As my parents at home? Gender differences in childrens' housework between Germany and Spain

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1. Introduction

Parents and children usually live together and, in consequence, we can presumably expect transmissions of behaviors. The study of transfers across generations or, in a more extent way, intergenerational mobility, has been extensively studied in the literature. Thus, Roemer (2004) formally discuss the relationship between intergenerational transfers and equality of opportunities and considers three categories of circumstances through which parents may give their children in advantage. First, parents may influence life chances through the genetic transmissions of personality, preferences or health. Second, parents may transmit economic advantages through social connections facilitating access to jobs or access to sources of human capital. Third, parents may influence the lifetime earnings of their children through a family culture and other monetary and non-monetary investments.[1]

However, the degree of intergenerational mobility will not change significantly without there being important behavioral changes in parents' habits and social norms, like, for instance, time dedicated to housework activities. Thus, we show in this paper the relationship between the housework time dedicated by parents and the housework time dedicated by children, by using diary data for two different countries: Germany (2002) and Spain (2002).[2]

We find positive correlations between parents and children's housework time, which indicates that the more time parents devote to housework the more time their children devote to housework. However, we find gender differences in these relationships, and while in Germany both fathers and mothers' housework is positively related with the time devoted to housework by the children, in Spain it is only father's time in housework that is positively related to children's housework time. Thus, it seems that we find a different relationship between parents and children's housework time in Mediterranean countries compared to continental countries. In particular, we find in

[1] Transfers can also found between individual of different households, with some evidence analyzing whether these private transfers are driven by altruistic or non-altruistic motives (Molina, 2013 and 2014; Cigno et al., 1998). Transmission behaviors also appear between private and public individuals.

[2] The advantage of time-use surveys over stylized-questions, such as those included in the data bases ECHP, the BHPS, and the SOEP (where respondents are asked how much time they have spent, for example, in the previous week, or normally spend each week, on market work or housework) is that diary-based estimates of time use are more reliable and accurate than estimates derived from direct questions (Juster and Stafford, 1985; Robinson, 1985; Robinson and Godbey, 1997; Bianchi et al., 2000; Bonke, 2005; Yee-Kan, 2008).

Germany that a difference of 10% in the time devoted to housework by fathers translates into a difference of 1% in the time devoted to housework by daughters, and into a difference of 0.3% in the time devoted to housework by sons. In the case of Spain, we find that a difference of 10% in the time devoted to housework by fathers translates into a difference of 0.4% and 1.2% for daughters and sons, respectively. These results are consistent to sample selection issues, as results show similar if we carry out the analysis considering the labour status, and the educational level of the parents, and also to unobserved heterogeneity of individuals and households.

These correlations are observed in two-earners households in both countries, while for one-earner households the mother's housework correlates with children's housework time only in Spain. Considering the educational level of the two parents, for Germany, we observe that the positive correlation between parents and children's housework time applies to households where the two members have secondary and university education. In the case of Spain, the positive correlation between fathers and children's housework time applies to households where the two members have secondary education only. Furthermore, in Spain we observe that mother's housework also have statistically significant correlations with children's housework time: negative and positive for daughters and sons in household with members of primary education, and positive for daughters and sons in household with members of university education.

Our contribution to the literature is threefold. First, we contribute to the existing research on intergenerational transmission of behaviours and attitudes. Despite the existence of research on intergenerational transmission of values (Wilhelm et al., 2008; Gronhoj and Thogersen, 2009; Bulte and Horan, 2011; Dohmen et al., 2012), happiness (Winkelman, 2005; Clair, 2012; Carlsson et al., 2014) and economic outcomes (Solon, 1999, 2002, 2004; Anger and Heineck, 2010; Black and Devereux, 2011; Holmlund et al., 2011; Anger, 2012; Tsou et al., 2012; Corak, 2013; Stella, 2013), few papers have directly analyzed the intergenerational transmission in the uses of time. To the extent that housework time represents an important proportion of daily life, especially for women, this paper also refers to the relevant issue of reconciling work and family life (see, for recent evidence, Molina, 2015) . Second, our paper also expands recent cross-country studies such as Burda, Hammermesh and Weil (2008), Gershuny (2009), Gauthier, Smeeding, and Furstenberg (2004), and Gimenez-Nadal and Sevilla (2012) among others. These studies generally analyze the use of time for a variety of developed

economies, and our paper extends these cross-country comparisons by additionally documenting for the first time the analysis of the time devoted to housework by European youths. Third, we analyze two European countries with different welfare regimes (Esping-Andersen, 1999) in an attempt to extract common patterns in the intergenerational transmission of housework. Different effects of different factors may imply that national welfare regimes influence how parents transmit roles to their children.

The rest of the paper is organized as follows. Sections 2 and 3 describe the data and the empirical strategy, respectively. Section 4 shows the empirical results, and Section 5 sets out the main conclusions.

2. Data

We use the Multinational Time Use Survey (MTUS), which is an ex-post harmonized cross-time, cross-national, comparative time use database, coordinated by the Centre for Time Use Research (CTUR) at the University of Oxford.[3] It is constructed from national randomly-sampled time-diary studies, with common series of background variables, and total time spent in 41 activities (Gershuny, 2009). The MTUS provides us with information on individual time use, based on diary questionnaires in which individuals report their activities throughout the 24 hours of the day.

The MTUS includes 41 activities, defined as the 'primary' or 'main' activity individuals were doing at the time of the interview. Thus, we are able to add up the time devoted to any activity of reference (e.g., paid work, leisure, housework) as 'primary' activity. It is important to acknowledge that, in this paper, the fact that our analysis is based on the comparison of a broad definition of housework provides a good basis to run meaningful comparisons across countries. As Gimenez-Nadal and Sevilla (2012) point out however, the harmonization exercise by the CTUR team addresses differences in survey methodologies such as different response rates (especially the lower response rate of some of the surveys), whether they covered or not the twelve months of the year, the sampling frame, and differences in activity codes. All the surveys provide weights designed to ensure that the surveys are nationally representative.

[3] Information on the variables, and on how to access the data, is available on the MTUS website: http://www.timeuse.org/mtus. See Fisher, Gershuny and Gauthier (2011) for a full description of the MTUS documentation. We use version W53 (accessed in October 2010) of the MTUS.

We select individuals who are 10 years or older who are reported as being a child in the household, and living with the two heterosexual parents. For the selection of countries, we choose countries with time use information for all members of the household 10 or older. Given that we want to analyze how housework time of parents relates to housework of their children we need time use information for all the members of the couple, we provide evidence on two countries which have multi-member time use surveys: Germany (2002) and Spain (2002), countries whose time use surveys have been harmonized by the CTUR team which allows a cross-country comparison of patterns.

We consider the time devoted to *housework* by both parents and their children, measured in hours per day. Our definition of *housework* includes the total time devoted to the following activities: cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel". Table 1 shows the time devoted to housework by children and their parents, by country. A first issue that emerges here is that children seem to devote about the same time to *housework*. In this sense, in all countries children devote around 1 hour per day to these activities. Regarding the time devoted to housework by parents, we find that fathers in Spain devote a relatively low amount of time to housework (1.39 hours per day) compared to fathers in Germany (2.04 hours per day). Conversely, mothers in Spain devote a relatively high amount of time to housework (5.96 hours per day) compared to mothers in Germany (4.50 hours per day). These results are consistent with previous studies showing that in the Mediterranean countries there is a large gender gap in *housework* favoring women, which makes these countries especially inegalitarian in the gender distribution of household labor (Sevilla, 2010; Sevilla et al, 2010; Gimenez-Nadal et al, 2012). Thus, we observe that our analysis includes countries with very different institutions (e.g., different social/gender norms, Burda et al., 2012), welfare regimes, and labor market structures, which proves relevant in our analysis for robustness reasons.

As we focus on the relationship between the time devoted to housework by parents and that of their children, we consider 3 problems that may arise when studying such relationship: 1) measurement error, 2) reverse causality, and 3) unobserved heterogeneity, which have been identified as sources of endogeneity. Regarding measurement error, the way time use information is collected for individuals reduces the possible errors individuals may make when they recall the time devoted to the different

activities throughout the day. In this sense, the advantage of time-use surveys over stylized-questions, such as those included in the European Community Household Panel, the British Household Panel Survey, and the German Socioeconomic Panel (where respondents are asked how much time they have spent, for example, in the previous week, or normally spend each week, on market work or housework), is that diary-based estimates of time use are more reliable and accurate than estimates derived from direct questions (Juster and Stafford, 1985; Robinson, 1985; Robinson and Godbey, 1997; Bianchi et al., 2000; Bonke, 2005; Yee-Kan, 2008).

For instance, in the labor supply literature, Klevmarken (2005) argues that information on actual hours of work from time-use surveys is more relevant than normal hours or contracted hours generally reported in stylized questions. Thus, in the same way that money-expenditure diaries have become the gold standard in the consumption literature, so have time-use diaries become the preferred method of gathering information on time spent on market work, non-market work, and leisure. Most studies documenting how individuals use their time are now based on these data sets (Aguiar and Hurst, 2007; Guryan, Hurst and Kearney, 2008; Gimenez-Nadal and Sevilla, 2012; Sevilla et al., 2012).[4] Likewise, measurement errors in the time devoted to housework by individuals is not likely to be a problem in the present study, since the fact that each respondent answers her/his own diary reduces the probability that children's housework is influenced by parents' housework.

