

Parental Son Preference, Gender Role Attitudes, and Sharing of Housework in Korea¹

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Abstract

This study investigates how cultural norms on gender roles affect sharing of housework between husband and wife in Korea based on analyzing the newly-added survey on time use in the Korea Labor and Panel Study (KLIPS). Based on the growing evidence on the intergenerational transmission of cultural norms, we hypothesize that parents' gender views play an important role in forming of children's gender role attitudes. We employ the sex ratio at birth from 1991 to 1994 in the place of birth as measure of parental son preference. The results of our analyses suggest that men's gender role attitudes have a significant effect on intra-family time allocation, especially the wife's time spent on housework. Women married to men whose parents had strong son preference (those born in places with higher sex ratios at birth) tend to spend more time on housework. If the husband has more traditional gender views (according to the answers to questionnaire related to gender views), his wife tends to spend more time on housework. These two measures of male gender norms (parental son preference and own gender views) independently affect the wife's time spent on housework. This paper empirically supports the view that persistence or slow change in traditional gender norms is an important explanation for the high level of gender inequality in within-family time allocations in Korea.

¹ This is a highly incomplete draft in progress. Please do not cite.

1. Introduction

Although relative educational achievement and labor-market performance of females remarkably improved over the last several decades, Korea is still known for its high level of gender inequality in within-family allocation of resources. It is well documented that the lion's share of household works falls upon wives even among working couples. According to the result from the 2009 Time Use Survey, the hours spent on household services by employed wives were about six times greater than that taken up by the working husbands (Joo 2012). The persistent gender inequality within the family is often regarded as a major cause of decline in marriage and fertility in recent years. In support of this view, cross-country comparisons have shown that the fertility rate is positively related to the fraction of household works allocated to husbands (Feyrer, Sacerdote, and Stern 2008).

Determinants of intra-family allocation of resources, especially sharing of time of married couples, have drawn a considerably large amount of attention from economists over the last several decades. Empirical research based on bargaining or collective model has attempted to identify socioeconomic determinants of bargaining power or "sharing rule" within the family. Major factors suggested by previous studies include relative earning power measured most frequently by wage rate (Clark et al. 2004; Bonke 2015, 2009b; Thibout 2015), remarriage market condition often measured by the sex ratio in the population (Chiappori et al. 2002), and the division of household wealth after divorce (Chiappori et al. 2002).

In countries like Korea where traditional expectation or pressure on females regarding their roles in the family still remains, non-economic factors may have strong influences on within-family allocation of time. A few studies have examined the influences of cultural or sociological variables on the sharing of resources within the family, utilizing proxy measures of cultural norms such as parental socioeconomic status, money management practices within the household, the fraction of marriage costs paid by the bride, the amount of dowry, and institutional features of the country (Zhang and Chan 1999; Clark et al. 2004; Couprie 2007; Hendy and Sofer 2010). However, the results on the impact of cultural variables are largely regarded less convincing (Himmelweit et al. 2013). Furthermore, evidence obtained from a particular country may not be applied other countries. Gender norms relevant for intra-family allocations need to be measured according to the unique cultural and institutional backgrounds of each country,

In the present paper, we attempt to add evidence to the relatively limited literature on the effects of cultural factors on the inter-family resource allocation by investigating how own and spouse's gender role attitudes affect the allocation of household work among working couples in Korea. For the purpose, we construct a new measure of gender role attitudes by exploiting the variations in parental son preference across regions that were revealed in the provincial sex ratios at

birth in the early 1990s. Linking this variable to the 2014 supplemental survey of the Korea Labor and Income Study (KLIPS) on time use, we analyze how the measure of parental son preference along with more conventional variables on gender role attitudes obtained from survey questionnaires affect the amount of housework shared by husband and wife.

2. Backgrounds

2.1. Cultural Norms on Gender Roles and Sharing of Resources within the Family

Social norms on gender roles can affect intra-family allocations through several different pathways. First, the threat point (in bargaining models) or the sharing rule (in collective models) can be influenced by social norms. For example, males with more traditional attitudes towards gender roles may have a higher level of reservation utility for maintaining marriage, which could strengthen their bargaining powers within the family. Second, social norms may affect the preferences of family members. For instance, males having more egalitarian ideas about gender roles would care more about the job career or social achievement of their partners in making decisions on household public good consumption and household production. Finally, social norms can play a role of constraints on the bargaining over allocations of resources within the family. In particular, strong social norms on gender roles could restrict bargaining over division of labor within the household. As suggested by Sen (1990), social norms can even make women believe they are not entitled to bargain on their own behalf. Under the circumstance, relative improvements in female labor-market status may not change women's relative share of housework.

A few previous studies have examined the influences of cultural or sociological variables, such as the partner's parental characteristics (e.g. education and employment), gender role attitudes (Clark et al. 2004; Couprie 2007; Hwang 2015), and money management practices within the household. Other studies attempt to utilize variations in institutions and cultural norms. For example, Hendy and Sofer (2010) suggest that the fraction of marriage costs paid by the bride has a positive effect on woman's allocation resulting from the sharing rule in Egypt. Zhang and Chan (1999) find that the amount of dowry is significantly associated with within-couple resource allocation. Datta Gupta and Stratton (2008) show that leisure time in couple is more sensitive to power considerations in the United States than in Denmark, and attribute the result to the more generous social welfare system and more egalitarian social norms in Denmark.

