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Building gender roles: Do children learn from their parents?

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Abstract

Intergenerational transmission has been successfully employed in economic research to explain the persistence of certain economic behaviors across generations. This paper evaluates the relevance of this transmission process in the formation of gender roles during childhood. In particular, we analyze the relationship between parents' and children's housework allocation patterns. The empirical application is carried out with the Spanish Time Use Survey 2002–2003. We find a significant positive correlation between the fathers' contribution to housework and a less asymmetrical distribution of domestic chores between sons and daughters. This correlation is robust to the inclusion of variables aimed at capturing social externalities and also to different definitions of father's involvement with household labor.

JEL Codes: J16, J22, C35

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1. INTRODUCTION

In recent decades, most industrialized countries have witnessed a convergence in the economic profiles of men and women. Statistics show common trends across countries: more women than men obtain university degrees; female labor force participation has reached unprecedented levels; male and female wages are slowly converging in many occupations; and female engagement in civic affairs, such as political activities, has significantly increased though their representation in key positions of power is still much lower than that of men (Eurostat, 2008).

Gender differences at home have also declined but to a lesser extent. Using U.S. data, Hursh and Aguiar (2007) document that, between 1965 and 2003, male nonmarket work hours increased by 3.9 hours per week while female nonmarket work fell by almost 12.6 hours per week. Similar changes have occurred in other developed countries. These data reveal that although the reduction in the housework gender gap has been mainly explained by women's withdrawal from these activities, men have also increased their housework participation in a modest but constant way across time. Taken together, women's social advances and men's involvement in traditionally feminine household activities have exposed younger generations to new family role models characterized by either a working mother or a father who performs household labor, or both.

There is a growing economic literature on the implications of maternal employment on several childhood outcomes, such as cognitive development, obesity, adolescent risky behaviors (see, e.g. Anderson et al. 2003; Lopoo, 2004; Ruhm, 2004, 2008). A recent line of research explores the long-run effect of maternal employment on gender roles of next generations. For example, Fernández et al. (2004) show that working mothers seem to transmit a set of beliefs or preferences to their sons and this increases their likelihood of marrying working women when adults. This empirical evidence gives us an indication of how female labor market participation evolves through generations (Fernández and Fogli, 2005; Fernández 2007). In contrast to this evidence, little is known about the effect of fathers' involvement in household labor on children's outcomes.

The aim of this paper is to explore the effect of father's engagement in housework on nonadult children's time allocation to similar activities. According to developmental psychologists, childhood and adolescence are crucial periods in the formation of gender roles (e.g. Eaves et al., 1989; Collins et al., 2000). Parents contribute significantly to this process by providing role models for children or by training them in what a boy and a girl should do. It is interesting that housework is one of the activities in which gender differences appear earlier. Data from time use surveys in developed countries reveal that, though neither boys nor girls devote much time to domestic tasks, girls' allocation nearly duplicates boys' (Larson and Verma, 1999; Kooreman, 2007). There is interest in housework because it is not a neutral kind of activity, such as caring for pets or engaging in sports. Instead, the experience of performing housework may itself contribute to the formation of preferences that determine gender roles. Moreover, since the home is where most children experience this activity, housework is one of the behaviors more likely to be influenced by parents' conduct—that is, more likely to be transmitted from generation to generation. As Bowles (1998) argues, "there is considerable evidence that preferences learned under one set of circumstances become generalized reasons for behavior." For example, learning by doing, imitation, inheritance and habituation are ways of acquiring and internalizing preferences that can help to explain observed behavior. Our assumption in this paper is that the father's involvement in housework communicates important information on gender roles at home that may be transmitted to children. Thus, a father who devotes more time to housework than his peers would be more likely to transmit preferences for egalitarian behavior that will result in his son (daughter) doing more (less) housework than others in his children's generation.

Although focusing on nonadult children precludes our addressing the long-term effect of parents on gender role formation, it does enable measuring their impact at the beginning of the process. At this stage of life, there is less exposure to other sources of influence, which facilitates identification of the parental effect up to the moment children enter adulthood. Establishing a role for parents in this setting is important for understanding the formation of preferences. If the father's household labor contributes to the erosion of traditional gender roles in childhood, then gender-equalizing policies that stimulate men's involvement

in domestic tasks may have spillovers to future generations. It would also contribute a relevant piece of information in the nature–nurture debate over gender roles.

The empirical application is carried out with the Spanish Time Use Survey 2002–2003 (STUS). The STUS collects time diaries for all members of the household aged at least 10 years. This allows us to have matched data on parents and children from the same sample of families, which is crucial for analyzing intergenerational relationships. In this sense, the STUS shows clear advantage over other time surveys (e.g., the American Time Use Survey) that collect time information on only one person per household. Besides these advantages of the data set, the Spanish context is particularly suitable for the analysis of gender role transmission. On the one hand, traditional roles are deeply ingrained in the Spanish society. Statistics show that Spanish citizens are less likely than those in other developed countries to exhibit egalitarian attitudes toward women’s role in society (Sevilla-Sanz, 2007) and that household labor division between men and women is still far short of equality even in dual-earner couples (Álvarez and Miles, 2003; Fernández et al., 2008). On the other hand, Spanish society is similar to other Mediterranean countries in that it exhibits strong family ties (Alesina and Giuliano, 2007; Reher, 1998). This aspect favors the transmission of traits and beliefs from parents to children.

The balance of the paper is organized as follows. Section 2 provides some empirical evidence on the gendered division of housework in Spain as well as a brief discussion of the economic theories that help to rationalize the parents-to-children transmission of gender roles. Section 3 presents the data set and justifies its suitability for the analysis of intergenerational transmission; this section also provides an overview of housework allocation for the children and parents in our sample. In Section 4, we discuss the econometric methodology and comment on the main results. Section 5 concludes.

2. PATTERNS OF HOUSEWORK ALLOCATION ACROSS GENERATIONS

Consistent with the experience of most modern countries, in Spain the gender division of housework is moving slowly toward equality. In Table 1 we have computed the husbands' average share of housework in two-earner and male-earner couples for four cohorts and two periods, 1991 and 2002–2003. These numbers were generated from the 1991 Work Situation and Time Use Survey¹ (WSTUS) collected by the Spanish *Instituto de la Mujer* and the 2002–2003 Spanish Time Use Survey carried out by the *Instituto Nacional de Estadística* (more details on this survey are presented in the next section). These two surveys are the only Spanish data sets that provide information on time allocation within couples

Insert Table 1

During the 1990s, men's contribution to household labor increased slightly within and across cohorts. For example, men aged 25–35 in 1991 performed, on average, 28.7% (13.5%) of housework in two-earner (male-earner) couples. Ten years later, the same birth cohort (i.e., men aged 36–45 in 2002) shared about 29.7% (15.8%) of housework with their wives. Similarly, by comparing same-age cohorts in these two surveys, we see that in all cases there has been movement toward a more egalitarian distribution of housework within couples. However, these advances have not entirely undone the asymmetric allocation of domestic tasks between men and women. Thus, in 2002, Spanish women still bore over two thirds of housework even in dual-earner couples.