Regarding reverse causality, the question here is whether the time devoted to housework by children depends on the time devoted to housework by their parents, while the time devoted to housework by the parents is not affected by the time devoted to housework by their children. If this is the case, e.g., one-way causal relationship, the results of regressing the time devoted to housework by children on the time devoted to housework by their parents would be unbiased. However, if there also exists an effect of children's housework on the time devoted to housework by their parents, we have reverse causality as we would have a two-way relationship, and simple econometric models that do not take into account this two-way relationship would yield biased estimations. Thus, we need to test for the presence of reverse causality between our variables of interest. To that end, we have applied the Durbin–Wu–Hausman test (i.e.,

[4] The MTUS has been widely used across the social sciences (Gershuny, 2000; Gershuny and Sullivan, 2003; Gauthier et al., 2004; Guryan, Hurst and Kearney, 2008; Gershuny, 2009, Gimenez-Nadal and Sevilla-Sanz, 2011;2012; Gimenez-Nadal and Molina, 2013, 2015).

augmented regression test) of endogeneity (e.g., reverse causality) between our variables. Results are shown in Appendix B and we obtain no evidence of reverse causality between children and parents' time devoted to housework in Spain. In the case of Germany, we find no evidence of reverse causality between fathers' housework time and that of their children, but we find evidence of reverse causality between mothers' housework time and that of their children.

Finally, regarding unobserved heterogeneity of individuals and households, this proves to be the biggest limitation of our analysis as our data is a cross-section of individuals, and thus we cannot take into account the unobserved heterogeneity of individuals and households. There may be unobserved factors at the individual and household level that correlate with both the time children devote to housework, and that of their parents. Factors such as parents' heterogeneity in time preferences and in the outsourcing of household chores, heterogeneity in productivity of individuals in housework, or differences in gender/social norms across the countries, are just a few examples of factors that can affect the time devoted to housework by parents and their children. Despite we test the robustness of our results by using panel-data models, these results cannot be considered as general, and we cannot thus identify any causal effect of parents' housework time on children's housework time, but we can just explore the correlational structure of the data. Unfortunately, at present there are no panels of time-use surveys currently available.

3. Empirical strategy

Using an adaptation from Black et al. (2005) and Stella (2013) who applied to human capital transfers, we regress the time dedicated to *housework* by children on the time devoted to housework by the father and mother of those children. In this sense, we regress the log of h*ousework* time of children on the log of *housework* time of the father and the mother. Additionally, with the aim of capture the expected differential impacts of maternal and parental housework time on children's dedication depending on the gender of the parent and the children, we also include the interactions between parental housework time and the gender dummy for the child Gender_{ih}, with this being equal to one when the child is male. We thus estimate the following model:

$$\ln Time_{ih} = \alpha + \beta_1 \ln Father'sTime_{ih} + \beta_2 * Mother'sTime_{ih} + \beta_3 \ln Father'sTime_{ih} * Gender_{ih} + \beta_4 \ln Mother'sTime_{ih} * Gender_{ih} + \beta_5 Gender_{ih} + \gamma X_{ih} + \varepsilon_{ih} \quad (1)$$

where the dependent variable $\ln Time_{ih}$ denotes the log of the time devoted to housework by child "*i*" in household "*h*", with this being expressed as a linear function of (log) time dedicated for parents to housework in the household respondent. The indicators of mobility β_1, β_2, β_3 and β_4 represent the elasticity of children's time with respect to their parents' time, with an elasticity of 0.5 implying that a 10% difference between two families time translates into an average difference of roughly 5% between their children's times. Despite we use the logarithm of housework of parents and their children, the transformed variables does not follow a normal distribution, which makes the error terms of regressions not being homoskedastic, and thus we correct our regressions by obtaining robust standard errors.[5]

The set of socio-demographic variables X_{ih} includes the children's characteristics (gender, age and work status), parent's characteristics (age, education, work status) and household characteristics (household size, number of children, whether the household owns the dwelling and urban residence). We specifically include both parent's ages which captures differences in housework time behaviors across parental birth cohorts, day-of-the-week dummies to scale the day of the week (ref.: Saturday). Finally, ε_{ih} represents the robust standard error.

We estimate using OLS regressions. However, as we observe a high proportion of "zeros" in the time devoted to housework (23% of observations in the pooled sample), there can be some controversy regarding the selection of alternative models, such as that of Tobin (1958). According to Frazis and Stewart (2012), OLS models are preferred in the analysis of time allocation decisions, and Gershuny (2012) argues that traditional diary studies can still produce accurate estimates of mean times in activities for samples and subgroups. Foster and Kalenkoski (2013) compare the use of tobit and OLS models in the analysis of the time devoted to childcare activities, finding that the qualitative conclusions are similar for the two estimation methods. Thus, we rely on OLS models, although we have alternatively estimated Tobit models, and our qualitative conclusions are the same (results available upon request).

[5] See Appendix B for a description of the distribution of housework time of parents and their children.

Table 1 shows means and standard deviations for our explanatory variables. We observe that there is a higher proportion of male children compared to female children, that the proportion of children working in larger in Germany, compared to Spain, and that the mean age of children in Spain is higher compared to the mean age of children in Germany, consistent with previous evidence showing that children leave parent's home at older ages (Angelini and Laferrère, 2013). Regarding parents characteristics, we observe that in two countries the proportion of fathers with university education is larger compared to mothers, fathers are older and have a higher probability of participation in the labor market compared to mothers in all countries. Regarding household characteristics, despite household size is similar across countries, households in Spain tend to have fewer children under 18, and in Germany almost the 100% of the household have a computer.

Figures 1 and 2 show the raw relationship between children and parents' housework times. The figures plot the average time devoted to housework by children for each time devoted to housework of the parent; that is, for all the households with the same amount of time devoted to housework by the father/mother, we average the time devoted to housework by the children, by gender and country. For instance, for all German households where the father devotes 1.04 hour to housework, we average the time devoted to housework by sons and daughters, obtaining a mean value of housework of 0.76 and of 0.46 hours per day for daughters and sons, respectively. We then plot (scatter plot) mean housework time of sons/daughters (y-axis) on the time devoted to housework (x-axis) by fathers (Figure 1) and mothers (Figure 2). We have also added a linear fit to see the extent to what scatters are distributed following a linear relationship.

We observe a positive relationship between the time devoted to housework by parents and the time devoted to housework by both sons and daughters. This raw relationship points toward a positive relationship between fathers and children's housework time, although we can ascertain whether this positive relationship is larger for sons compared to daughters. However, in the case of mothers' housework time, we find mixed evidence, and while we observe a positive association between mothers' housework time and the time devoted to housework by sons in Germany, we find a negative association between mothers' housework time and the time devoted to housework by daughters in Spain, with no significant relationship for the rest of the cases. Thus, while it seems there is a robust positive association between fathers and

children's housework time, there are cross-country and gender differences in the relationship between mothers and children's housework time, which clearly indicates the necessity to take into the gender of the parent and the child in the regressions.

4. Results

Table 2 shows the results of estimating Equation (1) on the time devoted by European youths in Germany and Spain. In summary, we find positive correlations between parents and children's housework time, which indicates that the more time parents devote to housework the more time their children devote to housework. However, we find cross-country and gender differences in these relationships, and while in Germany both fathers and mothers' housework is positively related with the time devoted to housework by the children, in Spain it is only father's time in housework that is positively related to children's housework time. Thus, it seems that we find a different relationship between parents and children's housework time in Mediterranean countries compared to continental countries. This evidence is consistent with the intergenerational transmission of behavior regarding the time devoted to housework, as more housework time of the parents is related to more housework time of their children.

In particular, for Germany we find a correlation of 0.12 between fathers and children's housework time, with no differential effect between sons and daughters. On the other hand, we find a positive relationship between mothers and daughters' housework time (e.g., 0.10 in Germany), while the relationship is smaller between mothers and sons' housework time (e.g., 0.03 for Germany). Given that children and parents' housework time has been transformed to logarithm, we can interpret these results in terms of elasticities: a difference of 10% in the time devoted to housework by fathers translates into a difference of 1% in the time devoted to housework by their children. Furthermore, a difference of 10% in the time devoted to housework by fathers translates into a difference of 1% in the time devoted to housework by daughters, and into a difference of 0.3% in the time devoted to housework by sons. All the coefficients are statistically significant at standard levels.

In the case of Spain, we find a positive correlation between father and children's housework time, with a larger correlation for Spanish sons compared to Spanish daughters. We find a differential correlation between sons and daughters, and while we

find a correlation of 0.04 between fathers and daughter's housework time, the correlation is 0.12 for sons' housework time. Thus, a difference of 10% in the time devoted to housework by fathers translates into a difference of 0.4% and 1.2% for daughters and sons in Spain, respectively.

For the rest of factors, we observe that male children devoted less time to housework compared to female children in both countries. Those who are unemployed, and/or have working parents devote more time to housework, while students and part-time workers devote less time to housework activities. We do not obtain a clear pattern for parents' education, while we find an inverted U-shaped effect of age on the time devoted to housework by children.

Heterogeneous effects

We now analyze the relationship between parents' and children's housework time when we consider that these relationships may vary depending on the economic status of the parents. For instance, it could be that in those couples where one of the members does not participate in the labor market, the members of such couple are more concerned about their children's behavior and well-being (e.g., one-earner couples have stronger preferences for raising their children by themselves). As a result, we could expect different patterns of behavioral transmission, e.g., larger correlations of parents' housework with the housework on their children. To that end, we consider as a conditioning the economic and labor status of parents.

First, we consider the labor status of the members of the couple. This analysis is relevant to the extent that Mediterranean countries have lower Female Labor Force Participation (FLFP) rates compared to Germany (EUROSTAT, 2013). This lower FLFP can be a consequence of individual/household preferences for time in the labor market, on the one hand, and for the attitudes and behaviors they want to transmit to their children. In this sense, a lower FLFP could reflect a weaker preference for time in the labor market and a stronger preference towards the rising of children. We thus consider whether the 2 members of the couple participate in the labor market (e.g., 2-earners households), or whether only one of the member of the couple participates in the labor market, on the other hand. To the extent that in one-earner couples it is women who do not participate, we consider male-earners households.

Panels A and B of Table 3 shows the results of estimating Equation (1) for 2-earners households, and male-earners households, respectively. We observe in Germany that for both 2-earners and male-earners households the fathers and mothers' housework is positively related with the time devoted to housework by the children, results that are consistent with previous results. However, in the case of Spain, while for 2-earners households it is only father's housework time that is related to children's housework time, while in male-earners households the mother's housework correlates with children's housework time, particularly, negatively for sons in Spain.

