may also contribute to skill acquisition (eg. a parent may report making meals as the primary activity but their children may be helping to cook), but also includes periods when parent and child are occupied with different activities in separate rooms. Parental 'time with children' includes any time when a child is in the room, whether the parent is directly engaged in an activity with them or not. Market work time from the time diaries includes work and work-related activities on all paid jobs. Household work includes household activities and obtaining goods and services. Leisure time includes time spent on socializing, recreation and personal care, including sleep. [10] A measure of child-free leisure—time without

[8] We exclude individuals who have more than ninety minutes of unaccounted time.
[9] However, Dahl and Moretti (2004) find a small degree of "son preference" in parity progression.
[10] See Data Appendix for more details on ATUS activities included in each category.

any children under age 18 present—yields patterns that are similar to total leisure and thus are not reported here.[11]

A.1. Descriptive Analysis

Table 1 presents the mean time spent by mothers and fathers in childcare and other activities by the gender of children in the household. These times are minutes per day, based on weighted averages of weekday reports and weekend and holiday reports (hereafter referred to as weekend), and so are representative of time use during the week. Significant differences between time spent with sons and time spent with daughters are indicated in bold. All estimates throughout the paper have been weighted using the ATUS respondent sample weights.

Panels 1 and 2 of Table 1 report the time use of mothers and fathers with one child in two age categories — under the age of 6 and from age 6 to 12. For parents with only one child under age 6, the only significant difference between the time use of parents with sons versus daughters is the substantially higher recreational childcare time of married fathers of sons. Recreational childcare represents activities such as 'horsing' around, attending child's events, and teaching your child to ride a bike. In families with a single child aged 6-12, married fathers spend more overall time with sons than daughters (about 39 minutes per day), married mothers spend slightly more recreational time with daughters than sons (about 6 minutes), and single mothers spend substantially more time with daughters (more than an hour) than sons. Mothers of daughters also spend more leisure time if they have daughters versus sons.

Panel 3 reports the average time use of mothers and fathers of two children of the same sex under age 13. Among two-parent two-child families, the sons' advantage in main activity childcare time, secondary childcare, and total time with fathers is large and significant (22 to 27 minutes per day). About half of the difference in main activity childcare time for fathers is attributable to greater recreational time with sons relative to daughters. Fathers of sons also report a sizable deficit in leisure time, relative to fathers of daughters. Sons of single mothers, on the other hand, receive considerably less direct childcare time than do daughters (about 29 minutes) and much less total time than do daughters (about 79 minutes).

In Panel 4, we examine the time use of mothers and fathers of any number of children, and report mean times for those parents in which the eldest child is a girl versus a boy. This

[11] The presence of children was determined from the ATUS "who" file.

approach allows us to avoid the potential bias due to endogeneity in the number and spacing of children in the other samples. We find that married fathers spend significantly more time in direct childcare and with their children overall if their eldest child is male rather than female, and this difference is largely attributable to greater recreational childcare time. Single mothers spend significantly more time with their children if the eldest is female rather than male.

A.2. Regression Analysis for Married Parents with Same-sex Children

The patterns of parental time use apparent in Table 1 generally persist in the regression analysis reported in Table 2. Table 2 presents the coefficients on a 'son' dummy from OLS time-use equations for parents with one child between the ages of 0 and 12 (Panels 1 and 2), and for the parents of two same-sex children (Panels 3 and 4). The dependent variables are minutes per day that the parent reports engaging in each activity.[12] Each equation also includes controls for parental age and age squared (for both parents in two-parent families), highest level of education (high school graduate, some college, college degree, or advanced degree with less than high school degree being the omitted group), race (black or 'other race' with white being the omitted group), Hispanic ethnicity, age of youngest child (3-5 or 6-12 with 0-2 being the omitted group), the presence of an adult female relative[13], and region of residence. Each equation also includes controls for temporal factors that could influence time use, such as the survey year, season, and whether the time diary refers to a weekend day.[14] We also estimate models that include an interaction of the son(s) dummy and the age of the youngest child being older than 5.

In one-child families, there are no significant differences in the any childcare time that married mothers provide to sons versus daughters Fathers spend significantly more time in recreational childcare of sons relative to daughters, and the interacted model indicates that this effect comes primarily from paternal care of a child under age 6. There is some evidence that the intensity of father's involvement involvement with sons is accompanied by a decrease in

[12] Zero time spent in a particular activity may be due to a parent's non-participation in that activity on all days, or in a parent participating on some days and not others. If all parents spend time in all of the activities we examine at some point in time, and if the day, season, and year we observe the parent's time use is random (i.e., is independent of the characteristics determining frequency of participating in the activity), then OLS will provide consistent estimates of the determinants of time use. If the zeroes are the result of infrequency of time allocated to a particular activity, then the tobit model would be misspecified (see Cragg 1971; Blundell and Meghir 1987). To the extent that some parents never spend time in a particular activity, then OLS estimates may be biased.

[13] We exclude grandmothers who the parent also reported caring for on the diary day.

[14] Sample means are shown in Appendix Table A1.

household chores. In families with two same-sex children, the effects of two sons versus two daughters are much more pronounced. Fathers with sons spend substantially more time in main activity childcare (about a quarter hour per day) and secondary childcare. More than half of fathers' additional childcare time with sons is in recreational childcare.

In summary, we find that married fathers spend more time with sons, particularly young sons and particularly fathers with more than one son, and that pre-teen girls in two-parent families are not compensated by additional time with their mothers.[15] Fathers of two sons adjust for additional childcare time spent on sons by reducing their leisure, and there is no significant impact of child gender on fathers' work hours, though married women with two sons increase their work hours.

A.3. Regression Analysis for Single Mothers with Same-sex Children

Table 3 presents results for equivalent regressions using samples of single mothers with one or two same-sex children. Single mothers with one son spend about a quarter of an hour less on direct childcare, almost an hour per day less with their child, and more in market work than mothers of one daughter. Single mothers with two boys spend significantly less time in both main-activity childcare (28 minutes) and total time with their children than mothers of daughters(72 minutes).

