Fathers' Time Investments in Children: Do Sons Get More?

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Abstract: Evidence suggests that, from birth, fathers treat sons differently than daughters in the U.S., as well as in developing countries. Fathers' time investments in children are one channel through which differential treatment by gender may affect children's outcomes. This paper uses data from the 2003 American Time Use Survey to explore three questions about paternal time in two-parent families: Does the gender composition of his children affect the amount of time a father spends with them? If so, does the gender of the individual child have an additional effect? And is a girl advantaged or disadvantaged by the presence of brothers in spending time with her father? Father-level and child-level regressions examine the effects of gender composition and gender. Family fixed effects specifications show that gender is important within families as well as across families. Overall, boys get more of fathers' time in certain types of activities, compared to girls in all-girl families and to girls with brothers. Although the contribution of this time to children's development cannot be directly measured, to the extent that these investments of fathers' time affect children's outcomes, it appears that girls are at a disadvantage, especially girls in all-girl families. Girls with brothers do receive more of fathers' time than girls with only sisters, but this is primarily in television watching, so whether it is an advantage or not is open to question.

Introduction

This study uses the American Time Use Survey (ATUS) to examine how the gender composition of the children in married-parent families influences how fathers allocate their time to those children. Sibling gender composition in the U.S. - specifically the presence of boys relative to girls - has been found to reduce the likelihood of divorce and to increase men's labor supply and wages, challenging the conventional wisdom that son preference is a more important phenomenon in developing countries than in the U.S.[1] Much of the work on the influence of child gender composition has focused on the behavior of fathers and their presumed preference for boys. The ATUS data provide the opportunity to examine directly whether this preference manifests itself in time spent with sons.

The determinants of parental investment in children are an important area of study because childhood circumstances influence both children's well-being and their economic outcomes in adult life.[2] Economists have traditionally viewed parental time as one of the most important investments in children (Becker 1960), implying that differences by child gender may have important implications for the relative well-being of girls and boys. However, unlike some other parental investments (*e.g.,* education expenditures), fathers' time is nonrival to a certain extent, so that additional time with one child need not exclude other children. The ATUS records all activities in a 24-hour period for each respondent and lists who else was present for each activity, allowing us to observe both the time a father spends with his children in sum and how much time was spent with each child in the household (Bureau of Labor Statistics (BLS) and U.S. Census Bureau (Census) 2004a). This paper utilizes this level of detail to examine these questions about paternal time: 1) does the gender composition of his children affect the

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[1] *e.g.*, Dahl and Moretti (no date), Morgan, Lye and Condran 1988; Lundberg and Rose 2002.
[2] *e.g.,* Card and Krueger 1992, Case, Fertig, and Paxson 2005, Mayer 1997, Solon 1992.

total amount of time a father spends with them? 2) If so, does the gender of the individual child have an additional effect? and 3) is a girl advantaged or disadvantaged by the presence of brothers in spending time with her father?

The first two questions build on the two strands of research which examine whether fathers have a preference for boys, and whether child gender or sibling gender composition affects their involvement with their children.[3] The third question explores the resulting implications for girls, and ties in with previous work that has found that girls with relatively more brothers are advantaged in terms of increased involvement from fathers as well as in educational outcomes.[4] I discuss this earlier work in the next section.

This study contributes to the literature in the following ways. Unlike the data used for many earlier studies of father involvement, the ATUS is a large, nationally representative data set which collects the time use information with time diaries[5], which are considered to be more accurate than other measures of time use, such as asking respondents to estimate time in activities on a "typical day" (Robinson 1985). The sample includes respondents with children of all ages rather than being limited to only certain age groups of children.[6] Respondents are asked who is with them during every activity, so that we know how much time each child in the family spent with the father (BLS and Census 2004a), unlike earlier studies which only have information on the amount of time the father spent with one target child, or the amount of time

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[3] *e.g.,* Harris and Morgan 1991, Hofferth 2003, Yeung *et al.* 2001. This literature is discussed in greater detail in the next section.
[4] Harris and Morgan 1991; Butcher and Case 1994.
[5] The ATUS time diary is a recall diary, constructed for each respondent by a telephone interviewer who asks what the respondent was doing yesterday at 4:00 am, how long the activity lasted, who was there, and where the activity took place, continuing through the day for 24 hours (BLS and Census 2004). (Another kind of time diary is a leave-behind written diary, which may be of higher quality but which are more costly to collect (Juster 1985)). Juster concludes that with high quality interviewing, the recall diaries may even be more accurate than the leave-behind diaries.)
[6] *cf.* Harris and Morgan 1991, Hofferth 2003, Marsiglio 1991, Yeung *et al.* 2001.

spent or frequency of activities with any or all children, not individual children.[7] I am therefore able to look at different aspects of fathers' time in detail, such as his leisure time spent without children, the time he spends with his children in the absence of his wife, and time he spends with individual children without his other children being present. Another advantage of the data is that the survey measures secondary child care, defined as care for children under age 13 given by an adult who is performing some other primary activity (like preparing a meal) (BLS and Census 2004b). Secondary care has been shown to be an important component of child care time that is not always captured in time diaries (Folbre *et al.* 2005, Zick and Bryant 1996).

The majority of studies of father involvement have examined the effects of child gender or of sibling gender composition but not both.[8] I address both of these issues and also the question of whether girls are advantaged or disadvantaged by the presence of brothers.[9] Since time with father is observed for multiple children in the same family, in addition to ordinary least squares estimates, I am able to include family fixed effects in my regressions which control for unobservable characteristics of the fathers which do not vary across children.

Previous Research

Research on "boy preference"

How gender correlates with measures of well-being is an important area of study for economists, with much research having focused on the developing world (King and Mason 2001). But in the United States as well, a person's gender has affected the level of education she is likely to receive, the occupation she will take up, and the wages she will be paid (Blau 1998, U.S. Department of Education 2000). In addition, women are much more likely than men to be

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[7] *cf.* Cooksey and Fondell 1996, Marsiglio 1991, Yeung *et al.* 2001.
[8] This literature is discussed in the next section.
[9] Harris and Morgan (1991) address all three of these issues as noted in the next section..

poor (Proctor and Dalaker 2003), so that gender continues to be an important marker of well-being. Differential treatment from parents by gender may be an important channel leading to these differential outcomes. There is evidence that children's gender affects parental behavior from birth. Lundberg and Rose (2002, 2003) found that men's labor supply and wage rates increase more in response to the births of sons than to the births of daughters, and that a woman is more likely to marry the child's father after a nonmarital birth if the child is a son. Other work has found that the gender of children and their siblings can affect the likelihood of growing up with two married parents, another important correlate of well-being (McLanahan and Sandefur 1994). Morgan, Lye, and Condran (1988) find that sons reduce the risk of marital disruption by 9% more than do daughters, while Dahl and Moretti (no date) find that having a girl significantly affects marriage, shotgun marriage, divorce, and child custody, resulting in a first-born daughter being 3.4% less likely to be living with her father compared to a first-born son. Morgan *et al.* present evidence that boys elicit greater involvement from fathers, contributing to marital stability; Dahl and Moretti present survey evidence that fathers report preferring boys. This evidence suggests that the preference for boys is harmful to girls, since a greater proportion of them will grow up in single-parent homes.

