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Educational attainment and housework participation among Japanese, Taiwanese, and American women across adult life transitions

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ABSTRACT

We investigate the association between women's educational levels and housework participation across cultural contexts and through different stages in the life-course. In testing the suggestion from previous research that women with higher levels of education spend less time on housework than do women with less education, we found that this argument holds true for single women in Japan, Taiwan, and the United States. Our results also indicate that for all American women and for single and married Taiwanese women without children, their numbers of years of education correlate inversely with their daily hours of domestic labour; however, this correlation does not exist for married Taiwanese women with children. Similarly, the educational levels of married Japanese women—with or without children—have no bearing on their housework participation.

KEYWORDS

Gender; housework; education; Japan; Taiwan

Introduction

Sociological research suggests that individuals with advanced degrees have more exposure to ideas about gender equality (Brayfield, 1992; Fan & Marini, 2000; Gershuny, 2000; Presser, 1994) and display a greater willingness to divide with their heterosexual partners the responsibilities for both household chores and income-earning activities. Housework literature associates higher levels of education among women with less time spent by the same women in performing domestic labour when they marry (Berardo et al., 1987; Ericksen et al., 1979; Torabi, 2020), also linking greater educational attainment among husbands with increases in their housework participation (Bergen, 1991; Kamo, 1988). On the other hand, men are also more likely to become stay-at-home fathers when their educational attainment is lower than that of their wives (Kramer & Kramer, 2016; Lui & Kee-lee, 2019). Yet even in an era in which the overall life-course trajectories indicate increasing numbers of women in post-secondary education and in the labour market, movement toward a more equal division of housework

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has been gradual, even in industrialised nations (Altintas & Sullivan, 2016, 2017; Kan et al., 2011; Sullivan et al., 2018).

Housework research has benefited from the application of the life-course perspective because this approach provides new insights into gender relations at home (Baxter et al., 2008; Coltrane & Ishii-Kuntz, 1992; Kan & Gershuny, 2009; Nitsche & Grunow, 2016). The life-course perspective's emphasis on transitions between socially defined states, such as first childbirth, helps to explain key moments of social change within the family (Kain, 2009). However, many assumptions underlying the life-course analysis of the effects of transitions on housework participation originate in research on Euro-American societies and prove problematic when applied to other cultural contexts. For example, in the countries of the global north, studies confirm that because women attain educational levels that are comparable to those of men (United Nations, 2015), women are more likely to have spouses who contribute greater amounts of their time to domestic labour (Berardo et al., 1987; Carriero & Todesco, 2018; Ericksen et al., 1979). Such arguments prove problematic in the case of East Asian societies (Kan & Laurie, 2018; Kolpashnikova et al., 2020; Kolpashnikova & Kan, 2020b). East Asian women with higher levels of educational attainment do not always have more opportunities to find gainful employment than do women with lower levels of education. In fact, women with any level of education encounter difficulties in finding and securing permanent jobs, especially when they marry and have children (Kan et al., 2019; Oshio et al., 2013; Raymo & Lim, 2011). Despite the numerous studies on how women's education influences housework participation during discrete life stages, researchers have paid little attention to the connections among women's educational attainment, housework participation, and life-course transitions in comparative research.

This paper contributes to the scholarly debate over the effects of education on housework participation by investigating whether the claims of previous research on the association between educational attainment and housework participation are applicable to contexts outside the global north. We test whether women's educational levels can predict their patterns of participation in domestic labour during different life-course stages in three different cultural contexts: Japan, Taiwan, and the United States. Additionally, our study tests outside of Euro-American contexts the assumptions present in life-course analyses of western countries. Previous studies examining domestic labour have concluded that marriage increases the time women spend doing housework (Blair & Lichter, 1991; South & Spitze, 1994) and that this burden grows substantially with women's transition to parenthood, resulting in the 'motherhood penalty' in wage work (Budig & Hodges, 2014) and concomitant increase in housework responsibilities (Cooke & Hook, 2018). Few studies, however, test whether life-course transitions are different across different cultures. The current study adopts a comparative angle by investigating whether these life transitions affect uniformly the association between educational attainment and housework participation in different contexts. Our findings will elucidate whether researchers should reformulate housework theories for broader applicability outside the global north.

The purpose of this project is to analyse whether differences in levels of education produce differences in allocations of time to household labour among Japanese and Taiwanese women at separate life stages in the same way that American women experience these differences, as previous studies suggest (Bianchi et al., 2000; Kan et al., 2019). Thus,

the present study addresses two principal research questions: (1) how does educational attainment correlate with housework participation during women's life-course stages of single adulthood, marriage, and motherhood? (2) Are the patterns of association similar among Japanese, Taiwanese, and American women?

Background

Individual experiences paired with institutionalised factors structure the life-course of each person. Factors that determine socioeconomic status, such as education and occupation, are psychologically important to the construction of the self and also the product of larger systemic processes that help to organise and legitimate this self across life transitions and sequences (Meyer, 1986). Education plays a substantial role in scheduling life-course transitions in the modern world (Clausen, 1991). From early childhood schooling to postsecondary education, strict rules specify the appropriate curriculum that each society believes will contribute to children's academic success and ideal cognitive development at each age-graded stage (Coombs, 1968). This system connects in turn to students' acquisition of credentials that will assist in sorting individuals as they transition to and within the work world (Apple, 1982; Bynner, 2009; Collins, 2019).

By viewing the life-course through a political or ideological lens, researchers can avoid forming deterministic and teleological accounts of how individuals strive for greater economic gain throughout their life trajectories. Life-course transitions represent the increasing incorporation of individuals into groups that rationalise practices that the groups previously justified in terms of the sacred, human nature, kinship obligations, and the economic roles specific to certain gender or age groups (Meyer, 1986). Many of these practices connect closely to the market economy because the modern life-course and its various transitions developed in response to new ways of organising labour (Kohli, 1986), including that of families.

