
Women's housework decreases fertility: Evidence from a longitudinal study among Finnish couples

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Abstract

Changes in the gendered divisions of domestic work are often assumed to influence couples' childbearing behaviour, but existing evidence is mixed and mostly limited to cross-sectional data. We study how the amount and division of housework and childcare predict subsequent childbearing among Finnish couples using Finnish Time Use Survey 1999–2000 (FTUS1999) time diary data linked with register data on subsequent births. Results show that women's housework hours were negatively associated with the likelihood of having children at all parities. Men's contribution to domestic tasks, measured in relative terms, had no impact on childbearing. However, a higher male share of childcare time slightly increased the couple's likelihood of having a second child. Results are markedly robust to the inclusion of socioeconomic factors. We conclude that while women's excessive domestic work in itself may decrease fertility, men's housework share is not associated with continued childbearing.

Keywords

Division of housework, gender equality, fertility, time use, time diary survey

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Introduction

The relationship between the gendered division of housework and childbearing has been of considerable interest to social scientists. It is widely assumed that more egalitarian family roles will reduce women's double burden and thus promote couples' childbearing (Esping-Andersen, 2009; McDonald, 2000a, 2000b; Neyer et al., 2013). However, research on the relationship between fertility and gender equality in housework is limited and draws a conflicting picture. Some studies have found traditional gender role attitudes and behaviours to be associated with earlier and higher fertility (see e.g. Bernhardt and Goldscheider, 2006; Henz, 2008; Kaufman, 2000; Philipov, 2008; Pinnelli and Fiori, 2008; Westoff and Higgins, 2009), while other studies have found that egalitarian gender roles and a more equal sharing of domestic labour do indeed increase childbearing (see e.g. Cooke, 2009; Duvander and Andersson, 2006; Miettinen et al., 2011; Mills et al., 2008; Puur et al., 2008; Torr and Short, 2004).

The inconsistencies are partly due to differences in how gender equality is defined and measured. Several studies on the impact of domestic gender equality on fertility measure gender role attitudes, not sharing behaviours (for instance, Kaufman, 2000; Miettinen et al., 2011; Philipov, 2008; Puur et al., 2008). Although attitudes can provide important information about intra-familial gender relations, their value as an indicator of the actual division of unpaid work within a family is limited (Evertsson, 2014). The rare studies which have explored everyday activities and the division of household work tend to rely on subjective accounts of the partners' relative contributions to unpaid work (for instance, Goldscheider et al., 2013; Mills et al., 2008; Pinelli and Fiori, 2008; Tazi-Preve et al., 2004). While these measures are easy to incorporate into fertility surveys, they are often restricted to a few predefined household tasks and not necessarily very accurate. More importantly, they ignore differences in the magnitude of domestic work between households: a male partner's greater share of unpaid work may be less important among couples doing little household work anyway, for instance.

This article investigates how each partner's participation in household and childcare activities influences the subsequent childbearing of couples. We use time diary data on couples' housework from the Finnish Time Use Survey 1999–2000 (FTUS1999) combined with register data on births during the subsequent five years. Time use data provides detailed, reliable and impartial information on domestic work performed by a couple, thereby painting a more accurate picture of each spouse's contribution to housework than in surveys, while also accounting for the variation in the amount of housework between individuals and households. We distinguish between housework (preparing meals, washing, cleaning, repair works, etc.) and childcare, since they have somewhat different implications on fertility.

The context of our study is a developed and wealthy welfare state with comparatively high gender equality. In Finland, the state promotes women's employment and provides family leaves, services and benefits to alleviate the double burden of parents. Finnish adult women typically live in dual-breadwinner households, in which partners are expected to share the provider and caretaker roles. Although women have a strong position in the labour market, men's participation in housework and childcare has increased only slowly during the past decades. Finnish women continue to do about two thirds of unpaid work in the family while also being engaged in full-time work (Miettinen and Rotkirch, 2012; Pääkkönen, 2010). Given the apparent discrepancy between the high level of gender equality in the labour market and the rather traditional gender roles in the family, we expect that a decrease in female housework and a more egalitarian division of domestic tasks and childcare will promote couples' childbearing.

Domestic gender equality and fertility

Theoretical background

In all industrialized societies, the growth in women's education and employment has narrowed the gender gap in time spent on housework. Much of this change has concerned women who are now doing less

housework, whereas men have been slow to increase their participation (Bianchi et al., 2000; Craig and Mullan, 2010; Gauthier et al., 2004; Sayer et al., 2004).

The changing position of women has contributed to the postponement of childbearing and low fertility. Opinions differ, however, regarding which mechanisms link women's participation in paid work with fertility. Neoclassical economic theory assumes that gender specialization – with men devoting their time to paid work and women to unpaid household tasks and childcare – promotes marital stability and childbearing in families (Becker, 1993). It maintains that the opportunity costs related to female employment surpass any positive income effect, leading to lower fertility among dual-earner couples. Accordingly, many studies have found a traditional division of labour to correlate positively with fertility (Matysiak and Vignoli, 2008).