Research on the effect of gender on father involvement

If the effect of gender on parental behavior is strong enough to affect divorce probabilities, clearly it may affect treatment of children within a marriage. Researchers in psychology and sociology have examined whether the gender of a child or the gender composition of a sibling set is a determinant of fathers' involvement with children, where involvement has been measured in a variety of ways including time diaries, time estimates, and

activity frequency measures.[10] [11] Researchers in these fields often seek to measure qualitative

aspects of the father-child relationship such as warmth and closeness, in addition to time

measures such as activity frequency or time allocation (Pleck and Masciadrelli 2004).

Observational psychology studies have found that fathers interact more with infant sons

and are more engaged with adolescent sons than daughters.[12] Studies using the 1987-88 National

Survey of Families and Households find that gender composition (such as all boys or fraction

boys) positively affects father involvement as measured by fathers' reports of the frequency of

different activities with their children.[13] Harris and Morgan (1991) use the 1981 National Survey

of Children to examine paternal involvement with adolescent children, measured by two indices:

affect (includes children's and mothers' reports of closeness to fathers) and behavior (includes

children's reports of frequency of enjoyable activities with father). They find positive and

significant results of gender (being a boy) on behavior and of gender composition (number of

boys) on affect.

Other studies have used time diaries. Bryant and Zick find that in two child families,

fathers share more household maintenance time with older sons and more shopping time with

younger sons and that fathers contribute more primary care time when the children are boys

(Bryant and Zick 1996, Zick and Bryant 1996). Recent studies used children's time diaries from

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[10] These studies look at gender and find a positive effect of being a boy on some measure of fathers' involvement:
Barnett and Baruch 1987, Crouter and Crowley 1990, Harris *et al.* 1998, Harris and Morgan 1991, Ishii-Kuntz 1994,
Yeung *et al.* 2001; these find no effect: Hofferth 2003, Hossain and Roopnarine 1993, Sandberg and Hofferth 2001,
Sanderson and Sanders-Thompson 2002, Snarey 1993. Lamb, *et al.,* 1988 find Swedish fathers spend more time
with daughters.   These studies look at gender composition: Cooksey and Fondell 1996, Harris and Morgan 1991,
Marsiglio 1991, Wilcox 2002.
[11] The studies I discuss here look at fathers who reside with their children, including nonbiological father figures
such as stepfathers. No consensus has been reached on how child gender may affect contact with fathers who live
outside of the household: *cf.* Cooksey and Craig 1988, Hetherington, Cox and Cox 1982, Lundberg, McLanahan,
and Rose 2005, Mott 1994, Seltzer and Bianchi 1988, Seltzer 1991. Although ATUS asks respondents to note the
presence of nonhousehold children (children of the respondent not living in the household), the sample size is too
small as of yet to provide meaningful results. 187 male respondents aged 18 or over reported nonhousehold children
and only 41 of these reported spending time with the child(ren) on the interview day.
[12] See the review by Lamb and Lewis (2004) of research on father-child relationships.
[13] Cooksey and Fondell 1996, Marsiglio 1991, Wilcox 2002, Zick, Bryant, and Osterbacka 2001.

the nationally representative 1997 Child Development Supplement to the Panel Study of Income Dynamics. Yeung *et al.* (2001) found that being a boy increased a child's time in play and companionship activities with fathers by 18 minutes on weekdays (and the effect is close to significant on weekends). However, Hofferth (2003) and Sandberg and Hofferth (2001) found that child gender had no effect on fathers' total engagement time with children. Other studies with smaller samples have also found no effect of gender.[14] Pleck and Masciadrelli (2004) note, "It is possible that child gender exerts less influence on paternal involvement today than in previous decades."

Research on "brother-advantage"

Harris and Morgan (1991) find suggestive evidence in the National Survey of Children that girls are advantaged by having brothers in terms of father involvement, and that being the only boy is an advantage for boys.[15] Butcher and Case (1994) find that women raised only with brothers achieved higher levels of education on average, although other studies have found no advantage or a disadvantage in educational outcomes for girls from having brothers relative to sisters.[16]

Fathers' time with children and its importance

Research into the effects of gender on paternal involvement with children is part of a broader inquiry into both the determinants and consequences of fathers' time with children. There is consensus among researchers that fathers spend less time in childcare than mothers do

[14] Hossain and Roopnarine 1993, Sanderson and Sanders-Thompson 2002, Snarey 1993.

[15] These results are not statistically significant at conventional levels (the sample size is small) and they are for the affect index measuring closeness (described earlier), rather than the behavior index which includes a measure of frequency of activities with father.

[16] Kaestner 1997, Hauser and Kuo 1998, Powell and Steelman 1989 and 1990. Studies in the economic development literature of the effect of sibling gender composition on outcomes include Das Gupta 1987, Garg and Morduch 1998, Morduch 2000, and Parish and Willis 1994.

(*e.g.*, Pleck and Masciadrelli 2004, Sayer, Bianchi, and Robinson 2004); nevertheless, psychologists argue, and I would venture that many people believe, that children's relationships with their fathers play an important role in children's development (*e.g.*, Lamb and Lewis 2004).[17] Psychologists argue that the quality of the time spent together is as important for children's outcomes as the amount, if not more so (Cabrera *et al.* 2000, Pleck and Masciadrelli 2004).[18] Economists would like to measure the time uses most likely to have an investment dimension - the potential to raise children's human capital.

Research indicates that a greater proportion of fathers' time relative to mothers' time is in playing and teaching time (such as helping with homework), as opposed to "custodial" care such as bathing and feeding (Robinson 1989, Yeung *et al.* 2001).[19] Robinson notes, "To the extent that this is the most enjoyable and influential (i.e., "quality" time) fathers get proportionately more if it." Psychologists have argued that fathers' play is more unpredictable and stimulating than mothers' (Lamb and Lewis 2004) and therefore may influence children's development disproportionately to the amount of time spent (Lamb and Tamis-Lemonda 2004). Because of this evidence, I will look at time fathers spend in playing and teaching activities with their children, as well as in leisure activities where their children are present.

Scholars of fathers' involvement often use the conceptualization of that involvement originated by Lamb *et al.* (1985). They have categorized paternal involvement in to three components: 1) interaction: fathers' direct contact with the child; 2) availability: time when the father is accessible to the child but may not be directly interacting with her; and 3) responsibility: activities that may be unrelated to time spent with the children, but that ensure

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[17] Amato and Rivera (1999) give a useful discussion of the methodological weaknesses of some of the literature on this topic.

[18] Although note that there is evidence that the amount of engagement time is correlated with "positive qualitative features such as warmth and closeness." (Pleck and Masciadrelli 2004).

[19] Although there is some evidence that this difference maybe diminishing over time (Pleck and Masciadrelli 2004) as fathers increase their child-maintenance activities (Sayer *et al.* 2004).

their well-being, such as "arranging for babysitters, making appointments with pediatricians and seeing that the child is taken to them, determining when the child needs new clothes, etc." Although the ATUS coding does not perfectly distinguish between time that may be used in these three ways, I use this as a guide for one way to think about how fathers' time may be valuable to children. I discuss this in more detail in the next section describing the time use variables.