A second factor that may condition the correlations observed in the analysis including all the couples is education. It could be that more educated parents are more concerned about the educational and attitudinal behavior of their children, as parents may consider they have attitudes and characteristics that are better compared to attitudes and characteristics of less educated parents. On the other hand, it could be that as more educated parents have a higher opportunity cost, they devote less time to housework, compared to lower educated parents, which negatively affects the positive correlation between parents and children's housework time. Thus, we estimate Equation (1) considering 3 possible levels of education of the members of the couples: primary education (e.g., less than high school level), secondary education (e.g., high school level), and university education (e.g., more than high school level).[6]

Panels C, D and E of Table 3 shows the results of estimating Equation (1) for couples where the two members of the household have primary education, secondary education, and university education, respectively. For Germany, we observe that the positive correlation between parents and children's housework time applies to households where the two members have secondary and university education. In the case of Spain, the positive correlation between fathers and children's housework time applies to households where the two members have secondary education only. Furthermore, in Spain we observe that mother's housework also have statistically significant correlations with children's housework time: negative and positive for daughters and sons in household with members of primary education, and positive for daughters and sons in household with members of university education.

[6] To the extent that there is positive assortative matching by education (Oppenheimer, 1988; Mare, 1991; Pencavel, 1998; Lewis and Oppenheimer, 2000; Blossfeld and Timm, 2003), we consider that parents have similar levels of education, and we thus exclude from the analysis those couples where the members of the couple have different levels of education.

Results considering unobserved heterogeneity

One of the limitations of the study is that time use surveys are cross-sectional data, and thus we cannot identify correlations between parents and children's housework time net of (permanent) individual and household heterogeneity in preferences. However, we now exploit the fact that for Germany we have 3 diaries per individual. Comparing the within-personal and between-personal variation of our dependent variable, we obtain a within-personal variation of 0.38, while the between-personal variation is 0.41. Thus, we have enough within-personal variation to apply a Fixed Effects estimator. We thus estimate the following model:

$$\ln Time_{iht} = \alpha_i + \beta_1 \ln Father'sTime_{iht} + \beta_2 * Mother'sTime_{iht} + \gamma Day_{iht} + \varepsilon_{iht} \quad (2)$$

where the dependent variable $\ln Time_{iht}$ denotes the log of the time devoted to housework by child "*i"* in household "*h"* and day *"t"* (t=1,2,3), with this being expressed as a linear function of (log) time dedicated for parents to housework in the household "*h"* of child "*i"* in day *"t"*. Unfortunately, we do not have any time-variant variable except for days when the diary was answered, which are included in the regressions, and thus we take these results as complementary and not as main results given that we cannot control for the observed heterogeneity of children and their parents.

Table 4 shows the results of estimating Equation (2) for Germany. We observe that father and mother's time in housework is positively related to housework time of children, with these associations being statistically significant at standard levels. Thus, we find that both fathers and mothers' housework is positively related with the time devoted to housework by the children, results that are consistent with previous results without taking into account the unobserved heterogeneity of individuals. Thus, it seems that unobserved heterogeneity of individuals and households does not alter our main results: that in Germany both fathers and mothers' housework is positively related with the time devoted to housework by the children.

Interpretation of results

The fact that we find cross-country and gender differences in the correlations between

parents and children's housework time indicates that different mechanisms may lay behind such observed differences. First, several authors have studied how social norms influence the time allocation decisions of individuals (Sevilla, 2010; Sevilla et al., 2010; Burda et al., 2013). In an attempt to transmit those roles to their children, parents may try to behave following those social norms, which may differ across-countries, on the one hand, and on the importance given to the housework of the parents, on the other. For instance, Mediterranean countries have been classified among the most inegalitarian countries in the gender distribution of household labor. Thus, it may be that in these countries social norms establish household responsibilities as women's tasks, while men are not seen as responsible for household managing. Under this framework, if children observe that fathers devote more time to the household labor, it has influence on their behavior, while mother's housework does not have any influence on children's behavior since it is seen as a role that must be done by women. Thus, differences in social norms regarding the distribution of labor may explain cross-country differences in our results.

Second, institutional factors such as welfare regimes or labor market structures may also help to explain cross-country differences in the correlations between parents and children's housework time. Regarding welfare regimes, Gálvez-Muñoz, Rodríguez-Modroño and Domínguez-Serrano (2011) classifies Germany in the group of countries with liberal systems, where state interventions are clearly subordinate to market mechanisms, while Spain is included in the group of Mediterranean countries with a strong "familialism", defined by the maintenance of intergenerational solidarity, weak institutional support for families, a dual labor market model, and limited female access to the labor market. As a result, policies regarding the availability of public childcare services differ between the countries, and female labor force participation rates are lower in Spain than in Germany (Boeri and Van Ours, 2008; Gálvez-Muñoz, Rodríguez-Modroño and Domínguez-Serrano, 2011).[7] All these differences may influence how parents interact with their children, and how children observe the behavior of their parents, which influences how behaviors are transmitted from parents to their children.

Despite we offer an interpretation of the channels through which the transmission of behavior in household labor may operate, we cannot disentangle to what extent each

[7] Boeri and Van Ours (2008) show that, at the time of the surveys, the percentage of children under age 3 using formal childcare facilities is 34% in the UK and 5% in Spain, indicating a significant difference in the availability of childcare services between the two countries

factor contributes to explain cross-country differences in correlation between parents and children's housework time.

6. Conclusions

This paper analyzes the relationship between parents' time devoted to housework and the time devoted to housework by their children. Using data from the Multinational Time Use Study for Germany and Spain, we find positive correlations between parents and children's housework time, which indicates that the more time parents devote to housework the more time their children devote to housework. However, we find cross-country and gender differences in these relationships, and while in Germany both fathers and mothers' housework is positively related with the time devoted to housework by the children, in Spain it is only father's time in housework that is positively related to children's housework time. Thus, we find a different relationship between parents and children's housework time in Mediterranean countries compared to other continental countries. We offer an interpretation of the channels through which cross-country differences can be explained, although we are not able to disentangle what channel has more influence. We leave this issue for future research.

These correlations are observed in two-earners households in the two countries, while for one-earner households the mother's housework correlates with children's housework time in Spain. Considering the educational level of the two parents, for Germany, we observe that the positive correlation between parents and children's housework time applies to households where the two members have secondary and university education. In the case of Spain, the positive correlation between fathers and children's housework time applies to households where the two members have secondary education only. Furthermore, in Spain we observe that mother's housework also have statistically significant correlations with children's housework time: negative and positive for daughters and sons in household with members of primary education, and positive for daughters and sons in household with members of university education.

One limitation of our analysis is that our data is a cross-section of individuals, and it does not allow us to identify correlations between parents and children's housework time net of (permanent) individual and household heterogeneity in preferences. This is particularly important in our context, as it could be that preferences for housework

differ by gender, or by household, or that productivities are different for different types of individuals. At present there are no panels of time-use surveys currently available.

REFERENCES

Aguiar, M., and E. Hurst (2007). "Measuring trends in leisure: the allocation of time over five decades," *Quarterly Journal of Economics* 122: 969-1006.

Albertini, M., M. Kohli and C. Vogel (2007). "Intergenerational transfers of time and money in European families: common patterns – different regimes?" *Journal of European Social Policy* 17: 319-334.

Altonji, J.G., F. Hayashi and L.J. Kotlikoff (1992). "Is the extended family altruistically linked? Direct evidence using micro data". *American Economic Review* 82: 1177-1198.

Angelini, V., and A. Laferrère (2013). "Parental altruism and nest leaving in Europe: evidence from a retrospective survey," *Review of Economics of the Household* 11: 393-420.

Anger, S. (2012). "Intergenerational transmission of cognitive and noncognitive skills," In *From parents to children. The intergenerational transmission of advantage*, Ermisch, Jäntti and Smeeding (eds.), New York: Russell Sage Foundation, pp. 393-421

Anger, S., and G. Heineck (2010). "Do Smart Parents Raise Smart Children? The Intergenerational Transmission of Cognitive Abilities," *Journal of Population Economics* 23: 1105-1132.

Ayalew, T. (2005). "Parental Preference, Heterogeneity, Human Capital Inequality," *Economic Development and Cultural Change* 53: 381–407.

Becker, G.S. (1981). *A Treatise on the Family*. Cambridge: Harvard University Press.

Becker, G.S., and R.J. Barro (1988). "A reformulation of the economic theory of fertility". *Quarterly Journal of Economics* 103: 1-25.

Becker, G.S., and N. Tomes (1976). "Child Endowments and the Quantity and Quality of Children," *Journal of Political Economy* 84: 143–162.

Behrman, J.R., R.A Pollak and P. Taubman (1982). "Parental Preferences and Provision

for Progeny," *Journal of Political Economy* 90: 52–73.

Behrman, J.R., M.R. Rosenzweig and P. Taubman (1994). "Endowments and the Allocation of Schooling in the Family and in the Marriage Market: The Twins Experiment," *Journal of Political Economy* 102: 1131–1174.

Bianchi, S., M. Milkie, L. Sayer and J.P. Robinson (2000). "Is anyone doing the housework? Trends in the gender division of household labor," *Social Forces* 79: 191–228.

Black, S.E., and P.J. Devereux (2011). "Recent developments in intergenerational mobility," In *Handbook of Labor Economics, Vol 4b*, Card and Ashenfelter (eds.), Elsevier, pp. 1487-1541.

Blossfeld, H.P., and A. Timm (2003). *Who marries whom? Educational systems as marriage markets in modern societies*. Dordrecht: Kluwer Academic Publishers.

Björklund, A., and L. Chadwick (2003). "Intergenerational income mobility in permanent and separated families," *Economics Letters* 80: 239-246.

Boeri, T., and J. Van Ours (2008). *The Economics of Imperfect Labor Markets*. Princeton University Press.

