Discussion Paper Series

No.110

Working Mothers and Sons' Preferences Regarding Female Labor: Direct Evidence from Stated Preferences

Daiji Kawaguchi
Junko Miyazaki

August 2005

Hitotsubashi University Research Unit for Statistical Analysis in Social Sciences
A 21st-Century COE Program

Institute of Economic Research
Hitotsubashi University
Kunitachi, Tokyo, 186-8603 Japan
http://hi-stat.ier.hit-u.ac.jp/

Working Mothers and Sons' Preferences Regarding Female Labor: Direct Evidence from Stated Preferences[1]

Daiji Kawaguchi[2]
Junko Miyazaki[3]

August 3, 2005

[1]This paper was initiated when both authors were affiliated with the University of Tsukuba. We appreciate comments from Miki Kohara, Tomohiro Machikita, Masaru Sasaki, Masayuki Takahara, Chikako Yamauchi and seminar participants at Tsukuba, Hitotsubashi University, Tokyo Institute of Technology, the Kansai Labor Economics Workshop, the spring 2005 Japanese Economic Association meeting in Kyoto, and the 2005 European Society of Population Economics meeting in Paris. We gratefully acknowledge the financial support from Japan Society for the Promotion of Science (Fundamental (A) 17203016 and Youth (B) 16730161). Donna Maurer provided excellent editorial assistance.

[2]Faculty of Economics, Hitotsubashi University, Naka 2-1, Kunitachi, Tokyo 186-8601, Japan, Tel: (81)-42-580-8851, Fax: (81)-42-580-8851, E-Mail: kawaguch@econ.hit-u.ac.jp

[3]Intage Inc.

Abstract

The labor force participation rate of women in Japan has increased in recent decades. To shed light on the mechanism behind this increase, we focus on the explanation that Fernandez, Fogli and Olivetti (QJE (2004)) suggest. They claim that men who are raised by working mothers form a preference that is favorable toward working women and, consequently, they are more likely to have working wives. We test this hypothesis using the Japanese General Social Survey 2000-2002, which consists of repeated cross-sectional data sets. We fail to find a positive correlation between men's mothers' full-time work status and their wives' full-time work status. However, the lack of a correlation may be due to confounding factors. To take these potentially confounding factors into account, we directly examine whether the men raised by working and non-working mothers respond differently to the opinion survey's questions regarding the division of gender roles. The estimation results indicate that men raised by full-time working mothers are less likely to support the idea of the division of gender roles. Those men are also less likely to believe in the negative impact of a mother's working on her children's development. We confirm that the responses to the opinion survey are correlated with wives' labor force status.

1 Introduction

Young women's employment rate in Japan has increased very rapidly over the last several years. For example, the labor force participation rate of women ages 25 to 29 increased from 56 percent in 1987 to 69 percent in 2002.[1] The increase in the employment rate is particularly notable among married women in this age group. For married women ages 25 to 29, the employment rate has increased from 69 percent in 1987 to 76 percent in 2002, which is a 7 percentage- point increase during the period. The rise in real wages for women largely explains this increase. The real wage rate rose by 23 percent during the period, while the wage elasticity of employment probability is estimated to have been between 0.05 and 0.2 based on cross-sectional data for this group[2]. Thus the real wage increase explains 4.6 of the percentage points increase in the employment rate at most, but the remaining 2.4 percentage points are left unexplained. Among several reasons, Mitani [2003] points out that a change in social norms regarding female labor force participation explains some of the gap. The Cabinet Office's poll on gender equality in society reports that 45.2 percent of male and female respondents support the statement "Husbands should work outside the home, and wives should keep household," while this statement was supported by 72.5 percent of the male and female respondents in the poll implemented in 1979 (Cabinet

[1]This is the authors' calculation, based on the Basic Survey of Employment Structure.

[2]This is the authors' calculation based on the Basic Survey of Employment Structure. Also see Morita [2002].

Office [2004]). In particular, husbands' attitudes toward wives' work is said to have been changed.

Fernandez et al. [2004] attempt to explain the increase in the U.S. female employment rate in recent decades and propose that the change in men's attitudes toward female labor force participation induced by mothers' labor force participation is an important factor that explains the recent dramatic increase in the female employment rate. They claim that men who were raised by working mothers view it as natural for women to work outside of the household. To test their hypothesis, they examined whether a wife's employment status depends on the employment status of her husband's mother when the husband was 15 years old. Based on the sample of married couples in the General Social Survey in 1988 and 1994, they find that husbands raised by working mothers were about 10 to 20 percentage points more likely to have working wives. Antecol [2001], and Fernandez and Fogli [2005] also have argued for the importance of "culture" or social norms to explain female labor force participation. They have shown that US women's decisions to participate in the labor force are affected by the labor force participation rate of the country of their or their ancestors' ethnic origin. Other researchers attribute the unexplained increase in female labor force participation to the relative income concern (Neumark and Postlewaite [1998]) or the development of electronic appliances that have relieved women from some household chores (Greenwood et al. [2005]).

Papers by Tanaka [2005] and Shirahase [2005] are the most closely related

to our work using Japanese data. Tanaka [2005] examined the Japanese General Social Surveys to find that a mother's labor force participation positively affects her daughter's educational attainment, while depressing that of her son. He interprets this result as evidence that working mothers act as role models for daughters. Shirahase [2005] examined the effect of mother's work status on individuals' opinions regarding the sex division of roles using the Social Stratification and Social Mobility Surveys (SSM Surveys) and found that a mother's labor force participation affects neither her sons' nor her daughters' opinions regarding gender roles.

The purpose of this paper is to examine whether the work status of a husband's mother affects his wife's labor supply. Using the Japanese General Social Survey (JGSS hereafter), we examine whether the husbands who were raised by working mothers are more likely to have working wives. The JGSS directly asks respondents about their attitudes toward women's labor and social participation. For example, the survey asks whether the respondent supports a statement that a married woman should not hold a job if her husband has sufficient earnings. Several questions like this are available in the JGSS and we establish the relationship between mother's work status and the responses to these questions.

