**Housework Participation and Fertility Intentions: Analysing the Gendered Division of Labour and Fertility in Taiwan**

Kamila Kolpashnikova, *University of Oxford*

Man-Yee Kan, *University of Oxford*

**Abstract**

**Purpose** The paper investigates whether fertility intentions increase when husbands do more housework.

**Methodology** Using the 2007-2016 Taiwan Panel Study of Family Dynamics, we examine the association between heterosexual husbands' housework participation on their own and wives' fertility intentions, according to the expectations of the post-transitional (occurring after the Second Demographic Transition) reversal in fertility rates and the gender revolution framework.

**Findings** Our analysis shows that the effects of spousal housework participation are evident among Taiwanese heterosexual women, but men's fertility intentions do not change depending on their own housework participation. In other words, more involvement in housework from husbands increases the fertility intentions among wives but does not increase their own fertility intentions. The results, therefore, indicate that Taiwanese men appear to lag behind on the gender revolution.

**Originality** The paper extends the existing literature on the effects of husbands' unpaid work participation on wives' fertility intentions.

**Keywords:** fertility intentions, housework participation, Panel Study of Family

Dynamics, Taiwan

Modern societies are plagued by low fertility rates (Billari and Kohler 2004; Frejka and Ross 2001; Kohler, Billari and Ortega 2002; McDonald 2000). Two striking patterns have emerged in counties of the global north. On the one hand, after a period of fluctuation, fertility rates settled close to the replacement level in some countries like the Nordic states, France, and the US (Goldscheider, Bernhardt and Lappegård 2015; McDonald 2009; Sullivan, Billari and Altintas 2014). On the other hand, in other OECD countries, especially in Southern Europe and East Asia, fertility rates dropped below the replacement rate and did not recover over the recent decades (Brinton et al. 2018). Considering low immigration levels in East Asia, in contrast with Southern Europe, the region is bound to experience shortages in the labour market, as well as the federal and local budget strains related to the support of rapidly increasing ageing population (Morikawa 2018). The prospects are particularly dire, considering that the reversal and stabilisation of fertility rates close to the replacement rate were only reported in western countries. However, Japan and Korea (both East Asian countries) continued to experience declining fertility rates (Myrskylä, Kohler and Billari 2009).

Theoretical developments in demographic research establish that gender role performances and intrafamilial relations shape these divergent trajectories in fertility rates (Esping-Andersen and Billari 2015). In the course of the gender revolution, fertility rates dropped as women began to take a more active role in education and the labour market (Brewster and Rindfuss 2000). These demographic changes were called the Second Demographic Transition (SDT) (Lesthaeghe and Van de Kaa 1986; van De Kaa 2002).

As the number of gainfully employed women rose, the association of labour market

participation with low fertility rates weakened and, in some cases, reversed by 1990s (Brewster and Rindfuss 2000). The reversal was common among countries with greater gender equality, where women retained more equal rights with men in the labour market and at home, particularly in Scandinavia (Esping-Andersen and Billari 2015). The increase in gender equality, as well as the widespread adoption of more egalitarian gender attitudes, were at the core of the reversal in fertility rates among countries, undergoing the SDT (Goldscheider, Bernhardt and Brandén 2013; Goldscheider, Bernhardt and Lappegård 2015; McDonald 2000; Myrskylä, Kohler and Billari 2009; Neyer, Lappegård and Vignoli 2013; Sullivan, Billari and Altintas 2014). Because fertility trend reversals occurred in countries with a considerable rise in husbands' contributions to domestic work, scholars identified husbands' housework participation as one of the critical factors (Kan and Hertog 2017; Kan, Hertog and Kolpashnikova 2019; Sullivan, Billari and Altintas 2014).

Although cultural differences exist (Brinton et al. 2018), East Asian countries are similar to South European countries in low fertility rates and the equally low acceptance of gender-egalitarian attitudes in the general population (McDonald 2009). However, the literature is terse about the effects of men's participation in housework on fertility intentions outside the European and North American contexts, with only a few exceptions (Brinton et al. 2018; Kan and Hertog 2017; Kan, Hertog and Kolpashnikova 2019).

In this paper, we test the association between the gender-egalitarian division of household labour and fertility intentions in Taiwan using panel data. Even though Taiwan is unique due to its distinct historical and cultural trajectory, it also shares many commonalities with other East Asian regions. Confucian family values and the reverence for the elderly are among a few common customs honoured in East Asian societies. East Asian countries also share demographic

commonalities such as an increase in women's labour participation and educational attainment, a decrease in fertility rates, and an increase in delayed marriages (Kan, Hertog and Kolpashnikova 2019; Zhou and Kan 2019). This paper will investigate whether the association between men's participation in housework affects husbands' and wives' intentions to have more children.