Modeling fathers' investment choices

Research into the effects of gender on paternal involvement with children has not resolved the question of why fathers may treat sons and daughters differently. One school of thought is that fathers play a special role in the development of sons, so that their inputs into the childrearing of sons have greater impact than inputs into daughters.[20] In this situation a greater investment of fathers' time in boys could be observed even if fathers care equally about the well-being of both girls and boys. A second notion is that fathers have a preference for boys that may result in greater investment in them. A very simple utility function that embodies both of these ideas is

$$U_D(\gamma_i \cdot U_i(\theta_i \cdot T_K), C)$$

where $U_D (U_i)$ is the utility function of the father(child), $i = B$ (G) if the child is a boy (girl), C is consumption of market goods, and T_K is the time the father spends in child-rearing. The father derives utility from the consumption of market goods and the utility or well-being of his child, and we assume the only input into child well-being is fathers' time. The father's choice variables

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[20] There is some evidence from the psychology literature that boys suffer more from divorce than girls (Hetherington and Stanley-Hagan 1997), suggesting that father presence may be more important for boys. Some studies have indicated a stronger link between the father-child relationship and children's well-being for boys than for girls, but other work finds effects on both boys and girls (see cites in Amato 1998; also Wenk, *et al.* 1994). But for most parents a belief that fathers are more important for boys may be a more important factor in their behavior than research showing such a link.

are C and T_K. The parameter θ_i captures the idea that fathers' inputs may be more important for boys than for girls; if we assume $\theta_B > \theta_G$, then a given level of fathers' time has a greater effect on a son's well-being than on a daughter's. The parameter γ_i captures the idea of boy preference; if we assume $\gamma_B > \gamma_G$, then a given level of child happiness makes the father happier if the child is a son than if the child is a daughter. Either of these mechanisms alone could induce a correlation between having a son and investing time in him, so finding a correlation will not allow me to distinguish if one or both of these mechanisms is at work. Nevertheless, documenting differential treatment is an important step in studying how gender relates to well-being.

Data and Summary Statistics

The American Time Use Survey is sponsored by the Bureau of Labor Statistics and is conducted by the U.S. Census Bureau. Households which have completed their eighth and final month interviews for the Current Population Survey (CPS) (approximately 7,500 per month) become eligible two months later for the ATUS. One household member aged 15 or over is randomly selected to complete the survey, usually conducted by computer-assisted telephone interviewing. In 2003, 3,375 of the households leaving the CPS sample each month were selected for the ATUS sample, and an average of 1726 respondents per month completed the survey, for a response rate of about 57%. The main reason given for nonresponse is that the selected respondents are tired from participating in the CPS (BLS 2004b). The limitations of the data include the usual possibility of nonsampling error and the response rate.[21] Another limitation (shared with the CPS) is that a respondent's children ("own children") may be

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[21] Whether the nonresponse rate is correlated with time use is currently being studied by Abraham, Bianchi and Maitland.

biological, adopted, or stepchildren.[22]

The samples:

The universe for the ATUS is the same as for the CPS: the civilian, non-institutionalized population of the U.S., aged 15 or over (BLS 2004b). The focus of this paper is married fathers and their resident children; as noted, the data does not distinguish between biological, adopted, or stepchildren. For simplicity I will refer to the respondents in my sample as fathers and to the own household children under age 18 of the respondents as children.[23] The father sample is comprised of 2,693 men aged 25 to 60, married to women, who report the presence of own household children under the age of 18.[24] The child sample is comprised of the 5,236 own household children under age 18 of the father sample. Means for the demographic characteristics of the two samples are presented in Appendix Table 1.

Time use variables:

Means and standard deviations for the time use measures used in this paper are reported in Table 1, along with proportions of the two samples reporting positive minutes in each time use category (columns 1, 3, and 5 for fathers, columns 2, 4 and 6 for children). These means are

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[22] Resident fathers are more engaged with their biological children than with stepchildren (Pleck and Masciadrelli 2004 and cites therein).

[23] Note that the ATUS documentation considers children to be people aged under 18 (BLS and Census 2004) but that the relationship code value for own household child (terrp = 22) is also applied to older children. I do not include resident children 18 and over in my counts of children in the household.

[24] Of the 20,720 respondents in the 2003 ATUS sample, 9,052 are men, with 8,573 of these being aged 18 or over. Of these 8,573, 2,902 report having no partner, married or unmarried. Of the 5,671 partnered men, we exclude 5 men who report a male as spouse, 27 who report a male as an unmarried partner, and 310 who report an unmarried female partner, leaving 5329 men married to women. (Of these 310 men with an unmarried female partner, only 68 report having own household children, so only 68/(2782+68) = 0.024, or 2.4% of the children in opposite sex couples are excluded because their parents are unmarried.) Of the 5329 men married to women, 2,782 report own household children. Restricting the age to 25 - 60 excludes 79 men. Two observations with metropolitan status not defined and 8 observations where the respondent's spouse has a missing value for education are dropped, leaving 2,693 in the father sample.

weighted with the ATUS respondent sample weights. Details on how the time use categories were coded are in Appendix Table 2. In row 1, total time with any or all children is defined as the total of all periods for which the respondent named any of his children when asked "Who was with you? / Who accompanied you?" (BLS 2005)[25] We see the fathers in the sample averaged a total 4.20 hours per day with their children, or 4.76 hours for the 88% of the sample who reported any time at all.[26] Next I categorize activities to try to capture characteristics that may affect children's human capital.

In the second row are figures for what I have denoted as primary child care time, which is all activities coded by ATUS as caring for and helping household children (such as physical care, talking to, playing with and "looking after" children), plus travel related to caring for and helping household children. These activities could roughly be considered to fall in to the "engagement" category of Lamb *et al.* (1985), and to the extent that direct interaction in child-oriented activities with children increases their human capital, primary care time can be considered a measure of investment. Fathers averaged nine tenths of an hour or about 52 minutes in this kind of time, or 1.7 hours for the 52% of fathers who reported any primary care time.

Because of the special role ascribed to fathers in developmental activities, row 3 shows "achievement time", a subset of the primary care activities which includes reading, playing, sports, and helping with homework. Achievement time could also be considered a more direct measure of investment in children's human capital. About 30% of fathers reported achievement activities on their interview day.

However, it is possible that some activities that parents might regard as primary childcare

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[25] The who question (tuwho_code) is not asked during sleeping, working, and personal care/grooming activities. (BLS and Census 2004a).
[26] Note that for those time uses which can be measure for both fathers and children, the means for the child sample differ from the father sample means only because of the different weighting in the child sample resulting from the fact that different fathers contribute different numbers of children to the child sample.

or actively engaged time are not coded that way in ATUS, because ATUS coding defines primary childcare as only those activities that have no purpose outside the child (BLS 2004).[27] To roughly capture activities where fathers may consider themselves engaged with their children, but which are not coded as primary care time, the fourth row records means for leisure activities where children are present. These activities include socializing, relaxing, leisure, sports, exercise, and recreation, some of which may be activities that fathers tend to do with boys. The next row breaks out television-watching time, one of the components of leisure time.[28] Fifty-nine percent of fathers report leisure time with children, and 38% report watching television with their children.

