Title: Relationship of Couples' Housework in 17 Countries

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Abstract:

The focus of our analysis is the effect of husbands' housework hours on those of wives' and the factors explaining the nation-level variation of that effect. The authors of this paper propose a hypothesis stipulating that there is a cross-level interaction between individual effect of husbands' housework and nation-level factors. The additional effect of husbands' housework time on that of the wives' are considered to have random variance among countries. Multilevel modeling technique is used to explain macro-level variance of intercept and coefficient by macro-level variables. Using the ISSP-2002 for 17 countries, the authors find that the nation-level variance cannot be explained by gender-egalitarian related variable like GEM and GDI. On the other hand, the national average of relative income by gender explains the substantive part of the nation level variance. Also variables such as gender gap on the employment and the labor force participation rate explain the nation level difference. Those findings reveal the relevance of the economic efficiency theory for explaining the couples' housework allocation. Husbands do less housework because it is economically efficient regarding the relative income gap between men and women. This study suggests that changes in the gender income gap might re-allocate couple's time to housework.

Introduction:

Recent research on household division of labor among couples has started to put focus on the national level comparison taking advantage of the availability of internationally comparable data like ISSP (International Social Survey Programme). However, those studies usually extend models which have been used for the analysis of a single country. For instance, the ratio of couples' housework allocation is the usual target of those analyses; taking couple's working hours, relative income level, number of children who need caring, and attitude for gender division of labor as explanatory factors (Shelton et al:1996, Bianchi:2000). Nickols & Metzen (1982), using United States longitudinal data on time use, point out that husbands increase their housework time when their wives increases their time spent at work. Using Michigan PSID from 1979-1987, Hersch, J. &Leslie S. S. (1994) point out that wives' housework time is positively related to their husbands' paid work hours while husbands' housework is unaffected by wives' paid work hours. Szinovacs (2000), using NSFH (National Survey of Family and Household) data, found that retired husbands use more time for housework because of the greater time availability. Matsuda & Suzuki (2002) test the time availability hypothesis in Japan and find basic support for it. Recent studies have found other factors affecting couple's housework allocation. South & Spitze (1994) point out the importance of couple status (living situation) and show that household formation increases women's housework hours while it decreases men's housework. Gupta (1999) found similar result using more recent data. Presser (1994) found the impact of employment schedule; husband's housework hours increases if his work

hours are different from his wife's. Shared results of those analyses are; relatively higher income for women, relatively scarce time availability for women, egalitarian attitude for men in terms of gender division of labor increase husbands' allocation of housework. The authors of this paper need comparative study to examine why husbands do more housework in some countries even after controlling for other characteristic.

Some comparative analyses implement models which are used in single country studies and attempt to demonstrate their validity after controlling for national average differences, using longitudinal models. Davis et al. (2007), for instance, uses ISSP-2002 data and demonstrates the more positive effect of egalitarian attitude toward husband's participation for housework among cohabiting couples than married couples. On the other hand, there are analyses which try to explain the national variance of the average or effect of explanatory variables. It is easily imaginable that if the effects of some explanatory variables were to be estimated, there would be an un-ignorable national level variation of that effect. Hook (2006) examines the effects of children in household on men's housework in 20 countries, using time-use surveys, and finds that the national variation of the effect can be explained by national level women's employment hours. Using ISSP-1994 with random intercept model of the multilevel analysis, Fuwa (2004) found that time restrictions on wives' housework have an effect that varies significantly among countries. This variance can be explained by national level attribute like GEM (Gender Empowerment Measure). In egalitarian countries, the effect of wives' relative time restrictions on housework is stronger than in less egalitarian countries. Couples' housework division occurs in a certain social environment that has specific norms that determine the appropriate rate of exchange. Geist (2005) uses ISSP-1994 data for a selection of 10 countries and finds that equal sharing of housework by both partners is rare in conservative countries. Diefenbach (2002), using ISSP-1994 data, examines the impact of spouses' relative resources on the division of housework in egalitarian, transitional, and traditional cultural contexts and finds that the relative resources have a greater impact on the division of housework in a transitional context than any other context. Batalova et al. (2002) also uses the 1994 data and finds that national cohabitation rates have equalizing effects on couples regardless of their own cohabitation experience, although the influence of cohabitation rates is only observed in countries with higher levels of overall gender equality. Those studies using ISSP-1994 only examine the husbands and wives relative share of housework because of the lack of information about "actual time" spent on housework. The share obscures national level factors that influence both husbands' and wives' time in the same direction (Hook, 2006). In order to capture the effect of husbands' housework time on those of wives, the authors of this paper use the ISSP-2002 data that contain the information on actual time for housework.