**Theoretical perspectives on the Second Demographic Transition**

Many career women struggle to fit motherhood into their long list of responsibilities at home and on the job (Kan 2014; Kolpashnikova and Kan 2020). However, with the rise of more egalitarian gender views, when men involve in the domestic sphere more actively, the pressures on women abate. In such societies, fertility rates may reverse and approach the replacement level on the aggregate level (Goldscheider, Bernhardt and Lappegård 2015). The reversal of fertility rates occurs via two distinct mechanisms: (a) more involved husbands alleviate the burden of wives in heterosexual unions, whereas wives become more confident in having children when they can expect their husbands' help at home, and (b) gender-egalitarian ideology promotes more equal partnerships between people and, therefore, forms more stable unions with happier couples, able to trust in each other's support with maintaining a household and raising children.

Research in the area provided evidence for the effects of the SDT on fertility rates, but it was based predominantly on the data from western countries, even though the original theoretical framework was envisioned to apply regardless of the cultural context (Goldscheider, Bernhardt and Lappegård 2015). Sullivan, Billari and Altintas (2014) show that in conservative Southern and Central European societies, such as Italy, Spain, and Germany, fertility decisions became responsive to husbands' increasing participation in unpaid work. Their findings indicate that the SDT manifests itself in these countries and that their fertility rates might rely increasingly on the gender-egalitarian ideology and the equality between women and men.

However, a one-size-fits-all approach to explaining fertility decisions should not be taken at face value, particularly considering that two countries in the East Asian region, Korea and Japan, were identified as outliers in the original research by Myrskylä, Kohler and Billari (2009). The unique patterns of historical trajectories and the evolution of cultural institutions may have moulded distinct family relations which presently affect fertility decisions in East Asia (Balbo, Billari and Mills 2013). Moreover, the research of East Asian societies has consistently shown that the patterns of domestic relations are different from those in Europe and North America (Brinton et al. 2018; Qian and Sayer 2016; Raymo et al. 2015; Zhou 2016; Zhou, Wu and He 2017).

East Asia has a few similarities with these conservative European countries in both more traditional gender roles and low fertility rates. Even though earlier studies were able to confirm only the effects of the labour market participation on fertility decisions (Ono 2003), more recent studies reveal the trends characteristic for the SDT for the East Asian countries as well (Kan and Hertog 2017; Kan, Hertog and Kolpashnikova 2019).

Because the transition occurs in countries at different developmental stages (Goldscheider, Oláh and Puur 2010), the pace of the transition may vary across countries (Sullivan, Billari and Altintas 2014). Moreover, it might not always have a linear progression. This paper seeks to confirm whether the association between men's participation in housework and fertility intentions in one of the East Asian societies, Taiwan. The results of this paper will allow testing the applicability of the claims of the post-SDT fertility reversal theory to the effects of egalitarian gender attitudes on fertility intentions in Taiwan, and East Asia, in general, extending the relevance of the framework to diverse cultural contexts.

**Gender inequality in East Asia and the link with fertility**

Few studies examined fertility in East Asia (Chen and Li 2014; Frejka, Jones and Sardon 2010; Raymo et al. 2015; Sechiyama 2013), but even less—applied the post-SDT framework to the analysis of the regional demographic trends. Frejka, Jones and Sardon (2010) present an exhaustive study of childbearing trends in East Asia (except China) since the 1950s. They emphasise the role of the expansion of education in the precipitous decline of fertility rates. Raymo et al. (2015) ascribe the low fertility in East Asian countries to the rapid social and economic changes, which transpired without the commensurate changes in family attitudes. Chen and Li (2014) emphasise that the role of governments had on fertility rates was not uniform; it exerted and continues to exert a stronger influence in China than in other counties of East Asia. Throughout history, the differences in governmental intervention formed diverging patterns within the region (see Estevez-Abe and Naldini 2016 for a comparison of Japan and South Korea).

Additionally, Suzuki (2013) argues that the declining fertility in East Asia is the result of the endemic gender inequality and Confucian family ideals. Similarly, McDonald (2009) suggests that gender inequality in East Asian societies exacerbates work-family conflict, and the lack of economic security among women results in the low fertility rates in the region. Therefore, most studies converge on the idea that fertility decline was at least partially because of the persistent gender inequality in East Asia. These arguments can be confirmed if our study can show that more egalitarian arrangements at home influence the fertility intentions of women and men.