Figure 1 shows a more detailed description of the cross-sectional life-cycle pattern of

¹The original aim of the 1991 Work Situation and Time Use Survey was to compare male and female performances in paid and unpaid activities. Information was collected from wage earners from six regions: Andalusia, Catalonia, Galicia, Madrid, Basque Country, and Valencia. To reduce unobserved heterogeneity as much as possible, the sample was restricted to sectors and occupations in which men and women had similar participation rates. Interviews were carried out at the workplace, and the total sample size of the survey was 2,054 employees (1,049 women and 1,005 men). In the case of married and cohabiting workers, the survey collected information on educational attainment, work status, and time use of the interviewee's partner.

housework time using data from the 2002–2003 STUS data set. This figure plots the data means for housework time by age and gender.

Insert Figure 1

Starting from age 16 (the legal working age in Spain), we present the data by splitting the male and female samples according to their working status. Overall we observe that the gender gap in housework time occurs at all ages, though it is not static. At age 10, both girls and boys devote nearly equal albeit few minutes to housework. The gap begins to increase for teenagers and then widens for adults. Controlling for working status introduces important changes in female housework times, which are significantly lower for working women than for non-working women. However, men’s behavior is not as sensitive to their own working status. In fact, one of the most salient features of this graph is that the male profile of housework time is quite flat across cohorts, especially for working men.

That the gender gap in housework starts early in childhood raises the question of how these preferences are formed. Unfortunately, the answer is not straightforward. There are no systematic explanations for how individuals build their preferences (Bowles, 1998). The sources of influence are diverse (e.g., family, peers, media, teachers) as are the channels through which they contribute to the formation of preferences (e.g., learning by doing, imitation, inheritance, habituation). For children, parents’ behavior is an important source of influence when preferences are formed.

How can we explain why children exhibit gendered time allocation patterns similar to their parents? According to Lundberg (2005), gender differences in time allocation during childhood can hardly be rationalized from the perspective of human capital because there are minimal differences in the economic costs and material returns to sons and daughters in nontraditional wealthy societies. A possible explanation for the relationship between parents’ and children’s gender roles comes from the cultural transmission model proposed by Bisin and Verdier (2000). They authors formalize cultural transmission as a kind of “paternalistic” altruism whereby parents wish to transmit their own trait (e.g., gender roles) to

their children. The mechanisms through which this transmission occurs may be deliberate inculcation or imitation. In the case of gender roles, the assignment of home responsibilities might be interpreted as a channel that is used to train children regarding parental expectations of what a boy and a girl should do. According to this vertical transmission process, one would expect that children raised in households where parents exhibit a traditional division of labor would be more likely to be assigned domestic chores that reproduce gender role stereotypes, and vice versa. Indeed, children are also exposed to other sources of socialization by peers, friends, and society in general through what are called horizontal and oblique transmission processes. These channels may complement or substitute vertical transmission.

The hypothesis of intergenerational transmission has been recently used to explain the increasing trend of female labor force participation (Fernández et al., 2004; Fernández, 2007; Fogli and Veldkamp, 2007; Farré and Vella, 2007). This framework has also been used to explain, for instance, the persistence across generations of ethnic and religious traits (Bisin and Verdier, 2000), socioeconomic status (Charles and Hurst, 2003), education (Patacchini and Zenou, 2004), risk aversion (Dohmen et al., 2006), smoking behavior (Bantle and Haisken-DeNew, 2002; Loureiro et al., 2006), and fertility patterns (Booth and Kee, 2006).

A second perspective from which to analyze the relationship between parents' and children's housework comes from the economic literature on identity formation (e.g., Akerlof and Kranton, 2000). This literature interprets gender as a social category that is associated with certain behavioral prescriptions. Following the behavioral prescriptions for one's gender affirms one's self-image, or identity, as a girl or as a boy and then leads to gains in utility. Violating the prescriptions evokes anxiety and discomfort in oneself and others and then leads to losses in utility. According to this view, a boy would be more likely to model his own behavior after his father than his mother in order to reinforce his gender identity. Under this hypothesis, a boy raised in a household where parents exhibit traditional gender roles would experience a disutility from the loss of coherence with his male gender identity when, for instance, he performs certain domestic tasks that he perceives to be "girls'

chores."

Outside the field of economics, a number of studies provide empirical evidence on the relationship between parents' and children's gender roles. For instance, Cunningham (2001a) finds that children's attitudes toward household labor in young adulthood are predicted by the behavioral models they observe earlier in life. Kiecolt and Acok (1988) and Burt and Scott (2002) show that, in adolescence, the presence of a working mother influences attitudes toward gender roles. Gupta (2006) finds that married and cohabiting men exposed to maternal employment during childhood spend more time on housework as adults than other men do. This association is restricted to men who grew up with their parents present. Cunningham (2001b) shows that the parental division of labor when a son was growing up affects the adult son's participation in routine housework once he marries.

From an empirical stand point, it is difficult to determine whether the observed correlation between parents' and children' behavior is due more to a deliberate transmission from parents to children or to an identity formation process in which children imitate their parents' roles at home. Without experimental data, it is impossible to establish the relative importance of these two effects in the process of preferences formation because they are observationally equivalent. Furthermore, even if we can accept a measure of the combined contribution of parents to the formation of gender roles, there is another problem that is difficult to overcome: a direct parent-child interaction cannot be distinguished from an indirect social influence (see Calvó-Armengol and Jackson (2009) for a theoretical discussion). If both children's and parents' behavior are sensitive to the behavior of the community, then disentangling parental (intergenerational) from oblique (social) transmission will prove to be a most complex task. In our empirical analysis we try to explore this hypothesis further.

3. THE DATA

3.1 Data and sample selection

The empirical analysis is based on the 2002–2003 Spanish Time Use Survey (STUS). This is a national household-based survey with questionnaire and time-diary components. The

questionnaire collects information on household characteristics such as income, housing and family composition as well as individual characteristics that include education, employment status, earnings, and demographic information. All household members over 10 years of age were asked to fill out a time diary for one randomly chosen 24-hour period (the same day for all members). They were instructed to record their main activity, any secondary activity undertaken simultaneously, and who was with them each 10-minute period. The STUS obtained 60,493 time diaries corresponding to individuals living in 20,603 households.

The main advantage of the STUS is that it offers information on all family members, which allows us to create one record for each child that includes his/her own individual information (age, gender, time allocation patterns, and schooling) and his/her parents' and siblings' information. In this way we can recover the whole picture of the household time allocation.

Our analysis is conducted using two-parent households with one or two children aged 10 to 17 years. Households with adult children were excluded from the sample because time allocation by adults is likely not determined by their parents. Moreover, adult children could face more complex time allocation decisions that stem from choosing between further education and the labor market. Restricting children's age to be less than 18 also avoids possible sample selection issues resulting from their decisions to leave the parents' household to attend either college or to start their own household. Households with more than two children were excluded in order to reduce households' heterogeneity and the complexity of household members' interactions.

To facilitate identifying the effects of different variables on time allocation decisions, we dropped households cohabiting with other relatives (e.g., grandparents) and those with a nonworking father. These restrictions yielded a sample of 812 children living in 545 two-parent households in which at least the father is working in the labor market. About half of the couples in our sample are two-earner couples. The sample includes 280 households with only one child, 112 households with two same-sex children, and 153 households with two opposite-sex children.