The neoclassical economic view has been challenged by some sociologists, who instead suggest that increasing financial insecurity and (male) unemployment can make it attractive for families to follow a strategy of dual employment. Consequently, more symmetrical spousal roles may boost fertility (Mills and Blossfeld, 2005; Oppenheimer, 1994). In today's Europe, relatively high fertility rates combined with extensive female labour force participation are currently found in the Nordic countries and in France. This suggests that fertility could rise in low-fertility societies once women's role conflict is solved and gender equality in unpaid work matches that in paid work (Esping-Andersen, 2009; McDonald, 2000a, 2000b; Neyer et al., 2013). Recent studies have indeed shown that women's increasing economic potential and employment may encourage couple's childbearing (Adsera, 2011; Andersson, 2000; Brewster and Rindfuss, 2000; Winkler-Dworak and Toulemon, 2007). These studies do not specifically apply gender symmetry to the division of housework, although they appear to assume that a more even division of unpaid work follows from a more egalitarian division of paid work.

Both the gender specialization and gender symmetry models presume a rather straightforward link between sharing domestic responsibilities and fertility. Other studies have paid attention to couple negotiations and expectations related to time allocation. Partners can trade money for time, commitment, sex or other resources for mutual benefit (Brines, 1994). Accordingly, women may interpret a male partner's housework as a sign of commitment to the relationship and the family, so that male housework is associated with greater marital satisfaction among wives (Frisco and Williams, 2003), which then promotes childbearing. A husband's bigger paycheck may also be traded against more housework from the wife even among dual-earner couples. In such situations, a more traditional division of housework may be perceived as fair and thus no hindrance to fertility (McDonald, 2000a, 2000b).

Gender ideology may influence both the distribution of tasks as well as perceptions of its fairness (Baxter, 2000; Coltrane, 2000; Evertsson, 2014). An inconsistency between expectations and the actual sharing of domestic tasks may be more important to fertility decisions than the real division of housework. Accordingly, Goldscheider et al. (2013), studying Swedish couples, found the gap between attitudes and the actual sharing of housework to be more important for continued childbearing than actual sharing behaviour. Gender ideology is related to educational level: women with a higher education are more likely than others to both favour and implement egalitarian family roles (Bianchi et al., 2000; Knudsen and Waerness, 2008; Sayer et al., 2004). A disproportionate share of housework is thus more likely to cause distress and conflict among highly educated women, or in dual-earner couples who share the provider roles. In these couples, women can be assumed to have more power and motivation to negotiate a higher male share of tasks. Dual-earner or high-income couples also have more resources to use paid help or purchase household services, reducing the demand for unpaid housework. A woman's earnings can thus influence the division of housework in two ways: higher income gives her more power in spousal bargaining as well as more resources to outsource part of the housework.

The male partner's view has been notably absent from theoretical considerations. The benefits of a more egalitarian relationship are less clear from the point of view of men, for whom a more equal sharing of unpaid work generally means an increasing workload. This is likely to depress male childbearing desires rather than increase them. Time use studies have shown that men's involvement in childcare tasks has progressed much faster than their participation in other household duties (Gauthier et al.,

2004; Sayer et al., 2004). While caring for small children may be a particularly time consuming activity, it often carries a different meaning to parents compared to other household routines. Presumably, men's participation in childcare signals a commitment to both fatherhood and the current couple relationship. This may improve women's marital satisfaction, thereby influencing couples' childbearing. Devoting time to children can also reflect a male personal preference for family life and children, which as such may contribute to higher fertility (Rotkirch et al., 2011). The few empirical studies about the effect of gender equality on men's fertility provide contradictory results: some find that egalitarian attitudes increase men's fertility intentions or fathering of a child (see e.g. Kaufman, 2000; Miettinen et al., 2011; Puur et al., 2008), while others find the opposite, or no visible effect (Bernhardt and Goldscheider, 2006; Philipov, 2008; Torr and Short, 2004; Westoff and Higgins, 2009).

Previous findings

Only a few longitudinal studies have previously investigated whether the actual housework contributions of partnered men and women relate to subsequent fertility. Cooke (2004) (for Germany), Nilsson (2010) (for Sweden), Goldscheider et al. (2013) (also for Sweden) and Craig and Siminski (2011) (for Australia), using panel data, found no effect of the man's share of domestic work on subsequent fertility. Neither did Schober (2013) find any clear association between British men's domestic work and subsequent fertility, although couples in which men participated less in housework had a higher risk of divorce than couples with a more egalitarian division of tasks. However, these studies used less reliable measures of housework and childcare than do time diary surveys.

