

Women's educational advantage and the gendered division of housework: Couples in France, Germany, Italy and the UK

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Abstract

Objective: This study explores how women's increased educational advantage is associated with gender (in)equality in housework across four different European cultural and institutional contexts.

Background: The rising gender gap in educational attainment – favoring women – across rich nations increased educationally hypogamous couples (where her attainment is greater than his). Several theories suggest this might equalize the division of housework by women's relative and absolute level of educational attainment.

Method: Couple-level time diary data from the harmonized Multinational Time Use Study (MTUS-X and MTUS) and national time use surveys for opposite-sex couples in France 1985 and 2009, Italy 1989 and 2013, Germany 1991 and 2013, and the UK 1983 and 2014 are used to examine the relationship between women's absolute and relative educational attainment and housework.

Results: Women's (and men's) own educational attainment, rather than hypogamy, is strongly associated with lower time spent on housework by women and higher by men, primarily in contexts with more traditional gender roles where housework is more unequally distributed, like in Italy and France in the 2010s, and all examined countries in the 1980s.

Conclusion: Results are most consistent with a diffusion perspective, but also suggest the limitations of women's rising educational attainment alone in spurring greater equality in housework.

Key words: domestic labour, hypogamy, time use, inequality, unpaid work, diffusion



1. Introduction

Women's increased educational attainment over time, and the reversal of the gender gap in education, have been linked to a variety of individual and family outcomes, including decisions about partnering, parenting, and employment (Van Bavel et al., 2018). One consequence is an increasing proportion of couples who are educationally homogamous and hypogamous (her attainment is greater than his) and a decrease in hypergamous (his attainment is greater) couples (Esteve et al., 2012; Van Bavel et al., 2018). Nevertheless, we know little about how women's increasing relative educational advantage is associated with the gender division of housework. Recent studies provide conflicting results and elide the thorny distinction between absolute and relative attainments (García-Román, 2023; García Román, 2021; Miller, 2020).

At the micro level of individuals and couples, studies on gender-based housework allocation mainly assess resource-based and social-symbolic explanations of housework's unequal distribution. These two broad perspectives predict opposing hypotheses about both relative and absolute resources. Relative resources or bargaining perspectives (Blood & Wolfe, 1960; Heer, 1963) would predict that women's educational advantage (hypogamy), all else equal, should translate into a smaller gender gap in housework time. Whereas a gender deviance neutralization perspective (Bittman et al., 2003; Brines, 1994), derived from social-symbolic explanations, would predict that hypogamy, all else equal, should translate to a larger gender gap in housework as partners perform housework in an attempt to neutralize gender deviance. An absolute resources perspective (Gupta, 2006, 2007) would predict that absolute education is most important, with both women and men using resources to lower their housework time; although the effect would be most pronounced for women who spend more time, on average, on housework than men. A social-symbolic explanation where absolute educational attainment serves as a marker of greater exposure and acceptance of gender egalitarian norms, on the contrary, would predict that women do less, but men do more as their own attainment increases.

At the macro, national level, scholars predict that these individual- and couple-level processes are conditioned by cultural and institutional context. At this level, we contrast two competing perspectives, the discount and diffusion perspectives. The discount hypothesis posits that women in more gender traditional countries benefit less from their individual-level resources and relative advantages because the exercise of power within relationships is discounted by an inequalitarian national context (Fuwa, 2004). In contrast, a diffusion hypothesis (Esping-Andersen & Billari, 2015; Nazio, 2008; Palloni, 2001) would predict earlier adoption of greater housework sharing by those with the most to gain from it (e.g., highly educated women). We would observe a wide gap by education at first, which then closes as the behavior diffuses to other groups. Thus, where education matters most will depend on how widely diffused egalitarianism is – we would expect smaller effects where equality is already more entrenched, the opposite of the discount hypothesis. To test these opposing theories, we compare four countries along the continuum from traditionalism to modernisation across two stages of their route to a more gender-equal, dual breadwinning model: from the 1980s to the 2010s when diffusion of egalitarian values and educational expansion occurred (Pailhé et al., 2021).

In this paper, we explore how women's increasing educational advantage is associated with gender (in)equality in time spent on housework. We ask: Controlling for absolute attainment, is there a smaller (or larger) gender gap in housework for hypogamous couples? If so, how is it associated with cultural/institutional contexts? Using couple-level time diary, we test the association between absolute and relative levels of educational attainment and men and women's housework time across four different European cultural and institutional contexts where both couple-level diary data and detailed educational classification were available: France 1985 and 2009, Italy 1989 and 2008, Germany 1991 and 2013, and the United Kingdom 1983 and 2014. We find that women's (and men's) own educational attainment, rather than hypogamy, is strongly associated with lower time spent on housework by women and higher by men, but primarily in contexts with more traditional gender roles where housework is more unequally distributed, like all countries in the 1980s but only in Italy and to a lesser extent France in the 2010s. Results within and across countries are most consistent with the diffusion perspective. None of the individual- or couple-level hypotheses are consistently supported for all countries across both periods.

2. Background

2.1 *Relative and absolute education – material resource or symbolic display?*

There is debate within the literature about what, exactly, educational attainment measures – is it a material resource, a symbolic indicator, or both? And is its absolute or relative level of most importance? As a material resource, the importance of relative (as opposed to absolute resources) derives from game theory in economics and social exchange theory in sociology (Blood & Wolfe, 1960; Heer, 1963). Essentially, housework is something to be bargained out of, so it is resources vis-à-vis the partner that matter most (Sen, 1990). In its classic formulation, resources were conceptualized as education, income, and occupational status. Early research found that relative education "strengthens the power position" and is a "highly consistent resource for marital power" (Blood & Wolfe, 1960, p. 37). Given its association with verbal skills and knowledge, educational advantage may result in better negotiating skills than one's partner, thus a greater capacity to bargain with a more equitable result. Women's educational advantage may allow them to negotiate (a) lowering the couple's standards, (b) outsourcing some tasks, or (c) redistributing some tasks to men (in part, via partner selection). Education provides a material resource as it associates (although more weakly for women) with *potential* economic returns, which may provide alternatives to staying in a relationship with a very unequal division of labor, by increasing the preference/threat for divorce (Breen & Cooke, 2005; Sen, 1990). Recent research finds that women's education advantage is associated with a higher likelihood that she is the family's main general and financial decision maker, controlling for both relative earnings and her absolute education (Klesment & Van Bavel, 2022).