3.2 Children's and parents' time allocation patterns

Table 2 reports the mean hours devoted by children to different activities during the survey day. To build this table, we grouped the activities recorded in the STUS into nine categories: personal care and sleeping; eating and drinking; education; social relations and relaxing; sports and exercise; recreation; traveling; housework; and other activities (see notes to Table 2 for details). The housework measure was built by summing up all minutes spent on female-typed tasks: cooking, setting the table, washing dishes, doing laundry, and cleaning the house. Activities are not mutually exclusive because they can be declared as a primary or secondary activity and, for that reason, the time spent in the nine categories may sum up more than 24 hours per day.

Insert Table 2

Three remarkable facts are evident in this table. First, boys and girls devote, on average, similar amounts of time to personal care, basic needs, and education. These activities occupy the majority of their daily time: 10 hours during weekdays and 11 hours during weekend days. Second, there are significant gender differences in some leisure activities. During weekdays, girls devote more time to social relations and relaxing activities than boys do. In contrast, boys spend more time on sports and recreation, though gender differences in sports are not significant on the weekends. The third and, for us, most remarkable fact is that girls spend, on average, more than twice the time spent by boys on domestic chores. This gender gap holds during the whole week. Similar findings are provided by Larson and Verma (1999) and Kooreman (2007) for other developed countries.

A detailed description of parent' and children's housework time allocation is provided in Table 3. Panel A shows the average minutes spent on housework by fathers and mothers as well as the percentage of parents who devote zero minutes to these activities. Panel B provides the same information for sons and daughters. These summary statistics are presented separately for two-earner and male-earner couples. We observe that mothers in two-earner couples spend on average 190 minutes on housework per day, while their

husbands average 44 minutes. This gender gap of 146 minutes doubles when we move to male-earner couples. Also remarkable is the high percentage of men who declare not doing any housework (33.7% in two-earner couples and 58.1% in male-earner couples). In contrast, very few mothers declare zero minutes of housework in either type of household.

For children, the gender gap in housework allocation is also evident. Although the time they devote to household activities is slightly higher in two-earner than in male-earner households, the gender gap remains almost the same across both types of households: the time girls allocate to housework is almost twice that allocated by boys. There is a sizable proportion of children declaring zero minutes of housework. About 35% of girls with a working mother and 49% of girls with a nonworking mother spent no time on housework during the survey day; these percentages rise to about 53% and 66%, respectively, for boys.

Insert Table 3

As a first step in analyzing the relationship between children's and parents' gender roles, Table 4 displays the average housework times for girls and boys controlling for the sibling composition of the household, the parents' work status, and the father's housework participation. We computed a series of *t*-tests to check the statistical significance of boy-girl gaps across different types of households. On aggregate (i.e., without controlling for parents' working status and father's housework participation), gender differences are significant across households with different sibling composition (see the last column of Table 4). The biggest gender gap is found for households with an only child. Once we control for the parents' work status and the father's housework participation, further differences arise. Although there is not a systematic pattern, we observe that boys' housework is, on average, higher in households where the father does domestic tasks than in households where the father does not. The exception occurs for children in households with same-sex siblings. For girls, there is no general pattern in the relationship with father's housework participation, but in most of cases their housework time *decreases* when the father does some housework. Only-child households and households with opposite-sex siblings are the contexts in which father's housework seems more clearly to have an effect in reducing the average gender gap

between girls' and boys' housework times.

Insert Table 4

Next section, we shall go further in this direction by exploring in more detail the effect of fathers' housework participation on sons' and daughters' behavior after controlling for other observable characteristics.

4. EMPIRICAL ANALYSIS

4.1 Baseline model

Our empirical analysis is based on the following relationship:

$$H_{if}^m = g(FH_f, X_i, Z_f, \varepsilon_{if}), \quad m = b, c. \quad (1)$$

For child i in household f , we analyze two outcomes: a binary variable that takes the value 1 if the child does housework and 0 otherwise (H_{if}^b); and a count data variable² for the number of 10-minute slots that the child devotes to housework per day (H_{if}^c). Besides the indicator variable FH_f , which takes the value 1 if the father does housework and 0 if he does not, we include a set of explanatory variables corresponding to child characteristics (X_i) and household-related variables (Z_f) in order to capture the child's time restrictions and the household labor burden. Finally, ε_{if} includes unobservable factors affecting child housework.

Child-related controls include the child's age and a set of variables that are likely to affect his/her time restriction. The first one is a dummy variable for the season of the year in which the diary information was collected. This variable takes the value 1 if the diary was completed during the summer season (June, July, or August) and 0 otherwise. The second variable indicates whether the child completed the diary survey during the

²In the STUS, time is recorded in blocks of 10 minutes; hence it takes values 0 (0 minutes), 1 (10 minutes), 2 (20 minutes) and so forth. Given the nonnegative integer nature of this variable, which includes a high percentage of zeros, we interpret it as a count data process.

weekend. Summer season and weekends are nonschool periods in which the opportunity cost of housework time is expected to be lower for children. Finally, the third variable indicates if the child declares that the survey day was a typical one. This variable may capture whether or not the child’s time use pattern was altered during the survey day.

Household-related variables include per capita household income (as a proxy for the availability of market substitutes), parental education, the type of dwelling (flat or detached/semidetached house), number of rooms per household member, and sibling composition of the household. This last information is captured by three dummy variables that indicate whether the child lives in an only-child household, a same-sex siblings household, or an opposite-sex siblings household. These variables account for the household size, which bears some relation to the overall housework burden. These variables also may account for sibling interaction and the reinforcement of identities. In this sense, there is some evidence that the presence of both a girl and a boy in the same family allows for more gender-typed chore allocations (McHale et al., 2003). Some papers suggest that equality of opportunities increases by level of education (Bonke, 1995; Lundberg, 2005). We should therefore expect that, in households with highly educated parents, the gender bias in children’s housework is smaller than in other households. We allow for nonlinearity in the effect of this variable by including a quadratic term.

Insert Table 5

Table 5 shows descriptive statistics of the explanatory variables for two-earner and male-earner households. The average age of children in the sample is 13 years. About 30–35 % of children answered the survey on the weekend, and most of them (78% and 83%) characterized the reference period as a “typical” day. As expected, per capita household income and parental education is higher in two-earner households than in households where only the father works for pay.

Throughout the analysis, we focus on measuring the effect of the father’s housework. This effect is estimated by maximum likelihood for the binary outcome H_{if}^b and by pseudo–

maximum likelihood Poisson for the count variable H_{if}^c , assuming a linear exponential specification of the conditional mean. To estimate this relationship, we split the sample into two-earner households and male-earner households.³ This strategy has implications for estimation of the father’s effect, because two-earner households face different time restrictions than male-earner couples and so the father’s participation in housework decisions is likely to define a different set of gender roles. For example, if the father is the only household member who works in the labor market, then his nonparticipation in housework may simply reflect time restrictions rather than gender roles. However, the same behavior in a dual-earner couple is more likely to reflect traditional gender roles at home.