Means for secondary care time are reported next. I use this as a very rough measure of "accessibility" time as described by Lamb *et al.* (1985). Secondary care designates care of children under 13 given by an adult who is performing some other primary activity, such as washing dishes (BLS and Census 2004b). This information is collected after the main diary is completed, with the interviewer probing as to whether there were children under the respondent's care during any of the activities listed in the diary (BLS and Census 2004a). Secondary childcare was only recorded for the 2,261 fathers in the sample who had at least one child less than 13 years old. (BLS 2005).[29] Fifty-two percent of these fathers reported some secondary care time.

Row 7 looks at time the father spends with his children in the absence of his wife, which could capture an aspect of the "responsibility" concept of Lamb *et al.* (1985) for fathers. Fifty-

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[27] "A child's presence during the respondent's activity is not enough in itself to classify the activity as childcare." (BLS and Census 2004b). For instance, playing games or doing arts and crafts with a child *and* with another adult, or seeing the Lion King with a child, are classified as leisure, not childcare (BLS 2004).
[28] Nock and Kingston (1988) find evidence that if a mother works in the evening it increases the time a father spends watching television with his children.
[29] There is no corresponding secondary care measure for the children because these question were asked about any and all children (BLS and Census 2004a).

eight percent of fathers report time in this category.[30] Means of fathers' leisure time without

children are presented in row 8; although obviously this is not a time use shared with children, a

reduction in childless leisure time may be a signal of a father's motivation to invest in his

children. Eighty percent of fathers report some childless leisure time.

The final variable is a child-level variable - how much time a child spends with her father

without siblings present. It is possible that this "alone time" with father is especially meaningful

for children. These means are only for families with more than one child, since in one-child

families this time measure is equivalent to total time. One-quarter of children in these families

are recorded as spending time alone with fathers.

Results

Father-level results:

Table 2 presents results from ordinary least squares regressions where the unit of

observation is the father, and the dependent variables are measures of time summed over any and

all children.[31] The father-level regressions address whether the gender composition of children

influences a father's time use. In this table each cell presents the coefficient from a separate

regression of the time-use dependent variable listed at the top of the column on the gender

composition variable, an indicator for the father having at least one boy, and other independent

variables.[32] [33] The omitted category for gender composition is families with all girls. The first

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[30] One category in the ATUS coding, (03-01-08 Organization and planning for household children) sounds ideal for
capturing an important part of the "responsibility" concept, but only 27 fathers in the sample reported this kind of
time.

[31] As can be seen in Table 1, varying proportions of fathers report zero time in the different time use categories For
all the results in the paper, Tobit regressions consistently produced results that were qualitatively similar to the OLS
regressions. I have presented the OLS results for ease in interpreting the coefficients.

[32] Other specifications for gender composition were tried, *e.g.*, entering number of boys and number of girls linearly
or as indicators. This specification seems to capture the effects best.

[33] The additional independent variables included in the regressions but not presented are number of children, age
gap from oldest to youngest child, age, household size, indicators for the age of the oldest child (0 to 3, 4 to 8, and 9

row shows the result for all families; the next two rows stratify families by whether they have

one child or more than one child. Some of the results over all family sizes seem to be driven by

the one child families and this stratification enables us to see this.

The first column shows that the presence of at least one boy among the children

significantly increases the father's total time with any or all of the children by 26 minutes per

day, relative to fathers of all-girl families.[34] The result is stronger for one child families than for

larger families, with the coefficient in row 2 indicating that fathers with an only son spend an

additional 26 minutes a day with their child compared to fathers with an only daughter (p =

0.055).[35] Although the coefficient for larger families in row 3 is not significant at conventional

levels (p = 0.117), its sign and size are almost identical to the coefficient for one child families,

so it is plausible that this coefficient is picking up a real effect in these larger families.

The next four columns present results for time measures that I suggested in the previous

section could represent aspects of fathers' "engagement time" as described by Lamb *et al.* (1985).

Having at least one boy significantly increases primary care time by fathers, although rows 2 and

3 suggest that this is driven by more time for boys in one-child families. In column 3, having at

least one boy has no significant effect on achievement time over all families. However, a boy in

a one-child family receives significantly more achievement time than a girl in a one-child family,

9.5 minutes. The effect of at least one boy in larger families is near zero and insignificant. If

to 12); indicators for race, education (high school, some college, college or more), metropolitan area, status, region, wife's education status, month of the year, and weekday. Concerns arise because aspects of the current household structure such as the number and age profile of the children may be endogenous. In most of my results I find that the inclusion or exclusion of the other demographic controls has little effect on the gender and gender composition coefficients. Similarly, although I have excluded fathers' work time from the regressions because of its endogeneity, (*cf.* the finding of Lundberg and Rose (2002) that gender impacts fathers' labor supply) results are similar when it is included.

[34] This is consistent with the previous literature that has found the *gender composition* of families to be a determinant of fathers' behavior: Cooksey and Fondell 1996, Harris and Morgan 1991, Marsiglio 1991, Wilcox 2002.

[35] By "only son (daughter)" I am referring to one-child families rather than families where there is only one son (daughter) but he (she) has sisters (brothers).

these achievement activities are important for children's outcomes, it appears that only boys are the only children that benefit.

Leisure time with children is increased significantly, by 16 minutes per day, by the presence of at least 1 boy (column 4). When stratified by family size, the coefficients are of similar magnitude (rows 2 and 3) although they are significant only at the 10% level. It is plausible that this indicates the effect is found in both one-child and larger families. If fathers with at least one son are more likely to include children in their leisure activities, is this beneficial for children? Column 5 shows that a large portion of this shared leisure time is time spent watching television. Fathers with at least one son spend significantly more time watching television with their children compared to fathers with all girls, 12 minutes per day. Interestingly, this is driven by the families with more than one child. It appears that sons in one-child families get more achievement time from fathers, but that while fathers in larger families spend more time with children if they have at least one son, much of that time is spent watching TV.[36]

Columns 6 - 8 turn to measures of "accessibility" and "responsibility." Having at least one boy has no significant effects on secondary care time (a loose measure of "accessibility") for fathers who have at least one child under age 13. Column 7 shows having at least one boy increases fathers' time with children without his wife present by 22 minutes per day, while rows 2 and 3 show the effect is strong for both one-child and larger parity families. If we interpret this as a measure of the "responsibility" that fathers take for their children, having at least one boy increases it. The last column suggests that fathers give up leisure time without children when

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[36] In results not shown, I calculate leisure time less television watching time. In a regression of this time use variable on at least one boy and the other independent variables, no significant difference is found between fathers with at least one boy and fathers with all girls, suggesting that the increase in leisure time in column 4 is driven by television watching time.

they have at least one boy, 16.5 minutes per day. The coefficient loses significance in the

regressions stratified by family size (p = 0.161 and p = 0.134), but has a similar magnitude.