The contrast between the responses to child gender of married and single mothers is striking. Married mothers of sons spend less time in secondary childcare than mothers of daughters, but this is accompanied by increases in the direct, and particularly recreational, childcare time of fathers. We cannot confirm, with these data, that the deficit in single mothers' time with sons is not offset by increased time with non-resident fathers, but given the magnitude of the gap (an hour or more per day depending on the sample) it seems likely that sons of single mothers are receiving less parental time overall than daughters.

These findings are consistent with the 'preference' hypothesis that parents prefer to spend time with same-sex children, but do not seem to support the 'child production' hypothesis that boys require more parental time. Even if maternal time is an imperfect substitute for paternal time in raising high-quality boys, we would expect single mothers to compensate for an absent

[15] These effects persist in the sample of all families with one or more children under age 13, when the gender of the eldest child is used to construct the "son" dummy. These results are reported in Appendix Table A2.

father by spending more time with sons than daughters, relative to married mothers. We cannot, of course, rule out the possibility that selection into single motherhood is associated with unobserved characteristics that lead to daughter preference in time allocation.

A.4. Family Fixed-Effects

The preceding results have compared parental time use patterns in families with all sons to those in families with all daughters, but do not address how brothers and sisters fare in terms of parental input in the same family. Since ATUS diaries provide information about when the parent is with specific children, we can also compare time spent with boys and girls in a sample of families with mixed-sex siblings. Table 4 presents the 'son' coefficients from a family fixed-effects model for married mothers and fathers and single mothers with at least one son and one daughter with all children in the household under the age of 13. In these regressions, we control for a quadratic in the age of the child, a first born indicator, and multiple birth status.

In married couple households, we see distinct parental specialization: mothers spend more childcare time, both direct and secondary, with daughters rather than sons, while fathers do the reverse. However, the quantities are similar, so that a sister receives additional mother time that is approximately compensatory for her reduced father time, relative to her brother. Single mothers with both sons and daughters devote the same amount of time to each—none of the son coefficients are significantly different from zero. This implies that the apparent inequities we observe in the allocation of parental time with children in all-boy versus all-girl families do not extend to parental behavior in families with both boys and girls.

B. Child Time Diaries from the Panel Study of Income Dynamics Child Development Supplement

In 1997, a supplement to the Panel Study of Income Dynamics collected data on children's time use from a nationally representative sample of families that had at least one child between the ages of 0 and 12. A time diary for a random preassigned weekday and weekend day was completed for up to two children in each family, preferably by the child's primary caregiver (usually the mother) and in cooperation with the child when possible (Yeung *et al.*, 2001). The respondents completed a time grid for the 24 hours between midnight and midnight for each of

these days, reporting the child's activities, the time an activity began and ended, who was doing the activity with the child, who was present but not directly involved in the activity, and what else the child was doing.

These data have provided a wealth of information about how young American children spend their time (Hofferth and Sandberg, 2001), and about parental involvement with children. Yeung *et al.* (2001) analyzed father's time with children in intact families, and reported that boys spend significantly more time with their fathers in play and companionship activities on weekdays than do girls.[16] In this section, we use a similar sample of 1,754 children who were living with both biological parents and had completed both a weekday and weekend diary in order to compare the average times that boys and girls spent per day with each of their parents in different activities. To the extent that gender affects the likelihood that a child is living with both parents, these differences may be biased by parent selectivity.

Child activities in which parents are directly involved are divided into six groups—household work and obtaining goods and services (shopping), personal needs and care, educational activities, social and organizational activities, sports and active leisure, and passive leisure. Table 5 reports the mean minutes per day that boys and girls spend in these activities with mothers and fathers, and also the time spent with parents who were not directly involved in the child's activities (secondary time).[17] We use a weighted average of the child's weekday and weekend diary time to calculate average daily minutes.[18]

Table 5 shows that mothers spend more time directly involved in the activities of daughters than of sons (about 17 minutes per day) and that most of this extra time consists of housework and shopping. The gender gap in direct time is partially offset by the additional secondary time mothers spend with sons, so that the child gender difference in mother's total time is not significant. Fathers, in contrast, spend about 14 minutes per day more in direct time with sons than daughters, and also significantly more total time. The gender pattern of parent-child activities that emerges from these data is quite clear. Mothers spend more direct time with daughters than with sons, particularly in stereotypically female activities, but do not spend significantly more time with them overall. The additional secondary time that mothers spend

[16] The multivariate analyses of Yeung *et al.* (2001) control for factors such as parental work hours, which may be endogenous with respect to child gender.
[17] Note that secondary time in the PSID-CDS is a narrower concept than 'secondary time' in the ATUS survey, which includes time that the parent is responsible for, but not with, the child.
[18] Summary statistics are given in Appendix Table A4.

with sons is concentrated in the active leisure category (not reported)—mothers go shopping with their daughters and attend their sons' sporting events. Fathers, on the other hand, devote more direct as well as secondary time to sons, and this is particularly true of college-educated dads. Some of this father-son time is, not surprisingly, spent on sports, but there is also a significant difference in the weekly time spent by more-educated fathers on educational activities with sons and daughters.

These simple descriptive results from recent child time diaries suggest greater investments of time in sons. Parental motivation for child-gender time differences is not apparent: father-son time engaged in sports or hobbies can yield both parental enjoyment and child skills. When mothers shop and do housework with daughters, this can be regarded as an investment in domestic skills that may be particularly valuable to daughters, or mothers may prefer interacting with daughters in some of these activities. The same-sex pattern of direct parent-child activities is therefore consistent with either the preference or the child production hypothesis: mothers may prefer interacting with daughters and fathers with sons or, if the desired skills or attributes of daughters are different from those of sons, it may be efficient for the parent most proficient in manly skills to spend more time with male offspring.

A future draft of this paper will include regression analysis of the PSID-CDS data, as well as some analysis of time diaries of children in single-mother households.