A crucial aspect of our analysis is its allowance for gender asymmetries in children’s response to the father’s participation in household labor. Toward this end we estimate separate models for girls and boys. If the father’s housework is a good indicator of gender roles, then one would expect to obtain opposite effects on sons and daughters—in particular a positive effect on sons’ housework and a negative effect on daughters’ housework. In contrast, finding similar effects on both sons and daughters would suggest that the fathers’ involvement in household labor merely reflects either household constraints or events that move all household members in the same direction.

4.2 The father’s effect

Table 6 presents the coefficient estimates of the indicator for the father’s participation in housework on children’s housework for the subsamples of sons and daughters in two-earner and male-earner households. Coefficient estimates of the remaining explanatory variables are presented in Table A in the Appendix. We have adjusted the estimated standard errors

³Ideally, we should specify a model in which children’s housework time is explained by the mother’s participation in the labor market and the father’s participation in household labor. These are the parents’ time uses that best define gender roles at home. Because time allocation decisions within the household are likely to be made simultaneously, estimating such a model would require data that are unavailable in the STUS (e.g., variables thought to explain the mother’s decision to participate in the labor market that do not also explain father’s and children’s time of housework).

to allow for correlations in the unobservables of children who live in the same household.

The estimates in Panel A of Table 6 show that having a father who does housework increases significantly the probability that sons do housework irrespective of the household type. Also we find a positive effect on the time children allocate to these activities, but it is significant only in two-earner households. However, the father's housework does not significantly alter either the participation or the time spent by girls on these activities, except for those living in male-earner couples. In this case, the father's housework reduces significantly the time daughters devote to housework. Thus, a girl whose father does housework herself devotes to housework about half the time devoted by an otherwise similar girl whose father does not do housework.⁴

Insert Table 6

Jointly these results suggest that the father's involvement in female-typed domestic chores reduces the average gap between sons' and daughters' housework times. This would be in line with the hypothesis that the father's participation in household labor results in an alteration of traditional gender roles that is transmitted (somehow) to children. The positive correlation between father's and sons' housework is consistent with the literature showing greater parental involvement with same-sex children and complementarity between same-sex family members (e.g., Lundberg, 2005; Lundberg et al., 2007). This correlation is also consistent with other theories that claim children take their same-sex parent as a role model (see, e.g., Bandura, 1977).

The household sibling composition can also mediate the transmission of gender roles from parents to children. To the extent that an only child receives more attention from parents than does a child with siblings, transmission of gender roles might be stronger for such a child (Dohmen et al., 2006). To test this hypothesis, we re-estimated the model by adding

⁴The linear exponential specification of the housework hours model leads us to interpret the coefficients of continuous explanatory variables as the proportional change in the conditional mean when the corresponding variable changes by one unit. If the k th explanatory variable is a dummy variable with coefficient γ_k , then the conditional mean is $\exp(\gamma_k)$ times larger if the dummy variable is 1 rather than 0.

interactions between the indicator variable of father’s housework and indicators for the household sibling composition. Given the small sample sizes used to estimate the models, results from these interactions should be taken cautiously. The estimated coefficients are presented in Panel B of Table 6. In both types of households, sons without a sibling are more likely to do domestic chores when the father does housework than when he does not. The effect, however, does not differ significantly from that obtained for boys with siblings in two-earner households. Regarding the time spent on housework, the Poisson estimates reveal a positive and significant effect for boys without siblings in two-earner and male-earner households. A positive and significant effect is also found for boys with a sister living in a two-earner household. In contrast, the interactions are not significant on girls’ housework, although coefficients are generally negative for those living in male-earner households.

4.3 Are social externalities driving the results?

As we mentioned previously, the estimates reported here do not necessarily confirm that gender roles are transmitted from parents to children. In fact, it is difficult to establish whether the children’s outcomes result from the father’s effect or from the effect of third variables that lead both parents and their children to behave in this way. That parents and their children live in the same community (or social environment) is a prominent confounding factor, since what seems to be parental influence could actually be an indirect social influence. To illustrate this idea, consider the count data model for the time of housework:

$$\begin{aligned} E(H_{if}^c | FH_f, X_i, Z_f) &= \exp(\delta FH_f + X_i' \alpha + Z_f' \beta + \eta_f) \\ &= \exp(X_i' \alpha + Z_f' \beta + \delta FH_f) \exp(\eta_f), \end{aligned} \tag{2}$$

where η_f accounts for unobserved family-specific fixed effects that are common to all family members. A causal interpretation of the relationship between father’s and children’s housework would hinge on the assumption of exogeneity of father’s time allocation. If η_f includes contextual social norms on gender roles that affect both parents’ and children’s behavior, then the estimates of δ would be biased.

A way to reduce the conditional correlation between the father’s variable and the unob-

served specific effects is by estimating with an instrumental variables approach. However, the impossibility of finding good instruments in our data set (i.e., variables affecting father's housework allocation that are not related to children's housework allocation) prevents us from implementing this strategy.

A second way to overcome the problem caused by endogeneity of the father's housework allocation would be to estimate a family fixed-effects model by exploiting information on siblings. Our sample does include households with same-sex siblings and with opposite-sex siblings. Unfortunately, implementing a fixed-effects approach is problematic in either subsample. Same-sex siblings would allow us to control for the unobserved heterogeneity that is common to members of the same family but would *not* allow us to estimate the father's effect which is assumed to be similar for same-sex children. We could use opposite-sex siblings to estimate the father's effect by introducing interactions of this variable by gender; the problem in this case is that the unobserved component may have gender-asymmetric feature. For example, living in a social and institutional environment that favors gender equality would have opposite effects on housework times of male and female family members. Therefore, estimating a family fixed-effects model would not remove this source of heterogeneity.

The third option is to add additional controls that proxy for these sources of unobserved heterogeneity and then to check whether their inclusion affects the original estimates (see, e.g., Ruhm, 2004). Unfortunately, the STUS does not offer much information on the social context in which individuals live. The only information that could be relevant is the distinction between rural and urban areas: people living in rural areas are more likely to exhibit traditional behavioral patterns than people living in urban areas. We try to capture these differences through three dummy variables indicating the size of the place of residence. To complement this information, a proxy for regional gender attitudes was obtained using a different Spanish data set. The 2002 Time Use Survey, collected by the *Instituto de la Mujer*, offers information on the time allocation patterns of one individual per household (aged 18 or more) in a representative sample of Spanish households in 2002. The advantage of this survey is that it includes questions on the gender attitudes of participants. We

selected respondents’ answers to the following statement: “It is much better for everyone if the man earns the main living and the woman takes care of the home and the family.” Respondents answered to this question on the basis of a 5-point scale that ranged from “strongly disagree” (1) to “strongly agree” (5). We computed the average of responses at a regional level and imputed them to households in our sample.⁵ Table B in the Appendix presents the coefficient estimates for these new variables.