A more egalitarian division of housework is likely to have a stronger impact on fertility among employed women. Accordingly, Torr and Short (2004), investigating dual-earner US couples, found a U-shaped association between the division of housework and second birth risks: both couples where wives did less than half of the housework, and couples where husbands contributed only little, were more likely to proceed to a second child than were intermediate couples. However, Henz (2008), measuring subjective accounts of the division of tasks, found the opposite to be the case in Germany, as a traditional division of housework increased the transition to parenthood among West-German couples even when the mother was expected to work. In Cooke (2004), a more egalitarian division of housework had no impact on couples' fertility, but the negative impact of a woman's employment on subsequent births diminished somewhat once the domestic division of tasks was accounted for.

Compared to studies on the impact of men's domestic work on fertility, findings from studies on fathers' involvement in childcare have been more consistent. Thus in Spain and Italy, fathers who played a substantial role in care activities with the first-born had a second child sooner (Cooke, 2009). Similarly, childcare provision by Italian fathers significantly increased the intention to have a second child among working women (Pinnelli and Fiori, 2008). Brodmann et al. (2007) found that paternal childcare positively influenced childbearing among Danish but not among Spanish couples. A positive effect of fathers' greater childcare contribution on fertility has also been found in Sweden and Norway in studies on men's use of parental leave (Duvander and Andersson, 2006; Duvander et al., 2010; Oláh, 2003).

Hypotheses

Based on the previous theoretical and empirical considerations, we investigate the relationship between gender equality in domestic work and childbearing in couples through the following hypotheses:

First, we expect a more egalitarian division of housework to increase couples' transition to a subsequent birth (Hypothesis 1). Given that parenthood considerably increases women's housework, we expect the impact to be more apparent among parents than childless couples.

Second, we expect the impact of increasing gender equality on fertility to be contingent on the intensity of the role conflict for the woman (Hypothesis 2). The effect of a more egalitarian division of housework is expected to be stronger among dual-earner couples, in particular among women with a long

working week (Hypothesis 2.1), and among women who share the provider role in the family, compared to dual-earner households in which the man is the main provider (Hypothesis 2.2).

Third, among parents, we expect men's share of childcare to be positively associated with subsequent childbearing (Hypothesis 3).

Data and method

Data

We use the Finnish Time Use Survey 1999–2000 (FTUS1999, collected by Statistics Finland). The surveyed households were drawn from the entire 15+-year-old population in Finland. In the sampled households, all members aged 10 years or older were asked to keep time diaries over one weekday and one weekend day (each household member filled in the diaries on the same days). The diary was returned by 56% of households and 52% of individuals (Niemi and Pääkkönen, 2001). The survey included questions on household composition and individual socioeconomic and demographic characteristics. Data was weighted by Statistics Finland to adjust for the disproportionate share of weekend days as well as for the sampling method and nonresponse bias.

We then combine the FTUS1999 time use data with register data on births, emigration and deaths (from 1999 to 2004) for the respondents (linked by Statistics Finland). This allowed us to investigate how the division of domestic tasks and other individual and couple-level characteristics in 1999 affected couples' fertility over the five subsequent years. We limited our study to cohabiting or married couples in which the woman was between 18 and 44 years of age in 1999. We also excluded couples who had three or more children as only a few of them proceed to have more children. Couples whose youngest child was older than 15 years were also excluded. In addition, only those days for which both partners had completed diaries were selected into the study, reducing our sample by 10% to 896 diary days (reduction in couples was 8%).

After these eliminations, our sample consisted of 504 couples (43,846 person months), of which 148 (29%) had a first, second or third child between 1999 and 2004. Although the sample size is not very large due to the eliminations and relatively low response rate in the original time use survey, we expect that the precision of the measurement of the main independent variables as well as the option to use carefully designed weights to cover for the nonresponse bias will partly compensate for the limited sample size. In addition, there is no bias due to attrition in the follow-up of the respondents, as the information on subsequent births was drawn from the population register for all respondents in the time use survey. Thus, compared with many longitudinal or panel studies with high attrition rates, we expect that our analyses are able to provide a fairly accurate picture of the associations between the dependent and independent variables.

Measurement of the division of housework

Our main explanatory variable is the division of housework between partners. Participants were asked to report their daily activities in 10-minute intervals during one weekday and one weekend day. These were weighted to obtain an overall average of each partner's time devoted to housework and childcare per day. Household tasks include meal preparation, dish washing, cleaning the house, washing and ironing, shopping, car maintenance and repairing, and outdoor tasks. We further classified some of these activities as routine tasks: these included preparation of meals, dish washing, doing the laundry and ironing, cleaning the house, and shopping – activities often performed mostly by women.

We distinguish childcare time from other domestic work. In the present study, childcare includes helping children with their meals, the physical care of children, helping with their homework from school, playing and reading with children, going out with children or accompanying them, and taking children to school, day care, or to hobbies. Although childcare tasks diminish markedly as children age,

parents of young teenagers still spend time in activities such as helping the young with their homework, or taking them to hobbies.