D. Teen Time Diaries from the American Time Use Survey

With the ATUS teen sample, we can examine how children's time spent with parents changes as the children grow older. Since the diaries are from the child's perspective, we can include time spent with both parents. It is not clear *a priori* how son-daughter effects should change as children grow older. Parental preferences for interacting with children of the same sex are likely to intensify as children develop skills in gender-stereotypical activities; while developmental motivations for these activities may either intensify or weaken. The pooled 2003 - 2006 teen sample consists of 1,957 boys and girls aged 15-17 who live with two parents – 678 who live with a single mother. We restricted the age to be less than 18 to avoid possible sample selection issues with teens' decisions to leave their parents' household to either attend college or start their own household. It is possible that teen boys may leave their home later for college if boys start kindergarten at a later age on average than girls, as evidenced by Datar (2006). As

discussed earlier, there is also evidence that marriages last longer when the couple has a boy rather than a girl. However, we find no significant difference in the proportion of boys among teens in the two-parent family sample and that among all teens in the ATUS. Furthermore, we find that the proportion of boys among teens in our two-parent family sample is not significantly different from the proportion of boys in a population with a sex ratio of 1.05, which is the typical sex ratio at birth.[19]

We examine teens' total time with each parent separately and total time with at least one parent present. Teen activities with parents are divided into categories similar to those in the PSID-CDS data.[20] We also examine several subcategories of household work and obtaining goods and services to see whether teens spend more time with parents in traditional gender-specific activities. These include shopping, general housework, cooking, and home and vehicle maintenance activities, such as mowing the yard, home repair, building furniture, and chopping firewood. From the passive leisure category, we report TV watching separately since this is such a large component of passive leisure.

D. 1. Descriptive Statistics

Table 6 presents the mean teen boy and girl activity times with married mothers and fathers separately and total time in the presence of at least one parent. We also report time with mothers in single-mother families. Mothers – both married and single – spend significantly more total time with daughters than sons, primarily in household work, shopping, and in social activities. These effects are generally larger for single mothers than for married mothers. Single mothers also spend significantly more time in passive leisure with teen girls. Married fathers spend significantly more time with sons than daughters overall, and they spend this time in home or vehicle maintenance, sports and active leisure, and in passive leisure, specifically watching TV. Overall, daughters spend more time doing activities with at least one of the parents present than do boys, with significant differences in shopping, housework, cooking, and social activities.

[19] The expected proportion male with a sex ratio of 1.05 is .512. This falls within a 90% confidence interval around the survey weighted proportion male in our two-parent teen sample, which is .549.
[20] This excludes personal care, and the education category includes a less-extensive set of activities than is appropriate for younger children—i.e. help with homework, but not reading to the child.

D. 2. Teen Time-Use Regressions

Table 7 presents the coefficients on a boy dummy from OLS time-use equations for the teen sample. The dependent variables are minutes per day that the teen spends doing an activity in the presence of a parent. Each equation also includes controls for teen's age and age squared, mother's age and age squared, father's age and age squared, mother college degree, father college degree, race, Hispanic ethnicity, region of residence, number of siblings in the household, three of four sibling composition groups (no siblings is omitted; female sibling(s), male sibling(s), and mixed sex siblings are included), and temporal factors, such as survey year, season, and whether the time diary was collected for a weekend day. Sample means are shown in Appendix Table A5.

The pattern of child gender differences in this multivariate analysis are essentially identical to those in the data means. Married mothers spend more than a half-hour per day with daughters relative to sons, while fathers spend 13 minutes more with sons than daughters. Single mothers spend even more time with daughters relative to sons – nearly three-quarters of an hour more in total. The teen diaries do provide time spent with all contacts throughout the day. On average teen boys living in single mother households spend only four minutes per day with a non-resident parent, presumably the father, while teen girls spend only two minutes with the non-resident parent. Mothers and teenage daughters spend time together doing 'women's work', while men and their sons spend more time doing 'men's work' and watching TV together. The patterns of time use for teens reflect the gendered division of labor in households, and preferences (of parents or children or both) for same-sex companionship, rather than a need for more parental time on the part of teen boys.

IV. Conclusion

Using two recent U.S. surveys of parent's time with children, we find that young sons spend more time with fathers than do daughters, and that daughters aged 0 to 12 are not compensated by greater overall time with mothers. In the PSID-CDS, we find that married mothers spend more time directly interacting with young daughters, mainly by doing housework and shopping together, but this is offset by more maternal secondary time with boys. In the ATUS, fathers tend to spend more time with boys both directly engaged in their activities and

also present but not involved, and much of this extra time is devoted to sports and other active leisure pursuits. In general, the father/son and mother/daughter engagement in gender-stereotypical activities is consistent with parental enjoyment in doing 'boy' and 'girl' things with a same-sex child or with a desire to train children in gender-appropriate skills. This pattern is particularly pronounced in the ATUS teen sample, and may reflect a desire to participate in more gender-stereotypical activities in general.[21] However, both the finding that young boys receive more total parental time than girls and the likelihood that the developmental implications of sports and housework will not be identical suggests that parents are investing more in pre-teen sons than in pre-teen daughters.

Single mothers spend more time with their children when they have daughters only, relative to sons only and, particularly for teen children, this time is allocated to stereotypically female activities. Family fixed-effects estimates, however, show that single mothers spend the same amount of time with brothers and sisters, and that married parents devote similar amounts of time to children of the same sex when they have both boys and girls. We find no evidence that mothers of sons benefit from an increase in relative bargaining power in terms of their leisure consumption or time doing housework.

We find that a gendered activities pattern begins early, particularly for boys and their fathers. Time with the same-sex parent in gender-typical activities becomes very important as children reach their teens. When combined with the result that single mothers do not seem to compensate for the absence of a father by spending more time with their sons, this suggests one of two things—either that mother's time and father's time are simply not substitutable in some domains, or that some parent-child time is pure parental consumption and is driven, effectively, by the child gender preferences of the parents rather than by any child investment motives.