These two indicators of social interactions were included in the baseline specification. Panel C of Table 6 displays the estimated effects of the father’s participation in housework after including sequentially the dummies for rural versus urban, the variable for regional gender attitudes and the p -value of the Wald test for the joint significance of the added variables. Overall, the results suggest that—even in those specifications where the new explanatory variables are shown to be significant—omitted variable bias does not strongly affect our conclusions. In fact, we find little evidence of the expected biasing effect on boys’ housework. In the Poisson specifications, the estimated effect of the father’s participation on the sons’ housework equations becomes slightly more, rather than less, positive after including the additional controls. Similarly, the effect on daughters’ housework time remains negative and significant (and with very little changes in its magnitude) in the sample of male-earner households.

4.4. Alternative definitions of parental gender roles

So far we have focused on the father’s participation in housework as the indicator of parental gender roles. To check the robustness of our results, we used two alternative definitions of household gender roles. The first measure consists of the difference between the father’s housework time and the housework time predicted from their observed characteristics. The assumption behind the use of this variable is that a father who devotes more time to housework than his peers is more likely to transmit egalitarian behavior that

⁵Whereas the Time Use Survey carried out by the *Instituto de la Mujer* allowed us to compute averages at a lower administrative level (provinces), the STUS informs only on the household’s region of residence.

will result in his son likewise doing more housework than others in the son's generation. Predicted housework times were obtained by estimating separate Poisson regression models for fathers' housework in two-earner and male-earner couples.⁶ In these models, we used the same set of explanatory variables as in the children's models but added controls for the parents' age, the presence of external household help, and parental health status. Because these models are used only for prediction purposes, we disregarded potential endogeneity biases in estimation.

The second measure of gender roles takes into account both mothers' and fathers' housework times. Including mothers' behavior may alter the definition of gender roles based on the father's performance of housework. For instance, if the father does housework but the mother devotes more time to housework than otherwise similar peers, then gender roles transmitted to children might be more traditional than those transmitted by otherwise similar households in which the mother does less housework than the average. To implement this idea, we compared actual fathers' and mothers' housework times with the estimated times predicted from their observed characteristics. Again, we estimated separate count data regression models for mothers and fathers in two-earner and male-earner couples. Then we carried out the following classification of households by comparing actual and predicted housework times:

- (a) *low-housework household* —both partners do less (or equal) housework than predicted;
- (b) *high-housework household* —both partners do more (or equal) housework than predicted;
- (c) *traditional household* —the wife does more housework than predicted and the husband does less housework than predicted;
- (d) *nontraditional household* —the wife does less housework than predicted and the husband does more housework than predicted.

Insert Table 7

⁶Estimation results from these models are available from the authors upon request.

Observe that the type of households defined by (a) and (b) capture deviations from prevailing behavior that are consistent with preferences for either a higher/lower preference for household cleanliness or less housework, whereas the type of households defined by (c) and (d) exhibit housework allocation patterns that are consistent with different conceptions of gender roles.

Table 7 reports the estimated coefficients on the new variables in the models for children's housework. The first row shows the estimated effect of the father's housework deviance, and the results are consistent with the father's effect found in Section 4.3. A father doing more housework than otherwise similar peers increases significantly both the likelihood of his son(s) doing housework and the time devoted to these chores (in this case, the effect is significant at the 10% level). Contrary to our previous results, we do not find any statistically significant effect on girls.

With respect to the second set of indicators, we observe that boys living in nontraditional households do more housework than boys living in traditional households, though the effect is significant (at the 10% level) only in the probit model estimated with the two-earner subsample and in the Poisson model of the male-earner subsample. These results are consistent with the gender roles transmission hypothesis. For girls, we do not find significant differences in housework between those living in nontraditional versus traditional households. Another expected finding is that boys and girls living in households classified as high-housework are more likely to do housework than otherwise similar children living in traditional households. However, in male-earner households, the amount of time that girls devote to these activities is significantly lower than in traditional households.

4.5 A quasi-experimental approach

Angrist and Pischke (2009) argue that "research questions that cannot be answered by any experiment are fundamentally unidentified questions". The father's effect estimated previously was obtained by running parametric regressions in which we pooled households with one or two children and assumed that including a set of variables eliminated the

possible endogeneity of the father’s housework involvement. The experimental ideal behind this strategy would consist of randomly assigning to households fathers who do housework and those who do not and then comparing children’s housework performance in these two types of households. Such a experiment is clearly unfeasible in practice.

In this section we carry out a different experimental approach to explore the robustness of our findings. For this purpose, we restrict analysis to the 180 sample households with opposite-sex siblings. The ideal experiment for capturing the father’s effect would be to observe how an exogenous increase in the housework load of children is allocated between the son and the daughter in households where the father does housework and in households where the father does not. How can we reproduce this scenario with the data at hand? We can take advantage of the fact that households interviewed in the STUS were randomly assigned to fill out the time diary on a weekday or on a weekend day. Hence we can view our data as two repeated cross-sections with samples drawn from the same population at two moments of time: weekdays and weekends. The key point is that weekends differ from weekdays in terms of the time available for doing housework. During weekdays, children and also parents have scheduled/compulsory activities that reduce the time available for other activities such as housework. In contrast, during weekends there are (on average) fewer time restrictions and hence there is more time available for activities such as housework. We shall use this weekend–weekday variation as an exogenous change in housework to see how the housework gap between daughters and sons is affected by the father’s involvement in housework activities.

Table 8 displays data on the time allocated to housework by opposite-sex siblings during weekdays and weekend days, controlling for parents’ working status and father’s participation in housework. The point estimates presented in the first row confirm that the total amount of housework carried out by children is, on average, significantly higher on weekend days than on weekdays.

Insert Table 8

To determine whether the asymmetry in the son–daughter distribution of this additional housework load differs according to the fathers’ involvement in household labor, we implement the following difference-in-difference approach. Let us denote by H_{sf}^t and H_{df}^t the housework times devoted by the son and the daughter, respectively, in family f on day t , where $t = \textit{weekday}, \textit{weekend}$. The variation of the gender gap of housework between a weekday and a weekend day can be written as

$$G_f = \left(H_{df}^{\textit{weekend}} - H_{df}^{\textit{weekday}} \right) - \left(H_{sf}^{\textit{weekend}} - H_{sf}^{\textit{weekday}} \right). \quad (3)$$

Note that if $G_f > 0$ then the increase in total children’s housework is mainly borne by the daughter, not the son. The problem with this measure is that we do not observe the same child on weekends and on weekdays.