A number of studies from Korea provide some circumstantial evidence suggesting that gender norms deeply rooted in the society play an important role in determining the patterns of intra-family allocations of resources. For example, papers by sociologists have found that, after a certain level, relative earnings of wives are *positively* associated with their shares of household work in Korea

(Kim and Kim 2007; Joo 2012), which has been interpreted as compensation for the reversed gender roles in earning power with a more traditional division of household work. Choi and Hwang (2015) report that girls spend twice as much time as boys in household activities based on the 1999, 2004, and 2009 Korean Time Use Surveys.

Even with the considerably large number of studies on the topic, the results on the impact of cultural variables are regarded less convincing (Himmelweit et al. 2013). First, a few studies have failed to find any significant effects of cultural and sociological variables on the sharing rule (Clark et al., 2004; Couprie 2007). To take an example from Korea, an analysis of the 2004 Time-Use Survey in Korea (Eun 2009) finds no significant effect of variables related to gender role attitudes on household division of labor. Second, how to interpret the previous results is not entirely straightforward. Since many of the cultural or socioeconomic variables employed in previous studies can also be associated with preference formation, it is difficult to determine if these variables affect intra-family allocation through their impact on the sharing rule or through their influences on individual preferences. Many of the cultural variables, such as response to questions on gender role attitudes and money management practices, can be endogenously determined by previous patterns of resource allocations within the family. In cross-country comparisons, it is difficult to separate the effect of one particular factor (e.g. cultural norms) from those of many other possible country-specific factors (e.g. differences in socioeconomic and political factors).

2.2. Parental Influences on Gender Norms

A growing number of studies have established that parental or ancestral influences on offspring cultural norms are strong. Particularly relevant for this study is the empirical evidence suggesting that cultural beliefs about the appropriate role of women in society transmit from parents (especially mothers) to children. For example, Fernandez, Fogli, and Olivetti (2004) show that US males whose mother worked while they were growing tend to be married to working women. Similarly, Hwang (2015) finds that Japanese men who had working or college graduate mothers during childhood have more egalitarian views regarding gender roles, and are more likely to be married to working women.

Another type of evidence on intergenerational linkage in cultural values comes from comparisons of immigrants having different cultural origins. For example, Fernandez and Fogli (2006) find that the female labor force participation in a woman's country of origin as of 1950 has a positive effect on her labor supply in the United States in 1970. Likewise, utilizing the General Social Survey for estimating cultural proxies, Fernandez (2013) provides that females whose country of ancestry is more conservative in terms of gender role attitudes tend to work less.

Parental influence has been considered in the literature on the effects of cultural factors on

the sharing of housework. Major proxies of parents' cultural norms employed in these studies are mother's education and job career. Education and labor-market experiences are clearly important determinants of a person's cultural attitudes. However, these are highly indirect measures of parental attitudes towards gender roles. Moreover, mother's socioeconomic status could be correlated with various unobservable personal characteristics that are associated with children's preference and behavior. Therefore, it is not entirely evident if the observed effects of maternal SES on children's sharing of housework actually capture the consequences of intergenerational transmission of cultural norms.

2.3. Sex Ratios at Birth and Parental Son Preference

Parents in Korea traditionally prefer having sons than daughters. A major root of son preference is cultural or religious beliefs. Influenced by the Confucian tradition, a son (especially the eldest son) is expected to inherit the family tradition and serve his ancestors. Economic incentives of parents matter, too. The lower labor market status of females makes daughters less attractive to parents as a source of old-age support. Wherever it originated from, it is likely that parental son preference strongly affect the children's gender norms.

The prevalence of son preference in Korea is revealed in the imbalance in the sex ratios at birth that emerged after the ultrasound technology was introduced in the early 1980s (see Figure 1). After reaching its highest level (117 boys per every 100 girls) in 1990, the boy-to-girl ratio declined to a normal level of 106 by 2007. The rapid rebalancing of the sex ratio is attributed to the changes in social norms, the development of the Korean economy, the increasing disadvantage of males in the marriage market, and the relative improvements in the social and economic status of females (Chung and Das Gupta 2007; Edlund and Lee 2013; Lee 2013).

The strength of parental son preference substantially differs across regions in Korea, as observed in the provincial differences in the sex ratios at birth in the 1980s and 1990s. The ratio is remarkably higher in southeastern regions, such as in the city of Daegu and the province of Kyungbuk, which are known for traditional gender role attitudes (see Figure 2). Although these inter-province differences in sex imbalance at birth have diminished over time, the boy-to-girl ratios in the southeast region remained high in the early 2000s.

The province-specific sex ratio at birth in the early 1990s is a reasonably good measure of average parental son preference of all individuals who were born in the region for the following reasons. First, it appears that the diffusion of sex selection technologies (e.g., ultrasonic tests) was completed by the late 1980s. This conjecture is consistent with the generally high sex ratio at birth in

1988, which has reached over 112 in the entire country and over 109 in 12 of its 15 provinces.² Therefore, the differences in the sex ratio at birth across counties in the early 1990s likely capture the varying preferences of parents for the gender of their offspring rather than the differences in the availability of sex selection technologies. Second, the son preferences of individuals, which are rooted in their cultural norms or religious beliefs, cannot change rapidly over time. Therefore, when mass migrations across regions are barred, we can assume that each region has a quasi-fixed distribution of son preference that remains stable over time. Consistent with this assumption, there were little changes over time in the variance pattern of son preferences across regions.³

3. Data and Methods

3.1. Data

To examine if parental gender norms affect within-family time allocations, we use the sex ratio at birth of each person's place of birth as a proxy variable for parental son preference. The sex ratios at birth were drawn from the Annual Report on Live Births and Deaths Statistics published by the Korean Statistical Office. This survey is designed for documenting demographic changes in Korea, such as live births, deaths, marriages, and divorces. These statistics are compiled and released annually based on the vital registrations of all Koreans. The sex ratio at birth for a particular year and administrative region was calculated based on the number of male and female births in a specific place in the year. We use the sex ratios at birth from 1991 to 1994 for the following reasons: 1) as noted above, the diffusion of sex determining technology had been completed by 1990; and 2) regional differences in the sex ratio at birth were most clearly revealed in the early 1990s when the extent of sex imbalance peaked.⁴