Bonke, J. (2005). "Paid work and unpaid work: Diary information versus questionnaire information," *Social Indicators Research* 70: 349–368.

Bulte, E.H., and R.D. Horan (2011). "Intergenerational transmission of preferences," *Economics Letters* 112: 85-87.

Burda, M., D. Hamermesh and P. Weil (2008). "The Distribution of Total Work in the US and EU," in *Working Hours and Job Sharing in the EU and USA: Are Americans Crazy? Are Europeans Lazy?* Boeri, Burda and Kramarz (eds.), Oxford Univ. Press.

Burda, M., D. Hamermesh and P. Weil (2013)." Total work and gender: facts and possible explanations," *Journal of Population Economics* 26: 239-261.

Carlsson, F., E. Lampi, W. Li and P. Martinsson (2014). "Subjective well-being among preadolescents and their parents: Evidence of intergenerational transmission of well-being from urban China," *Journal of Socio-Economics*, http://dx.doi.org/10.1016/j.socec.2013.10.003.

Casas, F., G. Coenders, R.A Cummins, M. Gonzalez, C. Figuer and S. Malo (2008). "Does subjective well-being show a relationship between parents and their children?" *Journal of Happiness Studies* 9: 197-205.

Cigno, A. (1993). "Intergenerational transfers without altruism. Family, market and state". *European Journal of Political Economy* 9: 508-518.

Cigno, A., G.C. Giannelli and F.C. Rosati (1998). "Voluntary transfers among Italian households: altruistic and non-altruistic explanations," *Structural Change and Economic Dynamics* 9: 435-451.

Clair, A. (2012). "The relationship between parent's subjective well-being and the life satisfaction of their children in Britain," *Child Indicators Research* 5: 631-650.

Corak, M. (2013). "Income inequality, equality of opportunity, and intergenerational mobility," *Journal of Economic Perspectives* 27: 79-102.

Cox, D. (1990). "Intergenerational Transfers and Liquidity Constraints." *Quarterly Journal of Economics* 105: 187–217.

Cox, D., and M. Rank (1992). "Inter-Vivos Transfers and Intergenerational Exchange," *Review of Economics and Statistics* 74: 305–314.

Datar, A., M.R. Kilburn and D.S. Loughran (2010). "Endowments and parental investements in infancy and early childhood," *Demography* 47: 145-162.

Davidson, R. and J. G. MacKinnon (1993). *Estimation and Inference in Econometrics*. New York: Oxford University Press

Dohmen, T., A. Falk, D. Huffman and U. Sunde (2012). "The intergenerational transmission of risk and trust attitudes," *Review of Economic Studies* 79: 645-677.

Edgeworth, F. (1881). *Mathematical Psychics: An Esssay of the Application of Mathematics to the Moral Sciences*. C. Kegan Paul and Co. London.

Esping-Andersen, G. (1999). *Social foundations of postindustrial economies*. Oxford: Oxford University Press.

EUROSTAT (2013). *Statistics, Population and Social Conditions*.

Fisher K, Gershuny J, Gauthier A (2011). "Multinational Time Use Study: User's Guide and Documentation," http://www.timeuse.org/files/cckpub/858/mtus-user-guide-r4.pdf. Accessed 1 September 2012.

Foster, G., and C. Kalenkoski (2013). "Tobit or OLS? An empirical evaluation under different diary window lengths," *Applied Economics* 45: 2994-3010.

Frazis, H., and J. Stewart (2012). "How to Think About Time-Use Data: What Inferences Can We Make About Long- and Short-Run Time Use from Time Use Diaries?" *Annals of Economics and Statistics* 105/106: 231-246.

Gálvez-Muñoz L, P. Rodríguez-Modroño and M. Domínguez-Serrano (2011). "Work and Time Use By Gender: A New Clustering of European Welfare Systems," *Feminist Economics* 17: 125-157.

Gauthier, A.H., T.M. Smeeding, and F.F. Furstenberg (2004). "Are parents investing less time in children? Trends in selected industrialized countries," *Population and Development Review* 30: 647–671.

Gershuny, J. (2000). *Changing times, work and leisure in post industrial society*. Oxford: Oxford University Press.

Gershuny, J.I. (2009). "Veblen in Reverse: Evidence from the Multinational Time-Use Archive," *Social Indicators Research* 93: 37–45.

Gershuny, J.I. (2012). "Too Many Zeros: A Method for Estimating Long-term Time-use from Short Diaries," *Annals of Economics and Statistics* 105/106: 247-270.

Gershuny, J., and O. Sullivan (2003). "Time use, gender, and public policy regimes," *Social Politics: International Studies in Gender, State and Society* 10: 205–228.

Giménez-Nadal, J.I., and J.A. Molina (2013). "Parents' education as determinant of educational childcare time," *Journal of Population Economics* 26: 719-749.

Giménez-Nadal, J.I., and J.A. Molina (2015). "Health status and the allocation of time: cross-country evidence from Europe," *Economic Modelling* 46: 188-203.

Gimenez-Nadal, J.I., and A. Sevilla (2011). "The Time-Crunch Paradox," *Social Indicators Research* 102: 181-196.

Giménez-Nadal, J.I. and A. Sevilla (2012). "Trends in time allocation: A cross-country analysis," *European Economic Review* 56: 1338-1359.

Griliches, Z. (1979). "Sibling Models and Data in Economics: Beginnings of a Survey," *Journal of Political Economy* 87: S37–S64.

Gronhof, A., and J. Thogersen (2009). "Like father, like son? Intergenerational

transmission of values, attitudes, and behaviours in the environmental domain," *Journal of Environmental Psychology* 29: 414-421.

Guryan, J., E. Hurst, and M. Kearney (2008). "Parental education and parental time with children," *Journal of Economic Perspectives* 22: 23–46.

Holmlund, H., M. Lindahl and E. Plug (2011). "The causal effects of parent's education on children' schooling: a comparison of estimation methods," *Journal of Economic Literature* 49: 615-651.

Juster, T. and F. Stafford (1985). *Time, Goods, and Well-Being*. Ann Arbor, MI. Institute for Social Research.

Klevmarken, N.A. (2005). "Estimates of a labour supply function using alternative measures of hours of work," *European Economic Review* 49: 55–73.

Lewis, S.K., and V.K. Oppenheimer (2000). "Educational assortative mating across marriage markets: non-Hispanic whites in the United States," *Demography* 37: 29–40.

Mare, R. (1991). "Five decades of educational assortative mating" *American Sociological Review* 56: 15–32.

Molina, J.A. (2013). "Altruism in the household: in-kind transfers in the context of kin selection," *Review of Economics of the Household* 11: 309-312.

Molina, J.A. (2014). "Altruism and monetary transfers in the household: inter- and intra generation issues", *Review of Economics of the Household,* 12 (3): 407-410.

Molina, J.A. (2015). "Caring within the family: reconciling work and family life", *Journal of Family and Economic issues,* DOI: 10.1007/s10834-015-9441-8..

Oppenheimer, V.K. (1988). "A theory of marriage timing: Assortative mating under varying degrees of uncertainty," *American Journal of Sociology* 94: 563–591.

Pencavel, J. (1998). "Assortative mating by schooling and the work behavior of wives and husbands," *American Economic Review* 88: 326–329.

Pitt, M.M., M.R. Rosenzweig and M.N. Hassan (1990). "Productivity, Health, and Inequality in the Intrahousehold Distribution of Food in Low-Income Countries," *American Economic Review* 80: 1139–56.

Robinson, JP (1985). "The validity and reliability of diaries versus alternative time use

measures," in *Time, goods, and well-being,* Juster and Stafford (eds). Ann Arbor, MI: The University of Michigan, pp 33–62.

Robinson, J.P., and G. Godbey (1997). *Time for Life: The Surprising Ways Americans Use their Time*. University Park, PA. Pennsylvania State University Press.

Roemer, J.E. (2004). "Equal opportunity and intergenerational mobility: going beyond intergenerational income transition matrices," In *Generational Income Mobility in north America and Europe*, Corak (ed.), Cambridge University Press.

Rosenzweig, M.R., and T.P. Schultz (1982). "Market Opportunities, Genetic Endowments, and Intrafamily Resource Distribution: Child Survival in Rural India," *American Economic Review* 72: 803–815.

Rosenzweig, M.R., and K.I. Wolpin (1988). "Heterogeneity, Intrafamily Distribution, and Child Health," *Journal of Human Resources* 23: 437-461.

Sevilla, A. (2010). "Household división of labor and cross-country differences in household formation rates," *Journal of Population Economics* 23: 225-249.

Sevilla, A., J.I. Gimenez-Nadal and C. Fernandez (2010). "Gender Roles and the Division of Unpaid Work in Spanish Households," *Feminist Economics* 16: 137-184.

Sevilla, A., J.I. Gimenez-Nadal, and J.I. Gershuny (2012). "Leisure inequality in the United States: 1965–2003," *Demography* 49: 939-964

Smith, A. (1759). *The Theory of Moral Sentiments*. Printed for A. Millar, in the Strand; and A. Kincaid and J. Bell, in Edinburgh.

Solon, G. (1999). "Intergenerational mobility in the labor market," In *Handbook of Labor Economics, Volume 3*, Ashenfelter and Card (eds.), Amsterdam: Elsevier Science, 1761-1800

Solon, G. (2002). "Cross-country differences in intergenerational earnings mobility," *Journal of Economic Perspectives* 16: 56-66.

Solon, G. (2004). "A model of intergenerational mobility variation over time and place," In *Generational Income Mobility in north America and Europe*, Corak (ed.). Cambridge University Press.

Stella, L. (2013). "Intergenerational transmission of human capital in Europe: evidence from SHARE," *IZA Journal of European Labor Studies*, 2-13.

Tobin, J. (1958). "Estimation of relationships for limited dependent variables," *Econometrica* 26: 24–36.