The father-level regressions indicate that fathers are investing more of certain types of

time in families where there is a son, but do not tell us whether this attention is confined to sons

or benefits all of the children. Next I look at how time is allocated to individual children.

Child level results:

Table 3 presents results of OLS regressions where the unit of observation is the child, and

measures of time are summed over all periods where the father reports the particular child being

present. Each panel presents the coefficient(s) from a separate regression of the time-use

dependent variable listed at the top of the column on the gender or gender composition

variable(s) and additional independent variables.[37] The children are weighted with the

respondent's weight and the standard errors are corrected for heteroskedasticity and correlation

between observations in the same family (children with the same father). In addition to allowing

us to measure the effect of gender and gender composition on the experiences of individual

children, these regressions allow us to control for the child's age and birth order, which have

been shown to be important determinants of investments in children.[38] [39]

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[37] The additional independent variables included in the regressions but not presented are number of siblings, father's age, child's age, multiple birth status (being a twin, triplet, etc.), age rank, age gap oldest to youngest sibling, indicators for age of oldest child in family (0 to 3, 4 to 8, and 9 to 12); indicators for race of father, education of father (high school, some college, college or more), metropolitan area status, region, mother's education status, month of the year, and weekday.   Age rank is similar to birth order. I cannot assign true birth order with the ATUS data, both because nonresident children aged 18 and over are not observed, and because I do not know whether the father's relationship with the children is biological. Instead I assign "age rank" (similar to Edmonds, forthcoming), where the age rank of the oldest child less than 18 in the household is one, the second oldest is two, etc. For most children this will be the same as their birth order.

[38]   Black, Devereux, and Salvanes 2005, Price 2005, Yeung *et al.* 2001.

[39] I also control for multiple birth status (being a twin or triplet, etc.) Since they are not of primary interest I do not present coefficients for these three variables in the tables. Consistent with other work, the unreported results show that increasing child age significantly reduces fathers' time and increasing age rank significantly decreases it. Multiple birth status has small and insignificant effects.

The first column in Table 3 investigates fathers' total time with children. The coefficient in Panel A suggests that the extra time invested by the father in households with at least 1 boy makes a significant difference to the time that each of the children in the household spends with her father, adding an average of 23 minutes relative to girls in all-girl families (the omitted category) . (Recall that the father can spend time with more than one child at once.) Panel B shows whether this average increase is spread across all children or is concentrated on the boys, following the strand of research that has found the gender of a child to be a determinant of father behavior.[40] The coefficient on the indicator for being a son is positive and significant (at $p = 0.052$), indicating that being male gains a child 12 minutes of father's time per day. (The omitted category is being a girl.) Panels C and D show that this is driven by one-child families with a coefficient of 26 minutes (significant at $p = 0.053$); larger families have an insignificant coefficient one third the size of this.

This result that only boys receive more time than only girls suggests that first-born boys may receive more time than first-born girls. Does the first-born son continue to receive more time after siblings are born? Will the first son get more time even if he is not the first child? I explore this in panels E and F by categorizing boys into indicators for the highest age rank boy - the oldest boy less than 18 in the household, whether or not he is the oldest child - and lower age rank boys. The omitted category is girls.[41] Over all families (panel E), the significant coefficient for highest age rank boy indicates he gets about 16 minutes more time than girls do; in families with more than one child (panel F), the highest age rank boys get about 12 more minutes ($p =$

[40] *e.g.*, Barnett and Baruch 1987, Crouter and Crowley 1990, Harris and Morgan 1991, Harris *et al.* 1998, Ishii-Kuntz 1994, Yeung *et al.* 2001.
[41] In an unreported specification I include an indicator for highest age rank girl, which was insignificant and did not change the significance or relative magnitudes of the coefficient on the boy indicators, so I omit it here for parsimony.

0.051).[42]

Panel G addresses the question of whether having brothers is an advantage, categorizing children into indicators for being a boy with no brothers, being a boy with at least one brother, and being a girl with at least one brother. The omitted category is girls with no brothers. This regression does not give much support to the notion that having a brother helps girls in terms of fathers' time. The respective coefficients indicate that compared to the omitted category of girls with no siblings or only sisters, boys with no siblings or only sisters gain 30 minutes of time with their father, a significant difference, boys with at least one brother show no significant difference, and girls with at least one brother have a marginally significant increase in time (p=0.094). Panel H shows the same result for families with more than one child, to see if the results for boys with no brothers are driven by only-boys. Here the boy without brothers continues to gain significantly compared to the girls in all-girl families, but neither the boys nor girls with any brothers do. The marginal significance of a girl having at least one brother has disappeared, suggesting that it was driven by the comparison between girls with any brothers and only-girls (who are included in the omitted category in Panel G).

For primary care time, the significant coefficient on being a boy for all families again appears to be driven by only-boy families, as does the significant coefficient on highest age rank boy for all families. Panel G offers evidence that girls are advantaged in primary care time by having brothers, although again the significance of this effect disappears when the regression is run on families with more than one child in panel H and the only-girls are removed from the omitted category.

The father-level regressions in Table 2 showed that fathers spend more achievement time

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[42] Results for one-child families are already shown in Panel C - I am a boy is the same as I am the highest age rank boy for one-child families.

with all children only in one-boy families. For completeness, column 3 of Table 3 presents the child-level regressions for achievement time, but they serve to confirm that the only-boy families are the only ones that show this result. Even the highest age rank boy receives no more achievement time in families with more than one child (panel F). Having brothers does not offer an advantage to either boys or girls (panels G and H).

Columns 4 and 5 consider children's time with fathers in leisure and television watching. Individual children in households with at least one son get significantly more of these kinds of time compared to all-girl families. Being a boy significantly increase television watching time, and this is driven by families with more than one child. The highest age rank boy receives significantly more of both kinds of this time compared to girls, regardless of family size. However, having brothers increases girls' leisure time with dad at marginal significance (p-values of 0.07 for the coefficient on this indicator in panels G and H); and interestingly, all children gain television time compared to girls with no brothers (panels G and H). The increase in time watching television for fathers with at least one son that we saw in Table 2 seems to be almost evenly distributed among all the children in the household - boys with no brothers get about 3 minutes more per day than boys and girls with brothers.

Table 2 showed that fathers with at least one boy spend more time with their children without their wife being present in all family sizes. Here column 6 shows how that time is distributed among the children in the families. On average, children in the families with at least one son get significantly more time (18 minutes) compared to children in all girl families, although boys get significantly more than girls (panels B, C, and D). The highest age rank boy gets significantly more of this time than both all girls (the omitted category) and lower age rank

boys (panels E and F).[43] Panels G and H indicate that having brothers increases both girls and boys time with fathers in the absence of mothers, relative to families with all girls. The coefficient for girls with any brothers is significant at p = 0.062 (p = 0.057) in the all families (families with more than one child) regression. This suggests that although the highest age rank boys get more of this time, girls (and boys) are advantaged by having brothers.