We attempt to supplement the evidence shown by Fernandez et al. [2004] through directly examining the effect of mothers' labor supply on sons' preferences regarding women's labor force participation. Although they found a positive correlation between mother-in-law's labor supply and wife's labor

supply and attribute the finding to a change in the men's preference, their conclusion is not yet definitive because there are other mechanisms that create this correlation. For example, those men raised by working mothers may receive less attention from them, and their unobserved ability may be lower than that of men raised by non-working mothers. If this is the case, men raised by working mothers may end up with low earnings and their wives may be more likely to work due to the income effect. Fernandez et al. [2004] exploited the variation of the female labor force participation rate due to the variation in the male mobilization rate during World War II to address this endogeneity. Although the results are convincing, the variation in the mobilization rate across US states could be correlated with regional industrial compositions, which can affect current female labor market conditions. Thus, it is very useful to examine the effect of mothers' labor supply on sons' preference in a direct way.

We first attempt to replicate the results by Fernandez et al. [2004] using the JGSS collected in 2000, 2001, and 2002. We fail to replicate their results that men raised by full-time working mothers are more likely to have full-time working wives than the men raised by non-working mothers holding other variables constant. However, by directly examining the survey responses to the gender role questions in the survey, we find that men raised by working mothers are more likely to respond negatively to gender stereotypes. For example, men raised by working mothers are more likely to object to the statement, "The husband should work outside the home and the wife should

keep the household," holding the men's age, educational background, and family background in his adolescence constant. In sum, the evidence indicates that the mothers' labor supply affects their sons' stated preferences toward female labor.

The rest of this paper is organized as follows. Section 2 describes the theory examining the effect of men's preference toward female labor on their marriage and their wives' labor supply, section 3 describes the empirical model, section 4 explains data, section 5 introduces the estimation results, section 6 discusses the relationship between the stated preference and the action taken, and the last section concludes.

2 The Model

We set up a simple model that examines the effect of mothers' work status on their sons' marriage choices and their wives' work status. We assume that there are many men and women in the economy. Each man has a heterogeneous earnings capacity I_h, and he was either raised by a working mother ($mw_h = 1$) or a non-working mother ($mw_h = 0$). Each woman has an earnings ability w_w, which is expressed in the rate of pay (w_w), and she has one unit of time as an endowment.

A man and a woman meet a potential partner once in their lives and decide whether they will marry or stay single. We assume that if a man decides to stay single, he consumes out of all his earnings capacity and enjoys the utility level $v_h(I_h)$. Similarly, if a woman decides to stay single, she uses

all of her time to earn income and consumes all of it. The resulting indirect utility is given as $v_w(w_w)$.

Once a couple decides to get married, they maximize the following joint utility function:

$$U(c, h; mw_h) = u_1(c) + u_2(h) - \alpha l_w(1 - mw_h), \tag{1}$$

where $u_1(c)$ is the utility from consumption, c is the amount of consumption by the couple, $u_2(h)$ is the utility from household production, h is the amount of household production, l_w is the amount of the wife's labor supplied to labor market, and mw_h is the dummy variable that takes one if the husband's mother was working during his adolescence. We assume that a husband who was not raised by a working mother feels uncomfortable if his wife works in the labor market, and the decline of utility is measured by $\alpha > 0$; a husband who was raised by a working mother does not feel uncomfortable if his wife works in the labor market. We assume, following Inada conditions: $u_1'(0) = \infty$ and $u_2'(0) = \infty$. For simplicity, we assume that the household labor is produced only by the wife and the production technology is linear. The wife's time endowment is normalized to 1 and the household production is given by:

$$h = 1 - l_w. \tag{2}$$

We assume that the husband inelastically supplies his labor to the labor market and earns I_h, and the wife's wage rate is given by w_w. Thus the

amount of consumption is determined by the following budget constraint:

$$c = I_h + w_w l_w. \tag{3}$$

There is a non-negativity constraint for l_w[3]:

$$l_w \geq 0. \tag{4}$$

The married couple maximizes their joint utility (1) by choosing the wife's labor supply to the market under three constraints: (2), (3), and (4). The first-order condition for the maximization problem is given by:

$$u_1' w_w - u_2' - \alpha(1 - mw_h) \leq 0. \tag{5}$$

Using the solution for the couple's maximization problem, we define the couple's indirect joint utility by using $v(I_h, mw_h, w_w)$.

A man and a woman decide to marry when the marriage will create surplus; $v(I_h, mw_h, w_w) > v_h(I_h) + v_w(w_w)$. Notice that this condition is less likely to hold if $mw_h = 0$ than if $mw_h = 1$ due to the increasing joint utility in mw_h because being raised by working mother removes an additional constraint in the joint utility maximization problem. Also note that among men raised by non-working mothers, the range of w_w that satisfies the above inequality is smaller than among the men raised by working mothers. This is because those men raised by non-working mothers do not like their wives to work outside the home, and they tend not to marry women with high-market wages.

[3]From the Inada conation $u_2'(0) = \infty$, the constraint $l_w \leq 1$ is always satisfied.

Once the couple decides to marry, from the first-order condition for the joint utility maximization problem, the reservation wage is defined as

$$w_w^r = \frac{v'(1) + \alpha(1 - mw_h)}{u'(I_h)}. \tag{6}$$

This shows that a wife's reservation wage is lower if her husband's mother worked during his adolescence because the second term of the numerator vanishes. Also, the reservation wage is increasing in I_h given $u_1''(.) < 0$. Due to this property of reservation wage, wives with husbands raised by working mothers are more likely to work.

Suppose the wage offered to the wife is determined by the amount of the wife's human capital and a stochastic factor. The offered wage is given as:

$$w_w^o = f(x, e), \tag{7}$$

where x is the vector of variables that indicates the human capital amount, and e is the unobserved factor in the wage determination. The wife participates in the labor force if and only if $w_w^o \geq w_w^r$. Whether a husband had a working mother affects his wife's labor force participation through several channels. The husband's mother's labor supply affects the husband's preference, reduces the reservation wage, and increases his wife's labor force participation rate. This is the mechanism on which we would like to focus, and this mechanism creates the dynamic behavior of women's labor force participation: Once the labor force participation rate increases, it also will be higher in the next generation.