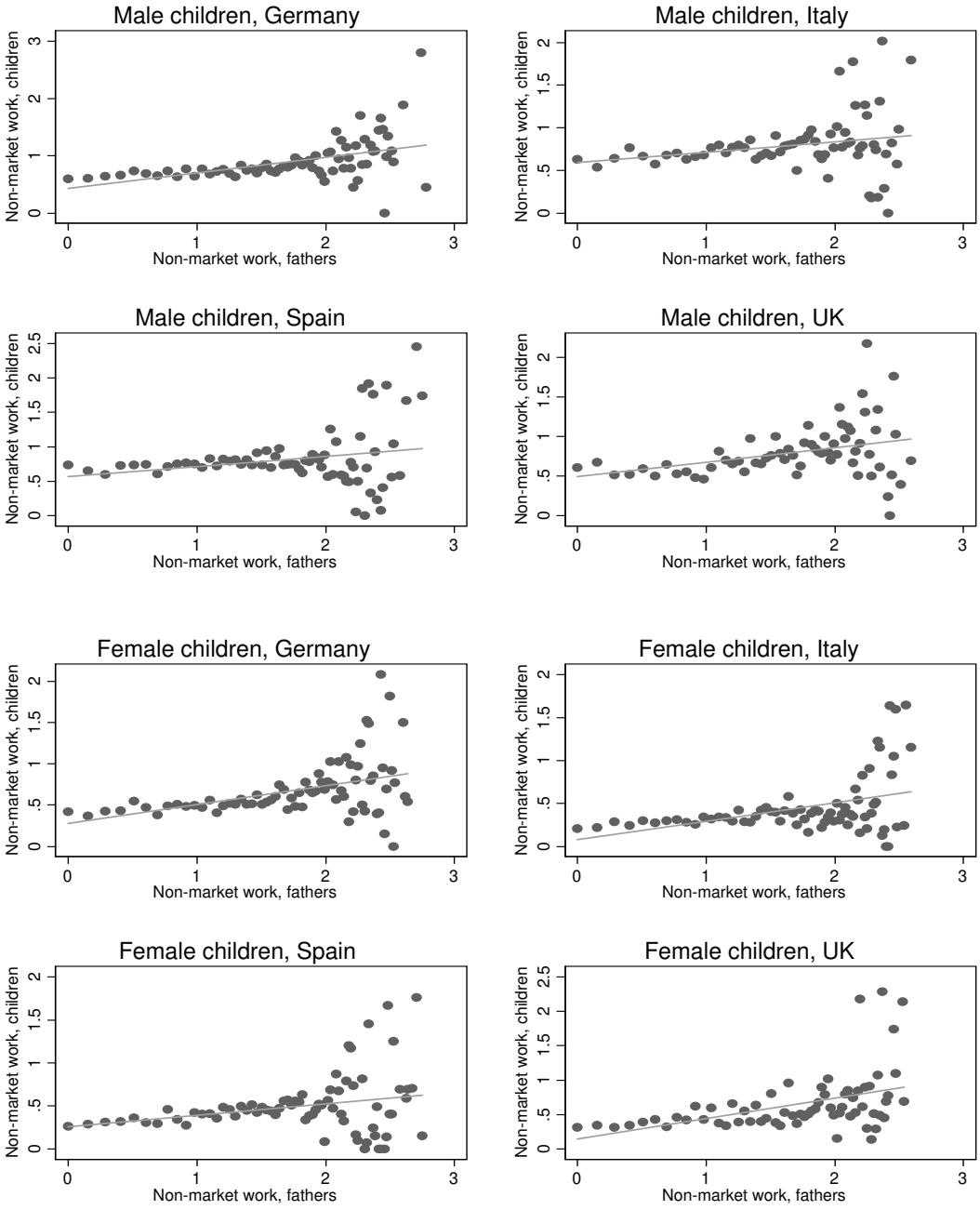
Tsou, M.W., J.T. Liu and J.K. Hammitt (2012). "The intergenerational transmission of education: Evidence from Taiwanese adoptions," *Economics Letters* 115: 134-136.

Wilhelm, M.O., E. Brown, P.M. Rooney and R. Steinberg (2008). "The intergenerational transmission of generosity," *Journal of Public Economics* 92: 2146-2156.

Winkelmann, R. (2005). "Subjective Well-Being and the Family: Results from an Ordered Probit Model with Multiple Random Effects," *Empirical Economics* 30: 749-761.

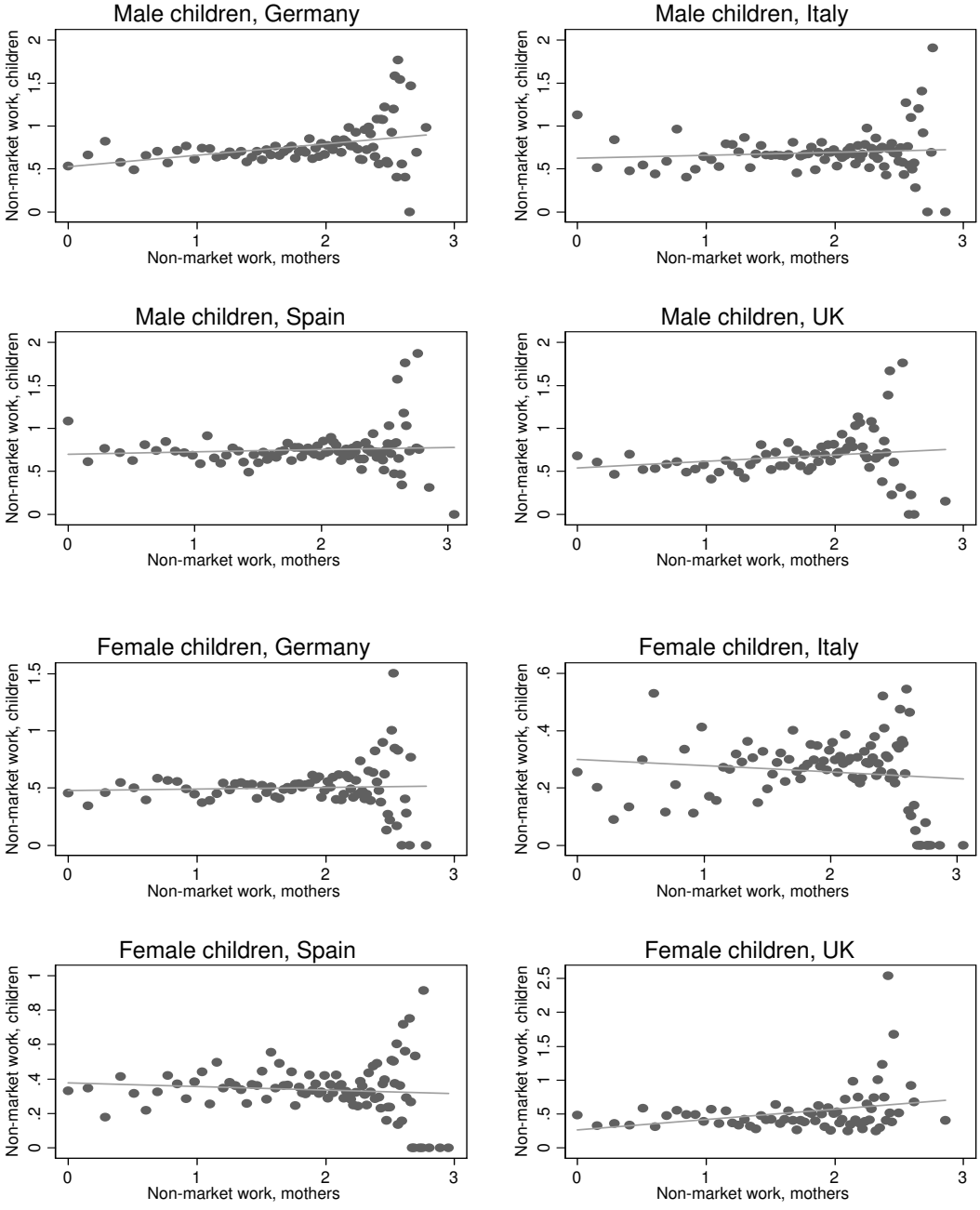
Yee-Kan, M. (2008). "Measuring Housework Participation: The Gap Between "Stylised" Questionnaire Estimates and Diary-Based Estimates," *Social Indicators Research* 86: 381-400.

Figure 1. Mean time devoted to non-market work, fathers and their children



Note: Sample consists of individuals who are 10 years or older who are reported as being a child in the household, and living with the two heterosexual parents from Germany, Italy, Spain and the United Kingdom. We include fathers of those children *Housework* includes the total time devoted to the following activities: cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel", and is measured in (log) hours per day.

Figure 2. Mean time devoted to non-market work, mothers and their children



Note: Sample consists of individuals who are 10 years or older who are reported as being a child in the household, and living with the two heterosexual parents from Germany, Italy, Spain and the United Kingdom. We include mothers of those children *Housework* includes the total time devoted to the following activities: cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel", and is measured in (log) hours per day.