Suppose we observe the housework allocation of children in family f on a weekend day and the housework allocation of children in family j on a weekday. Then we can rewrite the equation for G_f as follows:

$$G_f = \left(H_{df}^{\textit{weekend}} - H_{dj}^{\textit{weekday}} \right) - \left(H_{sf}^{\textit{weekend}} - H_{sj}^{\textit{weekday}} \right) - \left[\left(H_{df}^{\textit{weekday}} - H_{sj}^{\textit{weekday}} \right) + \left(H_{sf}^{\textit{weekday}} - H_{sj}^{\textit{weekday}} \right) \right], \quad (4)$$

where the term in brackets is the bias of this approximation. Assume that, during weekdays, sons and daughters in family f do the same housework (on average) as sons and daughters in family j ; that is assume

$$E \left(H_{df}^{\textit{weekday}} - H_{dj}^{\textit{weekday}} \right) = E \left(H_{sf}^{\textit{weekday}} - H_{sj}^{\textit{weekday}} \right) = 0. \quad (5)$$

Then the expected value of the G_f is given by

$$E(G_f) = E \left(H_{df}^{\textit{weekend}} - H_{dj}^{\textit{weekday}} \right) - E \left(H_{sf}^{\textit{weekend}} - H_{sj}^{\textit{weekday}} \right). \quad (6)$$

The last row of Table 8 presents the point estimates for this gap. Overall we observe that the additional housework load performed during weekends is allocated more asymmetrically in households where the father does not do housework than in households where the father does housework. Thus, on average, girls living in two-earner households where the father

does housework devote 18 minutes more to housework on a weekend day than on a weekday, whereas their brothers spend about 13 minutes more on a weekend day. In contrast, girls whose fathers are not involved in household labor increase their contribution to these activities by 44 minutes during weekends, whereas their brothers' housework increases by 16.5 minutes. Similar findings are obtained for children living in male-earner households. These results provide further support to the empirical results discussed in the previous sections and suggest that the father's behavior matters in the formation of gender roles during childhood. Nonetheless, though our point estimates suggest a relevant effect of fathers' involvement on the boy-girl housework gap, our small sample size precludes an assessment of the accuracy of our results (Ziliak and McCloskey, 2008).

5. CONCLUSIONS

Children's behavior is a natural area for empirical analysis of intergenerational transmissions. A number of recent studies show a causal relationship between parents' behavior and childhood outcomes (risk aversion, education, altruism, etc.). Our paper contributes to this literature by providing evidence on the relationship between parents' and nonadult children's gender roles. This issue is important because adolescents and young people have been identified as target groups for policies designed to eliminate gender inequality (United Nations Millennium Project, 2004). Therefore, learning about the vehicles of transmission for gender roles at those ages is crucial to defining the nature of the policy interventions.

Our results indicate that the fathers' involvement in household labor contributes to reducing the observed boy-girl gap in housework and thus to the erosion of traditional gender roles in childhood. Boys whose fathers do housework are more likely to do housework themselves and to devote more time to these activities than boys whose fathers do not participate in household labor. The effect on girls is, in general, either not significant or negative and significant. Although the estimates in this paper are not conclusive regarding the channels through which this effect is transmitted, they are robust to the inclusion of some variables that account for social norms and to alternative definitions of parental gender roles. Addi-

tional data are required to better identify whether the strong relationship between fathers' and children's behavior is due more to an intergenerational transmission of preferences or to an indirect social influence.

Unfortunately, our data do not allow us to test whether children's preferences on gender roles that are acquired at early ages persist until adulthood. There is, however, some empirical evidence that male adolescents' participation in housework is positively correlated with contributing to these home activities in adulthood (Anderson and Robson, 2006). Based on this evidence, our results suggest that policies aimed at equalizing men's and women's household labor contribution within couples may have positive long-term effects on children. Ignoring such effects may lead to a suboptimal design or use of these policies.

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TABLE 1: Husbands' share of housework for Spanish two-earner and male-earner couples

	Two-earner couples		Male-earner couples	
	1991	2002-03	1991	2002-03
25-35	0.287 (0.218) <i>259</i>	0.318 (0.245) <i>339</i>	0.135 (0.190) <i>82</i>	0.167 (0.204) <i>419</i>
36-45	0.244 (0.216) <i>178</i>	0.297 (0.236) <i>654</i>	0.108 (0.179) <i>71</i>	0.158 (0.196) <i>804</i>
46-55	0.213 (0.209) <i>76</i>	0.299 (0.242) <i>270</i>	0.066 (0.115) <i>52</i>	0.160 (0.204) <i>434</i>
56-65	0.188 (0.222) <i>11</i>	0.232 (0.213) <i>46</i>	0.084 (0.147) <i>31</i>	0.148 (0.201) <i>165</i>
Total	0.263 (0.216) <i>524</i>	0.300 (0.239) <i>1,309</i>	0.114 (0.179) <i>236</i>	0.160 (0.200) <i>1,822</i>

Sources: The Spanish Work Situation and Time Use Survey 1991 was collected by the Spanish Instituto de la Mujer (a section of the Ministry of Labor and Social Affairs) among wage earners working in sectors and occupations in which men and women had similar participation rates. The STUS 2002–2003 is a national representative survey collected by the Spanish Instituto Nacional de Estadística.

Notes: Sample sizes in italics. Standard errors in parentheses.

TABLE 2: Mean hours spent on different activities during one day for children aged 10–17 years.

Activities	Monday to friday			Weekend		
	Girls	Boys	Ratio	Girls	Boys	Ratio
(a) Personal care and sleeping	9.92	9.83	1.01	11.43	11.22	1.02
(b) Eating and drinking	1.69	1.78	0.95	2.12	2.06	1.03
(c) Education	5.72	5.64	1.01	1.03	0.90	1.14
(d) Social relations and relaxing	4.88	4.45*	1.10	6.85	6.28	1.09
(e) Sports and physical exercise	0.78	1.00**	0.78	1.55	1.72	0.90
(f) Recreation	0.53	0.93**	0.57	0.80	1.54**	0.52
(g) Travelling	1.19	1.22	0.98	1.04	1.20	0.87
(h) Housework	0.44	0.21**	2.13	0.70	0.36**	1.96
(i) Other activities	0.30	0.29	1.04	0.48	0.55	0.87
Total	25.46	25.36		26.00	25.84	1.01

Notes: The sample is composed of 812 children, 10 to 17 years old, living in two-parent households in which at least the father works in the labor market. The sample includes only households with one or two children ages 10 to 17. Activities included in each category: (a) Sleeping, dressing, sick in bed, personal hygiene. (b) Eating and drinking at home or outdoors. (c) Classes, homework, study at libraries. (d) Sport activities. (e) Social life in family; talking to friends or relatives; speaking by phone; attending cultural events (cinema, theater, concerts, exhibitions); watching TV; reading; Internet; listening to music; passive leisure (doing nothing). (f) Indoor and outdoor games, including computer games. (g) Traveling in private or public transport. (h) Cooking; setting the table; washing dishes; doing laundry; cleaning the house; tidying up the room. (i) Other activities not included in previous categories, e.g., religious practices.

Differences between girls and boys significant at the 5% level (**) and 10% level (*).

TABLE 3: Parents' and children's housework by type of household (minutes per day)

	Two-earner		Male-earner		All	
	Mean (s.d.)	% zeros	Mean (s.d.)	% zeros	Mean (s.d.)	% zeros
PANEL A: Parents						
Mothers	189.74 (112.13)	1.81	317.63 (119.22)	1.11	252.98 (132.12)	1.47
Fathers	44.35 (53.56)	33.7	19.74 (37.23)	58.15	32.18 (47.78)	45.79
PANEL B: Children						
Daughters	36.17 (54.09)	35.41	27.76 (51.50)	49.30	31.91 (52.90)	42.45
Sons	18.62 (31.95)	53.57	13.69 (32.25)	66.15	16.18 (32.15)	59.79
No. girls	215		196		424	
No. boys	192		209		388	
No. households	270		276		546	

Source: Spanish Time Use Survey 2002-2003.