In the time diaries, respondents could identify a main and a secondary activity in case they were engaged in simultaneous activities. We used data from both the main and the secondary activity to measure childcare hours, since childcare reported as the main activity has been shown to underestimate considerably parental time with children (Folbre et al., 2005; Miettinen and Rotkirch, 2012). Data on household chores comprises only time use in the main activity.

Although we lack information on how the spousal division of housework evolves during the follow-up period, we are fairly confident that the situation of the couples in 1999 reflects rather well the division of housework during the subsequent five-year period. Studies on the long-term division of household work in couples have found marked stability in spousal distribution of tasks once the effect of the entry into parenthood is taken into account (Evertsson and Nermo, 2007; Kühhirt, 2012).

In the preliminary analyses, we examined the impact of housework and childcare on childbearing by considering various measures of housework and its division between spouses: each partner's housework time in all household chores, in routine tasks, and in childcare, measured in absolute hours as well as in relative time use (i.e. the percentage of time men (or women) spend in housework or in childcare tasks relative to the total daily housework or childcare time of both partners). In the final analyses we incorporate two measures of housework. One is the amount of female housework hours and the other is the male partner's share of housework, measuring directly the division of unpaid work between partners. In a similar fashion, we use women's childcare hours and men's share of childcare to examine the impact of the division of childcare on couples' subsequent childbearing. Since the analyses using either total housework or routine housework gave similar results, only the division of the routine tasks was included in the final analyses. We also focus here on female housework hours (instead of both partners' combined housework hours), since it is a straightforward measure of her workload while (male) housework share measures the division of tasks. We also explored categorical representations of our main variables, but since they did not add any insights to the analyses, we use woman's housework and childcare hours and man's housework and childcare share as continuous variables in the models.

Control variables

The regression analyses control for factors known to influence childbearing behaviour: the age of the female respondent, number of children living in the household and the age of the youngest child (if the couple had children), place of residence (urban/rural), and type of union (married/cohabiting). FTUS1999 does not provide information on whether the children living in the household are shared or stepchildren. This is an obvious shortcoming in the data, since the wish to have a common child increases childbearing among remarried couples (Henz and Thomson, 2005; Vikat et al., 2004). However, we have no reason to expect that the effect of the division of housework on continued childbearing among couples with stepchildren is very different from couples who have no children, or only shared biological children.

Socioeconomic characteristics include each partner's educational attainment (only basic level/middle level/tertiary level), partners' economic activity (weekly employment hours; non-employed respondents were assigned 0 hours), each partner's enrolment in education, total household income (logged), and the proportion of the woman's income of the total household income (see Appendix Table 5 for the distribution of control variables). Income includes all income derived from earnings, social and unemployment benefits, parental leave benefits, etc. Earnings from gainful employment could not be separated from all income since the data included only information on total (taxable) income. All independent variables are measured at the time of the FTUS1999 survey (i.e. they are time-invariant).

In our sample, close to 70% of childless women and mothers were gainfully employed, most of them full-time. Being a full-time homemaker is rare in Finland if there are no children, or if the children have grown older: most mothers return to the labour market after 1–2 years of parental leave. On average,

employed women without children worked 34.9 hours per week and employed mothers 36.6 hours per week. Men's weekly working time was on average 39 hours. 20% of childless women and 12% of childless men were studying.

Method and analytical strategy

Cox proportional hazards models were applied to analyse the impact of the division of housework on the birth of a child within the following five years after the FTUS1999 survey. The time until the birth of a child (or until a censoring event) was measured as months since the completion of the time diary in 1999. A couple was excluded from the analyses if they had a child within the first five months after completing the FTUS1999. This is to avoid anticipatory analysis, since the male partner may assume a bigger share of household tasks due to his partner's pregnancy. Couples were followed until the birth of a child, or until the emigration or death of either partner, if this took place before the end of the five-year follow-up period. Ideally, we would have liked to control for the separation of the couples, but the register data included only information on the date of (juridical) divorce and not on moving apart, which would have been a more accurate date for estimating the true exposure period for pregnancy.

Our analytic procedure was as follows. We first investigated the impact of a woman's hours in routine housework and a husband's relative share of routine tasks on continued childbearing among all childless respondents and parents (Hypothesis 1). Since it could be expected that a male partner's contributions would have a stronger impact on a couple's decision to have a(nother) child at both extremes, we tested for a curvilinear relationship between men's share of housework and childbearing.