Table 1. Sum stats of variables, by country

	(1)	(2)	(3)	(4)
	Germany 2001	Italy 2002	Spain 2002	UK 2000
Children's housework (log)	1.17	0.96	1.08	1.09
	(0.02)	(0.02)	(0.02)	(0.03)
Father's housework (log)	2.04	1.61	1.39	2.16
	(0.03)	(0.03)	(0.02)	(0.05)
Mother's housework (log)	4.50	6.58	5.96	4.45
	(0.03)	(0.04)	(0.03)	(0.05)
Male	0.52	0.54	0.52	0.53
	(0.01)	(0.01)	(0.01)	(0.01)
Age of respondent	16.30	21.22	21.09	16.52
	(0.06)	(0.10)	(0.09)	(0.13)
Student	0.63	0.29	0.53	0.68
	(0.01)	(0.01)	(0.01)	(0.01)
Unemployed	0.01	0.08	0.08	0.04
	(0.00)	(0.00)	(0.00)	(0.00)
Working part-/full-time	0.35	0.36	0.37	0.35
	(0.01)	(0.01)	(0.01)	(0.01)
Father's secondary education	0.47	0.65	0.50	0.35
	(0.01)	(0.01)	(0.01)	(0.01)
Mother's secondary education	0.64	0.66	0.53	0.33
	(0.01)	(0.01)	(0.01)	(0.01)
Father's university education	0.47	0.07	0.18	0.26
	(0.01)	(0.00)	(0.00)	(0.01)
Mother's university education	0.24	0.06	0.12	0.24
	(0.01)	(0.00)	(0.00)	(0.01)
Father's age	47.42	52.76	52.11	46.56
	(0.09)	(0.12)	(0.11)	(0.18)
Mother's age	44.20	48.84	49.14	44.18
	(0.08)	(0.12)	(0.11)	(0.16)
Father working part-/full-time	0.90	0.72	0.75	0.81
	(0.00)	(0.01)	(0.01)	(0.01)
Mother working part-/full-time	0.74	0.41	0.38	0.73
	(0.01)	(0.01)	(0.01)	(0.01)
Household size	4.22	4.09	4.35	4.42
	(0.01)	(0.01)	(0.01)	(0.03)
Number of children < 18	1.46	0.85	0.91	1.75
	(0.01)	(0.01)	(0.01)	(0.03)
Household owns dwelling	0.77	0.80	0.89	0.82
	(0.01)	(0.01)	(0.00)	(0.01)
Computer at home	0.98	0.65	0.67	0.79
	(0.00)	(0.01)	(0.01)	(0.01)
Urban residence	.	0.62	0.58	0.62
	.	(0.01)	(0.01)	(0.03)
Observations	7,074	10,346	8,080	2,703

Notes: Standard deviations in parenthesis. The sample is restricted to include individuals who are reported to be son/daughterof the reference person of the household in the Multinational Time Use Study (MTUS) from Germany, Italy, Spain and the United Kingdom. Housework is measured in hours per day, and is defined as the sum of the time devoted to "cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel."

Table 2. Regression results for housework time of children, by country

	(1)	(2)	(3)	(4)
Log of housework time	Germany 2001	Italy 2002	Spain 2002	UK 2000
Father's housework (log)	0.117***	0.092***	0.035**	0.122***
	(0.02)	(0.02)	(0.02)	(0.03)
Mother's housework (log)	0.104***	0.02	0.00	0.110***
	(0.02)	(0.02)	(0.02)	(0.03)
Father's housework (log)*Male	0.01	0.00	0.089***	0.02
	(0.02)	(0.02)	(0.02)	(0.03)
Mother's housework (log)*Male	-0.071***	0.00	0.00	-0.083**
	(0.03)	(0.03)	(0.02)	(0.04)
Male	-0.104**	-0.401***	-0.426***	-0.12
	(0.04)	(0.06)	(0.05)	(0.07)
Age of respondent	0.010***	0.023***	0.010***	0.009**
	(0.00)	(0.00)	(0.00)	(0.00)
Student	-0.190**	-0.103***	-0.180***	-0.06
	(0.10)	(0.02)	(0.04)	(0.05)
Unemployed	0.208*	0.184***	0.162***	0.224***
	(0.11)	(0.04)	(0.05)	(0.09)
Working part-/full-time	-0.194**	-0.257***	-0.301***	-0.155***
	(0.09)	(0.03)	(0.04)	(0.05)
Father's secondary education	0.049*	-0.053***	-0.01	0.03
	(0.03)	(0.02)	(0.02)	(0.03)
Mother's secondary education	-0.038*	-0.03	-0.033**	0.03
	(0.02)	(0.02)	(0.02)	(0.03)
Father's university education	0.04	-0.065**	-0.055***	-0.01
	(0.03)	(0.03)	(0.02)	(0.03)
Mother's university education	-0.01	-0.123***	-0.02	-0.01
	(0.02)	(0.03)	(0.02)	(0.03)
Father's age	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Mother's age	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Father working part-/full-time	0.067***	0.073***	0.036**	0.04
	(0.02)	(0.02)	(0.02)	(0.03)
Mother working part-/full-time	0.049***	0.073***	0.033**	0.04
	(0.02)	(0.02)	(0.01)	(0.03)
Household size	-0.01	0.022**	0.027***	0.03
	(0.01)	(0.01)	(0.01)	(0.02)
Number of children < 18	0.01	-0.026**	-0.01	-0.03
	(0.01)	(0.01)	(0.01)	(0.02)
Household owns dwelling	0.02	0.02	0.02	0.04
	(0.02)	(0.02)	(0.02)	(0.03)
Computer at home	-0.01	-0.02	-0.01	-0.02
	(0.05)	(0.02)	(0.01)	(0.03)
Urban residence	-	-0.054***	-0.02	-0.01
	-	(0.01)	(0.01)	(0.01)
Constant	0.524***	0.382***	0.604***	0.269**
	(0.14)	(0.09)	(0.09)	(0.14)
Observations	7,074	10,346	8,080	2,703
R-squared	0.107	0.221	0.211	0.126

Notes: Robust standard errors in parenthesis. The sample is restricted to include individuals who are reported to be son/daughterof the reference person of the household in the Multinational Time Use Study (MTUS) from Germany, Italy, Spain and the United Kingdom. Housework is measured in hours per day, and is defined as the sum of the time devoted to "cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel." *Significant at the 90% level **Significant at the 95% level ***Significant at the 99%

Table 3. Regression results for housework, by country and demographic groups

	(1)	(2)	(3)	(4)
Log of housework time	Germany 2001	Italy 2002	Spain 2002	UK 2000
Panel A: 2-earners households				
Father's housework (log)	0.092***	0.120***	0.040*	0.109***
	(0.02)	(0.03)	(0.02)	(0.03)
Mother's housework (log)	0.136***	0.01	0.01	0.103***
	(0.02)	(0.04)	(0.03)	(0.04)
Father's housework (log)*Male	0.03	0.03	0.118***	0.01
	(0.03)	(0.03)	(0.03)	(0.04)
Mother's housework (log)*Male	-0.083***	0.04	0.06	-0.093*
	(0.03)	(0.05)	(0.04)	(0.05)
Panel B: male-earner households				
Father's housework (log)	0.189***	0.066**	0.069***	0.199***
	(0.04)	(0.03)	(0.03)	(0.07)
Mother's housework (log)	0.157***	0.109**	0.05	0.243**
	(0.04)	(0.05)	(0.03)	(0.10)
Father's housework (log)*Male	-0.06	0.067*	0.101***	0.03
	(0.05)	(0.03)	(0.03)	(0.08)
Mother's housework (log)*Male	-0.173***	-0.05	-0.111**	-0.277**
	(0.06)	(0.05)	(0.04)	(0.13)
Panel C: prim educated households				
Father's housework (log)	0.12	0.07	-0.02	0.139**
	(0.20)	(0.04)	(0.04)	(0.06)
Mother's housework (log)	0.42	0.03	-0.133***	0.132**
	(0.25)	(0.07)	(0.04)	(0.07)
Father's housework (log)*Male	-0.48	0.03	0.133***	0.02
	(0.34)	(0.05)	(0.04)	(0.08)
Mother's housework (log)*Male	0.22	-0.03	0.154***	-0.11
	(0.32)	(0.08)	(0.05)	(0.09)
Panel D: sec educated households				
Father's housework (log)	0.153***	0.103***	0.02	0.114*
	(0.03)	(0.02)	(0.02)	(0.06)
Mother's housework (log)	0.079**	0.01	0.00	0.03
	(0.03)	(0.03)	(0.03)	(0.10)
Father's housework (log)*Male	-0.01	-0.02	0.071**	0.02
	(0.03)	(0.03)	(0.03)	(0.09)
Mother's housework (log)*Male	-0.04	0.04	-0.01	-0.08
	(0.04)	(0.04)	(0.04)	(0.12)
Panel E: univ educated households				
Father's housework (log)	0.097***	0.09	0.107**	0.06
	(0.04)	(0.07)	(0.05)	(0.07)
Mother's housework (log)	0.105**	-0.01	0.157***	0.382***
	(0.05)	(0.08)	(0.05)	(0.09)
Father's housework (log)*Male	0.00	0.04	0.09	0.08
	(0.05)	(0.09)	(0.07)	(0.10)
Mother's housework (log)*Male	-0.095*	0.03	-0.114*	-0.268**
	(0.06)	(0.12)	(0.06)	(0.11)

Notes: Robust standard errors in parenthesis. The sample is restricted to include individuals who are reported to be son/daughterof the reference person of the household in the Multinational Time Use Study (MTUS) from Germany, Italy, Spain and the United Kingdom. Housework is measured in hours per day, and is defined as the sum of the time devoted to "cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel." *Significant at the 90% level **Significant at the 95% level ***Significant at the 99%

Table 4. FE Regressions for housework, Germany and the United Kingdom.

	(1)	(2)	(3)	(4)
Log of housework time	Germany males	Germany females	UK males	UK females
Father's housework (log)	0.097***	0.077***	0.184***	0.084**
	(0.02)	(0.02)	(0.03)	(0.03)
Mother's housework (log)	0.071***	0.141***	0.071*	0.140***
	(0.02)	(0.02)	(0.04)	(0.04)
Diff father's-mother's housework	0.03	-0.06	0.11	-0.06
P-value	(0.38)	(0.06)	(0.05)	(0.35)
N. Observations	3,711	3,363	1,366	1,337
R.Squared	0.061	0.078	0.114	0.167

Notes: Robust standard errors in parenthesis. The sample is restricted to include individuals who are reported to be son/daughter of the reference person of the household in the Multinational Time Use Study (MTUS) from Austria, Germany, Italy, Spain and the United Kingdom. Housework is measured in hours per day, and is defined as the sum of the time devoted to "cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel." *Significant at the 90% level **Significant at the 95% level ***Significant at the 99%.