[21] Teens in general will have more say than younger children about what types of activities they engage in and with whom they do them.

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Table 1. American Time Use Survey: Parental Minutes per Day, by Activity

	Married Mother's Time				Married Father's Time				Single Mother's Time			
	Means		Difference		Means		Difference		Means		Difference	
	Boy(s)	Girl(s)	Boy – Girl	P-value	Boy(s)	Girl(s)	Boy – Girl	P-value	Boy(s)	Girl(s)	Boy – Girl	P-value
Panel 1. Mothers and Fathers with 1 Child Aged <6												
Childcare	155.2	153	2.2	0.82	80.4	70.1	10.3	0.19	107.3	124.8	-17.5	0.16
Subcategory: Recreational Childcare	55.3	53.0	2.3	0.69	39.4	26.8	**12.6**	0.02	30.7	34.3	-3.6	0.61
Secondary Childcare	400.3	409.3	-9	0.60	268.8	257.5	11.3	0.46	329.2	364.4	-35.2	0.21
Time with Child	426	455	-29	0.13	275.8	273.1	2.7	0.85	334.2	378	-43.8	0.14
Market Work	177.2	158.2	19	0.25	332.7	356.7	-24	0.16	232.9	190.4	42.5	0.16
Leisure	791.3	799.2	-7.9	0.54	774.4	755.3	19.1	0.21	860.6	850.3	10.3	0.72
Household Work	165.3	166.3	-1	0.92	92.3	88.2	4.1	0.59	108.1	129.3	-21.2	0.12
Number of Observations	648	601			593	560			234	233		
Panel 2. Mothers and Fathers with 1 Child Aged 6-12												
Childcare	64.4	64.6	-0.2	0.97	41.9	32.3	9.6	0.08	52.1	70.6	**-18.5**	0.01
Subcategory: Recreational Childcare	11.8	6.1	**5.7**	0.02	14.5	8.9	5.6	0.11	8.2	5.9	2.3	0.36
Secondary Childcare	353.7	345.3	8.4	0.62	283.1	261.	22.1	0.24	346.2	318.4	27.8	0.34
Time with Child	273.9	282.5	-8.6	0.60	228.2	189.4	**38.8**	0.02	215.6	283.1	**-67.5**	0.00
Market Work	216	243.4	-27.4	0.16	343.5	345.2	-1.7	0.94	256.1	220.9	35.2	0.24
Leisure	818.9	790.7	**28.2**	0.07	780.9	786.9	-6	0.76	842.2	830.9	11.3	0.65
Household Work	182.6	187.8	-5.2	0.67	99.1	116.9	-17.8	0.14	140.3	158.1	-17.8	0.33
Number of Observations	432	433			340	354			331	354		
Panel 3. Mothers and Fathers with 2 Same-Sex Children Aged <13												
Childcare	158	147.3	10.7	0.24	86	63.8	**22.2**	0.01	117.6	146.9	**-29.3**	0.09
Subcategory: Recreational Childcare	38.4	32.2	6.2	0.17	32.5	19.5	**13**	0.00	21.4	18.6	2.8	0.67
Secondary Childcare	420.9	438.2	-17.3	0.31	285.7	260.8	**25.4**	0.12	339.3	364.1	-24.8	0.42
Time with Child	460.9	455.3	5.6	0.76	290.5	263.3	**27.2**	0.08	321.8	400.6	**-78.8**	0.01
Market Work	147.7	157.5	1.3	0.53	334.8	344.6	-10	0.57	169.4	171.8	-2.4	0.94
Leisure	783	775.7	7.3	0.58	743.1	767.8	**-24.7**	0.08	855.2	823.2	32	0.34
Household Work	196.1	200.5	-4.4	0.67	105.4	105	0.4	0.97	161	152.2	8.8	0.65
Number of Observations	649	594			569	551			189	184		
Panel 4. Mothers & Fathers with Any Children Aged<13, by Gender of Eldest Child												
Childcare	148.1	143.2	4.9	0.26	76.7	64.9	**11.8**	0.00	106.8	115.3	-8.5	0.22
Subcategory: Recreational Childcare	36.3	33.9	2.4	0.26	30.1	23.1	**7**	0.00	21.4	19.8	1.6	0.59
Secondary Childcare	422.7	423.1	-0.4	0.86	276.9	263.6	**13.3**	0.07	349.6	370.9	-21.3	0.15
Time with Child	441.9	444	-2.1	0.80	280.7	266.4	**14.3**	0.04	322.3	362.8	**-40.5**	0.01
Market Work	161.3	161.9	-0.6	0.94	341.3	350	-8.7	0.28	200.7	193.5	13.5	0.62
Leisure	781.4	782.3	-0.9	0.89	759.9	757.5	2.4	0.74	841.2	839.4	1.8	0.89
Household Work	197.7	198.7	-1	0.83	97.9	102.8	-4.9	0.26	143.1	144.1	-1	0.90
Number of Observations	3,063	2,845			2,632	2,530			1,148	1,083		

Note: Average minutes per day based on weighted average of weekday and weekend diaries.
Survey weights used.