Next, we examined the impact of the division of housework on childbearing among dual-earner couples (Hypothesis 2). We studied how women's housework both in relative and absolute terms affects the propensity to have a(nother) child among couples who share paid work more evenly, paying special attention to mothers with a long working week (Hypothesis 2.1). We also tested for an interaction between the female partner's share of household income and the division of housework in dual-earner couples (Hypothesis 2.2). We assumed that a traditional division of tasks would not discourage childbearing among dual-earner couples in which the male partner bears the main responsibility for the household income compared to couples in which women account for a substantial or greater share of the total household income.

Finally, we investigated the impact of paternal involvement in childcare on couples' transition to a second or a third child (Hypothesis 3).

Since we cannot follow the couples from the start of their union, or from the birth of a child, the problem of left-censoring arises. For example, couples who had already had their first child before the FTUS1999 survey are not included in the group of childless couples. Thus we know nothing about their division of housework before the birth of the first child or its impact on the likelihood of birth. It could be that couples with a traditional division of housework entered parenthood very quickly and thus do not contribute to our sample of childless couples. In a similar way, couples who had already had their second (or third) child are excluded from our sample of one-child (two-child) parents. The majority of Finnish couples have their children within intervals of a few years, so that left-censoring is likely to be more relevant among couples with relatively old children. To evaluate the effect of the left-censoring, we tested if the results for childless couples depended on the age of the woman (used here as a proxy for union duration), or, for couples with children, on the age of the youngest child. For couples without children, we included an interaction between the age of the woman and the division of housework. For couples with children, we first tested for an interaction between the age of the youngest child and the division of housework, and second, restricted the sample to couples in which the age of the youngest child was below 10 years. None of these tests yielded marked changes in the directions or strength of the effects found in the main analyses.

In the analyses, we used STATA software (StataCorp 2011) Cox regression for survey data, which takes into account the cluster sample design of the data and can incorporate survey sampling weights in the analyses.

Results

Finnish women spent on average 2.5 hours per day doing routine housework and men roughly one hour. Childless women did on average 2.0 hours housework per day, and men a little over an hour (Table 1). Parenthood considerably increased women's housework, while its impact on men's time use was limited. Mothers (women with at least one child below 16 years of age) performed on average 2.8 hours per day of housework, while fathers did on average one hour. Mothers additionally devoted on average 2.9 hours per day and fathers a little over one hour per day to childcare. Employed mothers spent on average 2.5 hours per day on routine housework, and 2.2 hours on childcare. Mothers who were not in employment devoted considerably more time to these activities: 3.4 hours per day to routine housework and 4.4 hours per day to childcare. Since mothers who were not in employment were likely to be at home on care leave with a child younger than three years, these differences also reflect the increased time spent taking care of very young children.

The results of the multivariate analyses are presented in Tables 2–4. In accordance with our first hypothesis, an increase in a woman's housework by 1.2 hours per week (by 10 minutes per day) decreased the hazard ratios for a birth by 1–3% (hazard ratios varying from 0.974 to 0.988, Table 2). The effect was statistically significant for childless couples.

Contrary to our expectations, however, men's relative contribution to routine housework had no clear effect on fertility. The male partner's relative housework contribution can increase if he increases his participation, or if the female partner decreases hers. Thus, the inclusion of her housework hours in the models controls for the variation in her housework, and we see in Table 2 the independent effect of the male share on continued childbearing. Table 2 shows the final models, which include all housework variables at the same time. The man's housework share is here rescaled into 5% intervals to facilitate the interpretation of the results. We had assumed a curvilinear association of the male partner's share with fertility and therefore examined the man's share squared in the model. This proved not to be the case since a squared term of his share did not reach statistical significance in any of the models we considered (results not shown).

Next, we examined whether the intensity of the role conflict would strengthen the impact of shared housework on fertility in dual-earner couples, as assumed in Hypothesis 2. Once we control for the employment status of the partners, the adverse association of female housework hours on fertility becomes stronger among parents (Table 3, models I and II). The effect was statistically significant among parents at the $p > 0.05$ threshold. Thus, for each additional hour per week devoted to housework by the mother, the risk of a subsequent birth decreased by 3% among dual-earner parents. As for the whole sample, the male partner's housework share was not significantly associated with continued childbearing among dual-earners (Table 3, models I and II). Since male contribution to housework can be assumed to be of higher importance in households in which the woman devotes considerable time to housework, we tested for an interaction between the man's housework share and a categorical representation of the woman's housework hours but found no statistically significant effects (results not shown).

Among childless couples, women's hours in gainful employment were positively related to continued childbearing, whereas for parents, a longer working week decreased the likelihood of childbearing. We included a dummy for a woman's long working week (weekly working time above 38 hours) to see if an increase in her housework, or a decrease in the male partner's housework share, would inhibit fertility particularly for women with a long working week (Hypothesis 2.1), but did not find any significant interaction effects (results not shown). About 20% of women in dual-earner couples have a weekly working time exceeding 38 hours. Since the difference in the mean weekly working hours between women with a short or a normal week and women with a long working week was fairly small (35.9 vs 40.4 hours), the similar negative impact of women's housework hours seems plausible. Women with a long working week also devoted almost as much time to housework as did women with a shorter working week.