Empirical evidence supports the importance of relative education as distinct from relative earnings. In Sweden, Evertsson and Neramo (2007) find support for education as a relative resource as it exerts influence on the division of housework independent of other resources; they find that it is associated with housework share and time similarly to relative earnings and status. Similar findings emerge for five of nine European countries (Aassve et al., 2014). Neither of these studies, however, controlled for absolute education. We hypothesize that (H1a) women's educational advantage, controlling for absolute attainment, will be associated with a smaller gender gap in housework time.

An opposing hypothesis, however, can be derived from the social-symbolic "doing gender" perspective within sociology. "Doing gender" focuses on gendered expectations for interaction and how individuals construct gender through housework (Fenstermaker Berk, 1985; West & Zimmerman, 1987). The most common hypothesis derived from this theory is that in counter-normative situations, such as hypogamy, women will reassert their femininity by doing more housework than women in normative situations and/or men will reassert their masculinity by doing less (Bittman et al., 2003; Brines, 1994). There is mixed support for the gender deviance neutralization hypothesis in relation to earnings (see summary in Hook, 2017; Sullivan, 2011), and this perspective is rarely considered vis-à-vis women's relative educational position. From a gender deviance neutralization perspective, we hypothesize that (H1b) women's educational advantage, controlling for absolute attainment, will be associated with a larger gender gap in housework time.

There is also space in the material resource tradition for the importance of absolute attainment. From an autonomy perspective (Gupta, 2006, 2007), greater individual resources translate to less time on housework. Those with higher absolute educational attainment may opt out (lower standards, frequency, time invested) or buy out housework. Women's own resources should be more salient for her housework time than men's (for men's time) because of women's disproportionate responsibility for housework, yet both should use their resources to lower their own time. Thus, (H2a) both women's and men's absolute attainment will be associated with less time spent on housework, but the association should be most pronounced for women.

Another perspective on the social-symbolic aspect of education posits that education promotes more egalitarian values and critical views, thus a more equal distribution of housework should follow (Esping-Andersen & Billari, 2015). For both men and women, education may provide different comparison standards about perceived gendered entitlements/responsibilities, sensitivity and openness to new behavioral options, and capacity to withstand social pressure to conform to traditional expectations (Major, 1993; Nazio, 2008; Palloni, 2001). Diffusion explanations (Nazio, 2008; Palloni, 2001) identify individuals' resources as a factor contributing to the spread of innovative behaviors, such as cohabiting unions (Nazio, 2008), themselves associated with a more gender-equal distribution of tasks in some contexts (Bianchi et al., 2014). According to this view, (H2b) absolute educational attainment, not the relative level, will be associated with a smaller gender gap in housework time, driven by women doing less and men doing more at higher levels of attainment.

Empirical findings for absolute levels of educational attainment generally support an egalitarian values/diffusion perspective. Own attainment is negatively associated with women's housework time and positively associated with men's (Bianchi et al., 2000). Yet, controlling for gender ideology, men's absolute attainment has an equalizing effect on housework share in Czechia, providing evidence that attainment is not purely a proxy for ideology (Hamplová et al., 2019). Although the effects of absolute attainment are well documented, if poorly understood, the role of partners' relative educational resources is less clear. In early studies of housework, relative education was theorized as an indicator of power, but it is difficult to disentangle whether educational advantage (particularly by men) indicates power or is a proxy for egalitarian gender ideology (see Blair & Lichter, 1991). The question of relative educational resources remained relatively quiet in the literature until recent interest in hypogamy (for exceptions see Nitsche & Grunow, 2016 on changes over time in the division of domestic labour).

Recent findings are mixed. Three studies find little support for the importance of hypogamy. Using US time diary data on individuals in dual-earner marriages, Miller (2020) finds no effect of relative education on men's or women's housework time; findings for relative education are unaffected by own and spouses' occupation and wage. In Czechia, it's not relative education, but men's absolute education that is associated with greater sharing of housework (Hamplová et al., 2019). Using Spanish couple-level time use data for dual-earners, García-Román (2023) finds that the gender gap in housework time is the same for hypogamous and hypergamous couples as well as homogamous couples where both partners have above a secondary degree; only homogamous couples where both partners have a secondary degree or less have a larger gender gap (relative earnings are controlled). In another study pooling two decades of individual-level time use data from France, Spain and the US for all couple types, however, García Román (2021) finds hypogamous couples have a more equal division of housework than hypergamous couples and homogamous couples with low attainment. Effect sizes for relative education are similar to or larger than for earnings (earnings are in four categorical combinations similar to education). Although the paper is cross-national and over time, effects of relative education are constrained to be the same across countries and time, so there is no insight on whether the effects vary. Only Hamplová and colleagues (2019) test absolute attainment as distinct from relative (Miller examines saturated pairings, whereas García-Román distinguishes levels only among homogamous couples). In our analyses, we pay careful attention to the distinction between absolute and relative educational attainments.