The primary dataset used in this paper for analyzing the time use of dual-earner couples is the Korean Labor and Income Panel Study (KLIPS) including the additional survey on time use (wave 17). Using the sampling frame for the 1995 Korean census, the KLIPS drew sample from the seven metropolitan cities and urban areas in eight provinces to construct nationally representative sample of the adult urban population. The first wave surveyed 5,000 households and around 13,000 household members (aged 15 and more years). Following up annually, up to now, seventeen waves have been

² Although abortion has been prohibited by South Korean law except under special circumstances, such law was not effectively enforced and abortion clinics in the country remained accessible and inexpensive.

³ This assumption is supported by the strong positive correlation between the provincial sex ratios at birth in 1989 and 1995 (Lee and Lee 2015).

⁴ The Annual Reports on Live Births and Deaths Statistics have provided county-level records (more detailed information than province-level) since 1991. However, information of birthplace obtained from the KLIPS dataset can be identified up to province level. Thus, throughout the paper, province-level sex ratio at birth is used.

completed (1998-2014).

In addition to the main survey, the KLIPS has conducted additional surveys (topical surveys) on different issues in some waves. Most recently, time-use survey has been added to the 17th wave based on each respondent's time-use diary. The KLIPS respondents were asked about how they spent 24 hours on the previous day. They were required to classify what they did for every 30 minutes into one of the 17 examples of activities. As a result, each individual reports 48 (1440/30) time recodes in total. The 17 examples of activities were divided into the 7 major categories: 1) sleeping, 2) personal maintenance, 3) working, 4) housework activities, 5) leisure, 6) social activities, and 7) others. For some categories, the respondent can choose more detailed examples of activities. In the category of housework, for example, there are three types of activities; child care, family care (caregiving to family members other than child), and housekeeping. Housekeeping includes food preparation, washing clothes, indoor cleaning, grocery shopping, and visiting bank/public office.

Although the classifications of time use in the KLIPS are less detailed compared to the Korean Time Use Survey, it has advantages in that richer information on demographic and socioeconomic characteristics can be linked to the information on time use. Particularly useful for the purpose of this study, the information on the place of birth, which is not available from the Korean Time Use Survey, can be used for creating location-specific variables on cultural norms.

Information on current household and individual characteristics such as non-labor household income, household structure, and wage was obtained from the wave 17 household/individual survey, whereas the information on the place of birth was collected from previous waves.⁵ The sample employed in our analyses is comprised of 2,014 KLIPS time-use survey respondents who are married and younger than 55. The age restriction is imposed to minimize the potential influences of selective retirement of the respondents, because we mainly focus on dual-earner couples. These sample selections and missing of explanatory variables leave us with a sample of 952 couples. Table 1 provides summary statistics for the sample of these 952 couples.

3.2. Regression Model

Our basic estimation model is a system of simultaneous equations for time-use that is similar to the model used in Kimmel and Connelly (2007):

⁵ For the initial sample of the KLIPS, the information on place of birth was surveyed in the first wave (1998). For the new household members who were added to the sample in later years (including the new sample added in 2009), the information was collected in the year of the first interview. Because new household members were added to the sample by moving into the initial household or by marrying to one of the initial household members, we used the entire waves from 1 to 16 to construct the variable on the place of birth for all respondents.

$$(1) y_w^* = \beta_0 + \beta_1 SR_m + \beta_2 SR_w + \beta_3' X + \varepsilon_w$$

$$(2) y_m^* = \gamma_0 + \gamma_1 SR_m + \gamma_2 SR_w + \gamma_3' X + \varepsilon_m$$

In the above equations, subscript w represents a woman (wife) and m indicates a man (husband). $y_w^*(y_m^*)$ is the latent number of minutes a woman (man) would choose to spend on housework. We define housework time as the total time spent on broadly-defined household production activities, which includes childcare, care giving to family member, and housekeeping. Note that housework time is different from housekeeping time. If $y_w^* (y_m^*)$ is less than zero, the actual observed minutes, $y_w(y_m)$ will be given as zero. In our sample, nearly 65 percent of men do not spend at all on housework whereas only 5 percent of women spend no time on housework.

In determining our estimation model, we had to consider the following potential problems. First, the dependent variable in our model is left-censored because one's time spent on housework cannot be negative. The Tobit model is often employed where the dependent variable is constrained by an upper or lower limit. Second, the two error terms, ε_w and ε_m could be arbitrarily correlated because the observed housework times of husband and wife are drawn from the same household. If the couple's housework times are substitutes, for example, their housework times should be negatively correlated with each other. The multivariate linear regression model with cross-equation correlation of errors, usually referred to as the seemingly unrelated regression (SUR) can be applied to this case. For these reasons, we employ multivariate Tobit models for our estimations.

The key explanatory variables, SR_m and SR_w represent sex ratios at birth in the province of birth for man and woman, respectively. We hypothesize that parents in places with a high SR tend to have stronger son preference, and the children grew under the influence would form more traditional gender norms. We also suspect that the husband's cultural norms on gender roles affect the allocation of time within the family.