Table 1. Time use in routine housework, childcare and paid work among childless men and women, and parents with one or two children by employment status. Means and standard deviations from weighted data (FTUS1999).

	Childless couples		Couples with 1–2 children		
	Routine housework, hrs/day Mean (sd)	Paid work, hrs/wk Mean (sd)	Routine housework, hrs/day Mean (sd)	Childcare, hrs/day Mean (sd)	Paid work, hrs/wk Mean (sd)
Women	2.0 (1.5)	–	2.8 (1.7)	2.9 (2.7)	–
Men	1.1 (1.1)	–	1.0 (1.1)	1.1 (1.5)	–
Employed women	1.9 (1.6)	34.9 (8.3)	2.5 (1.6)	2.2 (2.3)	36.6 (4.2)
Employed men	1.0 (1.0)	38.5 (5.5)	1.0 (1.1)	1.1 (1.5)	39.6 (5.5)
Not employed women	2.4 (1.3)	–	3.4 (1.9)	4.4 (2.7)	–
Not employed men	1.5 (1.6)	–	1.5 (1.4)	1.5 (1.7)	–
N (All, diary days, not weighted)	352		525		

Source: FTUS1999 (Finnish Time Use Survey 1999–2000), authors' calculations.

Table 2. Division of routine housework in couples and the risk of first or subsequent birth (hazard ratios). Cox proportional hazards model.

	Childless couples		Couples with 1 child		Couples with 2 children	
	HR	s.e.	HR	s.e.	HR	s.e.
Woman's routine housework hours (10 min)	0.974*	0.013	0.985	0.013	0.988	0.023
Man's share of routine tasks (5%)	0.983	0.023	1.003	0.026	1.076	0.049
Man's paid work hours (hours/week)	1.011	0.013	0.985	0.015	1.013	0.015
Woman's paid work hours (hours/week)	1.096	0.066	1.017	0.065	1.128+	0.081
Woman's paid work hours squared	0.998	0.002	1.000	0.002	0.997*	0.002
N (diary days, not weighted)	352		208		317	

Note: Models include controls for woman's age, presence of children below four years of age (for couples with children), educational attainment of each partner, type of union, place of residence, either partner being a student, household income, woman's share of household income and her income share squared, and a dummy for a week/weekend day. Standard errors (s.e.) by delta rule.

HR: hazard ratios

Significance levels: + $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: FTUS1999 (Finnish Time Use Survey 1999–2000), authors' calculations.

Previous research has suggested that the relationship between gender equality and fertility might be mediated by gender role attitudes or expectations concerning the division of housework. Since the data did not include any variables measuring attitudes or preferences, we cannot test this assumption directly. However, we included an interaction between a woman's share of household income and the division of housework to test if the results would differ depending on her role as a co-provider in the household (Hypothesis 2.2) (Table 3, model III). Since we also controlled for each partner's working hours, a woman's income share is here a straightforward measure of her economic power within the family.

We divided dual-earner households into three types: in 'male-provider' households the female partner's income share is below 36% of the total household income; in 'female-provider' households her share is 56% or more of the total household income; and in 'dual-provider' households her income share is between 36 and 56% (65% of the dual-earner couples belong to this category). If the unequal division of housework is considered legitimate among male-provider couples, one can expect a positive (or non-

Table 3. Division of routine housework and transition to a subsequent birth, dual-earner couples (hazard ratios). Cox proportional hazards model.

	Model I childless dual- earners		Model II dual-earner couples with 1–2 children		Model III dual-earner couples with 0–2 children	
	HR	s.e.	HR	s.e.	HR	s.e.
Woman's routine housework hours (10 min)	0.976	0.015	0.971*	0.013	0.959**	0.013
Man's share of routine tasks (5%)	0.966	0.023	0.963	0.031	0.987	0.022
Man's share of routine tasks, squared	–	–	–	–	0.994*	0.003
Man's paid work hours (hours/week)	0.997	0.014	0.992	0.016	0.998	0.011
Woman's paid work hours (hours/week)	1.015	0.021	0.954	0.035	1.018	0.017
Woman's paid work hours above 38 hours/week (cat.)	1.043	0.451	0.298*	0.183	0.670	0.244
Dual-provider household (woman's income share 36–55%) (ref)					1	
Male-provider household (woman's income share <36%)					0.715	0.236
Female-provider household (woman's income share 56+%)					0.722	0.277
Male-provider household * woman's housework hours					1.059**	0.021
Female-provider household * woman's housework hours					1.005	0.024
N (diary days, not weighted)	222		348		570	

Note: Models include controls for woman's age, presence of children below four years of age and number of children (for models II and III), educational attainment of each partner, type of union, place of residence, man's paid work hours, household income, woman's share of household income and her income share squared (for models I and II), and a dummy for a week/weekend day. Standard errors (s.e.) by delta rule. Note that in model III, we centred woman's housework hours and men's housework share into their means.