The last column examines a possible measure of the quality of time with fathers, specifically "alone time" with dad, without the presence of siblings. The regressions here are for families with more than one child, since for one-child families, any time with dad is time without the presence of siblings. Panel B indicates that for individual children, time with father without other children present is not significantly influenced by being a boy.[44] However, panels C and D show that the highest age rank boys and boys with no brothers receive significantly more alone time with fathers than do the other categories of children.[45] Having brothers does not increase this time for either boys or girls.

In sum, the child level OLS regressions show that the gender of children, the gender composition of their siblings, and specifically having brothers for girls do appear to affect how fathers allocate their time to their children. Whether that time involved is "quality" time is less clear. For the time measure that is most arguably quality time, achievement time, boys in one child families receive more than girls in one child families, but gender and gender composition have little effect on achievement time for larger families.

Looking at the other time measures, being a boy increases total time with father in one child families and television watching time in families with more than one child, and time with

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[43] The F-test for equality of the coefficient for lower age rank boys and the coefficient for the highest age rank boys shows they are significantly different at p = 0.04 (p=0.06) in all families (families with more than one child).
[44] Results not reported for "at least one boy" are also insignificant.
[45] The F-test for equality of the coefficient for lower age rank boys and the coefficient for the highest age rank boys shows they are significantly different at p = 0.00.   The boy with no brothers coefficient is significantly different from both the boy with at least one brother coefficient and the girl with at least one brother coefficient at p = 0.00.

father only without mother present. Being the highest age rank boy or being the only boy in the family has more pervasive effects than just being a boy: these increase time with father in all the measures (except achievement time). In addition, the highest age rank boy does significantly better compared not just to girls but also to lower age rank boys for time with father without mother and time with father without other siblings.

The results are suggestive that girls with a brother get more time compared to girls in all-girl families. For families with more than one child, the significant increases are in television watching time and time with father without mother.

These results overall have indicated that boys, especially if they are the highest age rank boy or the only boy in a family, do better than girls in terms of fathers' time. However, these comparisons are across families, and could be driven by differences between all-girl families and families with boys.[46] To determine whether boys are getting more time from their fathers compared to their own sisters, I next turn to family fixed effects. [47]

Family fixed effects results:

Table 4 presents the family fixed effects results.[48] The coefficient on "I am a boy" in the fixed effect regressions is interpreted as the extra time a father spends with a son relative to a daughter, after controlling for differences in age, age rank, and multiple birth status. The coefficients tell a fairly consistent story: being a boy and in particular the highest age rank boy

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[46] When the omitted category is "I am a girl", for instance, it includes girls in all-girl families and girls in families with sons. If boys get more time, it could be because they get more time than both of these types of girls; or it could be that they get more time than the girls in all-girl families and the same average time as girls in families with sons, with the former driving the significant differences for boys.

[47] One source of these across-family differences could be unobserved heterogeneity across fathers, such as an unobservable preference for sons that might contribute both to the gender composition of the children and to a father's propensity to spend more time with sons. The fixed effects control for these characteristics to the extent that they do not vary across children.

[48] The independent variables in the regression for which coefficients are not reported are child's age, child's age rank, and child's multiple birth status (being a twin, triplet, etc.).

increases a child's time with father relative to girls in the same family, in every measure except for primary care time and achievement time.[49]

Conclusion

This study documents that both gender and gender composition play a role in how fathers allocate time to children. Being a boy and being the highest age rank boy are shown to increase time with fathers in both the OLS regressions and the family fixed effects specifications, indicating that boys average more time with fathers both in comparison to girls in all-girl families and in comparison to girls in families with both boys and girls. Results also show that for girls having brothers increases certain types of time with fathers.

How this time may affect boys' and girls' outcomes remains an important question. For mental health outcomes, Pleck and Masciadrelli (2004) conclude that in the psychology literature "positive paternal engagement is associated with desirable outcomes for children, adolescents, and young adults."[50] However, the link between fathers' time investments and the human capital outcomes for their children typically studied by economists is not well documented, because data measuring both outcomes for adults and information on their fathers' time use is not available. The evidence we do have is for children's human capital. Zick, Bryant, and Osterbacka (2001) studied the effect of the frequency of reading and playing with young children and found negative effects on behavioral problems and positive effects on grades in school; Cooksey and

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[49] For total time, the "I am a boy" coefficient is significant at $p = 0.071$ and the "highest age rank boy" coefficient is significant at $p = 0.074$.

[50] Typical outcomes studied include behavior problems for children, positive school attitudes for adolescents, and self-esteem and life satisfaction in adults. Although on balance there does seem to be a consensus in this literature that father involvement is important for children, Amato and Rivera (1999) point out that the more methodologically rigorous studies yield weaker evidence, and that more research is needed.

Fondell (1996) find a similar result on grades.[51]

Although more research on how fathers' time affects children's outcomes is needed, we can speculate on the implications for children of the time uses describe in this paper. For the time that is arguably most related to the development of human capital, achievement time, being a boy helps, but only in one child families. In the measure most closely related to direct engagement, primary care time, fathers devote more of this time in families with at least one boy, but within families (Table 4), boys do not get significantly more of this time.

Boys do better than their sisters on average in leisure time, although this appears to be driven by television watching time. This extra companionship time with father may benefit sons, or it may be neutral or even negative for their development. Girls with brothers get more TV time with father than girls in all-girl families; again it is questionable whether this is beneficial to their development or not. Similarly, although time with father without mother is greater for boys and for girls with brothers, it is difficult to evaluate if this is beneficial time for them or not, because this time without mom may be spent watching television.

For the measure of time with father without siblings, the highest age rank boys and those who are the only sons in a family get more. To the extent that the presence of other children dilutes the fathers' inputs into children, this will be beneficial for boys.

Overall, boys get more of fathers' time in certain types of activities. Although we cannot directly measure the contribution of this time to the children's development, to the extent that these investments of father's time affect children's outcomes, it appears that girls are at a disadvantage, especially girls in all-girl families. Girls with brothers do receive more of fathers'

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[51] For adult outcomes, Yeung, Duncan and Hill (2001) use the Panel Study of Income Dynamics to look at how young adults' completed schooling, wage rates, and nonmarital childbearing were affected by some aspects of their fathers' time use during childhood (along with another of other characteristics of the fathers); however the time use measures in their data did not include measures of fathers' time spent with children.

time than girls with only sisters, but this is primarily in television watching, so whether it is an

advantage or not is open to question.