**Hypotheses**

Based on the theoretical ideas of the post-SDT fertility reversal (Esping-Andersen and Billari 2015; Myrskylä, Kohler and Billari 2009) and the previous empirical findings regarding

the association between fertility intentions and husbands' participation in domestic work in East Asia (Kan and Hertog 2017; Kan, Hertog and Kolpashnikova 2019), we propose to test the following hypotheses:

**Hypothesis 1**: Husbands in couples where men contribute more to housework show higher fertility intentions.

**Hypothesis 2**: Wives in couples where men contribute more to domestic work also show higher fertility intentions.

Support for these hypotheses would confirm the relevance of the connections between the egalitarian division of housework and fertility intentions in the East Asian context. The support for hypotheses will corroborate our ideas, using the international cross-country comparison. It would also suggest that these countries are undergoing the SDT at the stage, characterised by meagre fertility rates and by the positive effects of gender egalitarianism on fertility intentions, i.e. the reversal stage of the J-curve in fertility rates (Myrskylä, Kohler and Billari 2009).

## Data

We analyse the 2007-2016 Taiwanese Panel Study of Family Dynamics (PSFD) (Acadmia Sinica 2019). This study started in 1999 to show the differences in family structures and dynamics in Taiwan and Greater China compared to the western world.

For the present study, we restricted our sample to the primary sample of married people who were in between 25 and 45. This selection left us with 9,368 person-year observations out of 34,062 in total. In 2007, the sample included the children of the original sample born in 1981-2, so the cohort of those born in 1982 is the youngest in the analytical sample.

We also excluded the observations with missing values in any of the main variables used for the analysis. This exclusion resulted in the analytical sample of 6,249 people (67% of 9,368),

including 2,690 men and 3,559 women, residing in Taiwan. Most of the missing values (1,584 and 953) come from the spousal paid work and fertility intention variables.

**Dependent Variables**

Our models use two main dependent variables in the analysis. One is the number of hours respondents report that they and their spouses spend on housework on an average week. Table 1 and 2 show that men spent, on average, 6.6 hours a week on housework, whereas women spent 17.4 in between 2007 and 2016. Although men estimated their own housework participation similarly to how women, on average, estimated their spouses' housework participation, men also underestimated the number of hours women spend on housework, compared to the housework time reported by women themselves. Longitudinal data reveals that people of the same cohort did not change their housework participation over time in Taiwan, reflected in the level of housework hours in Tables 1 and 2 over the period.

Another dependent variable, measuring the fertility intentions, is a dummy variable representing whether the respondent wants to have more children (=1) or not (=0). Table 1 and 2, summarising the descriptive statistics for the sample, show that the fertility intentions among men, on average, are higher than among women, because higher proportions of men report wanting to have more children (41.6%) than women (30.7%). In between 2010-2014, the tables show that there was a spike in the fertility intention both among women and men, which is explained by the aggressive government promotion of marriage among younger generations, following an economic recession (Hsueh 2018). It is interesting, however, to see this to be the case in the sample of the same people observed over time. It suggests that the overall fertility intentions in the society might affect individual fertility intentions, even if the individual is not

newly married.

**Independent and Control Variables**

For the housework models, we chose demographic variables and variables that are commonly used to explain the gendered division of housework, such as income transfer, personal and household incomes, and education variables because, in housework research, resource frameworks are usually measured by these variables.

Education variable is represented by years of schooling. Paid work time is measured in hours spent on paid work per week. Age is measured in years. Household size represents the number of all household members. Children are a variable measuring the number of children in households. Personal and household incomes are measured in thousand New Taiwanese dollars per year. Income transfer is calculated as a difference in personal income and partner's income, divided by the total income.

Tables 1 and 2 summarise the descriptive statistics for the samples of men and women by year. The overall educational level has increased among women and men between 2007 and 2016. Paid work time remained relatively stable over the period. Actual fertility, as reflected in the number of children, has decreased slightly from 2007 to 2016. Personal and household incomes remained level over the period. There is, however, a slight progression towards economic equality between women and men as reflected in the changes in the income transfer variable from 2007 to 2016.

PSFD also includes variables that measure family life satisfaction. We ran the robustness checks to see whether being more satisfied with one's family life makes women and men more likely to want more children. Although the coefficients show that those who are satisfied with their family lives are more likely to want more children (both women and men), they were not on

a statistically significant level. Additionally, the inclusion of family life satisfaction variables did not change the main findings regarding housework participation, so we did not include them into the models for parsimony concerns. The robustness check results can be provided upon request.