2.2 Cross-national differences over time

We compare four different European cultural and institutional contexts (limited by the availability of couple-level time diary data) over three decades: Germany, France, Italy, and the United Kingdom. In Europe, the least egalitarian gender divisions of housework have been generally found in Southern countries (i.e., Italy), followed by Western countries (i.e. France and Germany), all of which share a path of conservative-corporatist policies. Countries within the liberal regime (i.e., the UK), in contrast, emphasize market-based solutions to work-family reconciliation issues and formal gender-neutrality of policies; housework is generally more egalitarian than in conservative-corporatist welfare states (Cooke & Baxter, 2010). Women's employment increased across the four countries from the 1980s to 2010s, from levels that reflect the country ordering suggested above. Attitudinal indicators also suggest greater levels of gender egalitarianism in the UK, followed by France and then Italy, particularly about men's involvement in the home (Pailhé et al., 2021). In the UK, Germany, and France, women's educational achievements and employment rates are steadily higher than in Italy, but part-time employment is more widespread. In Italy, educational levels still strongly stratify women's opportunities to pursue continuous employment after motherhood and reenter after an interruption, and education provides 'work legitimacy' over and above human capital (Solera & Bettio, 2013).

These differences are reflected in the 2013 Gender Equality Index (GEI), based on 2010 data, which ranks the countries from most to least gender equal: UK (60.4), France (57.1), Germany (51.6), with Italy far behind (40.9) (European Institute for Gender Equality, 2013). However, Germany and France invert their order along the relevant GEI dimensions relating to gender gaps in *paid work*, *financial resources*, and *time* devoted to care and social activities, with Germany showing a higher degree of equality than France in the 2010s (index not available for the 1980s). Similarly, recent work finds analogous gender gaps in housework time in France and the UK, with a substantially higher gap in Italy, and gender convergence between the 1980s and the 2010s due more to women's decrease than men's increase in domestic work (Pailhé et al., 2021). Thus, whereas all contexts were substantially more traditional in the 1980s, the speed of change was different across countries,

with the UK and Germany equalising faster (see Table 2). We rank countries as most to least gender equal: the UK, Germany, France, and Italy.

Theoretically, at the national-level we contrast two competing perspectives, the discount and diffusion hypotheses. The discount hypothesis (Fuwa, 2004) proposes that women in less gender egalitarian countries benefit less from their resources because the exercise of power within relationships is conditioned – or discounted - by national contexts. Fuwa (2004) finds support for this theory; the equalizing effects of women’s full-time employment and egalitarian gender ideology on women’s share of housework are greater in more egalitarian countries than in less egalitarian countries. Findings for relative income are similar, but not statistically significant (education is controlled by “some college”). Similarly, Aassve and colleagues (2014) find the equalizing effect of women’s educational advantage is only present in more gender-equal Western European countries (in contrast to Eastern European contexts). As applied to our four countries, H3a: education, both absolute and relative, would be most important in the UK, followed by Germany, France, and least in Italy.

In contrast, a diffusion hypothesis, described above, would predict earlier adoption of greater housework sharing by those with the most to be gained and higher capacity to stand normative pressures to conform to traditional expectations (e.g., highly educated women), and thus an initial wider gap by education, closing as greater sharing diffuses to other groups (Esping-Andersen & Billari, 2015; Nazio, 2008; Palloni, 2001). In a diffusion framework, a more egalitarian division of domestic labour is seen as a new emerging social behaviour in a shift from traditional societies (in the 1980s, and in whose families the 2010s respondents have grown up), to a widely accepted social reality where dual-breadwinner households have become the norm in most European societies. As the tension between paid employment and housework responsibility increases (along with rising educational attainment levels), women will look for new solutions even when the emerging behaviors go against traditional norms and risk incurring costs and sanctions from significant others (Rindfuss et al., 2004), being their partners, families of origin or the general institutional context. The higher the absolute education, the higher the stakes (for women) in a more equitable division of labor and the higher their capacity to adopt non-normative behaviors withstanding pressures, especially in more conservative contexts.

Table 1: Summary of hypotheses

Theory	Hypothesis about housework
Couple-level: relative education	
Material: relative resources/bargaining	H1a. Hypogamy = more equal
Symbolic: gender deviance neutralization	H1b. Hypogamy = less equal
Individual-level: absolute education	
Material: autonomy	H2a. Higher attainment = less housework for <i>both</i> , especially for women
Symbolic: egalitarianism	H2b. Higher attainment = less housework for women & <i>more for men</i>
Macro-level: relative & absolute	
Discount	H3a. Effects smaller in more unequal contexts
Diffusion	H3b. Effects larger in more unequal contexts

Diffusion theory predicts we observe a wide gap by education at the beginning of the process when the new behaviour is either more salient to (highly educated female) forerunners, or they are better able to resist pressures to conform to traditional expectations, a gap that then closes as the behavior diffuses. Thus, where education matters most will depend on how widely diffused egalitarianism is – we would expect smaller effects where equality is already more entrenched, the opposite of the discount hypothesis. Comparing between countries and over the two time points, we thus expect the effect of higher educational attainments to be stronger the more conservative the country is, thus, highest in Italy in the 1980s, followed by France, Germany and least in the UK, and the effects to lower as the gender egalitarian norms diffuse within each country, by the 2010s. We also expect hypogamy to have a significant influence with the same gradient, net of own educational level, because within conservative societies education still strongly differentiates approval of ‘modern roles’; thus, men marrying upwards may be less attached to traditional family models. Thus, H3b: absolute

and relative education would be most important in Italy, followed by France, Germany and least in UK. Table 1 provides a summary of hypotheses.