Previous studies, either using domestic data or internationally comparable data, have tried to explain the factors that increase husbands' share of housework or reduce those of wives', reflecting an egalitarian standpoint. From an economic point of view, however, another focus of analysis can be pointed out. That is, are wives' and husbands' time for housework substitutive or complementary?

And, if it is complementary, is that economically inefficient? Becker's theory of effective households predicts that they are substitutive in order to maintain economic efficiency. However, empirical research provides contradictory results. Using Japanese data, Ueda (2005) found that husbands' housework time is not a perfect substitute to the wives' housework time. Matsuda & Suzuki (2002) demonstrate similar relationships between husbands' and wives' housework time based on a time-survey in Japan. If husbands increase their housework, leading to a less economically inefficient household, what makes husbands do more housework in some countries and less in others? In this paper, the authors explore whether time allocation for housework is nationally different, and if so, what it is that explains the nation-level variation, using nationally comparable data.

Theory and Hypothesis:

As stated above, economic prediction of the relationship of wives' and husbands' housework is a substitutive one. Division and specialization of labor provide a more efficient outcome. On the other hand, one can think of several reasons for a complementary relationship. Egalitarian attitude might lead to joint housework rather than substitution. That is, if the total need for housework is increased, husbands and wives try to allocate the whole task in an egalitarian fashion, even if it is economically inefficient. The wives' housework and the husbands' housework can be considered as endogenous of each other, whether these are substitutive or complementary. However, since in almost all countries, women spend more time on housework than men, this paper uses a linear model which takes wives' housework time as the target variable. The additional effect of husbands' housework time on that of the wives' is considered to have a random variance among countries. A multilevel modeling technique is used to explain macro-level variance of intercept and coefficient by macro-level variables.

Data and Method:

This paper uses data from the ISSP (International Social Survey Programme) 2002, Family and Changing Gender Roles III. Countries that were lacking in specified variables were excluded from the analysis. 17 countries are used for the analysis: Germany, Great Britain, United States, Austria, Hungary, Norway, Sweden, Poland, New Zealand, Japan, Spain, Portugal, Denmark, Switzerland, Flanders(Belgium), Finland and Mexico. The response variable is "hours spent on housework per week by married or cohabiting women"*. The main explanatory variables are "hours spent on housework per week by married or cohabiting men". The focus of our analysis is on the effect and the relationship of husbands' housework hours on wives' housework hours and factors explaining the nation-level variation of that effect. The authors propose a hypothesis stipulating that there is a cross-level interaction between individual effect of husband's housework and nation-level factors. The individual level control variables are "working hours per week by wives and husbands (including those who cohabit)", "number of children under 6 years old within households", a "husband dummy (for controlling respondent bias)" and "age of the respondent".

* The actual question is "On average, how many hours a week do you personally spend on household work, not including childcare and leisure time activities?" The question is posed to respondents and their spouses.

The nation-level explanatory variables are GEM (Gender Development Measure), GDI (Gender-Related Development Index), and a national average ratio of income between women and men (women's average income/men's average income). GEM and GDI are taken from UNDP (2002: P.222). Ratio of income is calculated from the ISSP data. The authors also use data on the employment gender gap and the ratio of women in the labor market in each country taken from OECD (2004:Pp.295-296). The resulting sample size is 11153. The summary statistics are shown in Table 1.

Table 1: Descriptive Statistics

	Mean	SD	Min	Max
Dependent Variable				
Wives' hours of housework	21.16	15.43	0	95
Individual-level Variables				
Husbands' hours of housework	7.82	9.68	0	90
Husbands' hours of paid work	30.92	23.16	0	95
Wives' hours of paid work	17.89	19.55	0	95
Number of kids under 6	0.25	0.58	0	9
Sex	0.46	0.50	0	1
Age	49.22	14.40	18	96
Nation-level Variables				
GEM	0.70	0.10	0.50	0.84
GDI	0.91	0.04	0.79	0.94
Relative Income	0.55	0.10	0.38	0.70
Employment Gap	18.23	10.28	6.40	47.40
Labor Participation Rate Gap	16.29	9.61	3.39	43.70

The primary focus of the analysis is to test whether the relationship between wives' and husbands' housework is substitutive or complementary in each country. Should there be a substantive nation-level variance, the authors will try to explain it. Thus, the basic random intercept model is specified as

$$WH=(\gamma_{00}+u_{0j})+\beta_{01}HH+\beta_{kj}\mathbf{X}_{kj}+e_{ij} ,$$

where WH and HH denote wife's and husband's housework hours, respectively. This variance component model divides the error term to national level (u_{0j}) and individual level (e_{ij}), controlling for other individual variables ($\mathbf{X}_{kj}$).