Table 2. American Time Use Survey: Son Effects on Married Parents' Time Use by Activity in One-Child and Two-Child Families (Children aged 0-12)

	Childcare	Recreational Childcare	Secondary Childcare	Time with Child	Leisure	Market Work	Household Work
Panel 1. One-Child Families, Married Mother's Time: Minutes per day (N=2,114)							
Son	2.79	4.94	-4.83	-18.96	-4.21	7.87	-2.74
	(5.77)	(3.54)	(11.71)	(12.14)	(9.66)	(12.43)	(7.04)
Son	6.91	4.41	-17.71	-28.10	-15.80	20.90	-1.45
	(8.69)	(5.62)	(15.90)	(17.55)	(11.81)	(15.69)	(9.05)
Son*Child Aged 6-12	-10.36	1.32	32.44	23.02	29.19	-32.82	-3.27
	(11.10)	(6.08)	(23.45)	(24.37)	(19.19)	(25.13)	(15.33)
Panel 2. One-Child Families, Married Father's Time: Minutes per day (N=1,847)							
Son	9.18*	**10.09*** **	8.54	9.18	3.51	-6.06	-5.39
	(5.24)	(3.41)	(11.82)	(11.15)	(11.74)	(12.93)	(6.53)
Son	9.29	**12.26*** **	10.35	2.50	12.00	-18.64	5.80
	(7.40)	(4.84)	(15.12)	(14.43)	(14.91)	(16.20)	(7.51)
Son*Child Aged 6-12	-0.31	-6.13	-5.09	18.85	-23.96	35.50	**-31.61** **
	(9.40)	(6.12)	(23.25)	(21.98)	(24.49)	(27.05)	(14.10)
Panel 3. Two-Child Families, Married Mother's Time: Minutes per day (N=1,243)							
Sons	8.43	5.01	-16.53	2.29	5.71	-6.70	-2.76
	(7.62)	(4.00)	(15.98)	(16.93)	(12.52)	(14.45)	(9.83)
Sons	8.18	7.52	-10.93	4.61	21.82	-16.54	-5.75
	(10.04)	(5.40)	(19.69)	(21.56)	(14.60)	(17.60)	(12.12)
Son*Child Aged 6-12	0.90	-9.10	-20.35	-8.44	**-58.50** **	35.72	10.85
	(15.20)	(7.18)	(33.16)	(33.57)	(27.36)	(30.38)	(19.75)
Panel 4. Two-Child Families, Married Father's Time: Minutes per day (N=1,120)							
Sons	**15.38** **	**10.30*** **	**25.94***	21.76	-16.56	-8.77	-1.69
	(7.17)	(3.71)	(15.61)	(13.99)	(13.32)	(16.87)	(9.19)
Sons	**22.32** **	**11.09** **	24.74	16.76	-22.47	-13.43	4.23
	(10.20)	(4.78)	(18.68)	(17.93)	(16.85)	(20.49)	(11.27)
Sons*Child Aged 6-12	-22.98	-2.62	4.00	16.54	19.55	15.43	-19.60
	(15.73)	(7.50)	(32.62)	(27.93)	(29.99)	(36.46)	(19.78)

Notes: Standard errors in parentheses. Survey weights used. *** significant at 1%; ** significant at 5%; * significant at 10%.
Each panel contains a separate model for each activity. Recreational Childcare is a subcategory of Childcare.
Control variables include a quadratic in age of respondent and spouse, race and ethnicity (black, other, Hispanic), region, year, and season, age category of youngest child, education category of respondent and spouse, presence of another female relative over the age of 18 in household, and weekend dummy.

Table 3. American Time Use Survey: Son Effects on Single Mother's Time Use by Activity in One-Child and Two-Child Families (Children aged 0-12)

	Childcare	Recreational Childcare	Secondary Childcare	Time with Children	Leisure	Market Work	Household Work
Panel 1. One-Child Families, Single Mother's Time: Minutes per day (N=1,152)							
Son	**-14.92****	0.33	-7.15	**-55.11*****	-5.95	**48.12*****	**-19.13****
	(6.24)	(3.45)	(18.12)	(16.73)	(15.06)	(17.83)	(9.80)
Son	-14.32	-3.73	-33.86	-41.12	-10.80	**57.80****	**-24.26****
	(10.82)	(6.71)	(26.78)	(27.19)	(23.35)	(26.33)	(12.31)
Son*Child Aged 6-12	-1.12	6.94	50.11	-26.23	9.09	-18.16	9.64
	(12.71)	(7.23)	(36.25)	(34.11)	(30.76)	(37.26)	(21.04)
Panel 2. Two-Child Families, Single Mother's Time: Minutes per day (N=373)							
Sons	**-27.98***	3.27	-20.49	**-74.03*****	28.58	-4.67	11.24
	(15.42)	(5.16)	(26.27)	(28.88)	(25.51)	(25.68)	(17.15)
Sons	-32.73	6.11	-5.08	**-74.06****	49.44	-31.34	19.03
	(21.58)	(6.86)	(31.24)	(35.53)	(30.06)	(30.75)	(22.30)
Sons*Child Aged 6-12	15.92	-9.50	-51.67	0.10	-69.90	**89.36***	-26.10
	(29.36)	(10.38)	(50.94)	(54.80)	(52.85)	(52.07)	(32.15)

Notes: Standard errors in parentheses. Survey weights used. Significance levels: *** =1%; ** = 5%; * = 10%.

Each panel contains a separate model for each activity. Recreational Childcare is a subcategory of Childcare.

Control variables include a quadratic in age of respondent and spouse, race and ethnicity (black, other, Hispanic), region, year, and season, age category of youngest child, education category of respondent and spouse, presence of another female relative over the age of 18 in household, age gap between children and weekend dummy.

Table 4. American Time Use Survey: Son Effects on Child Time with Parent in Boy-Girl Families Controlling for Family Fixed-Effects by Activity (Children aged 0-12)

	Married Mother	Married Father	Single Mother
Childcare	**-2.85***	**2.60****	-2.41
	(1.73)	(1.22)	(4.88)
Recreational childcare	0.26	**1.30***	-0.43
	(0.69)	(0.80)	(1.79)
Secondary Childcare	**-9.14*****	**6.64*****	3.17
	(3.65)	(2.07)	(8.75)
Total time with Parent	**-12.88*****	**9.29*****	0.32
	(4.52)	(2.67)	(1.45)
N	5,660	4,883	1,482

Notes: Standard errors in parentheses. Survey weights used. Standard errors are corrected for clustering to account for within family correlation of the error terms.

Significance levels: *** = 1%;** = 5%;* = 10%.

Recreational childcare is a subcategory of childcare.

Control variables in child-level regressions include quadratic in age, first born indicator, and multiple birth status.