Other control variables (X) include individual characteristics such as years of schooling, age, job type (wage worker or self-employed), and the type of the diary day (week or weekend) for both husbands and wives.⁶ For household characteristics, the number of children in the household aged five and under, six to eighteen, the number of adults in the household, and the log of non-labor household income are included.⁷ We create variables on the number of children by age category

⁶ The couple's working hours are not included in the baseline model because working hours may be simultaneously determined with housework time. As will be shown below, adding hours of work does not change the major results.

⁷ The number of adults in the household may affect husband and wife's housework time, but it is difficult to determine the direction of the effect theoretically. As the number of adults living in household increases, women or men's time on housework may decrease if the co-residing adult contributes to household work directly. If the adult contribute income to the household, the householder may purchase home services substitutes from market. However, at the same time, demand for housework could increase, especially if the household adult member is

because younger children are expected to demand more time from their parents than older children do. Variables indicating Seoul (omitted category), other metropolitan areas, and non-metropolitan places are included to consider the differences by extent of urbanization. Following previous studies on time allocation within the family, we also include proxy variables on bargaining power of husband and wife, including age differences (man's age – woman's age), relative education (woman's years of schooling / man's years of schooling) and relative hourly wage (woman's hourly wage / man's hourly wage).⁸

Finally, we consider an alternative measure of gender norms constructed from the answers to the questions on gender attitudes. The additional time use survey of KLIPS asks respondents if they agree or disagree with the following statements: “The ideal family is that a husband earns money and a wife looks after the home and family,” “Mother's labor-market work has negative effect on a preschool child,” “Dual-earner couples should equally divide housework,” “Husband's and wife's incomes should be managed separately,” and “A house where a couple live together should be co-owned.” If the respondent “strongly agree” or “agree” with the first two statements, and “strongly disagree” or “disagree” with the last three statements, they are given 1 for each question that indicates ‘traditional gender attitudes’ and 0 otherwise. We constructed a variable “gender index” by summing up the values of the five dummy variables, which ranges from 0 to 5. A higher gender index indicates more traditional (or less progressive) gender views. The means and standard errors of the variables on gender attitudes and gender index are reported in Table 2.

4. Regression Results

Table 3 presents the estimated coefficients of the correlates of the total time (in minute) spent on housework for women and men. Model 1 (columns 1 and 4) is the baseline specification in which the variable on parental son preference is included along with other determining factors of housework time. In Model 2 (column 2, 5), we include the gender index computed from the answers to the questionnaire related to gender attitudes as the alternative measure of gender norms. Model 3 (column 3, 6) includes both proxy variables on gender norms.

The results for women's housework time, reported in the first three columns in Table 3, suggest that men's gender role attitudes have a significant effect on the wife's time spent on housework. Women married to men with more traditional gender norms (those born in places with higher sex ratios at birth) tend to spend more time on housework. The magnitude of the effect is substantially large. For instance, an increase in the boys-to-girls ratio from 105 to 115 would be

an elderly in need of care. The number of adult in household may also affect women and men differently because women are more likely to assume care giving responsibility in Korea.

⁸ See Thibout (2015) for the recent study on the sharing rule within couples.

associated with an increase in women's time spent on housework by 34 minutes per day. The actual difference in the 1990 sex ratio at birth between Incheon (112) and Kyung-buk (131) would produce a change in the wife's housework by more than one hour.

As expected, household configuration has significant effects on women's housework time. Having younger children increases women's time spent on housework substantially. Each additional child aged five or younger would result in 107 additional minutes of the wife's housework. Older children aged 6 to 18 also significantly increases their mother's housework, but the effect is substantially smaller in magnitude. The extent of urbanization has significant effects, too. Compared to Seoul, dwellers in metropolitan cities report fewer housework hours, and women living in small cities tend to spend far less time in housework. It is not too surprising to find that women spend less time on housework on their work days, whereas they increase housework hours on their husband's work days.

Column 2 of Table 3 reports the effect of the gender attitude index on women's housework time. The coefficient on men's gender index is positive and statistically significant while their own gender attitudes have no significant effect. This implies that if the husband has more traditional gender views (according to his answers to questionnaire related to gender views), his wife tends to spend more time on housework. This is consistent with results of Hwang (2015) showing that U.S. women married to men originated from countries with lower female labor force participation tend to spend more time on housework.

Column 3 of Table 3 provides the results of regressions in which both the variables on parental son preference and the gender index are included at the same time. The estimated coefficient for each of the two variables is practically the same as those reported in columns 1 and 2. The result suggests that the two measures of male gender norms (parental son preference and own gender views) independently affect the wife's time spent on housework. This in turn implies that parental son preference doesn't affect the sharing of housework through the gender views explicitly revealed by the respondents.

A possible interpretation of this result is that the two measures capture different aspects of a person's gender norms. For example, parental son preference or parents' general attitudes toward gender may have stronger influences on the child's basic personal attributes, such as preference, habit, housework skills, and standards for desirable family life, whereas the variables on own gender views could show one's perception or ideal about gender role. If this is the case, we may observe discrepancies between the two measures of gender norms, while both of them are positively correlated to the wife's housework time. For example, if a man is accustomed to traditional way of family life because of his family backgrounds, he can still develop progressive ideas about gender roles because of education or social pressure. The man's egalitarian gender views could help reduce the burden of

his wife's household work. At the same time, his (unconscious) adhering to gendered stereotypes of his parents' generation would demand more household activities of his wife. To put it differently, a man's behavior can be influenced by both "who he is" and "what he thinks" in independent manners.