For the probit models of fertility intentions, we followed our previous research to allow comparability (Kan, Hertog and Kolpashnikova 2019). However, we also added housework hours of the respondent and the spouse as the explanatory variables, as well as the pressure from parents and in-laws to have more children (1= 'presence of the parental pressure', 0 = 'otherwise').

**Models**

The first set of models are on the hours spent on housework by women and men, as reported by respondents for themselves and their spouses. For these models, we use fixed-effects regressions on the panel PSFD data (person-years). In the second sets of models, we run the population-averaged probit models to estimate whether spousal housework participation affects fertility intentions in the average population, particularly among women. Random effects estimation is used to show whether the increase of housework time for individuals is associated with an increase in fertility intentions for the same individuals. In contrast, the population average estimators show whether parts of the population, which are performing more housework, are more likely to have higher fertility intentions, on average, than the parts of the population, which perform less housework. Model outputs are presented in Tables 3 and 4. We also ran a robustness check of our results, using the fixed-effect logit models. The coefficients in the checks were in the same direction as those reported in this paper. Additionally, we ran models with random effects instead of population-averaged. The results proved to be similar to those reported in this paper.

Table 1. Mean (SD) of Main Variables, Men (N=2690)

| | Men in 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2014 | 2016 | Total |
|---|---|---|---|---|---|---|---|---|---|
| Fertility Intention | 0.328 | 0.333 | 0.379 | 0.450 | 0.444 | 0.459 | 0.459 | 0.382 | 0.416 |
| | (0.471) | (0.472) | (0.486) | (0.498) | (0.497) | (0.499) | (0.499) | (0.486) | (0.493) |
| Housework | 5.210 | 5.114 | 6.340 | 9.347 | 6.452 | 6.047 | 7.176 | 5.908 | 6.576 |
| | (5.792) | (5.794) | (7.180) | (14.456) | (8.062) | (6.913) | (8.282) | (8.932) | (8.925) |
| Spouse: Housework | 13.544 | 14.184 | 14.917 | 16.840 | 12.719 | 11.462 | 13.128 | 10.891 | 13.159 |
| | (10.688) | (13.446) | (14.370) | (19.513) | (13.122) | (10.851) | (14.972) | (12.260) | (14.064) |
| Education | 9.031 | 9.039 | 9.485 | 9.759 | 10.071 | 10.298 | 10.804 | 10.987 | 10.139 |
| | (3.243) | (3.201) | (3.079) | (3.169) | (3.050) | (2.952) | (2.785) | (2.888) | (3.081) |
| Spouse: Education | 9.015 | 8.908 | 9.568 | 9.779 | 9.949 | 10.238 | 10.680 | 10.885 | 10.071 |
| | (2.855) | (3.042) | (2.894) | (2.882) | (2.931) | (2.891) | (2.671) | (2.669) | (2.901) |
| Paid Work Time | 51.179 | 49.899 | 46.772 | 49.676 | 50.314 | 49.206 | 49.527 | 47.597 | 49.210 |
| | (17.133) | (15.460) | (17.540) | (17.665) | (16.887) | (17.892) | (14.663) | (13.009) | (16.156) |
| Spouse: Paid Work Time | 45.354 | 46.298 | 45.005 | 46.628 | 45.579 | 44.623 | 44.297 | 43.288 | 44.956 |
| | (12.352) | (13.787) | (13.057) | (14.770) | (12.881) | (12.043) | (10.955) | (10.242) | (12.386) |
| Age | 35.892 | 36.298 | 36.432 | 34.186 | 34.673 | 34.772 | 35.701 | 36.858 | 35.542 |
| | (4.525) | (5.026) | (4.770) | (4.670) | (4.383) | (4.166) | (3.529) | (3.256) | (4.281) |
| Household size | 3.856 | 3.627 | 3.485 | 3.708 | 3.536 | 3.588 | 3.438 | 3.484 | 3.568 |
| | (2.396) | (2.209) | (2.170) | (2.361) | (2.393) | (2.396) | (2.182) | (2.067) | (2.268) |
| Children | 1.477 | 1.452 | 1.320 | 1.209 | 1.230 | 1.191 | 1.237 | 1.351 | 1.288 |
| | (0.904) | (0.921) | (0.939) | (0.922) | (0.909) | (0.931) | (0.912) | (0.859) | (0.913) |
| Personal Income | 667.451 | 611.808 | 644.785 | 613.513 | 603.089 | 618.992 | 676.831 | 746.417 | 652.951 |
| | (988.447) | (704.559) | (738.557) | (828.367) | (469.643) | (414.439) | (392.680) | (637.723) | (632.799) |
| Spouse: Income | 349.196 | 403.488 | 355.917 | 373.767 | 374.387 | 385.661 | 421.219 | 451.278 | 396.539 |
| | (199.938) | (675.451) | (209.674) | (596.638) | (338.793) | (291.720) | (228.794) | (363.828) | (391.601) |
| Household Income | 1016.647 | 1015.296 | 1000.703 | 987.279 | 977.476 | 1004.653 | 1098.050 | 1197.695 | 1049.489 |
| | (1024.365) | (985.054) | (815.383) | (1303.330) | (732.929) | (615.764) | (513.512) | (784.462) | (849.350) |
| Income Transfer | 0.256 | 0.226 | 0.267 | 0.232 | 0.236 | 0.247 | 0.223 | 0.231 | 0.237 |
| | (0.310) | (0.359) | (0.314) | (0.365) | (0.339) | (0.344) | (0.314) | (0.351) | (0.339) |