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Table 1
Means for time use variables

Time variable	1	2	3	4	5	6
	Fraction who report time >0		Whole sample means		Means for those with time>0	
	Fathers	Children	Fathers	Children	Fathers	Children
total time with children (fathers)	0.88 (0.34)	0.86 (0.38)	4.20 (4.13)	3.76 (3.52)	4.76 (3.65)	4.38 (3.49)
primary care time	0.52 (0.53)	0.49 (0.55)	0.88 (1.56)	0.70 (1.28)	1.67 (1.62)	1.44 (1.47)
achievement time	0.29 (0.48)	0.27 (0.48)	0.39 (0.97)	0.35 (0.95)	1.34 (1.22)	1.33 (1.21)
leisure time w/ children (fathers)	0.59 (0.52)	0.55 (0.54)	1.61 (2.42)	1.41 (2.30)	2.72 (2.40)	2.58 (2.19)
total time watching TV w/ children (fathers)	0.38 (0.52)	0.35 (0.52)	0.86 (1.66)	0.77 (1.62)	2.24 (1.82)	2.22 (1.72)
secondary care time (for those w/ children <13)	0.52 (0.53)		0.88 (1.56)		1.67 (1.62)	
time w/ children (father) w/o spouse (mother)	0.58 (0.53)	0.50 (0.55)	1.45 (2.40)	1.12 (1.99)	2.49 (2.43)	2.23 (2.23)
total leisure time w/o children	0.79 (0.43)		2.15 (2.58)		2.72 (2.57)	
time w/ father w/o siblings (>1 child families only)		0.25 (0.48)		0.44 (1.30)		1.74 (2.03)

Notes to Table 1:
Standard deviations reported in parentheses. Means are weighted with the respondent sample weight (tufinlwgt).
Time is measured in hours.
Sample: Data from 2003 ATUS; the father sample is male respondents aged 25 to 60, married to women, who report the presence of own household children under the age of 18. Sample size for fathers is 2,693 except for secondary time (n=2,261). The child sample is the children of the father sample; sample size for children is 5,236 except for time with father without siblings (n= 4,294.)
Secondary care time is only reported for those with youngest child age < 13. Time with father without siblings is only reported for families with more than one child.

Table 2
Time use: Father-level OLS regressions

	1	2	3	4	5	6	7	8
	total with children	primary care with children	achievement with children	leisure with children	watching TV with children	secondary care time	w/ children, w/o wife	leisure w/o children
at least 1 boy (all families)	26.09 (10.58)** n=2,693	10.54 (3.79)*** n=2,693	4.15 (2.62) n=2,693	16.08 (6.55)** n=2,693	11.39 (4.14)*** n=2,693	2.39 (13.77) n=2,261	22.34 (6.09)*** n=2,693	-16.54 (7.25)** n=2,693
at least 1 boy (one child families)	26.39 (13.72)* n=942	12.36 (5.21)** n=942	9.56 (3.77)** n=942	16.23 (9.75)* n=942	7.45 (5.80) n=942	22.10 (19.18) n=628	19.28 (8.57)** n=942	-15.50 (11.06) n=942
at least 1 boy (>1 child families)	25.26 (16.1) n=1,751	8.63 (5.59) n=1,751	0.80 (3.75) n=1,751	14.84 (8.55)* n=1,751	15.34 (5.82)** n=1,751	-6.74 (19.37) n=1,633	26.27 (8.77)*** n=1,751	-14.39 (9.59) n=1,751

Notes to Table 2:

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Observations are weighted with the respondent sample weight (tufinlwgt).

Time is measured in minutes.

Each cell in the table presents a coefficient from a separate regression of the time-use dependent variable listed at the top of the column on the gender composition variable, an indicator for the father having at least one boy, and other independent variables listed below.

The omitted category relative to at least one boy is families with all girls. R^2 varies from 0.06 to 0.25.

Sample: Date from 2003 ATUS; male respondents aged 25 to 60, married to women, who report the presence of own household children under the age of 18.

Independent variables included in the regression for which results are not reported are number of children, age gap from oldest to youngest child, age, household size, indicators for the age of the oldest child (0 to 3, 4 to 8, and 9 to 12); indicators for race, education (high school, some college, college or more), metropolitan area status, region, wife's education status, month of the year, and weekday.

Table 3
Time use: Child-level OLS regressions

	1	2	3	4	5	6	7
	total with father	primary care with father	achievement with father	leisure with father	watching TV with father	with father, w/o mother	with father, w/o siblings
Panel A (all families)							
at least 1 boy	23.25	8.42	3.30	12.84	10.98	18.11	
(n = 5,236)	(10.58)**	(3.39)**	(2.56)	(5.86)**	(4.05)***	(5.19)***	
Panel B (all families)							
I am a boy	12.06	3.69	2.51	6.09	5.86	13.21	
(n = 5,236)	(6.22)*	(2.11)*	(1.45)*	(3.46)*	(2.52)**	(3.32)***	
Panel C (1 child families)							
I am a boy	25.97	9.96	9.55	10.22	6.02	18.7	
(n = 942)	(13.42)*	(4.70)**	(3.71)**	(8.30)	(5.58)	(8.15)**	
Panel D (>1 child families)							
I am a boy	8.76	2.57	1.33	5.06	5.79	11.97	3.20
(n = 4,294)	(6.83)	(2.30)	(1.53)	(3.76)	(2.77)**	(3.55)***	(2.56)
Panel E (all families)							
highest age rank boy	15.85	4.27	3.17	8.13	6.89	16.13	
	(5.75)***	(1.97)**	(1.46)**	(3.20)**	(2.26)***	(3.27)***	
lower age rank boy	2.13	2.18	0.79	0.72	3.15	5.56	
(n = 5,236)	(10.51)	(3.74)	(2.28)	(5.92)	(4.51)	(5.62)	
Panel F (>1 child families)							
highest age rank boy	11.96	3.24	1.65	7.04	6.87	15.23	7.25
	(6.13)*	(2.08)	(1.47)	(3.31)**	(2.36)***	(3.46)***	(2.96)**
lower age rank boy	2.42	1.24	0.68	1.12	3.64	5.51	-4.83
(n = 4,294)	(10.54)	(3.82)	(2.33)	(5.99)	(4.53)	(5.66)	(3.47)
Panel G (all families)							
boy with no brother	29.78	9.21	5.11	15.75	11.97	24.63	
	(10.55)***	(3.59)**	(2.72)*	(6.08)***	(4.15)***	(5.66)***	
boy with brother(s)	16.55	7.27	2.00	9.46	10.47	14.63	
	(13.40)	(4.13)*	(2.94)	(7.23)	(5.26)**	(6.22)**	
girl with brother(s)	19.94	8.37	1.77	11.79	9.92	11.39	
(n = 5,236)	(11.89)*	(3.95)**	(2.86)	(6.57)*	(4.68)**	(6.11)*	
Panel H (>1 child families)							
boy with no brother	29.84	9.51	3.04	18.26	15.11	27.69	15.56
	(14.83)**	(5.05)*	(3.74)	(8.43)**	(5.64)***	(7.72)***	(5.05)***
boy with brother(s)	19.88	6.22	1.65	12.31	12.94	17.10	-0.38
	(15.41)	(4.78)	(3.52)	(8.30)	(5.80)**	(6.91)**	(3.97)
girl with brother(s)	22.32	7.34	1.24	14.26	12.07	13.53	3.16
(n = 4,294)	(14.61)	(4.73)	(3.61)	(8.07)*	(5.55)**	(7.12)*	(4.29)

Standard errors reported in parentheses. Observations are weighted with the respondent's weight (tufinlwgt) and the standard errors are corrected for heteroskedasticity and correlation between observations in the same family (children with the same father);

Time is measured in minutes.