It remains a black box how a man's gender norms transmitted from parents can affect the housework time of his wife.⁹ Determining the mechanisms is beyond the scope of this paper. We just offer here a couple of possible pathways. First, a man who grew up under the influence of traditional parents would have less opportunity to develop skills required for doing or learning housework. Under the circumstance, his wife would have to do more to fill in the gap compared to the wives of men with better housework skills, even if all men spend the same time on housework. Second, a man with traditional parents would prefer the household production technology that requires greater time inputs of his wife. Out of their own childhood experiences, for example, their tastes for housekeeping or meals could be more demanding; and they would perhaps be less willing to adopt technology that can save women's household work efforts.¹⁰

The last three columns in Table 3 report the estimation results for husband's housework time. In contrast to the case of women, the coefficient for the sex ratios at birth of men's birthplace is not statistically significant. The measure of parental son preference for women has no significant effect, either. The number of very young children and of children aged 6 to 18 significantly increases men's time, as in the case of women, although the coefficients are smaller in magnitude than that of women. Unlike the case of women, the number of adult family members is negatively correlated with men's housework time. It may indicate that additional adult family member contribute to reduce husband's housework time. The population size of the place of residence is not significantly associated with men's housework time. As men get older, they spend less time on housework, which could be an indicative of more traditional gender attitudes of older generations.

To investigate what type of housework is more strongly influenced by gender norm variables, we conduct the regression analysis separately for each category of housework activities, namely, child care, family care, and housekeeping. Because time allocation decisions on child care, family care, and

⁹ Differences in the opportunity cost of time among couples or in the price of home-service substitutes cannot be the main determinant of the variations in housework time across men with different cultural backgrounds. If husbands who have traditional gender preference are likely to have more earning ability, variation in wives' housework time may just reflect the difference in opportunity cost of housework time. However, the above results remain unchanged if we control not only husband and wife's hourly wage and their relative hourly wage, but also their own education and relative years of schooling to take account for the differences in (potential) earning ability. Thus, unequal sharing of housework is not likely to be a consequence of differences in productivity in market.

¹⁰ Couprie et al (2014) tests the efficiency of household time-allocation by running an experiment with real couples in France. Individual productivity in home production (detailed tasks) is measured and used to disentangle explanations on inefficient sharing of home production; efficiency versus stereotypes. They find that false beliefs based on stereotypes about men's and women's relative productivities in housework lead to inefficient allocation of housework tasks.

housekeeping could be correlated with one another, we employ estimation strategy similar to the previous one, except that we estimate three simultaneous equations rather than two.

Table 4 presents the results of multivariate Tobit regressions for women's child care, family care and housekeeping times. The coefficients of the key variable of interest, the sex ratios at birth of men's birthplace, are significant only for housekeeping. For child care and family care, the coefficients for the husband's gender norm variable are positive but less precisely estimated. This suggests that the increase in the housework hours spent by women married to husbands with more traditional cultural background are driven mainly by increased housekeeping activities.

If we restrict the sample to the households having at least one child aged 0 to 18, the estimated coefficients for child care hours become larger and statistically significant. The magnitude of the estimated coefficient for childcare is slightly larger than that for housekeeping. A 10 unit increase in the sex ratios at birth of men's birthplace would increase housekeeping time by 19 minutes and child care time by 21 minutes. We also report correlations among the three types of housework activities at the bottom of Table 4, which reveals a strong tradeoff between child care time and family care time.

We conduct several robustness tests of which results are summarized in Table 5. First, we use dummy variables to capture the husband and wife's cultural background (Panel A). We define *high 5* regions as the provinces ranked among the top 5 in terms of the sex ratio at birth in early 1990s.¹¹ The results show that women married to men born in the high 5 regions spend 31 minutes per day more than the rest of married women in the sample. The effects of the variable on parental son preference remain significant if we additionally control usual hours of work of males and females.¹² Restricting the sample to the households having at least one child (Panel B), conducting OLS estimations (Panel C), and employing the SUR model estimations without accounting for left-censoring (Panel D) provide results that are similar to those of the baseline specifications.

5. Conclusions

We have investigated how cultural norms on gender roles affect sharing of housework between husband and wife in Korea based on analyzing the newly-added survey on time use in the Korea Labor and Panel Study (KLIPS). Based on the growing evidence on the intergenerational transmission of cultural norms, we hypothesize that parents' gender views play an important role in

¹¹ Out of 16 provinces, the highest sex ratio at birth was recorded in Daegu followed by Kyung-buk, Ulsan, Kyung-nam and Busan. The variable has a value of 1 if the respondent's birthplace belongs to the high 5 regions, and 0 otherwise. 34.8% of men and 35.0% of women in the sample were born in high 5 regions.

¹² Usual working hours of both husbands and wives are not included in the main specification because working hours can be endogenously determined. If a woman married to a traditional type of husband is more likely to have a job demanding less working hours because of the husband's preference for the traditional wife, our estimates can be biased.

forming of children's gender role attitudes. For measuring parental gender norms, we exploit the regional variations in the strength of son preference and the imbalance in the sex ratios at birth that emerged after the introduction of sex selection technology in Korea. The resulting index of gender norms employed in this paper is the sex ratio at birth from 1991 to 1994 in the province of birth.

The results of our analyses suggest that men's gender role attitudes have a significant effect on intra-family time allocation, especially the wife's time spent on housework. Women married to men with more traditional gender norms (those born in places with higher sex ratios at birth) tend to spend more time on housework. An increase in the boys-to-girls ratio from 105 to 115 would be associated with an increase in women's time spent on housework by 34 minutes per day. If the husband has more traditional gender views (according to his answers to questionnaire related to gender views), his wife tends to spend more time on housework. It turns out the two measures of male gender norms (parental son preference and own gender views) independently affect the wife's time spent on housework. For the entire sample of working couples, the effects of the husband's gender norms on the total housework are largely driven by the increased housekeeping time of women who are married to more traditional men. For those with at least one child, the husband's birthplace sex ratio at birth significantly increases the wife's time spent on childcare as well as housekeeping.