Table 2. Mean (SD) of Main Variables, Women (N=3559)

| | Women in 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2014 | 2016 | Total |
|---|---|---|---|---|---|---|---|---|---|
| Fertility Intention | 0.203 | 0.228 | 0.269 | 0.315 | 0.359 | 0.376 | 0.304 | 0.281 | 0.307 |
| | (0.403) | (0.421) | (0.444) | (0.465) | (0.480) | (0.485) | (0.460) | (0.450) | (0.461) |
| Housework | 16.237 | 14.512 | 15.545 | 22.873 | 18.533 | 17.891 | 17.027 | 14.018 | 17.371 |
| | (17.359) | (15.204) | (17.271) | (27.086) | (22.635) | (23.085) | (21.544) | (17.737) | (21.503) |
| Spouse: Housework | 5.233 | 4.795 | 5.402 | 9.639 | 6.496 | 6.278 | 6.747 | 5.280 | 6.460 |
| | (7.776) | (6.712) | (7.937) | (15.475) | (8.718) | (7.548) | (9.297) | (7.618) | (9.646) |
| Education | 9.047 | 9.098 | 9.523 | 9.498 | 9.792 | 10.301 | 10.507 | 10.698 | 9.985 |
| | (2.700) | (2.671) | (2.639) | (2.776) | (2.722) | (2.688) | (2.612) | (2.708) | (2.750) |
| Spouse: Education | 9.099 | 9.224 | 9.583 | 9.531 | 9.704 | 10.283 | 10.415 | 10.479 | 9.937 |
| | (3.119) | (3.137) | (3.174) | (3.050) | (2.969) | (2.933) | (2.891) | (3.109) | (3.061) |
| Paid Work Time | 34.246 | 32.815 | 31.413 | 32.876 | 33.712 | 33.458 | 34.065 | 33.059 | 33.292 |
| | (22.818) | (21.978) | (22.002) | (21.910) | (21.256) | (20.507) | (21.006) | (20.638) | (21.294) |
| Spouse: Paid Work Time | 48.681 | 49.323 | 49.572 | 51.210 | 50.533 | 49.520 | 49.302 | 49.032 | 49.734 |
| | (13.530) | (12.437) | (15.054) | (14.952) | (14.319) | (14.247) | (14.425) | (14.411) | (14.323) |
| Age | 35.095 | 35.358 | 35.284 | 32.900 | 33.327 | 33.665 | 34.928 | 35.928 | 34.436 |
| | (5.077) | (5.476) | (5.552) | (4.515) | (4.201) | (3.698) | (3.045) | (3.090) | (4.267) |
| Household size | 3.819 | 3.791 | 3.602 | 3.788 | 3.732 | 3.791 | 3.627 | 3.660 | 3.720 |
| | (1.932) | (2.043) | (2.081) | (1.972) | (1.989) | (2.154) | (1.959) | (1.926) | (2.005) |
| Children | 1.763 | 1.724 | 1.621 | 1.506 | 1.465 | 1.415 | 1.535 | 1.558 | 1.540 |
| | (0.958) | (0.938) | (0.987) | (0.937) | (0.925) | (0.949) | (0.956) | (0.913) | (0.945) |
| Personal Income | 338.563 | 335.359 | 336.386 | 284.720 | 322.830 | 348.795 | 366.995 | 382.685 | 341.853 |
| | (685.740) | (336.226) | (404.052) | (352.948) | (489.648) | (271.827) | (316.427) | (328.101) | (390.256) |
| Spouse: Income | 636.349 | 726.896 | 671.443 | 598.386 | 656.468 | 622.273 | 652.350 | 739.279 | 661.361 |
| | (399.735) | (850.819) | (756.715) | (636.462) | (857.355) | (409.341) | (407.657) | (589.481) | (624.529) |
| Household Income | 974.912 | 1062.255 | 1007.830 | 883.105 | 979.298 | 971.069 | 1019.345 | 1121.964 | 1003.214 |
| | (811.084) | (1031.425) | (925.750) | (739.778) | (1157.201) | (548.392) | (572.743) | (759.038) | (818.010) |
| Income Transfer | -0.391 | -0.390 | -0.387 | -0.399 | -0.351 | -0.319 | -0.325 | -0.353 | -0.357 |
| | (0.413) | (0.438) | (0.434) | (0.452) | (0.463) | (0.427) | (0.438) | (0.429) | (0.439) |