However, there are several other channels through which the husband's mother's labor supply affects his wife's labor supply. First, the fact that the husband's mother was working may imply that the husband had grown up in a relatively poor household, holding other characteristics of the household constant. If a man grew up in a poor household, he is more likely to be poor, and thus the lower income of the son results in his wife's lower reservation wage due to the income effect. Similarly, a child growing up in a household with a working mother may receive less attention from the mother and consequently may acquire lower ability (Leibowitz [1974] and Datcher-Loury [1988]). This lower ability may result in the husband's lower income and his wife's lower reservation wage. Second, as pointed out by Fernandez et al. [2004], the unobserved factor of wage determination may work favorably for female labor in a certain region due to its industrial structure. If this unobserved factor is persistent and people do not move, the husband's mother and his wife may engage in similar behavior just because they live in a similar economic environment. Thus, holding the husband's income and the regional wage structure constant is crucial to conclude that the observed correlation between the husband's mother's labor supply and his wife's labor supply occurs through the formation of the husband's preference toward female labor.

3 Empirical Model

We attempt to estimate the effect of a husband's mother's work status during the husband's adolescence on marital status, the son's selection of a marriage partner, and, given being married, his wife's work status. The theoretical model predicts that those men raised by working mothers are more likely to get married, controlling for other characteristics. To empirically test this prediction, we first estimate the effect of the mother's work status on marriage by estimating the following probit model:

$$P(m_i = 1|mw_{hi}, I_i, x_i) = \Phi(\gamma_1 mw_{hi} + \gamma_2 x_i), \tag{8}$$

where Φ is the standard normal distribution function, $m_i = 1$, if the individual i is married, le mw_i is the set of dummy variables that indicates his mother's work status at his age of 15, and x_i is the vector of characteristics that includes years of education, age, its square, the residence location category (3: urban, 2: city, and 1: rural), and a constant. The vector x_i also includes the parents' years of education as proxy variables for the husband's family background.

The other empirical prediction of the theoretical model is that men raised by non-working mothers are less likely to marry women with high wage rates. To test this prediction, we estimate the following model:

$$wife\_educ_i = \theta_1 mw_{hi} + \theta_2 x_i + u_i, \tag{9}$$

where $wife\_educ$ is the wife's years of education. We use education as a

proxy of earnings capacity because we cannot observe a wage rate among non-working women.

We next focus on the analysis of wives' labor force status conditioned on being married. We model four labor market outcomes (1: do not work, 2: employed as a part-time worker, 3: employed as a full-time worker, and 4: work as a self-employed or work for a family business). As implied by the theoretical analysis, wives' work statuses are determined by the their offered wage and the reservation wage, which is a function of husband's income and the husband's mother's work status. We specify the determination of work status as the following multinomial logit model.

$$P(y_i = j|mw_{hi}, I_i, x_i) = (\beta_{1j} mw_{hi} + \beta_{2j} I_i + x_i \beta_{3j}) / (1 + \sum_{i=2}^{4} \{\beta_{1j} mw_{hi} + \beta_{2j} I_i + x_i \beta_{3j}\}), \tag{10}$$

where $y_i = 1$ if the wife of household i does not work, $y_i = 2$ if she is a part-time worker, $y_i = 3$ if she is a full-time worker and $y_i = 4$ if she is a self-employed or family business worker. The dummy variable mw_{hi} is the set of dummy variables that indicates the husband's mother's work status at his age of 15; I_i is the husband's annual income; and x_i is the vector of the wife's characteristics in household i that determines the wife's offered wage.

The parameter β_{1j} captures the effect of a husband's mother's work status on the wife's choice of work status j through the formation of the husband's preference. However, as discussed in the previous section, his mother's labor supply may be endogenous because it may pick up family characteristics. To deal with this possible omitted variable bias, we include the husband's

parents' years of education as proxy variables. Also, the husband's mother's work status may be correlated with the region where the husband had grown up, and this region is presumably correlated with the region of his current residence. The region of current residence may affect the wife's work decision through its industrial structure. The endogeneity of mw_{hi} due to unobserved regional characteristics could be addressed by including 47 prefectural dummies of current residence and the husband's residence at age 15.

Next, to directly examine the effect of the mother's labor supply on her son's preference formation, we analyze how the mother's labor supply affects her son's stated preference recorded in our data. As explained in detail in the data section, the survey employed in this study records whether the respondent supports some statements regarding gender roles. The respondents are asked to choose one of the following four choices: 1. agree, 2. somewhat agree, 3. somewhat disagree, or 4. disagree. The responses are combined into a dummy variable that takes one if the respondent agrees to the statement and zero if the respondent disagrees. This dummy variable is regressed upon the dummy variables indicating the mother's work status at the son's age of 15, and other explanatory variables, using the following probit model:

$$P(agree = 1|mw, z) = \Phi(\delta_0 + \delta_1 mw_{hi} + z_i\delta_2), \tag{11}$$

where *agree* is the dummy variable that takes one if the respondent agrees with the statement, and mw_{hi} is the set of dummy variables that indicates the husband's mother's work status at his age of 15. The vector of variables

z_i includes years of education, age, its square, the residence location category (3: urban, 2: city, or 1: rural), and parents' years of education. The parameter vector δ_1 indicates the effect of the mother's work status on the husband's stated preference regarding gender roles. To estimate this parameter consistently, it is important to control for the current location of residence and the location at the husband's age of 15 because those factors may affect both his preference and the mother's labor supply. It is worth noting that the causality runs from the mother's labor supply to the stated preference in one direction because the survey asks the mother's labor supply at the husband's age of 15, as well as his current preference toward female labor.