3. Research strategy

3.1 Data and sample

To answer our questions, we require household-level surveys which provide 24-hour time diaries from both partners in a couple. Of the over 100 time diary studies catalogued by the Multinational Time Use Study, less than one-third are collected at the household level. We also require data collection that spans at least two decades and provides detailed educational codes that can be harmonized both over time and across countries. We identified publicly available data from four European countries meeting these criteria: France (1985, 2009), Germany (1991, 2013), Italy (1989, 2008), and the UK (1983, 2014). We draw data for France, Italy (2008), and the UK from the harmonized Multinational Time Use Study archived in the MTUS-X data extract builder (Fisher et al., 2019). MTUS-X is an archive of time diary data post-hoc harmonized for compatibility across time and place. Both diary data (e.g., activities) and individual-level variables (e.g., employment) are harmonized. Data for Italy (1989) is taken from the MTUS archive (Gershuny et al., 2020), and for Germany (1991, 2013) we downloaded public use files from the German Research Data Centre (RDC of the Federal Statistical Office and Statistical Offices of the Federal States of Germany, 2024a, 2024b) and harmonized them consistent with MTUS-X. Although some countries have recently fielded their decadal time use survey for the 2020s (e.g. Germany 2022, Italy 2023), this data is not yet available to researchers, and other recent data is not coded in a comparable way (e.g., Italy 2013 further collapsed levels of education for anonymization purposes, thus we only use it for robustness checks).

Our sample is limited to opposite-sex couples ages 18-64 completing a matched diary day ($n = 42,671$ matched diaries). Results are robust to limiting the sample to couples with men aged 25-55 with partners aged 21-55. We listwise deleted 193 observations missing data on education or employment. Our final sample size is $N = 42,478$ matched diaries. Italy (1989) and France (1985) are single-day diaries. Germany (1991), France (2009) and UK (2014) have up to two diary days per couple, Germany (2013) has up to three, and the UK (1983) has up to seven. The number of matched diaries and couples per survey are listed at the bottom of Table 2. The inclusion of a former East/West indicator for Germany did not alter findings and is omitted.

3.2 Measures

Housework time (minutes per day). Housework measures minutes spent on unpaid core housework, which includes food preparation/cooking, setting the table, washing or putting away dishes, cleaning, laundry, purchasing goods, and other domestic work. The category is expansive due to the need to harmonize domestic work across countries; an aggregated measure minimizes variation that may arise from small differences in survey coding. An expansive category is conservative; that is, it is more likely to underestimate gender inequality due to gendered task segregation. We do not include home/vehicle maintenance because this work tends to be more discretionary and time-flexible, not a daily housework task (Hook, 2010). We do not include childcare for both theoretical and analytical reasons. In contrast to childcare, housework is one of the least enjoyed activities for both men and women, shows trends of disinvestment over time, and is more resistant to gender equity. Thus, theoretical perspectives used to understand housework (e.g., bargaining) are not directly applicable to childcare (Sullivan, 2013).

Educational attainment. The primary independent variables are women's and men's individual-level educational attainment and relative educational attainment at the couple level. Examining educational attainment required harmonization across four countries and two time periods. We do not use the 3-category scheme provided by MTUS-X. Instead, we selected a 5-category scheme that represents educational hierarchies within each country. Detailed coding is in the Appendix, Table A-1. Categories are ordered hierarchically within countries, but these categories are not necessarily comparable across countries given different educational systems and distributions, but they do roughly coincide with ISCED levels 1-5+.

We use this 5-level scheme to create indicators for hypergamy (his>hers) and hypogamy (hers>his), with homogamy as the reference category. Unlike previous work (García-Román, 2023; García Román, 2021) we

do not code homogamy into low/high attainment because this elides absolute attainment with relative attainment. Our use of five educational categories provides enough variation to help us decouple relative versus absolute attainment – an advance from previous work on the topic. We include absolute educational attainment as a 3-category measure, combining levels 1 and 2 and levels 3 and 4. Results are robust to using five categories of attainment. We chose to use three categories because it simplifies the presentation of results.

Given our interest in cross-country comparisons, we include several control variables to standardize basic demographic characteristics (women’s age and couple-level age difference), household composition (number of children, and the presence of a youngest child 0-4 and 5-12), and survey design across countries (whether the diary was completed on a weekday or weekend). We also control for a potential mediator: couple-level employment arrangements. Theories of human capital predict a causal relationship between education and employment intensity, particularly for women. That is, greater investments in human capital are associated with greater levels of employment and work hours. The time constraints perspective (Bianchi et al., 2000) further predicts that employment and work hours are associated with less housework time for both men and women. Thus, the relationship between education and housework may be explained, in part, by employment. We control for four arrangements that differ from the reference category male-breadwinner: neither employed, female-breadwinner, dual-earner she is part-time, and dual-earner she is full-time. Although work arrangements are important predictors of housework time, results are generally robust across different arrangements; that is, relationships we observe between education and housework are not restricted to certain couple types, such as dual-earners.

3.3 *Methods*

Following conventions in the time use literature we use OLS models for housework time. OLS is preferred over Tobit and is also preferred over a two-part model if a covariate predicts performance of and time spent on an activity (Stewart, 2013), which is the case for the covariates included in the model. To address repeated observations (i.e., multiple diaries per couple in some surveys) we calculate cluster-robust standard errors that allow for intragroup correlation. We test the equality of coefficients across subsamples using seemingly unrelated regression (SUR). Post estimation command “suest” (Stata 16) combines estimation results—both parameter estimates and (co)variance matrices—allowing tests of cross-model hypotheses via Wald tests. All descriptive statistics and analyses are weighted using the provided MTUS weight.

4. Results

4.1 *Descriptive*

Table 2 shows descriptive statistics for the eight surveys, beginning with housework time. Across countries, women’s housework time has declined by one to two hours per day. By the 2010s it ranges from a low of 109 minutes in Germany to a high of 295 minutes in Italy, so a range of less than two hours to nearly five hours per day. Changes in men’s time have been much less dramatic (-10 to +13 minutes), and by the 2010s, ranged from a low of 49 minutes in Italy to a high of 73 minutes in France and 72 minutes in the UK. All within country changes in housework time are statistically significant ($p < .05$).