## Results

### Models on Housework Hours

Table 3 summarises the fixed-effects models on housework participation among men and women. The coefficients for control variables are, overall, in the expected direction. The time spent on paid work is inversely related to housework time, whereas spouses are more likely to do more housework if the respondents spend more time on paid work. These findings are in accordance with the time availability framework in housework research, stating that the more time women and men have, the more likely they are to do housework (Bianchi et al. 2000; Coverman 1985; England and Farkas 1986).

The results also show that older respondents, particularly women, and their spouses do less housework than younger generations. This finding is more characteristic of the Taiwanese society than of other (western) countries. According to the previous housework literature in western societies, younger generations are more likely to do less housework than the older generations because older generations have more traditional arrangements at home than younger people (Gershuny 2000). Considering that the sample is restricted to below 45 years of age, this finding is strikingly different from the patterns usually reported in western societies and cannot be ascribed to being younger. The findings that older generations have a more egalitarian division of housework, however, are also reported in other Asian societies such as in Central Asia, where older women have more power in (usually) multigenerational households (Kolpashnikova 2018; Kolpashnikova 2020), which is also true for Taiwanese families.

Motherhood contributes to the burden of housework responsibilities. Commonly, the time spent on housework increases with marriage and childbearing (Kolpashnikova, Kan and Shirakawa 2019a; Kolpashnikova, Kan and Shirakawa 2019b). Our results in Taiwan also show

that women with children report and are reported by spouses to spend more time on housework.

Overall, the respondents with higher levels of personal income report doing less housework than those who earn less, which confirms the mainstream (resource-based) findings in housework research (Killewald and Gough 2010; Sayer 2010). In particular, it is clear from the model results in Table 3 that although men's personal income does not affect the level of housework participation significantly, women's personal income affects both own and spousal housework participation. Women in higher quartiles of personal income are significantly more likely to report lower own housework hours and higher spousal hours.

The education variable does not appear to affect the respondent's own housework participation significantly. However, higher educated men are more likely to report higher levels of housework time spent by their spouses. Interestingly, the relationship between own housework and spousal housework does not seem to be a zero-sum game. On the contrary, in households, where women and men do more housework, their partners are likely to do more as well. One explanation for this phenomenon could be that rural households are more likely to require more housework hours than those in urban areas. Rural residence might be the case why in households where women do more housework than men, men are also more involved in domestic chores. This finding also puts the applicability of the bargaining explanations of housework participation in Taiwan into question.

The results of r-squared of the panel data reveal that the models can explain more of within-panel variation than between-panel, except in the Model (2) of women's own housework participation. The results reveal that the resource-based variables (and, by extension, theories) better apply to the explanation of the differences between women than between men.