Each cell in the table presents a coefficient from a separate regression of the time-use dependent variable listed at the top of the column on the gender composition variable(s), listed in that panel, along with additional independent variables listed below. The omitted category relative to at least one boy is being in a family with all girls; to " I am a boy" is "I am a girl"; to highest age rank boy and lower age rank boys is "I am a girl"; to panels G and H is girls without brothers. R^2 varies from 0.05 to 0.26.

Sample: Data from 2003 ATUS; the child sample is the own household children under age 18 of the father sample, which is male respondents aged 25 to 60, married to women, who report the presence of own household children under the age of 18.

Independent variables included in the regression for which results are not reported are number of siblings, father's age, child's age, multiple birth status (being a twin, triplet, etc.), age rank, age gap oldest to youngest sib, indicators for age of oldest child in family (0 to 3, 4 to 8, and 9 to 12); indicators for race of father, education of father (high school, some college, college or more), metropolitan area status, region, mother's education status, month of the year, and weekday.

Table 4
Time Use: Child-level Fixed Effects Regressions

	1	2	3	4	5	6	7
	total with father	primary care with father	achievement with father	leisure with father	watching TV with father	with father, w/o mother	with father, w/o siblings
Panel A							
I am a boy	8.04	1.57	1.32	5.08	3.77	11.27	7.54
	(4.45)*	(1.79)	(1.08)	(2.10)**	(1.71)**	(3.41)***	(3.58)**
Panel B							
highest age rank boy	8.36	1.71	1.49	5.00	3.90	12.16	8.40
	(4.51)*	(1.78)	(1.08)	(2.17)**	(1.75)**	(3.46)***	(3.34)**
lower age rank boy	6.38	0.82	0.42	5.49	3.07	6.61	3.07
	(6.59)	(2.80)	(1.76)	(2.84)*	(2.22)	(5.20)	(4.51)

Notes to Table 4:

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Observations are weighted with the respondent's weight (tufinlwgt).

Time is measured in minutes.

Each cell in the table presents a coefficient from a separate regression of the time-use dependent variable listed at the top of the column on the gender composition variable(s) listed in the panel and child's' age, age rank, and multiple birth status (coefficients not reported). The omitted category in each panel is "I am a girl." R^2 varies from 0.85 to 0.94.

Sample: Data from 2003 ATUS; the child sample is the own household children under age 18 of the father sample, which is male respondents aged 25 to 60, married to women, who report the presence of own household children under the age of 18.

Appendix Table 1
Summary Statistics - Demographic Variables

Fathers	Mean (s.d.)	Children	Mean (s.d.)
number of children	1.96 (.99)	number of siblings	2.40 (1.18)
has only child	0.35 (.46)		
has two children	0.42 (0.47)		
has three children	0.17 (0.36)		
has four or more children	0.06 (0.25)		
has at least one boy	0.71 (0.48)	at least one boy in household	0.77 (0.46)
		male	0.51 (0.55)
		highest age rank boy	0.37 (0.46)
		lower age rank boy	0.14 (0.38)
		boy with no brother	0.24 (0.41)
		boy with brother(s)	0.27 (0.42)
		girl with brother(s)	0.27 (0.42)
		multiple births in family (twins or more)	0.05 (0.23)
		age rank	1.70 (0.84)
age gap oldest to youngest child	3.11 (3.63)	age gap oldest to youngest sib	4.38 (3.73)
=1 if oldest child aged 0 to 3	0.14 (0.37)	=1 if oldest child aged 0 to 3	0.09 (0.32)
=1 if oldest child aged 4 to 8	0.24 (0.46)	=1 if oldest child aged 4 to 8	0.24 (0.46)
=1 if oldest child aged 9 to12	0.21 (0.44)	=1 if oldest child aged 9 to12	0.24 (0.47)
=1 if oldest child aged 13 to17	0.40 (0.52)	=1 if oldest child aged 13 to17	0.43 (0.54)
age	39.59 (7.88)	father's age	39.23 (7.59)
		age	8.47 (5.49)
less than high school ed.	0.11 (0.34)	father has less than high school ed.	0.12 (0.36)

Fathers	Mean (s.d.)	Children	Mean (s.d.)
high school education	0.28 (0.48)	father has high school education	0.28 (0.49)
some college education	0.25 (0.46)	father has some college education	0.25 (0.47)
college or higher education	0.36 (0.51)	father has college or higher education	0.35 (0.52)
household size	4.30 (1.27)	household size	4.71 (1.44)
white	0.85 (0.38)	white	0.64 (0.48)
black	0.09 (0.30)	black	0.06 (0.23)
american indian	0.01 (0.12)	american indian	0.01 (0.08)
asian	0.04 (0.21)	asian	0.03 (0.16)
two or more races	0.01 (0.10)	two or more races	0.01 (0.10)
		race not reported	0.27 (0.44)
wife less than high school ed.	0.10 (0.32)	mother less than high school ed.	0.11 (0.35)
wife has high school ed.	0.25 (0.46)	mother has high school ed.	0.25 (0.47)
wife has some college	0.29 (0.48)	mother has some college	0.29 (0.50)
wife has college or more	0.36 (0.51)	mother has college or more	0.35 (0.52)
weekday	0.71 (0.48)	weekday	0.71 (0.50)
weekend	0.29 (0.48)	weekend	0.29 (0.50)
sample size (unweighted)	n=2,693		n=5,236

Notes to Appendix Table 1:
Standard deviations reported in parentheses.   Means are weighted with the respondent sample weight (tufinlwgt).
Time is measured in hours.
Sample: Data from 2003 ATUS; the father sample is male respondents aged 25 to 60, married to women, who report the presence of own household children under the age of 18. The child sample is the children of the father sample.

Appendix Table 2
Coding for Time Use Variables

variable	code
total time	ATUS variable: Any activity for which own household child is listed as present (tuwho_code = 22).[1]
primary care time	All activities with ATUS codes 03-01-xx or 17-03-01.
achievement time	All activities with ATUS codes 030102-030107, 030201, or 030203 AND for which own household child is listed as present (tuwho_code = 22).
leisure time	All activities with ATUS codes 12-xx-xx or 13-xx-xx AND for which own household child is listed as present (tuwho_code = 22).
TV time	All activities with ATUS codes 120303 AND for which own household child is listed as present (tuwho_code = 22).
secondary child care time	ATUS variable: Total time spent providing secondary childcare for Respondent File household and own non-household children <13 (BLS 2005).[2] (Defined for fathers only)
time with children without wife	Any activity for which own household child is listed as present (tuwho_code = 22) where wife is not listed (tuwho_code = 20).
leisure time without children	All activities with ATUS codes 12-xx-xx or 13-xx-xx where own household children are not listed. (Defined for fathers only)
time with father with no other children	Any activity for which the ATUS line number (tulineno) for this particular own household child is listed and line numbers for any other household children are not listed. (Defined for children only)

Notes to Appendix Table 2:
Code numbers can be found in BLS (2003).
1. Note that all activities for which who information is not collected, such as sleeping, are omitted from this calculation (BLS 2005).
2. This information is collected after the main diary is completed, with the interviewer probing as to whether there were children under the respondent's care during any of the activities listed in the diary (BLS Census 2004a).