Table 5. PSID-Child Development Supplement—Married Parent'sTime with Child (Aged 0-12) by Child's Primary Activity

	Mother's time: Minutes per day				Father's time: Minutes per day			
	Means		Difference	P-value	Means		Difference	P-value
	Boys	Girls	Boy-Girl		Boys	Girls	Boy-Girl	
Household work and obtaining goods and services	26	36	**-10**	0.00	16	14	**2**	0.07
Personal needs and care	72	74	-1	0.58	39	39	0	0.84
Educational and professional training	17	16	1	0.51	6	5	1	0.19
Social and organizational activities	23	24	-1	0.45	17	16	2	0.33
Sports and active leisure	39	41	**-2**	0.53	34	28	**6**	0.01
Passive leisure	34	37	**-3**	0.18	27	24	**3**	0.09
Total direct time	211	228	**-17**	0.01	139	125	**14**	0.00
Total secondary time	183	172	**11**	0.05	112	105	**7**	0.10
Total (direct and secondary) time	394	400	-6	0.46	252	230	**21**	0.00
Number of observations	903	851			903	851		

Note: Average minutes per day based on weighted average of weekday and weekend diaries.

Table 6. American Time Use Survey: Parental Minutes per Day with Teens (Aged 15-17) by Teen's Primary Activity

	Married Mother's time				**Married Father's time**				**Any Married Parent time**				**Single Mother's time**			
	Means		Difference		Means		Difference		Means		Difference		Means		Difference	
	Boys	Girls	Boy-Girl	P	Boys	Girls	Boy-Girl	P	Boys	Girls	Boy-Girl	P	Boys	Girls	Boy-Girl	P
Total time	95.4	133.2	**-37.8**	0.00	93.6	81.5	**12.1**	0.08	130.5	154.9	**-24.4**	0.00	75.2	116.6	**-41.4**	0.00
Household work and obtaining goods and services	9.4	22.3	**-12.9**	0.00	9.3	9.6	-0.3	0.89	15.4	26.3	**-10.9**	0.00	10.1	17.6	**-7.5**	0.06
Subcategories:																
Shopping	5.4	10.7	**-5.3**	0.00	2.5	3.6	-1.1	0.20	6.1	11.7	**-5.6**	0.00	4.1	8.1	**-4.0**	0.04
Housework	0.7	3.7	**-3.0**	0.00	1.0	1.3	-0.3	0.66	1.5	3.9	**-2.4**	0.00	0.7	4.1	**-3.4**	0.00
Cooking	1.4	3.7	**-2.3**	0.01	0.6	1.2	**-0.6**	0.10	1.7	4.3	**-2.6**	0.00	1.1	2.8	**-1.7**	0.03
Home & vehicle maintenance	0.9	1.4	-0.5	0.42	4.1	1.0	**3.1**	0.00	4.2	2.0	**2.2**	0.05	0.5	1.3	-0.8	0.28
Education (homework)	2.2	4.0	-1.8	0.13	0.7	1.9	**-1.2**	0.02	2.7	4.6	-1.9	0.13	0.3	1.0	-0.7	0.13
Social and organizational activities	13.3	19.7	**-6.4**	0.00	12.6	14.3	-1.7	0.44	15.1	22.0	**-6.9**	0.00	12.1	21.9	**-9.8**	0.08
Sports and active leisure	3.1	3.4	-0.3	0.77	5.4	2.5	**2.9**	0.05	6.6	4.3	2.3	0.15	4.5	5.6	-1.1	0.64
Passive leisure	29.3	32.1	-2.7	0.44	31.3	20.1	**11.2**	0.00	42.5	38.0	4.5	0.28	23.2	34.4	**-11.2**	0.10
Subcategory: TV	25.9	26.7	-0.8	0.81	27.6	18	**9.6**	0.00	37.5	31.7	5.8	0.12	21.2	28.6	-7.4	0.25
Eating & drinking	21.3	23.5	-2.2	0.14	18.5	18.7	-0.2	0.87	23.5	25.2	-1.7	0.29	11.3	12.7	-1.4	0.41
Number of observations	1,008	949			1,008	949			1,008	949			337	341		

Notes: Average minutes per day based on weighted average of weekday and weekend diaries.
Survey weights use.

Table 7. American Time Use Survey: Male Effect for Teens' (Aged 15-17) Minutes per Day with Parents by Teen's Primary Activity

	Married Mother	Married Father	Any Married Parent	Single Mother
Total time	**-37.37*** **	**13.34***	**-23.26*** **	**-43.40*** **
	(7.30)	(7.29)	(8.80)	(12.38)
Household work and obtaining goods and services	**-13.57*** **	-0.12	**-11.29*** **	**-7.46***
	(1.75)	(1.89)	(2.72)	(4.04)
Subcategories:				
Shopping	**-5.93*** **	-1.29	**-6.06*** **	**-4.12****
	(1.75)	(1.01)	(1.82)	(1.79)
Housework	**-3.22*** **	-0.24	**-2.54*** **	**-3.33*** **
	(0.78)	(0.61)	(0.91)	(1.15)
Cooking	**-2.27*** **	-0.66*	**-2.62*** **	**-1.55****
	(0.58)	(0.39)	(0.66)	(0.80)
Home & vehicle maintenance	-0.44	**3.29*** **	**2.45****	-1.18
	(0.67)	(1.08)	(1.19)	(0.84)
Education (homework)	-1.54	**-1.13****	-1.60	-0.70
	(1.14)	(0.51)	(1.18)	(0.44)
Social and organizational activities	**-6.18*****	-1.60	**-6.83*** **	**-11.95****
	(2.33)	(2.31)	(2.51)	(5.70)
Sports and active leisure	-0.42	2.90**	2.11	-1.24
	(1.01)	(1.40)	(1.54)	(2.33)
Passive leisure	-2.08	**11.91*** **	5.43	-10.39
	(3.55)	(3.29)	(4.12)	(6.80)
Subcategory: TV	-0.38	**10.29*** **	**6.25***	-6.05
	(3.24)	(3.02)	(3.73)	(6.34)
Eating and Drinking	-2.06	0.14	-1.22	-1.98
	(1.53)	(1.41)	(1.55)	(1.67)
Number of observations	1,957	1,957	1,957	678

Notes: Only the Male dummy coefficient is shown for each model.