Table 3. Fixed-effect Models for Housework Hours

| | Model (1) Men Housework | Model (2) Women Housework | Model (3) Men Spouse: Housework | Model (4) Women Spouse: Housework |
|---|---|---|---|---|
| Paid Work Time | -0.063*** | -0.134*** | 0.086*** | 0.050*** |
| | (0.017) | (0.031) | (0.024) | (0.013) |
| Spouse: Paid Work Time | 0.053** | 0.052 | -0.052 | -0.030* |
| | (0.019) | (0.037) | (0.034) | (0.014) |
| Age | -0.005 | -0.700*** | -0.410*** | -0.215** |
| | (0.075) | (0.151) | (0.112) | (0.070) |
| Household size | 0.167 | 0.571+ | -0.213 | -0.240+ |
| | (0.131) | (0.324) | (0.180) | (0.131) |
| Children | 0.320 | 5.520*** | 3.092*** | 0.648 |
| | (0.583) | (0.984) | (0.652) | (0.447) |
| Income Transfer | -2.084+ | -0.381 | 6.134*** | -1.173+ |
| | (1.150) | (1.320) | (1.548) | (0.628) |
| 1. Lower PI Quartile | Ref. | Ref. | Ref. | Ref. |
| 2. 25-50th PI Percentile | -3.684 | -6.140** | 2.057 | 1.546+ |
| | (4.901) | (2.223) | (6.005) | (0.797) |
| 3. 50-75th PI Percentile | -3.801 | -8.066** | -0.181 | 2.685* |
| | (5.044) | (2.781) | (6.442) | (1.063) |
| 4. Upper PI Quartile | -3.669 | -10.126** | -0.468 | 4.169** |
| | (5.017) | (3.073) | (6.615) | (1.359) |
| Education | -0.201 | -0.363 | 1.256** | 0.075 |
| | (0.481) | (0.626) | (0.478) | (0.303) |
| Spouse: Education | 0.050 | 0.933* | 0.049 | -0.055 |
| | (0.231) | (0.373) | (0.417) | (0.193) |
| Housework | | | 0.955*** | 0.278*** |
| | | | (0.040) | (0.025) |
| Spouse: Housework | 0.420*** | 1.046*** | | |
| | (0.063) | (0.055) | | |
| Constant | 6.641 | 26.363** | 1.773 | 6.078 |
| | (5.502) | (9.785) | (9.354) | (3.897) |
| Observations | 2690 | 3559 | 2690 | 3559 |
| R-squared within | 0.419 | 0.360 | 0.432 | 0.310 |
| R-squared between | 0.184 | 0.384 | 0.138 | 0.232 |
| R-squared overall | 0.303 | 0.381 | 0.265 | 0.272 |

Standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Note: PI = 'personal income.'

**Models on Fertility Intentions: Testing the Hypotheses**

In the second set of models, presented in Table 4, we estimated the likelihood of wanting to have more children. The focus and the main independent variables for the models were the spousal participation in housework among women and own housework participation among men while controlling for other demographic variables.

On the one hand, we do not find enough evidence to support Hypothesis 1 among men's own fertility intentions, because the association between own housework participation and fertility intention is not on a significant level. Moreover, the odds ratios, reported in Table 4, are lower than 1, meaning that with more housework hours per week, men are less likely to want to have more children.

On the other hand, we find support for Hypothesis 2 among women. Women, whose spouses contribute more to housework, are significantly more likely to want to have more children than women, whose husbands contribute less to housework. These findings strengthen the claims in Kan, Hertog and Kolpashnikova (2019) by confirming that more support from husbands in housework helps to improve the fertility intentions among women.

However, the results indicate that although the gender revolution might have influenced the fertility intentions of women, men are lagging behind because the gender egalitarianism does not affect their fertility intentions as the lagged adaptation hypothesis in gender revolution suggests (Gershuny, Godwin and Jones 1994). The results show that men are more likely to follow the traditional model when it comes to higher fertility intentions.

Overall, findings are supportive of the three-stage transitional theory findings in Kan, Kolpashnikova and Tai (2019), who also find that men are lagging in pre-transitional and transitional stages, whereas women are entering the post-transitional stage of the SDT.

Table 4. Probit models of the intention to have more children (odds ratios)

| | Model (1) Men | Model (2) Women |
|---|---|---|
| Housework | 0.997 | 0.998 |
| | (0.004) | (0.002) |
| Spouse: Housework | 1.008** | 1.006+ |
| | (0.003) | (0.003) |
| Paid Work Time | 1.003 | 0.996+ |
| | (0.002) | (0.002) |
| Spouse: Paid Work Time | 1.004 | 1.006** |
| | (0.003) | (0.002) |
| Age | 0.920*** | 0.898*** |
| | (0.010) | (0.009) |
| Household size | 1.027 | 1.006 |
| | (0.019) | (0.020) |
| Children | 0.244*** | 0.292*** |
| | (0.019) | (0.019) |
| Income Transfer | 1.024 | 1.044 |
| | (0.136) | (0.133) |
| 1. Lower PI Quartile | Ref. | Ref. |
| 2. 25-50th PI Percentile | 0.512** | 1.018 |
| | (0.126) | (0.141) |
| 3. 50-75th PI Percentile | 0.498** | 1.002 |
| | (0.125) | (0.163) |
| 4. Upper PI Quartile | 0.576* | 1.151 |
| | (0.152) | (0.221) |
| Education | 1.014 | 1.004 |
| | (0.020) | (0.022) |
| Spouse: Education | 1.047* | 1.065*** |
| | (0.021) | (0.020) |
| Pressure from parents | 1.303* | 1.279* |
| | (0.150) | (0.130) |
| Observations | 2690 | 3559 |
| Wald $chi^2$ | 430.900 | 589.259 |
| Degrees of freedom | 14 | 14 |
| P-value | 0.000 | 0.000 |