HR: hazard ratios.

Significance levels: + $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: FTUS1999 (Finnish Time Use Survey 1999–2000), authors' calculations.

Table 4. Division of childcare and transition to a second or a third birth (hazard ratios). Cox proportional hazards model.

	Couples with 1 child		Couples with 2 children		Dual-earner couples with 1–2 children	
	HR	s.e.	HR	s.e.	HR	s.e.
Woman's childcare hours (10 min)	0.990	0.014	1.008	0.013	1.013	0.012
Man's share of childcare (5%)	1.210*	0.110	1.170	0.143	1.212+	0.136
Man's childcare share squared	0.985*	0.006	0.985+	0.008	0.981*	0.008
N (diary days, not weighted)	183		279		294	

Note: Models include controls for woman's age, presence of children below four years of age (for couples with children), educational attainment of each partner, type of union, place of residence, either partner being a student, household income, woman's share of household income and her income share squared, and a dummy for a week/weekend day. Standard errors (s.e.) by delta rule.

HR: hazard ratios.

Significance levels: + $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: FTUS1999 (Finnish Time Use Survey 1999–2000), authors' calculations.

negative) association between the female share of housework and childbearing. By contrast, in female-provider and dual-provider households, a traditional division of housework could be expected to inhibit childbearing.

Model III in Table 3 shows the results from the model including the interaction term. The main effect of women's housework hours represents the association between female housework hours and childbearing in dual-provider households (the reference category). As the interaction term was not statistically significant for the female-provider households, the overall effect of woman's housework hours on fertility is negative in dual- and female-provider households. However, the interaction term was statistically significant among the male-provider households, indicating that for this type of household, women's housework hours did not have a similar negative effect on childbearing as in the other two household types, thus supporting our hypothesis. The male partner's housework share appeared to have an inverse U-shaped association with continued childbearing, as indicated by a statistically significant squared term of his housework share (Table 3 model III). A closer examination revealed that this pattern applied to male-provider households only, so that male housework share had a negative association with fertility in dual- and female-provider households (results not shown).

Finally, our third hypothesis concerned the impact of the division of childcare on a couple's propensity to have another child. As expected, we found a positive association between fathers' contribution to childcare and couples' subsequent childbearing, statistically significant among one-child parents and marginally statistically significant among dual-earner parents (Table 4). In the preliminary analyses we also investigated the association between a father's (absolute) childcare hours and the propensity to have another child, but found no significant results. We expected that parental time with children indicates a preference towards children and thus can affect fertility. Given that maternal time with children correlates positively with paternal time, we controlled only for maternal childcare hours in the models.

A statistically significant squared term of father's childcare share indicates that the effect is curvilinear. A closer examination revealed that when the father's participation exceeded the male average share of childcare (around 30%), the marginal effect of the father's share diminished (results not shown). Thus, couples in which father's childcare share was very small, or in which his share was well above the overall male average, were less likely to continue childbearing compared to 'intermediate' couples.

Socioeconomic variables appeared to have a stronger effect on couples' childbearing than any indicator of the division of housework. Labour force attachment encouraged parenthood, while either partner being enrolled in education postponed childbearing. Weekly working hours for women were also, up to a point, associated with a higher likelihood of a subsequent birth. In addition, the association of household income with fertility was positive (figures not shown).

Discussion

It is often suggested that once the level of equity in private life catches up with that in education and employment, fathers will share housework and childcare and thus diminish the current costs of childbearing for mothers (Esping-Andersen, 2009; McDonald, 2000a, 2000b). This can be expected to lead to higher numbers of children, especially among couples who have no children or only a small number of children. On a macro level, the Nordic countries (including Finland) would appear to confirm these expectations regarding the relationship between a high level of gender equality and comparatively high fertility.

Once we investigate the division of housework and gender equality within the family, the picture becomes more complex. Our study is among the few to use detailed time use data from each partner to examine the association between the distribution of unpaid work and couples' subsequent fertility. We hypothesized that higher gender equality in the family would promote childbearing among Finnish couples. Our expectations were confirmed in that a smaller female contribution to domestic work – in terms of the hours women devote to housework – was significantly and consistently associated with a higher risk of a subsequent birth. In contrast, men's increased contribution to domestic work did not elevate couples' fertility, although male participation in childcare raised the likelihood of having a subsequent child.