This paper provides empirical evidence supporting the view that persistence or slow change in traditional gender norms is an important explanation for the high level of gender inequality in within-family time allocations in Korea. The recent improvements in female socioeconomic performances and changes in the marriage-market conditions in favor of women should have improved the female share in resource allocations within the family if the bargaining or collective models are applied. If social or cultural norms transmitted from parents strongly affect the children's gender role attitudes, however, the female progress within the family would be slower than predicted by economic changes. This study also provides an explanation for why it is so difficult to change marriage and fertility behaviors in a short period of time with policies for changing economic incentives.

The secular decline in the sex ratios at birth from the mid 1990s suggests that parental son preference in Korea became increasingly weaker over time at least during the last two decades. Given that the rise in the sex imbalance in the 1980s was driven by the introduction of sex selection technology, it is possible that actual parental son preference had been declining prior to the mid 1990s. Therefore, it is likely that the birth cohorts born in recent decades have parents with weaker son preference than the previous generations. Given that the younger cohorts probably possess more progressive gender norms transmitted from their parents, we may witness much speedier changes in gender inequality in intra-family resource allocations in the near future.

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Table 1: Descriptive Statistics: Individual and Household Characteristics

	Man	Woman
Variables: Individual level		
Sex ratio at birth of place of birth (POB)	115.5 (4.555)	115.5 (4.627)
Years of schooling	14.05 (2.625)	13.53 (2.347)
Age	44.31 (6.704)	41.43 (6.553)
Wage worker	0.800 (0.400)	0.853 (0.354)
Hourly wage (unit: 10,000 KR won)	1.767 (1.271)	1.174 (1.206)
Usual work hours (hour/week)	49.17 (12.46)	41.90 (12.92)
Survey on working day	0.823 (0.382)	0.777 (0.417)
Variables: Individual Time Use (minute/day)		
Home production time	40.286 (79.67)	211.24 (157.14)
Housework time	17.46 (46.68)	154.13 (98.07)
Childcare time	20.54 (57.24)	52.35 (116.1)
Family care time	2.286 (17.48)	4.762 (40.50)
Variables: Household levels		
Ratio of schooling (Woman's schooling/Man's schooling)	0.977 (0.148)	
Age difference (Man's age – Woman's age)	2.503 (2.724)	
Number of children under 5	0.260 (0.531)	
Number of children age 5-18	0.966 (0.907)	
Number of adults family member	2.382 (0.770)	
Ln(non-labor family income)	3.212 (2.886)	
Live in metropolitan (other than Seoul)	0.281 (0.450)	
Live in not metropolitan	0.583 (0.493)	
Number of couples	945	

Notes: Sample means and standard deviations are given in parenthesis. The information on time use is drawn from the 2014 KLIPS additional survey. The information on individual backgrounds (i.e., place of birth (POB), mother's years of schooling) is collected from the 1998-2014 KLIPS. "Live in metropolitan" indicates whether the couples live in one of the six metropolitan cities other than Seoul (i.e., Busan, Daegu, Daejeon, Incheon, Gwangju and Ulsan) or not. "Usual work hours" reports the hours of work respondents usually spend in the labor market, not the hours on the day of the time use survey. We exclude respondents older than age 55 at the time of the 2014 survey from the sample.

Table 2: Descriptive Statistics: Responses to Questionnaire on Gender Attitudes

	Men	Women
1. Agree: The ideal family is that the husband earns money and the wife looks after the home and family	0.381 (0.486)	0.372 (0.484)
2. Agree: Mother's work has negative effects on preschool children	0.560 (0.497)	0.566 (0.496)
3. Disagree: Dual-earner couples should equally divide housework	0.275 (0.447)	0.127 (0.333)
4. Disagree: Husband's and Wife's incomes should be managed separately	0.741 (0.438)	0.675 (0.469)
5. Disagree: A house where a couple live together should be co-owned	0.560 (0.497)	0.359 (0.480)
Gender index	2.516 (1.173)	2.099 (1.061)
Observations	945	945

Notes: Respondents were asked if they agree with six statements. We exclude one statement ("For gender equality between couples, women should work outside") from our analysis because it is less straightforward if the statement is opposed to gender equality or not. Variables are coded as indicators with the value of 1 if the answer represents traditional gender role "Agree" or "Strongly agree" for Q1 and Q2, "Disagree" or "Strongly disagree" for Q3-Q5. "Gender index" is the summation of the five indicators.