The random coefficient model, which allows β_{01} to be randomly distributed among countries, is specified as

$$WH=(\gamma_{00}+u_{0j})+(\gamma_{10}+u_{1j})HH+\mathbf{X}_{kj}+e_{ij} .$$

The model which explains the nation level variance of the intercept (u_{0j}) and that of the coefficient (u_{1j}) is then

$$WH=(\gamma_{00}+\gamma_{01}NX+u_{0j})+(\gamma_{10}+\gamma_{11}NX+u_{1j})HH+\mathbf{X}_{kj}+e_{ij}\ .$$

Analysis:

The relationships of husbands' and wives' housework (OLS fitted line) for each country are shown in Figure 1. Contrary to prediction by the economic efficiency theory, most countries show a positive relationship between wives' and husbands' housework hours. In other words, if the total amount of housework is increased, husbands will try to keep their share of housework the same as before, so their time for housework will increase. By contrast, in countries like Japan and Spain, there seems to be no relationship between husbands' housework and wives' housework. Now using the multi-level model, the authors examine the effect of husbands' housework on those of wives' by controlling for each individual characteristic.

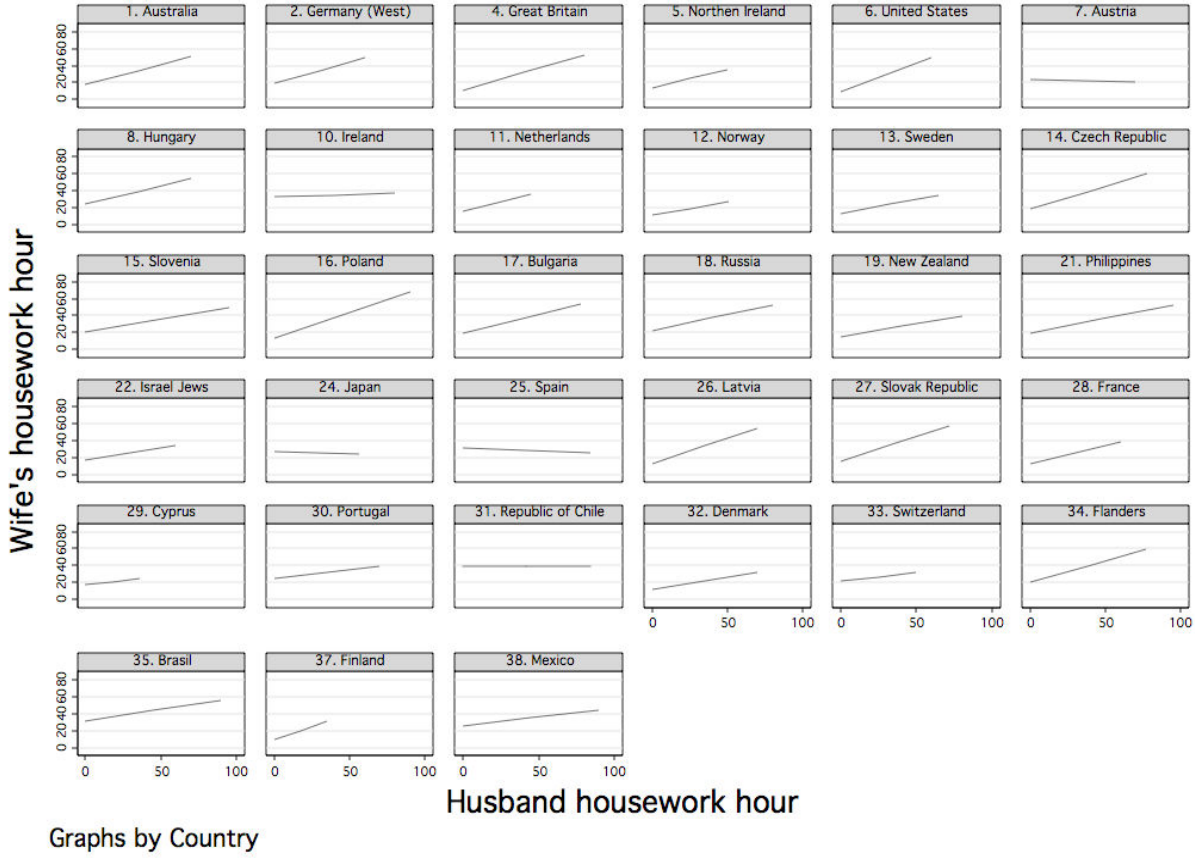

Figure 1: OLS fitted line by country

Table 2: Mixed effects Multi-Level Models predicting Wives' Housework

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Individual-level Variables												
Husbands' hours of housework(Intercept)	0.371 **	0.05	0.011	0.35	-0.043	1.08	-0.265	0.26	0.562 **	0.09	0.550 **	0.10
Husbands' hours of paid work	0.082 **	0.01	0.083 **	0.01	0.083 **	0.01	0.082 **	0.01	0.082 **	0.01	0.082 **	0.01
Wives' hours of paid work	-0.214 **	0.01	-0.214 **	0.01	-0.214 **	0.01	-0.213 **	0.01	-0.213 **	0.01	-0.214 **	0.01
Number of kids under 6	0.470 †	0.24	0.468 †	0.24	0.469 †	0.24	0.462 †	0.24	0.465 †	0.24	0.466 †	0.25
Sex	-0.763 **	0.25	-0.764 **	0.25	-0.763 **	0.25	-0.768 **	0.25	-0.764 **	0.25	-0.764 **	0.25
Age	0.075 **	0.01	0.075 **	0.12	0.075 **	0.01	0.075 **	0.01	0.075 **	0.01	0.075 **	0.01
Nation-level Variables												
GEM			-31.013 **	8.37								
GDI					-52.680 *	23.89						
Relative Income							-40.272 **	6.79				
Employment Gap									0.345 **	0.10		
Labor Participation Rate Gap											0.297 **	0.10
Cross-level Interactions												
Husband's housework×GEM			0.517	0.49								
Husband's housework×GDI					0.458	1.20						
Husband's housework×Relative Income							1.142 *	0.46				
Husband's housework×Employment Gap									-0.012 *	0.00		
Husband's housework×Labor Participation Gap											-0.010 *	0.00
Constant	18.960 **	1.42	40.663 **	5.97	66.642 **	21.66	41.545 **	3.94	13.637 **	1.93	13.765 **	2.10
Variance Components												
National-Level variance of the Intercept	0.212		0.205		0.212		0.178		0.180		0.187	