TABLE 4: Children's housework by father's housework participation and sibling composition: Average minutes

	Two-earner		Male-earner		All	<i>N</i>
	Father does housework		Father does housework			
	Yes	No	Yes	No		
Only child						
Boys	21.10 (32.87)	6.08 (13.40)	23.33 (37.52)	5.00 (12.44)	14.84 (28.42)	128
Girls	39.63 (61.39)	33.75 (41.47)	18.27 (26.87)	32.17 (62.28)	32.41 (53.97)	153
Gender gap	18.53*	27.67***	-5.06	27.17**	17.57***	
Two siblings						
Same sex						
Boys	16.05 (16.85)	20.00 (51.69)	10.83 (14.42)	15.31 (48.32)	15.09 (33.50)	106
Girls	26.66 (28.88)	63.33 (83.52)	12.66 (18.37)	25.27 (37.52)	28.25 (44.60)	120
Gender gap	10.61*	43.33	1.83	9.96	13.16**	
Different sex						
Boys	27.22 (41.18)	9.56 (17.44)	15.59 (29.25)	13.02 (33.27)	18.05 (34.18)	154
Girls	35.74 (48.58)	25.21 (58.92)	24.12 (39.39)	43.02 (76.20)	33.63 (57.47)	154
Gender gap	8.52	15.65	8.53	30**	15.58***	

Source: Spanish Time Use Survey 2002-2003

Notes: We reject the null hypothesis of a gender gap equal to zero at the 1% level (***), 5% level (**), and 10% level (*); standard deviations in parentheses.

TABLE 5: Descriptive statistics

	Two-earner		Male-earner	
	Boys	Girls	Boys	Girls
Age	13.41 (2.243)	13.29 (2.327)	13.43 (2.343)	13.42 (0.315)
Only child	0.352 —	0.373 —	0.307 —	0.344 —
Opposite-sex siblings	0.393 —	0.368 —	0.401 —	0.358 —
Same-sex siblings	0.255 —	0.258 —	0.291 —	0.297 —
Usual day	0.791 —	0.784 —	0.812 —	0.828 —
Weekend	0.321 —	0.354 —	0.323 —	0.302 —
Summer season	0.189 —	0.196 —	0.192 —	0.242 —
Per capita monthly household income $\times 10^{-2}$	5.560 (2.961)	6.510 (2.987)	3.817 (1.953)	3.719 (1.875)
Parents's average education ^a	5.566 (1.771)	5.662 (2.988)	4.786 (1.432)	4.576 (1.358)
Father does housework	0.704 —	0.689 —	0.443 —	0.432 —
No. of children	196	209	192	215

a Education is coded as follows: 1=illiterate; 2=some schooling; 3=five years or more but incomplete primary; 4=primary school; 5=high school; 6=vocational; 7=vocational II; 8=three years university; 9=five (or more) years degree; 10=PhD.

Notes: Standard deviations in parentheses.

TABLE 6: Estimated coefficients on the effect of father's housework on children's housework

	Two-earner				Male-earner			
	Probit		PML Poisson		Probit		PML Poisson	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
PANEL A: Baseline model								
Father does housework (FH)	0.681*** (0.213)	0.199 (0.235)	0.804** (0.392)	0.130 (0.248)	0.469** (0.210)	-0.019 (0.193)	0.360 (0.350)	-0.529** (0.242)
PANEL B: Baseline model +interactions with sibling composition								
FH × only child	0.695** (0.356)	-0.258 (0.366)	1.297** (0.511)	0.393 (0.362)	0.623 (0.380)	0.388 (0.320)	1.108** (0.539)	-0.407 (0.367)
FH × same-sex siblings	0.745** (0.353)	0.411 (0.341)	-0.242 (0.613)	-0.594 (0.368)	0.509 (0.417)	-0.257 (0.391)	-0.111 (0.496)	-0.546 (0.431)
FH × opposite-sex siblings	0.630* (0.352)	0.564 (0.516)	1.115** (0.451)	0.519 (0.497)	0.332 (0.329)	-0.200 (0.303)	0.219 (0.541)	-0.600 (0.376)
PANEL C: Social norms								
Baseline model + rural/urban dummies								
Father does housework (FH)	0.685*** (0.213)	0.215 (0.235)	0.816** (0.370)	0.142 (0.245)	0.461** (0.210)	-0.008 (0.194)	0.367 (0.348)	-0.533** (0.234)
Significance of additional regressors (p-value)	0.394	0.625	0.057	0.738	0.064	0.267	0.727	0.721
Baseline model + rural/urban dummies + regional gender attitudes								
Father does housework (FH)	0.674*** (0.215)	0.207 (0.233)	0.824** (0.358)	0.194 (0.243)	0.492** (0.212)	0.009 (0.196)	0.439 (0.328)	-0.511** (0.228)
Significance of additional regressors (p-value)	0.538	0.670	0.756	0.014	0.366	0.250	0.039	0.150

Notes: The baseline model includes as explanatory variables child's age, per capita household income, number of rooms per household member, and a set of dummy variables for sibling composition, weekend, summer season, and usual day. Robust standard errors in parentheses. Coefficient estimates significant at the (***) 1% level, (**) 5% level, (*) 10% level.

TABLE 7: Alternative classification of households: Coefficient estimates on children's housework

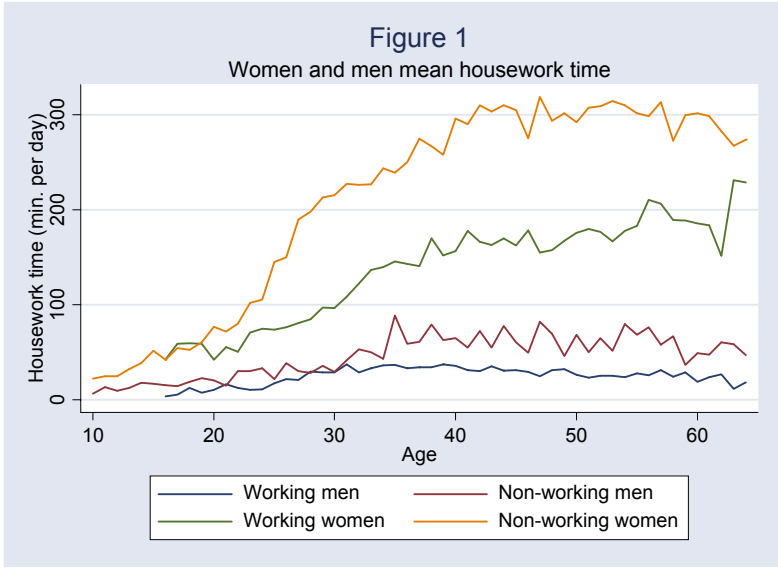
Type of household	Two-earner				Male-earner			
	Probit		PML Poisson		Probit		PML Poisson	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
(1) Father does more housework than predicted	0.499** (0.217)	0.078 (0.211)	0.409* (0.229)	0.169 (0.201)	0.641** (0.258)	0.299 (0.216)	0.481* (0.292)	-0.371 (0.237)
(2) Father's and mother's housework deviations								
Nontraditional	0.269 (0.309)	0.108 (0.295)	0.610* (0.346)	0.068 (0.262)	0.584* (0.337)	0.393 (0.282)	0.721 (0.497)	-0.374 (0.308)
High-housework	0.799*** (0.310)	-0.022 (0.316)	0.501 (0.315)	0.432 (0.268)	0.731* (0.384)	0.018 (0.319)	0.318 (0.442)	-0.885*** (0.338)
Low-housework	-0.0006 (0.243)	-0.050 (0.248)	0.238 (0.309)	0.164 (0.237)	0.014 (0.242)	-0.174 (0.221)	0.094 (0.397)	-0.548** (0.256)

Notes: In the model specification (2) the reference category is "Traditional household". Remaining explanatory variables are those included in the baseline model presented in Table 6. Robust standard errors in parentheses. Significance at the (***) 1% level, (**) 5% level and (*) 10% level.