Despite differences in the distribution of educational attainment, relative educational attainment is largely similar across countries. Most couples are homogamous, with a range from 43 to 57 percent of couples. Hypergamy (his>hers) ranges from 20 to 36 percent, and hypogamy (hers>his) ranges from 12 to 33 percent. Hypogamy has increased in all countries, except for France which shows stable relative attainment despite substantial increases in absolute attainment. We further investigated whether couple types were well distributed within countries by age. Although in each survey hypogamous couples (hers>his) are more common among younger cohorts, they are well distributed across birth cohorts.

We also note that male-breadwinner families have declined in all countries but remain sizeable in Italy at about one-third. By the 2010s, the most common arrangement in all countries is some type of dual-earning, with couples in which she is employed part-time the most common dual-earner arrangement in Germany and full-time the most common in France, Italy, and the UK.

Table 2: Means by survey, weighted

	Italy		France		Germany		UK	
	1989	2008	1985	2009	1991	2013	1983	2014
Housework time (minutes/day)								
Women's	361 (158)	295 (157)	245 (126)	184 (128)	233 (127)	109 (73)	225 (134)	164 (121)
Men's	37 (66)	49 (75)	60 (69)	73 (90)	64 (77)	54 (56)	60 (79)	72 (84)
Women's education								
Low 1	.42	.11	.26	.10	.13	.05	.55	.05
Low 2	.27	.35	.35	.11	.52	.42	.19	.22
Medium 1	.07	.09	.19	.38	.13	.12	.03	.22
Medium 2	.18	.33	.05	.12	.12	.16	.17	.15
High	.05	.13	.15	.28	.10	.25	.05	.36
Men's education								
Low 1	.38	.11	.28	.11	.05	.03	.41	.07
Low 2	.29	.41	.40	.10	.46	.40	.19	.29
Medium 1	.06	.07	.14	.44	.13	.07	.21	.16
Medium 2	.20	.30	.04	.12	.19	.19	.10	.18
High	.07	.11	.14	.24	.17	.30	.09	.30
Relative education								
Homogamy	.57	.55	.52	.50	.55	.45	.41	.45
Hypergamy (his>hers)	.24	.20	.21	.23	.33	.31	.36	.22
Hypogamy (hers>his)	.18	.25	.27	.27	.12	.24	.23	.33
Couple-level employment								
Neither employed	.12	.11	.12	.20	.09	.05	.11	.07
Male-breadwinner	.46	.36	.31	.16	.29	.16	.35	.17
Female-breadwinner	.03	.06	.06	.15	.05	.05	.05	.05
Dual-earner: she PT	.06	.14	.13	.15	.29	.43	.40	.32
Dual-earner: she FT	.33	.33	.37	.34	.28	.31	.09	.38
Women's age	40.4	43.8	39.0	43.9	41.0	43.4	38.0	42.7
Age difference	3.7	3.2	2.4	2.2	2.7	2.4	2.8	2.1
Number of children	.8	.9	1.0	.9	1.0	.9	1.3	.9
Age of youngest child								
Child 0-4	.23	.22	.24	.21	.26	.21	.31	.24
Child 5-12	.26	.23	.23	.21	.19	.18	.12	.18
Weekend	.28	.28	.28	.27	.28	.30	.30	.28
N - matched diaries	8,492	7,189	4,996	6,549	5,645	4,560	2,044	3,003
N - couples	8,492	7,189	4,996	4,290	2,823	1,531	292	1,502

Note: Standard deviations in parentheses. All differences in Housework Time from T1 to T2 are statistically significant ($p < .05$)

4.2 Multivariate

Table 3 reports coefficients of interest for three models. The first half of the table shows coefficients for relative education generated from two models, Model 1 controlling for her absolute educational attainment and Model 2 controlling for his attainment. The main takeaway is that coefficients for hypergamy and hypogamy tell very different stories depending on whether we control for her or his absolute attainment, often flipping direction depending on whose attainment we control. This is because absolute attainment – both hers and his – is negatively associated with her housework time. Flipping effects for relative education reflect the lack of control for own or partner's absolute level of education, providing evidence of the importance of absolute attainment – both own and partner's attainment.

Table 3: OLS regressions of women's housework time

	Italy 1989	Italy 2008	France 1985	France 2009	Germany 1991	Germany 2013	UK 1983	UK 2014
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Models 1 & 2: relative education (ref. homogamy), controlling for her or his absolute education								
Hypergamy (his>hers)								
M1 - Control her educ	-4.2 (4.5)	-11.6 * (5.0)	-2.6 (4.1)	-6.4 (4.7)	3.3 (4.9)	2.6 (3.7)	-3.2 (10.6)	4.1 (7.0)
M2 - Control his educ	9.1 * (4.1)	4.9 (4.5)	9.2 * (4.1)	9.2 * (4.2)	24.1 *** (4.5)	9.4 ** (3.2)	1.4 (10.9)	1.8 (6.2)
Hypogamy (hers>his)								
M1 - Control her educ	4.9 (5.1)	15.3 ** (4.8)	11.1 ** (4.0)	-1.5 (3.9)	5.5 (7.6)	1.9 (3.7)	-5.4 (13.2)	0.9 (5.6)
M2 - Control his educ	-15.3 *** (4.3)	-8.7 * (4.1)	-7.8 * (3.9)	-17.0 *** (4.1)	-6.6 (5.5)	-4.2 (3.1)	-27.2 * (11.9)	-4.4 (5.9)
Model 3: Both absolute education								
Her medium education	-19.5 *** (4.3)	-10.0 * (4.1)	-13.4 ** (4.2)	-15.3 ** (4.7)	-14.9 ** (4.8)	-3.8 (3.0)	-30.4 ** (11.5)	5.5 † (6.1)
Her high education	-36.5 *** (8.2)	-27.0 *** (6.5)	-32.4 *** (5.7)	-28.4 *** (5.8)	-27.6 *** (6.3)	-14.4 *** (3.2)	-42.8 ** (16.5)	-6.5 † (6.8)
His medium education	-11.5 ** (4.1)	-19.9 *** (4.0)	-9.4 * (4.5)	-5.3 (4.5)	-4.7 (4.6)	-0.7 (3.0)	18.0 (9.9)	2.0 (5.7)
His high education	-25.0 *** (7.2)	-30.9 *** (6.5)	-14.7 ** (5.5)	-10.7 (5.5)	-5.9 (5.3)	2.4 (3.2)	-24.4 (15.7)	-2.7 (6.4)
N - diaries	8492	7189	4996	6549	5645	4560	2044	3003