Table 3: Effects of Gender Norms on Housework Time

	Woman's housework time			Man's housework time		
	(1)	(2)	(3)	(4)	(5)	(6)
Man's POB sex ratio	3.422*** (1.185)		3.347*** (1.179)	1.721 (1.644)		1.779 (1.642)
Woman's POB sex ratio	-0.260 (1.165)		-0.164 (1.156)	-0.845 (1.631)		-0.859 (1.631)
Man's gender index		7.942** (3.773)	8.287** (3.681)		-0.102 (2.047)	-4.259 (5.154)
Woman's gender index		2.518 (4.160)	1.702 (4.045)		1.153 (2.257)	3.927 (5.340)
Man's years of schooling	-3.177 (6.949)	-2.699 (7.252)	-1.904 (7.017)	2.725 (10.37)	4.836 (3.934)	1.967 (10.31)
Woman's years of schooling	5.737 (7.273)	5.313 (7.544)	4.628 (7.331)	11.64 (10.90)	0.704 (4.093)	12.39 (10.87)
Ratio of years of schooling	-83.04 (79.95)	-78.97 (97.10)	-68.16 (80.64)	-28.16 (138.6)	21.06 (52.68)	-38.50 (137.5)
Age (woman ; man)	0.492 (0.954)	0.0915 (0.877)	0.388 (0.959)	-2.829** (1.123)	-0.882* (0.476)	-2.862** (1.121)
Age difference	-2.855* (1.637)	-2.523 (1.592)	-2.830* (1.623)	4.190* (2.281)	1.656* (0.905)	4.184* (2.283)
No. of children under 5	107.0*** (12.08)	100.2*** (9.905)	106.4*** (12.06)	74.75*** (11.74)	33.76*** (5.373)	75.42*** (11.77)
No. of children age 5-18	30.31*** (5.265)	26.29*** (5.191)	29.84*** (5.239)	20.89*** (6.731)	5.557** (2.816)	21.31*** (6.774)
No. of adults family member	4.654 (6.393)	1.820 (6.765)	3.353 (6.306)	-20.93** (10.53)	-1.292 (3.670)	-20.46* (10.59)
Ln(non-labor family income)	-1.102 (1.616)	-0.323 (1.476)	-1.052 (1.618)	0.139 (2.036)	0.546 (0.801)	0.126 (2.031)
Man's job: self-employed	3.829 (10.23)	3.741 (10.63)	3.941 (10.24)	-14.34 (15.96)	-1.877 (5.766)	-14.69 (15.91)
Woman's job: self-employed	16.94 (10.80)	14.82 (11.91)	15.49 (10.78)	28.50* (16.93)	9.358 (6.460)	29.13* (16.97)
Man's wage	1.826 (4.918)	1.063 (5.643)	1.427 (4.925)	-4.682 (6.993)	-2.157 (3.061)	-4.554 (6.966)
Woman's wage	-6.461 (4.018)	-7.559 (6.538)	-6.740* (3.978)	-10.23 (10.90)	-1.723 (3.547)	-10.12 (10.89)
Man's wage*woman's wage	-2.350 (3.281)	-0.982 (3.917)	-1.606 (3.301)	2.086 (4.901)	-0.193 (2.125)	1.848 (4.912)
Metropolitan city (except Seoul)	-30.85* (16.78)	-21.89 (14.00)	-32.65* (16.80)	-13.33 (19.50)	-4.859 (7.594)	-13.49 (19.59)
Not metropolitan city	-51.94*** (15.51)	-46.52*** (12.74)	-52.75*** (15.54)	13.72 (17.09)	3.191 (6.911)	13.39 (17.16)
Man: weekend	48.71*** (16.86)	46.58*** (13.31)	48.47*** (16.83)	-130.2*** (18.43)	-61.30*** (7.222)	-130.6*** (18.50)
Woman: weekend	-194.3*** (17.16)	-191.7*** (12.25)	-194.0*** (17.11)	-20.53 (15.76)	-21.44*** (6.646)	-20.49 (15.78)
Constant	-30.01 (164.8)	328.1*** (108.1)	-65.91 (164.0)	-72.90 (217.6)	34.35 (58.63)	-64.62 (216.2)
p(men's time/women's time)	0.1844** * (0.439)					
Observations	945	945	945	945	945	945

Notes: The sample mean of housework time per day is 211.2 minutes for women and 40.29 minutes for men.

The estimated correlation between housework times spent by men and women are reported as ρ . Robust standard errors are reported in parenthesis. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Women's Time Spent on Housekeeping, Child Care and Family Care

	All			Women who have at least one child (under age 18)		
	(1) House- keeping	(2) Child care	(3) Family care	(4) House- keeping	(5) Child care	(6) Family care
Man's POB sex ratio	1.836** (0.744)	0.904 (0.815)	0.374 (0.347)	1.895** (0.886)	2.063* (1.082)	0.561 (0.481)
Woman's POB sex ratio	-0.640 (0.735)	-0.0963 (0.805)	0.349 (0.343)	-1.260 (0.871)	-0.482 (1.062)	0.508 (0.474)
$\rho(\text{housework/childcare})$	0.0097 (0.0542)			0.0088 (0.0572)		
$\rho(\text{childcare/family care})$	-0.516*** (0.0846)			-0.562*** (0.081)		
$\rho(\text{housework/family care})$	-0.0451 (0.738)			-0.0623 (0.0823)		
Observation	945	945	945	683	683	683

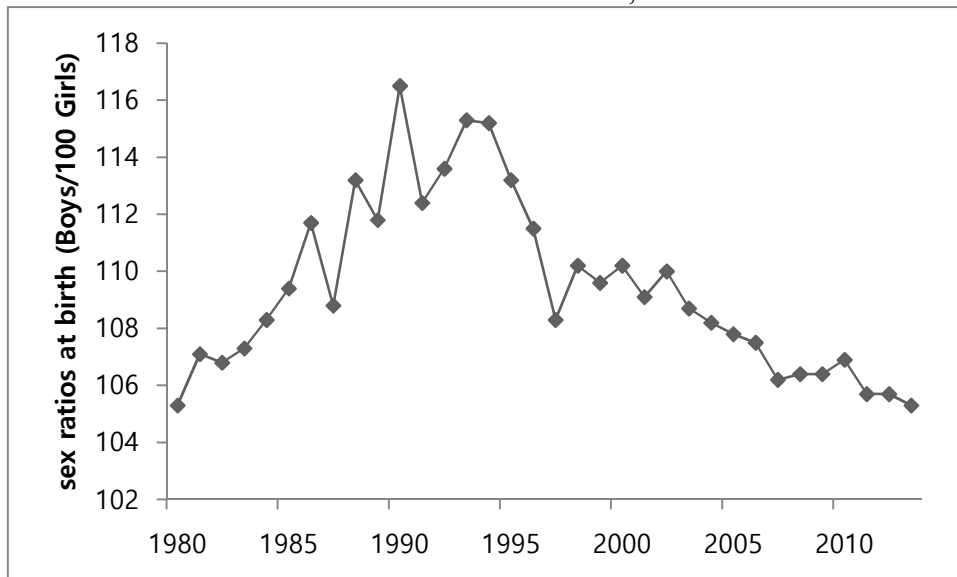
Notes: For columns 4 to 6, we restrict the sample to couples who have at least one child. The multivariate Tobit model is used. The estimated correlation between housework times spent by men and women are reported as ρ . Robust standard errors are reported in parenthesis. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Robustness Tests