4 Data

We use repeated cross-sectional data of the Japanese General Social Surveys (JGSS) conducted in 2000, 2001, and 2002.[4] The JGSS is designed to be the Japanese counterpart of General Social Surveys in the US. Each cross section includes about 3,000 individuals that are representative of all men and women between the ages of 20 and 89. The surveys adopt a two-step, stratified sampling method and were conducted between October and November of

[4]The JGSS are designed and carried out at the Institute of Regional Studies at Osaka University of Commerce in collaboration with the Institute of Social Science at the University of Tokyo under the direction of Ichiro Tanioka, Michio Nitta, Hiroki Sato, and Noriko Iwai, with Project Manager, Minae Osawa. The project was financially supposed by a Gakujutsu Frontier Grant from the Japanese Ministry of Education, Culture, Sports, Science and Technology for the 1999-2003 academic years, and the datasets are compiled and distributed by the SSJ Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, the University of Tokyo.

each survey year.

This survey asks the standard survey questions regarding labor force status and family structure through face to face interviews. The interviewers collect information regarding the respondents' lives at age 15, and these questions include the mother's work status, the place of residence, and the parents' educational background. In addition, the survey asks respondents to fill out questionnaires that include sensitive questions that are collected before or after the interview. This questionnaire includes questions regarding the respondents' opinions about gender roles. Several statements are shown to the respondents, and they are asked whether they 1. agree, 2. somewhat agree, 3. somewhat disagree, or 4. disagree with each statement. The following four statements are used in this study .

1. If a husband has sufficient income, his wife should not have a job.

2. A husband should work outside the home and a wife should keep the household.

3. If a mother holds a job, it has a negative impact on the development of the pre-primary school-age children.

4. It is more important for a wife to help her husband's career than to pursue her own career.

The analysis sample construction is tabulated in Table 1. Analysis sample (1) includes single men, but analysis sample (2) only includes married men

and their wives. The descriptive statistics of the analysis sample (2) by husband's mother's work status are tabulated in Table 2. 29% of the married men raised by mothers working part-time has wives with part-time jobs, and this percentage is higher than the corresponding numbers for men who were raised by non-working, full-time working, or self-employed mothers. At the same time, 26 % of men raised by full-time working mothers has wives with full-time jobs, and again this percentage is higher than the number for the men who were not raised by full-time working mothers. An examination of the descriptive statistics reveals that sons are likely to marry women who are similar to their mothers. However, men raised by working mothers may have different characteristics than men raised by full-time housewives. Thus, to infer the partial effect of mothers' working status on the attitude toward female labor/social participation, it is important to control for observable explanatory variables.

Table 3 tabulates the mother's work status by men's age cohorts. This tabulation shows that younger men are more likely to be raised by part- or full-time workers, while they are less likely to be raised by farmers. Thus if men being raised by part- or full-time working mothers are more likely to have working wives or to have a positive opinion toward female labor, the increase in the number of men who are raised by part- or full-time working mothers explains why young women are more likely to work.

Table 4 tabulates the responses to the gender-stereotype statements. 57.98 percent of men raised by non-working mothers agree with the state-

ment, "If a husband has sufficient income, his wife should not work," while 47.53 percent of men raised by full-time working mothers agree to this statement. The difference in responses is more striking for the statement "A husband should work outside the home and a wife should keep the household." Of the men raised by non-working mothers, 58.91 percent agree with this statement, but only 43.50 percent of men raised by full-time working mothers agree. A brief look at the figures shows that men raised by full-time working mothers are less likely to agree with the statement expressing gender stereotypes.

5 Results

5.1 Selection for marriage

Columns (1) and (2) of Table 5 tabulate the results of the probit regression of men's current marital status on their mothers' work status when the men were 15 years old. None of the coefficients is statistically significant. Although the theory predicts that those men raised by working mothers are more likely to marry than men raised by non-working mothers, the evidence here does not support this prediction. Columns (3) and (4) of Table 5 report the results of the OLS regression of wife's years of education on husband's mother's work status, using the married couples as the sample. The results imply that the mother's work status does not affect the selection of marriage partner in terms of educational attainment. Although the theory predicts that those men raised by working mothers are more likely to have wives with

more years of education, the empirical evidence does not support this prediction. Overall, the empirical results in Table 5 suggest that the mother's work status affects neither a man's marital status nor his selection of a partner. These results imply that we can safely analyze the sample of married people without the fear of sample selection bias.

5.2 Wives' employment

Table 6 Panel A reports the results of the multinominal logit estimation that regresses four categories of wives' employment status on husbands' mothers' work status when the husbands were 15 years old, along with the control variables, such as wife's years of education, wife's age, its square, the number of children under age 6, the number of children, the log of husband's income, and the husbands' parents' years of education. This regression result in column (1) indicates that men raised by part-time working mothers are about 7 percentage points more likely to have part-time working wives than men raised by non-working mothers. Column (2) indicates that men raised by full-time working mothers are 4 percentage points more likely to have full-time working wives, although the estimated coefficient is not statistically significant. Column (3) indicates that those men raised by self-employed mothers are 15 percentage points more likely to have self-employed wives, and those raised by mothers who were farmers are 7 percentage points more likely to have self-employed wives. These results suggest that men are likely to marry women who have an employment status similar to their mothers.

The regression results so far support the hypothesis that men raised by working mothers are more likely to have working wives; however, the estimated relationship could have been subject to an omitted variable bias. In particular, we are concerned with the possibility that the link between mothers' work status and wives' work status is created by regional employment structures. To capture the heterogeneity of industrial structure and the demand for female labor, we include 46×2 prefecture dummy variables that indicate the husband's current residence and his residence at age of 15. Table 6 Panel B tabulates the results of the multinominal logit regression with 92 prefectural dummy variables. According to Column (1), men raised by part-time working mothers are 5 percentage points more likely to have part-time working wives than men raised by full-time working mothers, although the coefficient is not statistically significant. As indicated in Column (2), the effect of being raised by full-time working mothers on wives' full-time working is much weakened in this specification, and we cannot detect a statistically significant effect. Column (3) indicates that those who are raised by self-employed (or family employee) mothers are more likely to have self-employed (or family employee) wives, but a straightforward interpretation of this result would be that sons of self-employed parents are more likely to be self-employed and their wives are likely to work as family employees.