Note: ***p < .001, **p < .01, *p < .05. † = coefficients differ from T1 to T2 in Model 3 (p < .05). In Model 3 coefficients do not differ between countries at T1. At T2 for "Her High Education," coefficients for Italy and France are different than Germany and UK (p < .05). At T2 for "His High Education T2," Italy is different than all others and France also differs from Germany (p < .05). Models include household employment, women's age, age difference, number of children, presence of a child 0-4 and 5-12, weekend, and a constant. Standard errors adjusted for clustering. Full results in Appendix Tables A-2A (model 1), 2B (model 2), and 2C (model 3)

In the second half of Table 3, we omit relative education and include both women and men's absolute attainment. In the earlier period (1983-1991), women's absolute educational attainment is strongly associated with less housework for women in all countries. At Time 1, coefficients do not differ across countries. In the later period (2008-2013), however, we fail to detect this relationship in the UK, with coefficients close to zero. The changes in coefficients from Time 1 to Time 2 are statistically significant in the UK (p = <.01 for high and p = .07 for medium). Coefficients for Germany also changed, with Time 2 estimates for medium attainment close to zero and no longer statistically significant and the coefficient for high attainment halved. These changes, however, are not statistically significant. Null findings for absolute education in the later period are consistent with panel studies modeling within-couple change in housework time in the UK (Schober, 2011), and in Germany for housework share (Nitsche & Grunow, 2016).

Thus, contrary to the "discount" hypothesis and in line with diffusion, in the later period women's individual resources matter more in less egalitarian countries. At Time 2, the negative relationship between women's high attainment and her housework time is larger in Italy and France than in Germany and the UK (p < .05). Although this may be partly mechanistic (there is less variation to explain in more equal contexts because women do less housework), this would not account for the lack of country difference at Time 1 when the mean spanned over three hours, nor the finding that France and the UK have fairly similar means at Time 2, differing by only 20 minutes per day. Adding further support for the importance of attainment in less egalitarian contexts, men's attainment is also associated with less housework time for women in Italy and France 1985. Contrary to what would be anticipated from a bargaining perspective, as men's absolute attainment increases in these contexts, women generally do less housework; the same relationship we observe for women's attainment.

Table 4 replicates this analysis for men's housework time. Like results for women's housework, the first half of the table shows that results for relative education change depending on whose absolute education is controlled. Moving to the second half of the table, we notice three things. First, coefficients are smaller than in Table 3, reflecting the smaller amount of housework that men do and that researchers are generally better able to explain variation in women's housework time than in men's. Second, men partnered to women with higher attainment do more housework than men partnered to lower educated women, except in the UK. Third, higher educated men also do more housework in Italy at both time points and at Time 1 in the other three countries; change over time is only statistically significant in the UK, however.

Table 4: OLS regressions of men's housework time

	Italy 1989		Italy 2008		France 1985		France 2009		Germany 1991		Germany 2013		UK 1983		UK 2014	
	b/se		b/se		b/se		b/se		b/se		b/se		b/se		b/se	
Models 1 & 2: relative education (ref: homogamy), controlling for her or his absolute education																
Hypergamy (his>hers)																
M1 - Control her educ	6.9	**	4.7		2.1		1.7		-1.4		2.8		14.5	*	6.3	
	(2.4)		(2.7)		(2.5)		(3.4)		(4.1)		(2.7)		(6.5)		(4.5)	
M2 - Control his educ	1.6		-2.9		-4.7		-2.3		-4.3		-4.0		8.5		-7.3	
	(2.0)		(2.5)		(2.5)		(3.0)		(2.7)		(2.7)		(7.8)		(4.5)	
Hypogamy (hers>his)																
M1 - Control her educ	-2.7		-8.8	***	0.4		1.7		-11.3		-4.0		-7.4		4.7	
	(2.3)		(2.4)		(2.5)		(3.1)		(6.2)		(3.2)		(8.4)		(4.0)	
M2 - Control his educ	6.2	**	-0.3		7.3	**	6.5	*	-1.6		3.4		1.1		3.2	
	(2.1)		(2.3)		(2.3)		(3.3)		(3.4)		(2.7)		(6.5)		(4.3)	
Model 3: Both absolute education																
Her medium education	6.8	**	6.4	**	6.6	**	2.4		5.0		5.3	*	-1.2		-3.7	
	(2.1)		(2.3)		(2.5)		(3.4)		(3.1)		(2.4)		(5.7)		(4.5)	
Her high education	8.0	*	12.1	***	13.6	***	9.3	*	7.2		6.8	*	-9.8		6.9	
	(4.0)		(3.6)		(3.4)		(4.3)		(3.8)		(2.7)		(13.2)		(5.2)	
His medium education	9.0	***	10.3	***	6.2	*	-0.2	†	-3.7		2.1		6.4		8.9	*
	(2.0)		(2.2)		(2.6)		(3.4)		(2.8)		(2.4)		(5.5)		(4.1)	
His high education	7.2	*	11.9	**	7.0	*	5.2		8.4	*	3.4		40.7	***	9.2	†
	(3.5)		(3.7)		(3.3)		(4.2)		(3.4)		(2.5)		(10.8)		(4.8)	
N - diaries	8492		7189		4996		6549		5645		4560		2044		3003	