Sample size		(1)	(2)	(3)
Dependent variables: Women's housework time				
A. Dummy variable				
Man's POB: High5	951	31.91*** (10.87)	30.62*** (10.79)	28.47*** (10.66)
Woman's POB: High5		-8.510 (11.00)	-8.293 (10.91) (3.986)	-6.693 (10.81) (3.881)
B. Have at least 1 child				
Man's POB sex ratio	683	4.690*** (1.542)	4.502*** (1.539)	4.259*** (1.488)
Woman's POB sex ratio		-1.111 (1.518)	-1.012 (1.505)	-0.705 (1.475)
C. OLS estimation				
Man's POB sex ratio	945	3.132** (1.209)	3.132** (1.209)	2.952** (1.262)
Woman's POB sex ratio		-0.348 (1.107)	-0.348 (1.107)	-0.146 (1.190)
D. SUR estimation				
Man's POB sex ratio	945	3.110*** (1.103)	3.046*** (1.100)	2.898*** (1.078)
Woman's POB sex ratio		-0.329 (1.091)	-0.234 (1.088)	-0.0653 (1.067)
Hours of work		No	No	Yes
Gender index		No	Yes	Yes
Dependent variables: Men's housework time				
A. Dummy variable				
Man's POB: High5	951	15.06 (15.89)	15.37 (15.89)	21.40 (16.15)
Woman's POB: High5		-11.56 (16.42)	-11.64 (16.42)	-16.29 (16.53)
B. Have at least 1 child sample				
Man's POB sex ratio	683	2.463 (1.884)	2.473 (1.883)	2.838 (1.969)
Woman's POB sex ratio		-1.655 (1.836)	-1.657 (1.835)	-1.943 (1.900)
C. OLS estimation				
Man's POB sex ratio	945	0.594 (0.510)	0.587 (0.508)	0.626 (0.569)
Woman's POB sex ratio		-0.0674 (0.609)	-0.0565 (0.612)	-0.0352 (0.596)
D. SUR estimation				
Man's POB sex ratio	945	0.619 (0.598)	0.620 (0.598)	0.663 (0.593)
Woman's POB sex ratio		-0.0556 (0.592)	-0.0562 (0.592)	-0.0393 (0.588)
Hours of work		No	No	Yes
Gender index		No	Yes	Yes

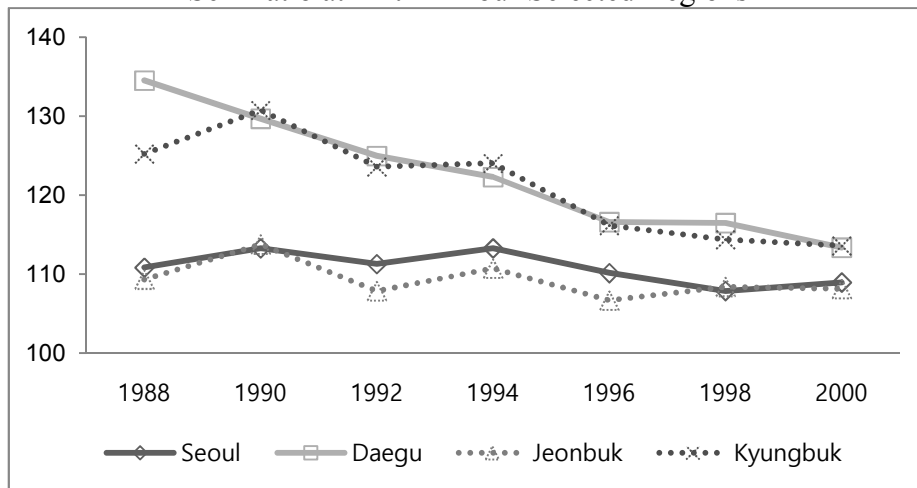
Notes: Included in the regressions but omitted from the tables are controls for both men's and women's age, years of schooling, hourly wage, job type (whether self-employed or not), characteristic of survey day (whether respondents were surveyed on the working day or not), number of young children (aged 0-5), number of children aged 6-18, number of adult household member, and location of residence (Seoul/metropolitan/not metropolitan). Model 2 add both men's and women's gender index to Model 1. In Model 3, both men's and women's usual working hour are additionally controlled. Standard errors are clustered by husband's birthplace. Significance level: *** p<0.01, ** p<0.05, * p<0.1

<Figure 1>
Sex Ratio at Birth in South Korea, 1980-2013



Source: Vital Statistics of Korea: Births and Deaths, each year; Drawn from the website of Korean Statistical Information Service (<http://www.kosis.kr>).

<Figure 2>
Sex Ratio at Birth in Four Selected Regions



Source: Annual Reports on Live Births and Deaths Statistics. 1988-2000