Overall, the results in Table 6 indicate that mothers' employment status weakly affects wives' employment status. However, the size of the effect is weakened when prefectural dummy variables for current and adolescent

residence are included. The fact that we did not find strong evidence for the effect of mothers' work status on wives' employment status could be due to the logical distance between the cause and the effect. After all, the wives' labor supply behavior is a function of many factors other than the mothers' past labor supply behavior. Thus, it is difficult to derive a definitive conclusion based on this research strategy as far as our data set is concerned. To overcome the difficulty due to the logical distance between the cause and the effect in the regression analysis, we attempt to "shorten" the logical distance by regressing husbands' opinions about sex roles on mothers' past labor supply behavior in the next analysis.

5.3 Men's stated preferences

We next report the results of the probit regression of men's response to the gender stereotype statement on their mothers' employment status when they were adolescents. This approach enables us to directly examine the effect of mothers' working status on men's stated preferences. In addition, we can examine this effect even among single men, contrary to the analysis in the previous subsection that was possible only among married men.

Table 7 Panel A Column (1) reports the results of the probit regression of the response (=1 if agree) to the statement "If a husband has sufficient income, his wife should not work" on mothers' employment status along with men's demographic characteristics. Those raised by full-time working mothers are 8 percentage points less likely to agree to this statement than

those raised by non-working mothers; the difference is statistically significant. Similarly, those men raised by part-time working, self-employed, or farmer mothers are about 4 or 5 percentage points less likely to agree to the statement, but these differences are not statistically significant. Table 7 Panel A Column (2) reports the results of the specification that includes prefectural dummy variables for current and past residence. Even after controlling for prefectural unobserved heterogeneity, those men raised by full-time working mothers are 7 percentage points less likely to support the statement.

We repeat the same exercise for the responses to the other statements in the survey. The results of the regressions of the responses to the statement, "A husband should work outside the home and his wife should keep the household" appear in Columns (3) and (4) of Table 7 Panel A. Those men raised by full-time working mothers are 12 percentage points less likely to agree with this statement, and this coefficient is statistically significant. Those men raised by part-time working mothers are 5 percentage points less likely to agree with this statement than men raised by non-working mothers, although the difference is not statistically significant. In addition, those raised by self-employed or farmer mothers are equally likely to agree with this statement as those raised by non-working mothers. This result is preserved even after controlling for the current and past prefecture of residence. It is striking that those men raised by full-time working mothers are more likely to disagree with this strong and straightforward statement on the division of gender roles.

The results of the analysis of the responses to the statement, "Mother's job holding has a negative impact on the development of pre-primary school child" appear in Columns (1) and (2) of Table 7 Panel B. Those men raised by full-time working mothers are 11 percentage points less likely to support this opinion than those raised by non-working mothers, and the difference is statistically significant. On the contrary, those men raised by part-time working, self-employed, or farmer mothers are equally likely to agree with this idea as those raised by non-working mothers. The findings are essentially unchanged when controlling for the prefectural dummy variables.

Columns (3) and (4) of Table 7 Panel B report the analysis results of the responses to the statement, "It is more important for a wife to help her husband's career than to pursue her own career." Those men raised by full-time working mothers are 7 percentage points less likely to agree with this statement than those raised by non-working mothers. The coefficients of the dummy variables for other types of working mothers are statistically insignificant, and this implies that those raised by part-time working, self-employed, and farmer mothers are equally likely to agree with this statement.

Overall, the results in Table 7 suggest that those men raised by full-time working mothers tend to disagree with the statement expressing gender stereotypes. It is also notable that men raised by mothers who were part-time working, self-employed, or farming are equally likely to agree to the division of gender roles as men raised by non-working mothers. From this difference in the effect on son's preference formation, we infer that full-time working

mothers are away from the home for long hours, and this strongly affects the formation of sons' preferences. Therefore, future studies that attempt to examine the effect of mothers' working behavior on son's preference formation should pay extra attention to the way mothers participate in the labor force.

6 Stated preference and action

Some readers might wonder how husbands' stated preferences translate into actual behavior. Running regressions of actual action, such as marital status, wife's educational attainment, or wife's employment status on the husband's stated preference would answer this question. However, we should pay attention to the endogeneity of preference formation from the action taken. People attempt to form their preferences so that they are consistent with their actions, as cognitive dissonance theory suggests. Thus, when we attempt to run regressions of actions on stated preferences, the stated preferences are likely to be endogenous. To deal with this endogeneity, we could use the instrumental variable estimation method, in which the obvious candidate for the instrumental variable is mother's work status in adolescence. The Wald estimator formula suggests that the instrumental variable estimator is the ratio of the covariance between the action and the mother's work status to the covariance between the stated preference and the mother's work status.[5] As we have learned from Tables 5 and 6, there is no clear correlation between

[5]This discussion does not exactly carry over to the non-linear models, but the essence of the discussion does not change even in the case of non-linear models.

the mother's work status and the son's marital status, the selection of marriage partner, or his wife's labor market status. Thus, we could expect that the instrumental variable approach does not work well, and it turns out to be the case when we implement the non-linear instrumental variable approach. This problem occurs because the mother's work status is not exogenous from the marriage equation, the wife's education equation, or the wife's employment equation, even after conditioning on the men's stated preference or other control variables because the mother's work status during adolescence may be correlated with unobserved factors that affect actions.

Having acknowledged the limitation of the straight regression of actions on stated preferences, we report the results of the regression of marital status and wife's education on stated preferences in Table 8. We also report the regression results of wife's employment status on stated preferences in Table 9. Readers are cautioned that these results do not indicate causation, but mere correlation.

Table 8 Columns (1) and (2) tabulate the results of the probit regression on stated preferences and other control variables. None of the coefficients is statistically significant, and we conclude that stated preferences do not directly affect the selection into marriage. Table 8 Columns (3) and (4) report the results of the OLS regression of wife's years of education on stated preference, using married men as the sample. Those men who agree with the statement that "It is more important for a wife to help her husband's career than to pursue her own career" are likely to have wives with 0.2 fewer years of

education. Those wives with less education presumably have a comparative advantage in household production over market production, and this result is consistent with the theoretical prediction because those men who want to be supported by their wives select women with a comparative advantage in household production as their partners.