APPENDIX A: Testing for reverse causality

To test for the presence of reverse causality in our estimated regressions, we applied an augmented regression test (DWH test), proposed by Davidson and MacKinnon (1990), which can be formed by including the residuals of each endogenous right-hand side variable, as a function of all exogenous variables, in a regression of the original model. In doing so, in a first step we estimate the time devoted to housework by fathers and mothers separately, where we include the demographic and household characteristics as defined in Equation (1). Additionally, we include variables that can affect the time devoted to housework by parents. We estimate the following equation as follows:

$$\ln\text{Time}_{jh} = \alpha + \gamma X_{jh} + \eta Z_{jh} + \varepsilon_{jh} \quad \text{(A1)}$$

where $lnTime_{jh}$ represents the time devoted to housework in household "h" by parent "j" (i=father, mother), and X_{jh} includes the set of socio-demographic variables as defined in Equation (1). We estimate separately for fathers and mothers. Additionally, we need to include variables to identify the system (Z_{jh}), where we use the following information reported by parents: where parents are cohabiting (1) or not (0), self-reported hours per week devoted to the labor market, whether the individual cares for a household adult (1) or not (0), and whether respondent has any disability (1) or not (0). Finally, ε_{jh} represents the robust standard error. Table A1 shows the results of estimating this regression using an OLS estimator.

After estimating Equation (B1) for each country and type of parent (e.g., mothers, fathers), we obtain the residuals for each regresion, which we then include in an augmented regression as follows:

$$\ln\text{Time}_{ih} = \alpha + \beta_1 \ln\text{Father'sTime}_{ih} + \gamma X_{ih} + \varphi \text{Res\_Father'sTime}_{ih} + \varepsilon_{ih} \quad \text{(A2)}$$

$$\ln\text{Time}_{ih} = \alpha + \beta_1 \ln\text{Mother'sTime}_{ih} + \gamma X_{ih} + \varphi \text{Res\_Mother'sTime}_{ih} + \varepsilon_{ih} \quad \text{(A3)}$$

where $lnTime_{ih}$ represents the time devoted to housework in household "h" by child "i", and X_{ih} includes the set of socio-demographic variables as defined in Equation (1). Equation (A2) is estimated when we analyze the relationship between father' and children' housework, and Equation (A3) is estimated when we analyze the relationship between father' and children' housework. The 2 equations include the residual of the father's/mother's time obtained from step one. If φ is significantly different from zero, then OLS is not consistent due to reverse causality. Table A2 shows the results of estimating Equations (A2) and (A3) and we find no

evidence of reverse causality between children and parents' time devoted to housework in Spain. In the case of Germany, we find no evidence of reverse causality between fathers' housework time and that of their children, but we find evidence of reverse causality between mothers' housework time and that of their children.

Table A1. First stage regressions on housework time, fathers and mothers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log of housework time	Fathers Germany	Mothers Germany	Fathers Italy	Mothers Italy	Fathers Spain	Mothers Spain	Fathers UK	Mothers UK
Cohabiting	0.13	-0.21	0.02	-0.03	-0.05	-0.05	0.01	0.017*
	(0.09)	(0.13)	(0.20)	(0.09)	(0.11)	(0.09)	(0.01)	(0.01)
Weekly work hours	-0.010***	-0.008***	0.001***	-0.003***	0.00	-0.005***	-0.002**	-0.004***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Caring for household adult	0.108***	0.082***	-0.08	0.036**	0.260***	0.115***	0.162***	0.135***
	(0.04)	(0.02)	(0.33)	(0.02)	(0.04)	(0.02)	(0.04)	(0.03)
Any disability	-	-	-0.03	-0.16	-0.273***	-0.315***	-0.04	-0.104***
	-	-	(0.08)	(0.13)	(0.04)	(0.04)	(0.04)	(0.03)
Male	-0.01	-0.01	0.039***	0.035***	0.036***	0.041***	0.052**	0.00
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)
Age of respondent	0.00	-0.007***	-0.009***	-0.005***	0.00	-0.012***	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Student	-0.147*	-0.02	0.02	0.046***	0.061*	0.02	0.06	-0.03
	(0.08)	(0.07)	(0.02)	(0.01)	(0.04)	(0.03)	(0.05)	(0.04)
Unemployed	-0.189*	-0.05	0.01	0.032*	-0.03	0.04	0.04	-0.126*
	(0.10)	(0.08)	(0.03)	(0.02)	(0.04)	(0.04)	(0.08)	(0.07)
Working part-/full-time	-0.12	0.00	0.047**	0.051***	0.01	0.058*	0.06	0.01
	(0.08)	(0.07)	(0.02)	(0.02)	(0.04)	(0.03)	(0.05)	(0.04)
Father's secondary education	-0.01	0.01	0.042**	-0.01	0.091***	-0.01	0.05	-0.03
	(0.03)	(0.03)	(0.02)	(0.01)	(0.02)	(0.01)	(0.03)	(0.03)
Mother's secondary education	0.03	0.02	0.035*	-0.036***	-0.02	0.00	-0.02	0.03
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)
Father's university education	-0.02	0.00	0.01	-0.02	0.173***	-0.058***	0.085**	-0.078***
	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.04)	(0.03)
Mother's university education	0.076***	-0.02	0.099***	-0.138***	0.02	-0.052**	0.067*	-0.04
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.04)	(0.03)
Father's age	0.00	0.003**	0.00	0.00	0.004*	-0.004**	0.006**	0.005*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mother's age	0.00	0.00	0.005**	0.00	-0.008***	0.007***	0.00	0.005*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Father working part-/full-time	-0.065*	0.086***	-0.471***	0.060***	-0.483***	0.02	-0.111**	0.092***
	(0.04)	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)	(0.05)	(0.03)
Mother working part-/full-time	0.02	-0.097***	0.116***	-0.254***	0.125***	-0.304***	0.102***	-0.097***
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Household size	-0.022**	0.037***	-0.023***	0.018***	0.00	0.015**	-0.037*	0.041***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Number of children < 18	0.029**	-0.019*	0.01	0.01	-0.025**	-0.035***	0.056***	0.032*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Household owns dwelling	-0.037**	0.062***	0.069***	0.01	0.051**	-0.049***	0.094**	0.066**
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.04)	(0.03)
Computer at home	0.101**	-0.02	0.070***	-0.01	0.094***	0.02	0.03	0.05
	(0.05)	(0.04)	(0.02)	(0.01)	(0.02)	(0.01)	(0.04)	(0.03)
Urban residence	-	-	0.066***	0.019**	0.060***	0.00	0.022**	-0.017***
	-	-	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	1.923***	1.478***	1.082***	2.014***	1.103***	2.057***	0.891***	1.114***
	(0.14)	(0.11)	(0.08)	(0.06)	(0.09)	(0.07)	(0.15)	(0.12)
Observations	7074	7074	10346	10346	8080	8080	2703	2703
R-squared	0.127	0.151	0.11	0.181	0.112	0.225	0.118	0.109

Notes: Robust standard errors in parenthesis. The sample is restricted to include individuals who are reported to be the reference person/spouse of the reference person of the household in the Multinational Time Use Study (MTUS) from Austria, Germany, Italy, Spain and the United Kingdom. Housework is measured in hours per day, and is defined as the sum of the time devoted to "cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel." *Significant at the 90% level **Significant at the 95% level ***Significant at the 99%.

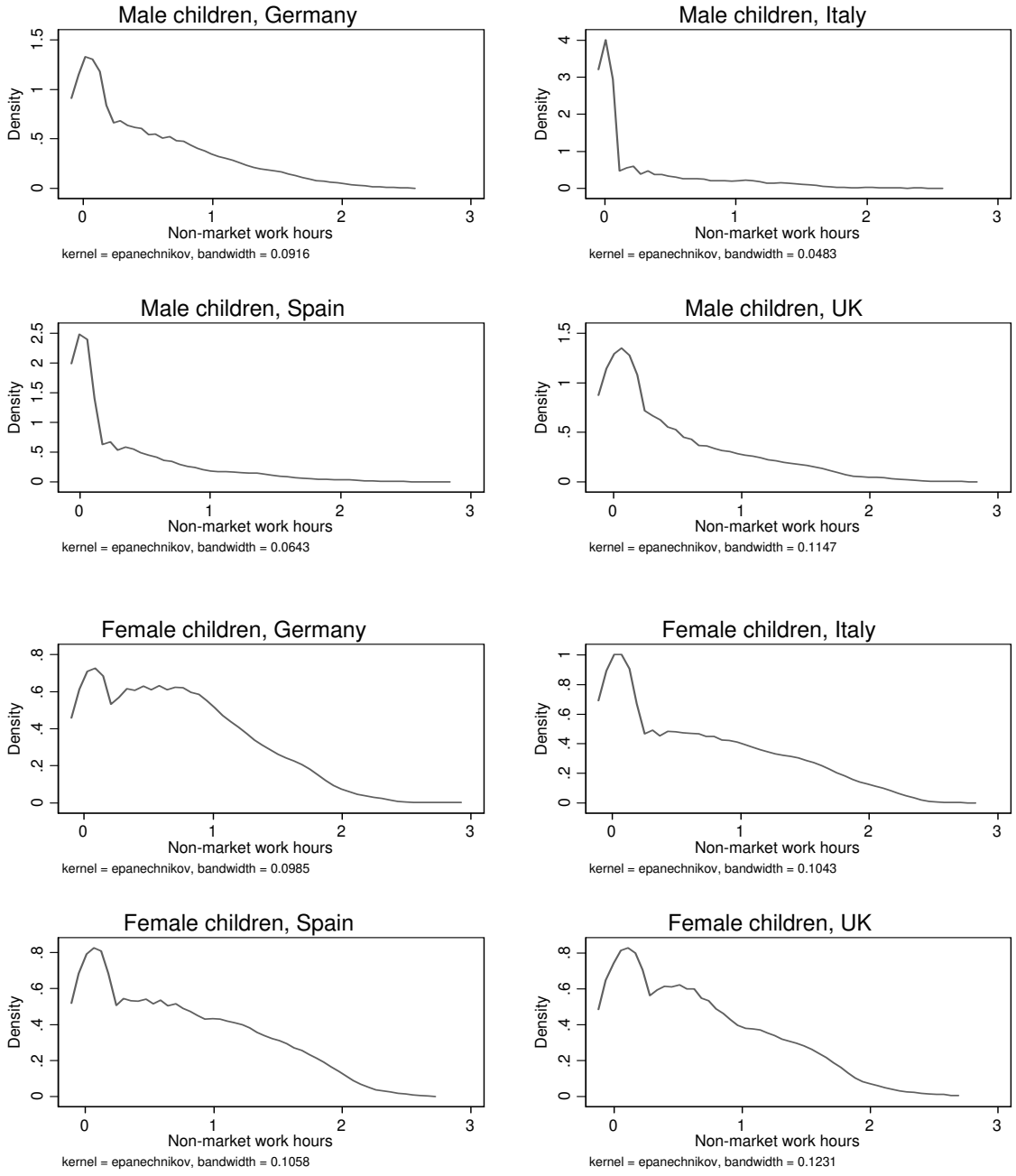
Table A2. Results for augmented regression on housework time of children, by country