Control variables for teens with married parents include a quadratic in age of child and both parents, mother college degree, father college degree, race and ethnicity (black, other, Hispanic), number of siblings, 3 of 4 sibship composition groups, region, year, season, and weekend dummy. Control variables for teens with a single mother exclude the age of father, father college degree, and include whether another female relative, such as a grandmother or aunt, lives in the household.

*** significant at 1%; ** significant at 5%; * significant at 10%.

Standard errors in parentheses. Survey weights used.

Appendix

Table A1. American Time Use Survey: Means for Parent Time Diary Samples (One or Two Children Aged 0-12)

	Married Mothers		Married Fathers		Single Mothers	
	1 Child	2 Children	1 Child	2 Children	1 Child	2 Children
Age	33.92	33.82	35.76	35.94	31.75	29.46
	(11.22)	(8.26)	(11.37)	(8.35)	(12.92)	(9.80)
Spouse's age	36.80	36.23	33.83	33.97		
	(11.68)	(8.61)	(10.47)	(8.36)		
Black	0.09	0.06	0.08	0.07	0.33	0.37
Other race	0.08	0.07	0.08	0.07	0.05	0.05
Hispanic	0.16	0.20	0.17	0.19	0.16	0.20
Son(s) dummy	0.53	0.53	0.54	0.49	0.50	0.53
(youngest) child aged 3-5	0.18	0.27	0.19	0.31	0.24	0.29
(youngest) child aged 6-12	0.39	0.28	0.36	0.30	0.53	0.29
Age gap between children		3.18		3.05		
		(2.73)		(2.67)		
Aged 6-12 * son(s)	0.21	0.15	0.20	0.14	0.26	0.14
Respondent Education						
High School grad	0.28	0.23	0.30	0.26	0.34	0.36
Some College	0.25	0.24	0.23	0.24	0.35	0.33
College Degree	0.25	0.29	0.22	0.24	0.11	0.09
Advanced Degree	0.14	0.13	0.14	0.12	0.04	0.03
Spouse education						
High School grad	0.28	0.24	0.26	0.22		
Some College	0.26	0.26	0.25	0.27		
College Degree	0.22	0.24	0.28	0.26		
Advanced Degree	0.14	0.14	0.12	0.14		
Female relative in household	0.04	0.05	0.06	0.06	0.24	0.29
Weekend	0.28	0.32	0.30	0.30	0.30	0.29
North	0.12					
Midwest	0.21	0.23	0.22	0.26	0.22	0.22
South	0.38	0.35	0.35	0.33	0.41	0.40
West	0.23	0.25	0.25	0.23	0.18	0.18
Winter	0.24	0.28	0.25	0.24	0.27	0.25
Spring	0.24	0.25	0.24	0.25	0.25	0.29
Summer	0.25	0.24	0.24	0.24	0.26	0.23
Fall	0.27	0.23	0.27	0.27	0.22	0.23
Year =2003	0.23	0.26	0.24	0.25	0.26	0.23
Year =2004	0.27	0.21	0.28	0.25	0.23	0.24
Year=2005	0.24	0.27	0.25	0.22	0.27	0.29
Year=2006	0.26	0.26	0.23	0.28	0.24	0.24
Number of observations	2,114	1,243	1,847	1,120	1,152	373

Note: Standard deviations in parentheses. Survey weights used.

Table A2. American Time Use Survey: Means for Parent Time Diary Samples (All Children Aged 0-12)

	Married Mothers	Married Fathers	Single Mothers
Age	33.67	35.74	30.05
	(9.77)	(9.83)	(11.94)
Spouse's age	36.33	33.76	
	(10.03)	(9.21)	
Black	0.07	0.07	0.35
Other race	0.07	0.07	0.05
Hispanic	0.19	0.20	0.20
Eldest son dummy	0.52	0.51	0.52
(youngest) child aged 3-5	0.25	0.27	0.27
(youngest) child aged 6-12	0.30	0.28	0.38
Respondent Education			
High School grad	0.26	0.28	0.37
Some College	0.26	0.23	0.32
College Degree	0.25	0.23	0.09
Advanced Degree	0.13	0.13	0.03
Spouse education			
High School grad	0.26	0.24	
Some College	0.26	0.25	
College Degree	0.22	0.27	
Advanced Degree	0.14	0.12	
Female relative in household	0.04	0.06	0.28
Weekend	0.30	0.29	0.30
Midwest	0.23	0.25	0.22
South	0.35	0.33	0.42
West	0.25	0.25	0.18
Spring	0.25	0.24	0.27
Summer	0.24	0.25	0.26
Fall	0.26	0.26	0.22
Year=2003	0.25	0.25	0.24
Year=2004	0.25	0.26	0.23
Year=2005	0.25	0.24	0.28
Year=2006	0.25	0.25	0.25
Number of observations	5,908	5,162	2,231

Note: Standard deviations in parentheses**.** Survey weights used.

Table A3. American Time Use Survey: Effect of Eldest Son on Parental Time Use by Activity (Children aged 0-12)

	Childcare	Recreational Childcare	Secondary Childcare	Time with Children	Leisure	Market Work	Household Work
Panel 1. Married Mother's Time: Minutes per day (N=5,908)							
Son	3.89	2.75	-0.85	-3.60	-2.95	0.59	0.75
	(3.95)	(1.97)	(7.34)	(7.69)	(5.67)	(7.08)	(4.57)
Panel 2. Married Father's Time: Minutes per day (N=5,162)							
Son	**10.88*** **	**6.63*** **	**14.62** **	**13.01** **	2.28	-7.95	-4.01
	(3.30)	(2.03)	(7.11)	(6.62)	(6.83)	(7.97)	(4.21)
Panel 3. Single Mother's Time: Minutes per day (N=2,231)							
Son	-8.15	1.78	**-24.25***	**-42.99*** **	-6.07	13.40	-1.65
	(6.48)	(2.88)	(13.83)	(13.90)	(11.80)	(12.99)	(7.68)

Notes: Standard errors in parentheses. Survey weights used. Significance levels: *** =1%; ** = 5%; * = 10%.