Table 9 tabulates the results of the multinomial regression of the wives' current work status on the husbands' stated preferences. The results in Panel A suggest that those husbands who agree with the statement "If a husband has sufficient income, his wife should not work" are 5 percentage points less likely to have part-time, full-time, or self-employed working wives than those husbands who disagree with the statement. Panel B suggests that the fact that the husband agrees with the statement, "A husband should work outside the home and his wife should keep the household" does not significantly lower the wife's part-time working or self-employed probability. However, agreeing with this statement lowers the wife's full-time working probability as much as 13 percentage points. The results reported in Panel C are similar to those in Panel B. Those who agree with the statement, " Mother's job holding has a negative impact on the development of pre-primary school child" are equally likely to have part-time working or self-employed wives, while they are about 9 percentage points less likely to have full-time working wives. The consistency of the regression results in Panels B and C is natural because raising children could be considered as the most crucial household duty. Panel D indicates that those who agree to the statement, "It is more

important for a wife to help her husband's career than to pursue her own career" are less likely to have part-time or full-time working wives than those who disagree with the statement.

Table 9 reveals that stated preferences and wives' labor market status are highly correlated, although we cannot claim that stated preferences cause the wives' labor market outcomes. However, we would be surprised if this strong correlation is solely created by a reverse causation, running from wives' labor market status to stated preferences. The strong correlation presumably suggests some causality running from (stated) preferences to wives' labor market status. If this is true, then the analysis of the determination of stated preferences is an important economic analysis, as the stated preference eventually determines the action.

7 Conclusion

This paper examined the effect of being raised by working mothers on men's preference formation toward familial gender roles. We first set up a simple model to examine the effect of mother's work status on son's marriage decisions and his wife's labor supply, assuming that the mother's labor supply affects the formation of her son's preference. The empirical implications of the model are tested using the Japanese General Social Surveys, which consist of repeated cross-sectional data sets. We did not find strong supporting evidence for the model's prediction that those men raised by working mothers are more likely to have working wives than men raised by non-working

mothers. The failure to find supportive evidence could be due to confounding factors; the wife's work status could be determined by many different factors that could be correlated with the mother's work status when the son was an adolescent.

To overcome the difficulty in testing the model's behavioral implications, we directly tested the model's assumption that men raised by working mothers are less likely to be subject to traditional gender stereotypes. Using the recorded response to the statements regarding traditional, familial gender roles as the dependent variable, we found that men raised by full-time working mothers are significantly more likely to disagree with statements regarding traditional gender roles than the men raised by non-working mothers, holding other variables constant. Also, they are less likely to think that having a working mother is disadvantageous for a child. Men raised by mothers who were engaged in part-time job, self-employment, family business, or farming tend to have similar opinions on gender roles as men raised by non-working mothers. We speculate that full-time working mothers are away from the home for long hours, and this strongly affects the formation of sons' preference.

The results described above supplement the results obtained in Fernandez et al. [2004], which tested the model's behavioral implications, by directly establishing a straightforward link between mothers' working status and sons' attitudes toward gender roles using subjective responses to survey questions. This serves as a direct test of the validity of the assumption employed in the

model by Fernandez et al. [2004].

A policy implication from this study is that education that exposes adolescents to working women may change their thoughts on gender roles. Direct examination of the effect of the policy variable on men's opinions of gender roles, such as the effect of the gender composition of school teachers on men's attitudes toward gender roles would be an interesting future research topic that would derive fruitful policy implications.

The methodology employed in this study using stated preferences can be generally applied to the examination of the mechanism of the intergenerational transmission of labor market outcomes. It is generally difficult to identify the mechanism behind the observed correlation between the labor market outcomes of parents and children because there are many paths through which parents' outcomes can affect children's outcomes. The suggested method of using stated preferences can partial out the importance of the endogenous formation of preferences from several other transmission channels.

References

H Antecol. Why is there interethnic variation in the gender wage gap? *Journal of Human Resources*, 36(1):119–143, 2001.

Cabinet Office. *The poll on gender equality in society.* Printing Bureau, 2004.

Linda Datcher-Loury. Effects of mother's home time on children's schooling. *The Review of Economics and Statistics*, 70:367–373, 1988.

Raquel Fernandez and Alessandra Fogli. Culture: An emprical investigation of beliefs, work, and fertility. NBER Working Paper Series, #11268, 2005.

Raquel Fernandez, Alessandra Fogli, and Claudia Olivetti. Mothers and sons: Preference formation and female labor force dynamics. *Quarterly Journal of Economics*, 119(4):1249–1299, November 2004.

Jeremy Greenwood, Ananth Seshadri, and Mehmet Yorukoglu. Engines of liberation. *Review of Economic Studies*, Forthcoming, 2005.

Arleen A. Leibowitz. Home investments in children. *Journal of Political Economy*, 82(2):S111–S131, 1974.

Naoki Mitani. *Examining the post war Japanese economy (Sengo Nihon Keizai wo Kenshosuru in Japanese)*, chapter 5: Labor: Skill formation and labor force allocation (Roudou: Ginou Keisei to Roudouryoku Haibun), pages 353–454. University of Tokyo Press, 2003.

Yoko Morita. *Assistance for child rearing in the society of falling birthrate (Shōshi shakai no kosodate shien)*, chapter 10: Child care policy and female employment (Hoiku seisaku to josei no shūgyō). University of Tokyo Press, 2002.

David Neumark and Andrew Postlewaite. Relative income concerns and the

rise in married women's employment. *Journal of Public Economics*, 70: 157–183, 1998.

Sawako Shirahase. *Unseen inequality in the low birthrate and aging society (Shousi-Kourei Shakai no Mienai Kakusa)*. University of Tokyo Press, 2005.

Ryuichi Tanaka. Working mothers as a role model for daughters: An emprical study of human capital accumulation. Institute of Social and Economic Research, Osaka University, 2005.