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log of housework time	Fathers Germany	Mothers Germany	Fathers Italy	Mothers Italy	Fathers Spain	Mothers Spain	Fathers UK	Mothers UK
Father's housework (log)	0.08	-	0.01	-	-0.01	-	0.417**	-
	(0.05)	-	(0.25)	-	(0.09)	-	(0.18)	-
Mother's housework (log)	-	-0.203***	-	0.06	-	-0.06	-	-0.01
	-	(0.06)	-	(0.21)	-	(0.08)	-	(0.13)
Male	-0.212***	-0.215***	-0.386***	-0.388***	-0.374***	-0.371***	-0.246***	-0.219***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Age of respondent	0.009***	0.007***	0.023***	0.022***	0.010***	0.009***	0.008**	0.009**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Student	-0.196**	-0.211**	-0.101***	-0.103***	-0.176***	-0.174***	-0.07	-0.05
	(0.10)	(0.09)	(0.02)	(0.02)	(0.04)	(0.04)	(0.05)	(0.05)
Unemployed	0.194*	0.17	0.186***	0.186***	0.159***	0.163***	0.207**	0.224***
	(0.11)	(0.11)	(0.04)	(0.04)	(0.05)	(0.05)	(0.09)	(0.09)
Working part-/full-time	-0.197**	-0.203**	-0.252***	-0.250***	-0.301***	-0.296***	-0.168***	-0.148***
	(0.09)	(0.09)	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.04)
Father's secondary education	0.050*	0.051*	-0.050**	-0.045**	0.00	0.00	0.02	0.04
	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Mother's secondary education	-0.038*	-0.03	-0.03	-0.03	-0.034**	-0.034**	0.04	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Father's university education	0.03	0.03	-0.065**	-0.064**	-0.042*	-0.046**	-0.04	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.04)	(0.03)
Mother's university education	-0.01	-0.02	-0.117***	-0.112**	-0.02	-0.02	-0.03	-0.01
	(0.02)	(0.02)	(0.04)	(0.04)	(0.02)	(0.02)	(0.03)	(0.03)
Father's age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mother's age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Father working part-/full-time	0.057*	0.04	0.04	0.01	0.00	0.00	0.090**	0.01
	(0.03)	(0.02)	(0.11)	(0.02)	(0.04)	(0.02)	(0.04)	(0.04)
Mother working part-/full-time	0.032**	-0.02	0.074**	0.10	0.044***	0.02	0.00	0.05
	(0.02)	(0.02)	(0.03)	(0.07)	(0.02)	(0.04)	(0.03)	(0.04)
Household size	-0.01	-0.01	0.021*	0.020*	0.027***	0.028***	0.043**	0.03
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Number of children < 18	0.01	0.01	-0.025**	-0.025**	-0.01	-0.01	-0.043**	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Household owns dwelling	0.027*	0.036**	0.03	0.030*	0.02	0.02	0.01	0.05
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.03)
Computer at home	-0.01	-0.01	-0.02	-0.02	-0.01	-0.01	-0.03	-0.02
	(0.05)	(0.05)	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)	(0.03)
Urban residence	-	´-	-0.047**	-0.050***	-0.01	-0.01	-0.017*	-0.01
	-	-	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Residual of housework time	0.05	0.299***	0.09	-0.03	0.09	0.07	-0.29	0.08
	(0.05)	(0.06)	(0.25)	(0.21)	(0.09)	(0.08)	(0.18)	(0.14)
Constant	0.739***	1.157***	0.516*	0.42	0.674***	0.804***	0.15	0.523***
	(0.17)	(0.15)	(0.28)	(0.43)	(0.12)	(0.18)	(0.20)	(0.20)
Observations	7074	7074	10346	10346	8080	8080	2703	2703
R-squared	0.103	0.092	0.221	0.211	0.209	0.201	0.122	0.103

Notes: Robust standard errors in parenthesis. The sample is restricted to include individuals who are reported to be son/daughter of the reference person of the household in the Multinational Time Use Study (MTUS) from Austria, Germany, Italy, Spain and the United Kingdom. Housework is measured in hours per day, and is defined as the sum of the time devoted to "cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel." *Significant at the 90% level **Significant at the 95% level ***Significant at the 99%.

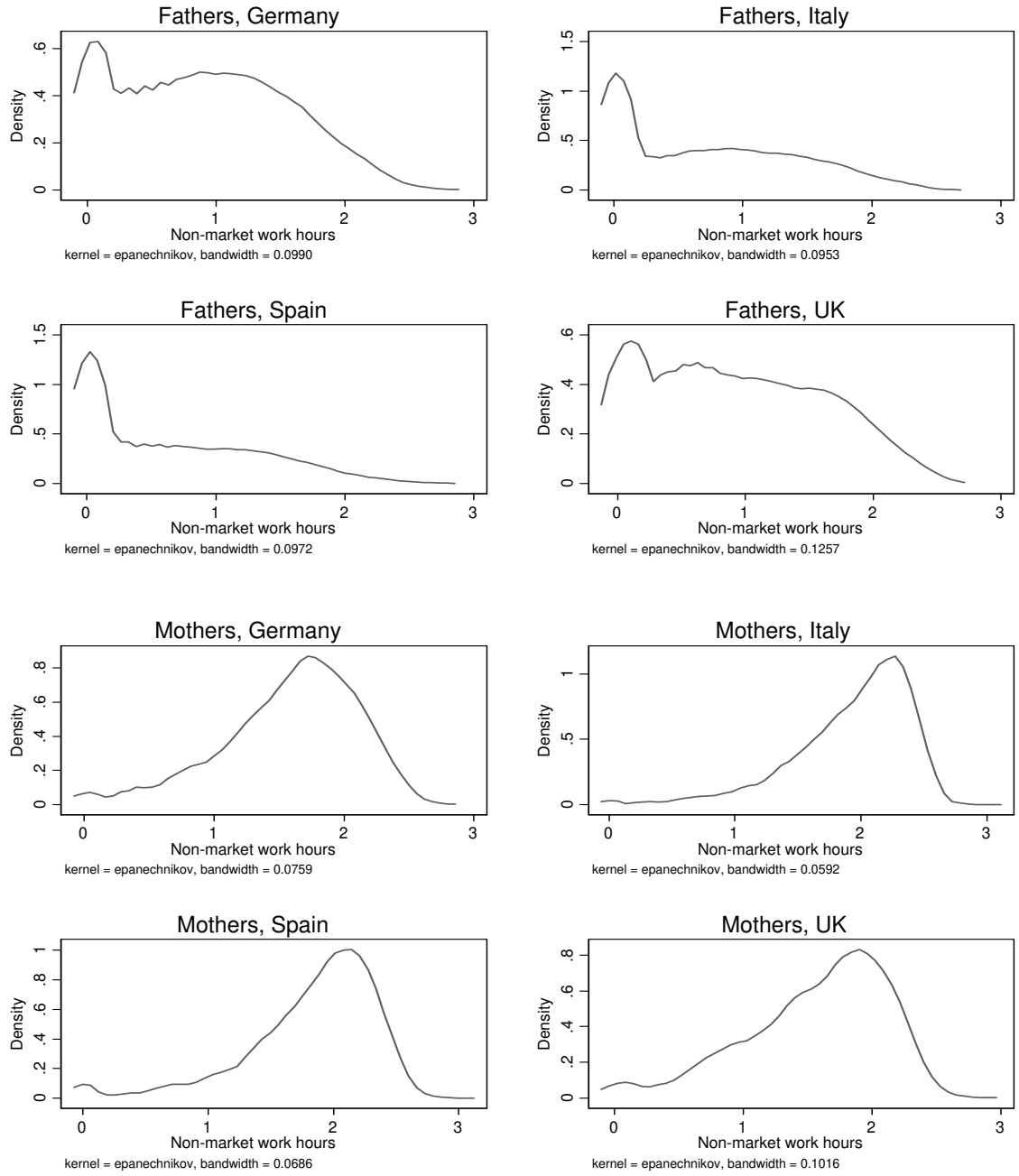
APPENDIX B: Distribution of housework time

Figure B1. Distribution of log (housework) time, children



Note: Sample consists of individuals who are 10 years or older who are reported as being a child in the household, and living with the two heterosexual parents from Germany, Italy, Spain and the United Kingdom. We include fathers of those children *Housework* includes the total time devoted to the following activities: cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel", and is measured in (log) hours per day.

Figure B2. Distribution of log (housework) time, parents



Note: Sample consists of individuals who are 10 years or older who are reported as being the reference person/spouse of reference person in household, living in heterosexual couples with at least one child from Germany, Italy, Spain and the United Kingdom. We include mothers of those children *Housework* includes the total time devoted to the following activities: cook, wash up", "housework", "odd jobs", "shopping" and "domestic travel", and is measured in (log) hours per day.