Our results are in line with recent studies using similar data on housework, finding no or little impact of male contribution at home on fertility (Cooke, 2004; Craig and Siminski, 2011; Nilsson, 2010; Schober, 2013). The increase in men's relative contribution to domestic work is known to result more from women spending less time in household work rather than men doing more. Taking this into account, the negligible effect of men's contribution to housework on fertility is maybe not so surprising. Employment and parenthood influence women's time use much more than they do for men, among whom there is also much less variation in the time spent on household activities (Bianchi et al., 2000; Coltrane, 2000). Thus, studies reporting a positive association between men's housework contributions and fertility, but not controlling for female housework hours, may have been measuring changes in her participation, not in his.

A larger sample size would have allowed us to carry out more detailed parity-specific analyses and investigate whether different working time arrangements, such as shift work, modify the impact of the division of housework on couples' childbearing. Small numbers in subgroups and relatively large standard errors also impede strong conclusions. Still, one strength of this study was the ability to provide highly reliable measures of each partner's contribution to domestic chores and link this with prospective data on couples' childbearing. While we did not find any support for the assumption that increasing male participation in housework contributes to fertility, the fact that female housework was related to couples' childbearing behaviour suggests that the amount of domestic unpaid work does matter. Thus, it could be that the same institutions which advance gender equity at the societal level, such as women's employment opportunities and income, flexible working time patterns and provision of municipal day care, informal help and subsidized services, may also influence couples' childbearing decisions indirectly, through their impact on unpaid household work.

We are unaware of similar results concerning the negative impact of women's housework on fertility. Due to the nature of our data, we can here only speculate about the mechanisms behind our findings. Our result is counterintuitive when considering that traditional women, who can be expected to do more housework, have in many studies been shown to bear more children.

Since the majority of Finnish couples are full-time working dual-earners, additional hours in housework can be expected to increase women's total weekly workload considerably. While women's hours in paid work were, up to a point, associated with a higher likelihood of a subsequent birth, unpaid work appeared to depress fertility more consistently. Given the fairly similar roles regarding participation in paid work and providing financial support for the family, the extra hours women put into housework may become a source of marital dissatisfaction and thus diminish couples' childbearing desires. Female housework hours did not have a similar negative effect on childbearing in dual-earner households in which the male partner accounted for a larger share of the household income. A traditional division of housework may thus be considered fair if the man has a considerably bigger paycheck.

The finding that fathers' greater involvement with childcare is related to a higher propensity to have another child among Finnish couples matches the results for other countries (Cooke, 2004, 2009; Duvander and Andersson, 2006; Oláh, 2003; Pinnelli and Fiori, 2008). This suggests two interpretations. First, it may not be the amount of male contribution which counts, but rather the type of tasks they share with their spouse. Time devoted to childcare is highly valued by parents, and fathers' involvement with children may signal a commitment to parenthood and the couple's relationship and thus encourage couples' childbearing. Second, a father's increased share of childcare may also reflect an underlying preference for children, which is not captured completely in the measure of time spent in childcare. Here, the results may be due to selection, so that fathers who are more prone to having additional children also show increased involvement in childcare.

Our study concerned only one country, Finland, a relatively gender egalitarian society in which women already have a long history in paid employment and in which the state supports working mothers. In this case, welfare state policies – childcare arrangements in particular – reduce the opportunity costs

related to motherhood so that there may be less need for men's domestic contributions than in other countries. Nevertheless, the detailed analyses allowed by time use survey data and longitudinal set-up provided an ideal case for testing gender equality theories on fertility behaviour. It appears that while women's time use in domestic work affects childbearing, men's does not.

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Appendix

Table 5. Descriptive statistics of the couples in our analytical sample (FTUS1999). Percentages and means (and standard deviations (sd)) from weighted data, *N* (diary days) from unweighted data.

		Childless couples Percentage/ mean (sd)	Couples with 1–2 children Percentage/ mean (sd)
Woman's employment	Employed	71.5	69.4
	Not employed	28.6	30.6
Man's employment	Employed	86.4	91.0
	Not employed	13.6	9.0
Woman's education	Basic level education	8.8	11.4
	Vocational (middle level)	77.7	74.9
	Tertiary	13.5	13.8
Man's education	Basic level education	13.2	67.5
	Vocational (middle level)	72.4	16.0
	Tertiary	14.4	16.5
Type of union	Married	32.2	75.8
	Cohabiting	67.8	24.2
Place of residence	Urban	83.7	76.3
	Rural	16.3	23.7
Woman's share of household income (only dual-earner couples)	35% or less ('male-provider')	19.9	26.2
	36–55% ('dual-provider')	66.3	63.9
	56% or above ('female-provider')	13.8	9.9
Woman's age	Years, mean (sd)	29.3 (7.4)	34.7 (5.8)
Age of the youngest child	Years, mean (sd)	–	5.3 (4.2)
Household income	1000 euros/year, mean (sd)	34.4 (20.9)	43.0 (20.5)
<i>N</i> (not weighted, diary days)		358	538

Source: FTUS1999 (Finnish Time Use Survey 1999–2000), authors' calculations.