Table 1: Sample construction

Description	N
Original Sample	8,636
Male	3,968
Age, years of schooling, annual income, location, and prefecture are available	2,520
Mother's work status and parents' schooling are available	2,019
Husband's subjective answers are available for 5 items in 2000-2002: Analysis sample (1)	1,969
Married, wife's years of schooling, labor force status, the number of children are available: Analysis sample (2)	1,467

Table 2: Descriptive statistics

Sample: Married Couple, Analysis Sample (2)

		Mother's work status				
	Total	Not working	Part-time	Full-time	Self-employed	Farm
Wife is a part-time worker (dummy)	0.23	0.20	0.29	0.17	0.23	0.24
Wife is a full-time worker (dummy)	0.20	0.19	0.15	0.26	0.22	0.20
Wife is a self-employed or a family employee	0.11	0.06	0.05	0.04	0.20	0.18
Wife's years of schooling	12.34	12.76	12.66	12.83	12.51	11.69
	(1.99)	(1.91)	(1.69)	(1.70)	(2.15)	(2.05)
Wife's age	46.95	47.19	39.27	40.24	47.64	51.12
	(11.98)	(11.20)	(9.91)	(10.61)	(12.00)	(11.60)
Number of children less than 6 years old	0.65	0.57	0.56	0.75	0.54	0.74
	(1.07)	(0.99)	(1.02)	(1.08)	(1.08)	(1.14)
Husband's age	49.39	49.99	40.51	42.34	49.95	53.77
	(12.41)	(11.50)	(10.38)	(11.24)	(12.48)	(11.71)
Husband's years of schooling	12.94	13.70	13.16	13.35	13.30	12.03
	(2.62)	(2.56)	(2.32)	(2.34)	(2.64)	(2.57)
Husband's mother's years of schooling	9.49	9.96	10.02	10.61	9.36	8.60
	(2.58)	(2.59)	(2.24)	(2.48)	(2.79)	(2.42)
Husband's father's years of schooling	9.96	10.94	10.21	10.80	9.69	8.83
	(3.20)	(3.53)	(2.89)	(2.79)	(3.44)	(2.67)
Husband's Annual Income (Million yen)	6.16	6.34	6.21	6.19	6.15	5.97
	(0.72)	(0.64)	(0.50)	(0.61)	(0.73)	(0.84)
Urban Category (1: Rural-3: Big City)	1.92	2.04	2.01	1.95	2.05	1.76
	(0.64)	(0.61)	(0.61)	(0.65)	(0.67)	(0.64)
Number of Observations	1467	488	194	148	81	556

Table 3: Summary of mother's work status by age cohort

Sample: Analysis sample (2)

Mother's Work Status	N	Part-timer	Full-timer	Self-employed	Farmer
COHORT					
20-25	27	0.37	0.15	0.07	0.22
26-30	90	0.28	0.20	0.03	0.16
31-35	119	0.31	0.21	0.06	0.21
36-40	142	0.22	0.16	0.06	0.23
41-45	166	0.19	0.16	0.04	0.27
46-50	192	0.12	0.07	0.05	0.43
51-55	261	0.09	0.05	0.06	0.41
56-60	183	0.05	0.09	0.07	0.38
61-65	144	0.01	0.02	0.03	0.56
66-70	84	0.04	0.01	0.06	0.62
71-75	49	0.02	0.16	0.06	0.69
76-80	9	0.00	0.00	0.11	0.56
81-85	1	0.00	0.00	0.00	1.00
Total	1467	0.13	0.10	0.06	0.38

Table 4: Response to questions by mother's work status.

Sample: Analysis sample (1)

		Mother's Work Status at Age 15				
Statement	Response	No job	Part-time	Full-time	Self Emp	Farmer
"If a husband has sufficient income, his wife should not work."	Agree	57.98	49.51	47.53	52.94	55.92
"Husband should work outside the home and wife should keep the household."	Agree	58.91	48.86	43.50	56.86	62.28
"Mother's job holding has a negative impact on the development of pre-primary school child."	Agree	46.67	43.00	37.22	49.02	49.42
"It is more important for a wife to help her husband's career than to pursue her own career."	Agree	55.81	47.88	40.81	53.92	55.06
Number of observations	1969	645	307	223	102	692

Table 5: Probit and OLS regression of marriage selection.

Sample: Analysis sample (1)

	(1)	(2)
Dependent Variable	Married	Wife's Year of Education
Mother's work status		
Full-time	0.02	-0.01
	(0.02)	(0.14)
Part-time	0.04	-0.12
	(0.02)	(0.13)
Self-employed	0.04	0.00
	(0.03)	(0.17)
Farmer	-0.00	-0.09
	(0.02)	(0.09)
Log Likelihood / R^2	-626.11	0.50
N	1969	1467

Note: Standard errors are reported in the parentheses below the coefficients. Marginal effects of probit estimation are reported in the columns (1) and (2). Years of education, age, its square, urban dummy, mother's years of education, father's years of education, prefectural dummies, prefecture at the age of 15 dummies, year dummies, and a constant are included in all of the specifications, but the coefficients are suppressed. The sample size of (2) is reduced from (1) due to the perfect prediction.

Table 6: Multinominal logit regression of wife's labor market outcomes.

Sample: Analysis sample (2)

Panel A: Results without prefectural dummies

Wife's work status	Part	∂P/∂X	Full	∂P/∂X	SE	∂P/∂X
Mother's work status						
Full-time	-0.25	-0.05	0.18	0.04	-0.02	-0.003
	(0.27)		(0.24)		(0.48)	
Part-time	0.30	0.07	-0.38	-0.07	0.23	0.02
	(0.22)		(0.25)		(0.41)	
Self-employed	0.48	0.01	0.50	0.02	1.54	0.15
	(0.33)		(0.34)		(0.39)	
Farmer	0.42	0.04	0.39	0.02	1.11	0.07
	(0.18)		(0.18)		(0.25)	
Year dummy	Yes					
Prefectural dummy	No					
Prefectural dummy age 15	No					
Log Likelihood	-1680.08					
N	1467					

Panel B: Results with prefectural dummies

Mother's work status	Part	∂P/∂X	Full	∂P/∂X	SE	∂P/∂X
Full-time	-0.45	-0.04	0.03	0.01	-0.02	0.0001
	(0.29)		(0.27)		(0.51)	
Part-time	0.32	0.05	-0.46	-0.07	0.14	0.001
	(0.23)		(0.27)		(0.46)	
Self-employed	0.31	0.02	0.56	0.08	1.62	0.01
	(0.35)		(0.37)		(0.45)	
Farmer	0.31	0.03	0.34	0.04	1.17	0.01
	(0.19)		(0.20)		(0.28)	
Year dummy	Yes					
Prefectural dummy	Yes					
Prefectural dummy age 15	Yes					
Log Likelihood	-1527.15					
N	1467					

Note: Standard errors are reported in the parentheses below the coefficients. Marginal effects are reported in the columns ∂P/∂X. Wife's years of education, wife's age, its square, the number of children under age 6, the number of children, the log of husband's income, the husband's mother's yeas of education, the husband's parents' year of education, and a constant are included in all the specifications, but the coefficients are suppressed.