Note: ***p < .001, **p < .01, *p < .05. † = coefficients differ from T1 to T2 in Model 3 (p < .05). At T1 for "His High Education," UK differs from all others. Models include household employment, women's age, age difference, number of children, presence of a child 0-4 and 5-12, weekend, and a constant. Standard errors adjusted for clustering. Full results in Appendix Tables A-3A (model 1), 3B (model 2), and 3C (model 3)

4.3 Supplemental analyses with earnings and gender ideology

Earnings may be an important mediator, partially explaining the relationship between education and housework time, particularly for women (Hamplová et al., 2019; Nitsche & Grunow, 2016). That is, education predicts higher earnings and higher earnings may predict lower housework time. Although we do not have comparable data on earnings, we are able to examine earnings in supplemental analyses for each country in the 2010s. In all four countries, relative earnings do not affect the associations we report for educational attainment with women's or men's housework time. Tables for all supplemental analyses are available by request.

We can measure absolute earnings in the 2010s in three countries, all but Italy. We find no change in reported educational associations in the UK. When controlling for her absolute earnings, the association between her high education and housework time is reduced by 18 percent for women in France and 17 percent for women in Germany. That is, the effect of women's educational attainment on housework time is partially explained by her absolute earnings, suggesting support for the autonomy perspective of 'her money, her time' and women's outsourcing housework (Gupta, 2006, 2007). Mediation analysis (*mediate* in Stata 18) confirms that the indirect effect of women's earnings accounts for nearly 20 percent of the total effect (p=0.03) in France. In no country did relative or individual earnings explain away the effects of education, suggesting other non-economic mechanisms undergird the relationship.

Perhaps then, educational attainment is a proxy for gender ideology. That is, education predicts more gender egalitarian attitudes and egalitarian attitudes predict lower housework time. Given our cross-sectional design, disentangling gender ideology and housework time is challenging as the relationship between gender ideology and housework is recursive (Carlson & Lynch, 2013), and women's ability to convert egalitarian attitudes into a smaller share of housework depends on her educational attainment (Carriero & Todesco, 2018).

We did, however, identify one time use survey with rich attitudinal measures (we do not use it in the main analysis because the measurement of educational attainment is collapsed at levels 1 and 2, preventing the construction of our relative education measure). Using the Italian National Institute of Statistics' (ISTAT)

Use of Time Survey 2013, we can test an index of attitudes about the gendered division of labor¹. The correlation between education and egalitarianism is .27 for women and .22 for men. Replicating Model 3, we find that the association between her high education and her housework time is reduced by 18% (driven mainly by *his* ideology, not hers), but remains large (from -55 to -45 minutes). Mediation analysis confirms that the indirect effect of men's ideology accounts for 22 percent of the total effect ($p=0.01$). For men in the 2013 data the association between education (hers or his) and his housework is weak across all models and the addition of ideology does not change this. Overall, we find that in Italy, his gender egalitarianism decreases her housework time and increases his, suggesting a heightened willingness to share more domestic tasks (by men) and a higher tolerance to lower housework standards. This is in line with a progressive reduction of the total housework load. Similar to findings in Czechia (Hamplová et al., 2019), gender ideology does not explain most of the relationship between educational attainment and housework. So what is educational attainment measuring if not income and gender ideology? We return to this in the discussion.

4.4 Limitations

Time diary data -- as opposed to survey questions -- provide the best measure of housework behaviors, particularly when investigating aspects of gender deviance neutralization. Kan (2008) argues that survey questions about housework are affected by social desirability bias; she finds that men with gender traditional attitudes perform more housework according to their time diary records than they report in an accompanying survey. Unfortunately, time diary data typically lacks rich information on all the independent variables of interest, particularly in cross-national comparative research. We are unable to examine mechanisms such as outsourcing housework or housework standards. There is, however, a sizable difference in total housework time comparing our most gender equal countries to the least gender equal country, suggesting some difference in outsourcing or standards between more and less gender equal contexts. We also find a substantial reduction in housework over time in all countries, which results from women's reduction in housework time and -only marginally- men's higher take-up, suggestive of a shift in standards. Though the patterns are the same across countries, we observed a clear gradient in behavioural change over time from the most to least equal.

5. Discussion

The objective of this paper was to explore how women's increasing educational advantage is associated with gender (in)equality in housework and test the association across four different European cultural and institutional contexts over the last few decades. We tested predictions from different micro and macro levels theories over a period that accounts for the emergence and establishment of a progressively more gender-equal division of labour. Consistent with prior research (Bianchi et al., 2000), we found in all countries in the 1980s women's (and men's in Italy and France) absolute attainment, rather than relative, is associated with less time spent on housework by women. And men's (and women's in Italy and France) absolute attainment is associated with more time spent on housework by men. However, as a more egalitarian culture took hold in the following decades, in the 2010s, we only found the same effects in Italy and, to a lesser extent, in France and Germany. Similar associations for absolute attainment using women's or men's attainment -- women do less, men do more - indicate that for men, absolute attainment operates in line with theories that conceptualize it as a proxy for having or having ability to enact egalitarianism, rather than a resource for bargaining.

For women, the supplemental analyses suggest that absolute education reduces women's housework time beyond its association with earnings and egalitarian ideology. So what is educational attainment measuring? A diffusion explanation emphasizes that as the tension between employment and women's housework responsibility increases, women will look for new solutions even when the emerging behaviors go against traditional norms -- including their own -- and risk incurring costs and sanctions from significant others (Rindfuss et al., 2004). We argue that housework is sensitive not only to own and/or partner's gender ideology but also to the wider gender norms in country/referent groups and their change as a more gender egalitarian

¹ Composed of three questions: 1) it is better for the family if the man dedicates himself mainly to economic needs and the woman to taking care of the house; 2) if both spouses/partners work full-time, the man must do the same amount of housework as the woman; and, 3) men perform household tasks just as well as women.

ideology diffuses over time. These causal relationships between ideology and behavior prove even more difficult to disentangle when intertwined with feedback effects in a social diffusion process.