TABLE 8: Sample of households with opposite-sex siblings: Average minutes of housework on weekdays and weekend days

	Two-earner		Male-earner	
	Father does housework		Father does housework	
	No	Yes	No	Yes
Children housework				
Weekend	40.71 (75.08)	41.11 (46.09)	28.12 (68.79)	29.00 (55.14)
Weekdays	10.52 (18.59)	25.69 (43.24)	19.22 (41.35)	14.73 (19.58)
Δ	30.19 (12.97)	15.42 (9.02)	8.90 (11.28)	14.27 (9.33)
Daughter				
Weekend	58.57 (100.38)	46.11 (48.64)	48.75 (92.72)	37.00 (63.77)
Weekdays	14.74 (21.44)	28.06 (47.19)	29.69 (50.30)	19.54 (22.56)
Δ^d	43.83 (24.38)	18.05 (13.76)	19.06 (20.53)	17.45 (15.14)
Son				
Weekend	22.85 (26.27)	36.11 (44.21)	7.50 (16.51)	21.00 (47.01)
Weekdays	6.31 (14.61)	23.33 (39.42)	8.75 (27.67)	10.00 (15.12)
Δ^s	16.54 (8.06)	12.78 (11.85)	-1.25 (7.53)	11.00 (10.94)
$\widehat{E}(G) = \Delta^d - \Delta^s$	27.29 (11.01)	5.27 (9.00)	20.31 (11.02)	6.45 (8.37)

Notes: Standard deviations in parentheses.



APPENDIX

TABLE A: Baseline models: Probit and PML Poisson coefficient estimates

	Two-earner				Male-earner			
	Probit		Poisson		Probit		Poisson	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Age	0.020 (0.043)	0.096** (0.042)	0.051 (0.059)	0.157*** (0.045)	-0.011 (0.040)	0.038 (0.037)	0.037 (0.069)	0.046 (0.046)
Only child	-0.588* (0.303)	-0.026 (0.304)	0.183 (0.319)	-0.122 (0.265)	0.042 (0.341)	-0.408 (0.277)	0.714 (0.507)	0.345 (0.356)
Opposite-sex siblings	-0.254 (0.274)	-0.456* (0.270)	0.354 (0.265)	-0.268 (0.244)	-0.145 (0.263)	-0.153 (0.245)	-0.088 (0.378)	0.500* (0.299)
Weekend	0.090 (0.226)	0.349* (0.212)	0.580** (0.239)	0.276 (0.244)	-0.111 (0.216)	0.342 (0.210)	0.326 (0.316)	0.659*** (0.231)
Summer season	0.378 (0.239)	0.262 (0.252)	0.105 (0.249)	0.410 (0.256)	-0.067 (0.273)	0.526 (0.224)	0.558 (0.364)	0.742 (0.280)
Typical day	0.133 (0.251)	0.271 (0.252)	-0.253 (0.289)	0.128 (0.269)	-0.762*** (0.264)	-0.293 (0.248)	-0.731*** (0.283)	-0.188 (0.349)
Household income	-0.037 (0.040)	0.014 (0.045)	-0.017 (0.051)	-0.022 (0.043)	0.082 (0.062)	-0.052 (0.068)	0.157* (0.082)	-0.042 (0.065)
Parents's average education	0.935** (0.424)	0.053 (0.365)	1.292** (0.516)	0.001 (0.349)	0.663* (0.393)	0.387 (0.375)	1.339** (0.585)	0.133 (0.495)
Parents' average education (squared)	-0.088** (0.036)	-0.006 (0.029)	-0.118** (0.047)	-0.002 (0.028)	-0.066* (0.036)	-0.036 (0.036)	-0.136** (0.054)	-0.016 (0.046)
Detached/semidetached house	-0.031 (0.215)	0.421* (0.217)	0.085 (0.262)	0.688*** (0.245)	0.063 (0.224)	0.105 (0.222)	0.738** (0.363)	0.242 (0.299)
No. rooms per capita	0.117 (0.258)	-0.240 (0.350)	-0.236 (0.306)	-0.088 (0.280)	-0.792 (0.543)	0.430 (0.453)	-2.718* (1.571)	-0.458 (0.591)
Father does housework	0.681*** (0.213)	0.199 (0.235)	0.804** (0.392)	0.131 (0.248)	0.470** (0.211)	-0.019 (0.194)	0.360 (0.350)	-0.529** (0.242)
Constant	-2.843** (1.421)	-1.206 (1.237)	-3.818** (1.673)	-1.073 (1.236)	-0.719 (1.280)	-1.579 (1.172)	-1.252 (2.770)	0.242 (1.262)

Notes: Robust standard errors in parentheses. Significance at the (***) 1% level, (**) 5% level, (*) 10% level

TABLE B: Probit and PML Poisson coefficient estimates of the explanatory variables capturing social externalities

	Two-earner				Male-earner			
	Probit		Poisson		Probit		Poisson	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Rural 1 (<10,000 inhabitants)	-0.442 (0.343)	0.164 (0.330)	-0.594* (0.357)	0.038 (0.212)	-0.858** (0.375)	0.604* (0.347)	-0.365 (0.570)	0.071 (0.382)
Rural 2 (10,000–50,000 inhabitants)	-0.267 (0.253)	-0.148 (0.241)	0.060 (0.382)	-0.077 (0.249)	-0.282 (0.254)	0.205 (0.228)	-0.303 (0.470)	0.157 (0.251)
Gender attitudes at a regional level ^a	-0.004 (0.007)	-0.003 (0.007)	0.002 (0.008)	0.018** (0.007)	0.007 (0.008)	0.008 (0.007)	0.018** (0.009)	0.013 (0.009)

Notes: The coefficient estimates corresponding to the second set of models presented in Panel C of Table 6. Remaining explanatory variables are those included in the baseline model of Table 6 (see Notes to Table 6). Robust standard errors in parentheses.

^a This variable was computed using the Time Use Survey, collected by the Spanish *Instituto de la Mujer* in 2002. It consists of the average of responses at the regional level to statement “It is much better for everyone if the man earns the main living and the woman takes care of the home” and the family”. Respondents answered to this question on the basis of a 5-point scale that ranged from “strongly disagree” (1) to “strongly agree” (5).

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