Exponentiated coefficients; Standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Note: PI = 'personal income.'

Table 5. Conditional marginal effects on the intention to have more children

| | Model (1) Men | Model (2) Women |
|---|---|---|
| Housework | -0.001 | -0.001 |
| | (0.002) | (0.001) |
| Spouse: Housework | 0.003** | 0.002+ |
| | (0.001) | (0.001) |
| Paid Work Time | 0.001 | -0.001+ |
| | (0.001) | (0.001) |
| Spouse: Paid Work Time | 0.002 | 0.002** |
| | (0.001) | (0.001) |
| Age | -0.031*** | -0.029*** |
| | (0.004) | (0.003) |
| Household size | 0.010 | 0.002 |
| | (0.007) | (0.005) |
| Children | -0.520*** | -0.335*** |
| | (0.029) | (0.020) |
| Income Transfer | 0.009 | 0.012 |
| | (0.049) | (0.035) |
| 1. Lower PI Quartile | Ref. | Ref. |
| 2. 25-50th PI Percentile | -0.260** | 0.005 |
| | (0.095) | (0.037) |
| 3. 50-75th PI Percentile | -0.270** | 0.000 |
| | (0.097) | (0.043) |
| 4. Upper PI Quartile | -0.217* | 0.040 |
| | (0.103) | (0.053) |
| Education | 0.005 | 0.001 |
| | (0.007) | (0.006) |
| Spouse: Education | 0.017* | 0.017*** |
| | (0.007) | (0.005) |
| Pressure from parents | 0.098* | 0.067* |
| | (0.042) | (0.028) |
| Observations | 2690 | 3559 |

Standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Note: PI = 'personal income.'

Table 5 summarises conditional marginal effects based on models in Table 4. It shows that an hour change in a weekly amount of spousal housework increases the intention of having more children by 0.2% among Taiwanese women. The same effect (but by 0.3%) can be observed among Taiwanese men. Although the associations are similar between women and men, the interpretations diverge. For women, the results indicate the support for an equal division of labour. For men, the outcomes are indicative of more traditional arrangements to be associated

with higher fertility intentions.

Among other variables, significantly associated with fertility intentions, Table 5 identifies education—women and men with better-educated spouses are more likely to want more children, paid work time—women, who work longer hours, are less likely to report wanting to have more children, older women and men are less likely to report wanting to have more children, and those respondents who receive pressure from their parents or in-laws to have more children are more likely to want more children.

## Conclusions

Our results show that women whose spouses contribute more to housework are more likely to want more children, which reflects more gender-egalitarian expectations. However, these expectations are not reciprocated on the men's side. Men, who participate more in housework, are not likely to want more children than men, who do less. These findings reflect the unevenness of the gender revolution in East Asia: women need more egalitarian arrangements, whereas men are slow to change. This lop-sidedness might be at the core of the steep decline in fertility rates in most East Asian countries.

It is, however, advisable to apply the findings of the present research to the rest of East Asia with caution. First, it is crucial to bear in mind that the gender revolution within East Asian countries have been uneven and with diverse trajectories for all countries in the region (Kan and Hertog 2017; Kan, Hertog and Kolpashnikova 2019). Second, Taiwan is a diverse society within itself, representing a multitude of peoples and cultures (Kolpashnikova 2019; Kolpashnikova, Galway and Sudoh 2016), which may also have different trajectories in gender revolution than the main pattern revealed by the present work. For instance, Kolpashnikova, Galway and Sudoh (2016) show that depending on national identity, the behaviours regarding cultural traditions and

religious observation may vary among Taiwanese. Considering cultural heterogeneity within the region, it might be difficult to generalise the findings of the present paper to countries and regions outside Taiwan, including those in East Asia.

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