Our results highlight the context-specific nature of individual-level associations both across countries and over time. Contrary to resources being “discounted” in more traditional contexts (Fuwa, 2004) and consistent with diffusion theory (Esping-Andersen & Billari, 2015; Nazio, 2008; Palloni, 2001), we find that educational attainment is most important in Italy and to a lesser extent France and Germany. We fail to detect a relationship in the UK in the latter period with respect to women’s absolute educational attainment, reflecting how far the gender revolution has advanced in each context (Pailhé et al., 2021). Absolute educational attainment has a larger association with housework in countries that, or when countries are, less egalitarian. The coherence we find between the effect of education and the stage in which countries are in the gender equalisation process is consistent with predictions from diffusion, although we certainly do not claim to prove diffusion theory.

Our findings also have methodological implications for assessing the effects of heterogamy. Similar to Miller (2020; US) and Hamplová and colleagues (2019; Czechia), we find little support for the importance of relative education. We observe that coefficients for heterogamy flip when we control for men’s instead of women’s absolute educational attainment. These changing associations reflect the lack of control for partner’s education in models including relative attainment. Thus, if both partners attainment is not controlled, heterogamy is likely to be mis-specified. One approach is saturation (Miller 2020), that is, measuring all educational pairings. This approach, however, requires very large sample sizes because most couples are homogamous, or nearly homogamous, so data for uncommon pairings is sparse.

Our findings also highlight clear gaps in workload among women by educational attainment in Italy and France in both time periods. Controlling for family composition and employment arrangements, in the 2010s women at the lowest levels of education are doing substantially more housework than women at the highest, almost 30 minutes per day more, suggesting some externalization of housework by higher educated women relying on the work of other (less educated) women for cleaning, cooking, or laundry. Additionally, gender gaps in housework time are also large at lower levels of education in Italy and France. Lower educated (working) women are thus caught in an inequality trap, with fewer opportunities to either externalize chores or shift them to their partner.

The gender gap in Italy, and to a lesser extent France, is still strongly conditioned by educational attainment, suggesting that greater equalization, by gender and class, could occur should more equal practices diffuse further. There is still over an hour gender gap in daily housework in the UK and nearly an hour gap in Germany, where education no longer exerts much influence. The exhaustion of the equalizing effect of absolute educational attainment over time and the little traction of hypogamy in promoting more gender equality highlight the limitations of educational expansion alone for securing gender equality in housework.

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Data availability statement

Data for France, Italy (2008), and the UK can be downloaded from the MTUS-X data extract builder (<https://www.mtusdata.org/mtus/>). Data for Italy (1989) can be downloaded from the MTUS archive (<https://www.timeuse.org/index.php/mtus>). Data for Germany can be downloaded from the German Research Data Centre of the Federal Statistical Office (<https://www.forschungsdaten-zentrum.de/de/haushalte/zve>). Data for Italy 2013 can be requested from the Italian National Institute of Statistics (ISTAT) (https://www.istat.it/dati/microdati/#file_ricerca).

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Information in German

Deutscher Titel

Der Bildungsvorsprung von Frauen und die geschlechtsspezifische Aufteilung der Hausarbeit: Paare in Frankreich, Deutschland, Italien und dem Vereinigten Königreich

Zusammenfassung

Fragestellung: In dieser Studie wird untersucht, wie der größere Bildungsvorsprung von Frauen mit der (Un-)Gleichheit der Geschlechter bei der Hausarbeit in vier verschiedenen europäischen kulturellen und institutionellen Kontexten zusammenhängt.

Hintergrund: Das zunehmende geschlechtsspezifische Bildungsgefälle - zugunsten der Frauen - in den reichen Ländern hat zu einem Anstieg der bildungshypogamen Paare geführt (bei denen die Frau einen höheren Bildungsabschluss hat als der Mann). Mehrere Theorien legen nahe, dass dies zu einer Angleichung der Aufteilung der Hausarbeit nach dem relativen und absoluten Bildungsniveau der Frauen führen könnte.

Methode: Zeittagebuchdaten auf Paarebene aus der harmonisierten Multinationalen Zeitverwendungsstudie (MTUS-X und MTUS) und nationalen Zeitverwendungserhebungen für gegengeschlechtliche Paare in Frankreich 1985 und 2009, Italien 1989 und 2013, Deutschland 1991 und 2013 und Großbritannien 1983 und 2014 werden verwendet, um den Zusammenhang zwischen dem absoluten und relativen Bildungsniveau der Frauen und der Hausarbeit zu untersuchen.

Ergebnisse: Nicht Hypogamie, sondern das eigene Bildungsniveau von Frauen (und Männern) ist stark mit einem geringeren Zeitaufwand für Hausarbeit bei Frauen und einem höheren bei Männern verbunden, vor allem in Kontexten mit traditionelleren Geschlechterrollen, in denen die Hausarbeit ungleicher verteilt ist, wie in Italien und Frankreich in den 2010er Jahren und in allen untersuchten Ländern in den 1980er Jahren.

Schlussfolgerung: Die Ergebnisse stimmen am ehesten mit einer Diffusionsperspektive überein, deuten aber auch darauf hin, dass das steigende Bildungsniveau der Frauen allein nur begrenzt zu mehr Gleichheit bei der Hausarbeit beitragen kann.

Schlagwörter: Hausarbeit, Hypogamie, Zeitnutzung, Ungleichheit, unbezahlte Arbeit, Diffusion

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