Each panel contains a separate model for each activity. Recreational Childcare is a subcategory of Childcare.

Control variables in the married parents regressions include a quadratic in age of respondent and spouse, race and ethnicity (black, other, Hispanic), region, year, and season, education category of respondent and spouse, presence of another female relative over the age of 18 in household, and weekend dummy. Control variables in the single mother regression exclude information on spouse.

Table A4. PSID - Child Development Supplement - Means

	Mean (std. dev.)
Mother	
Age	34.66
	(6.17)
White	76.14
Black	6.62
Other race	17.25
With college degree	27.94
Without college degree	72.06
Father	
Age	36.85
	(6.80)
White	75.81
Black	6.41
Other race	17.78
With college degree	34.38
Without college degree	65.62
Number of observations (children)	1,754
-excluding observations with missing mother's education	1,744
-excluding observations with missing father's education	1,731

Table A5. American Time Use Survey: Means for Teen Time Diary Samples (Children Aged 15-17)

	Living with Married Parents	Living with Single Mother
Age	16.06	16.11
	(0.98)	(0.99)
Male	0.52	0.50
Mother's age	43.93	42.69
	(2.37)	(7.25)
Father's age	46.20	
	(7.85)	
Mother college degree	0.16	0.06
Father college degree	0.16	
Black	0.09	0.31
Other race	0.07	0.07
Hispanic	0.19	0.17
Number of siblings in HH	1.48	1.36
	(1.41)	(1.75)
Male siblings	0.31	0.25
Female siblings	0.28	0.25
Mixed-gender siblings	0.24	0.24
Female relative	0.03	0.08
Weekend	0.30	0.31
Midwest	0.25	0.26
South	0.31	0.34
West	0.26	0.23
Winter	0.25	0.28
Spring	0.24	0.24
Summer	0.25	0.22
Fall	0.26	0.26
Year = 2003	0.24	0.26
Year = 2004	0.26	0.24
Year = 2005	0.24	0.26
Year = 2006	0.26	0.24
Number of observations	1,957	678

Note: Standard deviations in parentheses. Survey weights used.

Data Appendix: Variables from the American Time Use Study

Notation: TX refers to tier X code in ATUS activity lexicon.

Parent Time Diary Samples

Variable	Definition
Childcare	Main activity care – sum of educational, primary, and recreational child care
Subcategory: Recreational Childcare	T1=3 & T2=1 & (T3=3 or 4 or 5 or 10): Playing with child(ren), e.g., playing basketball, teaching to ride a bike, "horsing around", building models, other crafts, attending child's events (e.g., game, recital, play), taking trick-or-treating, etc.
Secondary Childcare	Any non-childcare activity while a child(ren) under age 13 is(are) in your care (child need not be in same room)
Time with Child(ren)	Time in any activity when child(ren) is(are) in the room
Market work	T1 = 5: Work and job-related activities, including job search, income generating activities, entertaining clients, job-specific training, etc.
Leisure	(T1=1, 12, 13, 14, or 15) or [T1=2 & T2=9 & (T3=3 or T3=4)] or [T1=6 & T2=1 & T3=2] or [T1=8 & T2=5] or [T1=16 & T2=1 & (T3=1 or T3=2)]: e.g., personal care & related services (haircut, pedicure), socializing, reading, going to movies, sports, exercise, hobbies, religious activities, volunteer work, personal email or letters, classes for personal interest, phone calls with friends and family, etc.
Household work	T1=2, 7, 8, 9, 10, or 16 excluding [T1=2 & T2=9 & (T3=3 or T3=4)] & [T1=8 & T2=5] & [T1=16 & T2=1 & (T3=1 or T3=2)]: Housework; food prep; care of pets; cooking; home, appliance, & vehicle maintenance & repair; household and financial management tasks; shopping; obtaining services for the household; using government services; civic obligations; household related phone calls, etc.

Notes: Times with children refer to own household children.
Leisure, home production, and market work may overlap with secondary care.

Teen Time Diary Sample

Father time	Total time (any activity) with father present
Mother time	Total time (any activity) with mother present
Any parent time	Total time (any activity) with one or both parents present
Household work and obtaining goods & services	T1=2 or T2=7 or (T1=8 excluding T2=5) or T1=9: Household activities, shopping, and obtaining professional and household services
Shopping	T1 = 7
Housework	T1 = 2 & T2=1
Cooking	T1 = 2 & T2=2
Home and vehicle maintenance	T1 = 2 & (T2=3 or T2=4): interior/exterior home maintenance, vehicle repair, yard work,
Education	T1=6 & T2=3: Homework
Social and organizational activities	[T1=12 & (T2=1,2, or 4 or (T2=5 & T3=1, 2 or 4)] or [T1=13 & (T2=2 or (T2=4 & T3=2))] or T1=14: general socializing, attending or hosting social events, attending arts/sport/recreation events, religious and spiritual activities
Sports and active leisure	[T1=3 & T2=1 & (T3=3,4, or 5)] or [T1=12 & T2=3 & (T2=7, 9, 10, or 11)] or [T1=13 & T2=1] or [T1=13 & T2=3 & T3=1] or [T1=13 & T2=4 & T3=1]: playing sports, arts & crafts, hobbies
Passive leisure	[T1=12 &T2=3 excluding T3 = 7, 9-11] or (T1=12 & T2=5 & T3=3): TV, listening to music, reading, conversations, relaxing, doing nothing
TV time	T1= 12 & T2=3 & T3=3: watching TV, not religious
Eating & drinking	T1= 11

Note: Times are in each activity when mother, father, or either parent is present.