Table 7: Probit regression of husband's opinion of gender roles on husband mother's work status

Sample: Analysis sample (1)

Dependent variable: 1: Agree, 0: Disagree

Panel A

Statement	"If a husband has sufficient income, his wife should not work."		"A Husband should work outside the home and his wife should keep the household."	
Mother's work status at 15	(1)	(2)	(3)	(4)
Full-time	-0.08	-0.07	-0.12	-0.11
	(0.04)	(0.04)	(0.04)	(0.04)
Part-time	-0.05	-0.05	-0.05	-0.05
	(0.04)	(0.04)	(0.04)	(0.04)
Self-employed	-0.05	-0.06	-0.03	-0.02
	(0.05)	(0.06)	(0.05)	(0.06)
Farmer	-0.04	-0.04	-0.02	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)
Year dummy	Yes	Yes	Yes	Yes
Prefectural dummy	No	Yes	No	Yes
Prefectural dummy age 15	No	Yes	No	Yes
Log likelihood	-1331.31	-1280.96	-1282.25	-1209.91
N	1969	1969	1969	1969

Note: Marginal effects evaluated at the sample mean are reported. Standard errors for the marginal effects are in parentheses. The standard errors are calculated so that the t-values are equal to the corresponding probit coefficients. Years of education, age, its square, location category variable (3: metropolitan, 2: urban, and 1: rural), parents' years of education, year dummy variables, and a constant are included in all of the specifications, but the coefficients are suppressed.

Table 7: Probit regression of husband's opinion of gender roles on husband's mother's work status

Sample: Analysis sample (1)

Dependent variable: 1: Agree – 0: Disagree

Panel B

	"Mother's job holding has a negative impact on the development of pre-primary school child."		It is more important for a wife to help her husband's career than to pursue her own career.	
Mother's work status at 15	(1)	(2)	(3)	(4)
Full-time	-0.11	-0.08	-0.07	-0.06
	(0.04)	(0.04)	(0.04)	(0.04)
Part-time	-0.02	-0.01	-0.01	0.00
	(0.04)	(0.04)	(0.04)	(0.04)
Self-employed	-0.01	-0.01	0.01	0.01
	(0.05)	(0.06)	(0.05)	(0.06)
Farmer	-0.03	-0.01	-0.04	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Year dummy	Yes	Yes	Yes	Yes
Prefectural dummy	No	Yes	No	Yes
Prefectural dummy age 15	No	Yes	No	Yes
Log likelihood	-1321.27	-1276.72	-1299.96	-1244.20
N	1969	1969	1969	1969

Note: The same note applies as in Table 6A.

Table 8: Probit and OLS regression of marriage selection based on stated preferences.

Sample: Analysis sample (2)

	(1)	(2)
Dependent Variable	Married	Wife's Year of Education
Preference		
Panel A		
Wife should not work	-0.01	-0.04
(Agree=1)	(0.01)	(0.08)
Log Likelihood / R^2	-570.20	0.53
N	1921	1467
Panel B		
Wife should keep household	0.00	-0.08
(Agree=1)	(0.01)	(0.08)
Log Likelihood / R^2	-570.64	0.53
N	1921	1467
Panel C		
Negative impact on child	0.01	0.01
(Agree=1)	(0.01)	(0.08)
Log Likelihood / R^2	-570.37	0.53
N	1921	1467
Panel D		
Helping husbands more important	-0.01	-0.19
(Agree=1)	(0.01)	(0.08)
Log Likelihood / R^2	-570.63	0.53
N	1921	1467

Note: Standard errors are reported in the parentheses below the coefficients. The marginal effects of the probit estimation are reported in columns (1) and (2). Years of education, age, its square, location category variable (3: metropolitan, 2: urban, and 1: rural), parents' years of education, prefectural dummies, prefecture at the age of 15 dummies, year dummies, and a constant are included in all of the specifications, but the coefficients are suppressed. The sample size of (2) is reduced from (1) due to the perfect prediction.

Table 9: Probit regression of wife's employment on stated preferences.

Sample: Analysis sample (2)

	(1)		(2)		(3)	
Wife's work status	Part	∂P/∂X	Full	∂P/∂X	SE	∂P/∂X
Preference						
Panel A						
Wife should not work	-0.54	-0.05	-0.49	-0.06	-0.74	-0.005
(Agree=1)	(0.15)		(0.16)		(0.21)	
Log Likelihood	-1538.63					
N	1467					
Panel B						
Husband Work, Wife Household	-0.34	-0.02	-0.90	-0.13	-0.47	-0.001
(Agree=1)	(0.16)		(0.17)		(0.22)	
Log Likelihood	-1534.47					
N	1467					
Panel C						
Negative impact on child	-0.13	0.002	-0.65	-0.09	-0.44	-0.003
(Agree=1)	(0.15)		(0.16)		(0.21)	
Log Likelihood	-1540.56					
N	1467					
Panel D						
Help husband's career	-0.34	-0.02	-0.69	-0.09	0.50	0.005
(Agree=1)	(0.15)		(0.17)		(0.22)	
Log Likelihood	-1534.60					
N	1467					

Note: Standard errors are reported in the parentheses below the coefficients. Wife's years of education, her age, its square, the number of children under age 6, the number of children, log (income), parents' years of education, year dummy variables, and a constant are included in all of the specifications, but the coefficients are suppressed.