National-Level variance of the Slope	4.906		3.628		4.319		2.751		3.715		3.918	
Residual	0.212		12.926		12.927		12.927		12.926		12.927	
Log likelihood	-44428.55		-44426.34		-44426.34		-44416.41		-44421.41		-44422.91	
Wald Chi^2	1160.26		1166.99		1166.99		1228.88		1196.97		1187.55	
(Degrees of freedom)	(6)		(8)		(8)		(8)		(8)		(8)	
Prob.>Chi^2	0.000		0.000		0.000		0.000		0.000		0.000	
LR test vs. liner regression	1792.95		1232.33		1547.21		527.96		902.03		1005.18	
Number of Obs.	11153		11153		11153		11153		11153		11153	
Number of groups (Nation)	17		17		17		17		17		17	

** p< 0.01 * p< 0.05 † p< 0.1

Multilevel model regression results are shown in Table 2. There is a significant variance between nations (Model 1). Observing husbands' housework hours for instance, the slope is 0.371 and the nation-level variance is 0.212. From Model 2 to 6, the authors examine which national level variable makes this nation-level variance smaller. For that purpose, the authors introduce the interaction of husbands' housework and national level variables to the models. GEM and GDI did not explain the national level variance of the husband housework on that of wives' (Model 2 and 3). Although, relative income has some explanatory power over the variance: the marginal effect of husbands' housework hour on that of wives' increases as relative income increases (Model 4). The authors also find the explanatory power of the gender gap in the employment and labor participation rates (Model 5 and 6) on nation level variance: when the gender gap become smaller, the effect of husbands' housework on that of wives' is increased. This means that husbands substitute wives share of housework because it is economically efficient to do so.

Discussion:

The national level variance of the effect of husbands' housework hour on that of wives' cannot be explained by gender-egalitarian related variables such as GEM and GDI. These explain the reduction of wives' housework share compared to that of husbands' (Fuwa 2004), but are no longer effective in explaining the variance of domestic housework time allocation. Instead, national average of relative income by gender explains a substantive part of the national level difference. Also, variables such as the gender gap in employment rates and the labor force participation rates explain the national level difference. These findings reveal the relevance of the economic efficiency theory in explaining husbands' and wives' housework time allocations. Husbands do less housework than wives because it is economically efficient to do so (opportunity cost for housework is lower for wives). This study suggests that changes in the gender gap on income might reallocate couples' time to housework.

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