Family lifestyles require more domestic labour than do individual lifestyles, and previous literature shows that married women, especially married women with children, usually spend more time on housework than single or divorced women do (Baxter et al., 2008; Gupta, 1999). In fact, women—no matter their levels of education or amount of resources—usually act in accordance with traditional gender expectations in settings where others hold them accountable for such performances. For instance, Thébaud et al. (2019) show that most societies hold women to higher standards of cleanliness than they do men.

One of these *gender factories* that systematically carry out the social process of gendering is the institution of marriage (Berk, 1985; West & Zimmerman, 1987). Married women often reaffirm their gender identity by engaging in supposedly feminine activities, such as housework, under the eyes of an audience that includes their husbands, children, and society. While women who hold more resources—including educational attainment—are better able to negotiate the degrees to which their partners participate in housework and child-care activities (Kolpashnikova, 2018; Kubo, 2009; Nakagawa, 2009), this bargaining power does not negate women's overall responsibility for domestic labour. According to scholars of gender, because most married women feel accountable to family members, married women are more likely to perform housework activities than are non-married women (Berk, 1985; Bittman et al., 2003; Pepin et al., 2018).

Alternatively, some researchers contend that personal evaluations of the cost-effectiveness of work opportunities may mitigate the influence of gender factories on women: as women with higher levels of education become capable of earning salaries comparable to those of men, such women may be less inclined to completely abandon paid work for housework even after they marry or have children (Becker, 1981; Gupta, 2007; Killewald & Gough, 2010). Overall, we can expect the following:

Hypothesis 1a: The higher the educational achievement of American, Japanese, and Taiwanese women, the less time they spend performing housework.

Hypothesis 1b: Although the overall time that these groups spend performing housework increases after marriage and childbearing, the direction of the association between educational attainment and housework participation does not change. That is, we expect a negative association between educational attainment and housework participation upon marriage and childbearing.

Our study tests whether these assumptions contained within housework theory and life-course theory are applicable in non-Western contexts. Some studies have revealed significant differences in East Asian countries (Kan et al., 2019; Qian & Sayer, 2016). At a minimum, we may anticipate some differences based on the fact that women in East Asian countries still experience significant pressure to quit their jobs after marriage or childbirth, regardless of their levels of education and professional attainment.

Previous research on gender equality and housework in Japan, Taiwan, and the United States

Despite women's growing educational attainment and some legal progress in protecting women's rights in the three countries' labour markets, women still do most housework in Japan, Taiwan, and the U.S. (Inaba, 1998; Ishii-Kuntz, 2009; Matsuda, 2001; Nishioka & Yamauchi, 2017; Tsuya, 2000; Tsuya et al., 2005). In each of these three countries, women's disproportionate share of housework is especially pronounced among couples with young children (Bianchi et al., 2012; Cheng & Hsu, 2020; Irani & Vemireddy, 2021; Nakamura & Akiyoshi, 2015), which may be alleviated to an extent by assistance from women in their extended families (Hu & Kamo, 2007; Kang & Cohen, 2018; Takahashi et al., 2013). Nevertheless, in East Asia, the division of labour still adheres to the traditional model featuring male-breadwinner and female-homemaker households (Slote & De Vos, 1998); Japanese and Taiwanese men occupy the public sphere and participate in the market economy, and their cultures still pressure most married women to stay at home and to perform the majority of housework and childcare (Borovoy, 2005; Chen & Yi, 2005; Kato et al., 2018; Shirahase, 2007).

Yet education may mediate the degree to which women pivot to the domestic sphere post-marriage and post-childbirth. In the West, particularly in the U.S., highly educated women with children are more likely than women with lower levels of education with children to be employed (England et al., 2004) and to subscribe to a gender ideology that encourages workforce participation and a more equitable distribution of domestic labour between married partners (Fan & Marini, 2000). Similarly, highly educated Japanese and Taiwanese women have a greater attachment to their careers and are less amenable to relying on their spouses for economic support (Jao & Li, 2012; Ng & Chen, 2018;

Raymo & Iwasawa, 2005). While the dual-earner model is more prevalent in the U.S. than in East Asia, married American women usually continue their employment but still perform more housework on average than their partners do (Kolpashnikova & Kan, 2020a; South & Spitze, 1994).

In contrast, the pressure to exit paid labour upon marriage and childbirth remains strong among East Asian women (Chen & Hsieh, 2017; Chen & Yi, 2005; Shirahase, 2007), so we may expect that life transitions are less likely to attenuate educational attainment's influence on housework participation in the U.S. During such transitions, East Asian women are more likely to relocate at least temporarily to the domestic sphere. They may return to the workplace on a part-time or permanent basis once their children have grown older, though the positions wives and mothers find available to them are frequently lower-paying and less stable than those they left behind (Raymo et al., 2015).

Notably, Taiwanese women face fewer barriers than do Japanese women when they re-enter the labour market after marriage or childbirth (Yu, 2009), despite the fact that Japanese hold more egalitarian gender ideologies than do Taiwanese women and men (Qian & Sayer, 2016). Highly educated Japanese women are both less likely to re-enter the workforce if they leave their positions and more likely to remain in the workforce after giving birth (Raymo & Lim, 2011) because they have more to lose economically through any sort of absence. However, this situation does not mean that the pressure on highly educated Japanese women to prioritise family over work is negligible (Takahashi et al., 2013). In Taiwan, pronatalist policies, workplace norms, and institutional support are more favourable to women than in Japan (Frejka et al., 2010). Taiwanese married women and mothers therefore engage more frequently in paid labour because they experience fewer penalties for balancing work and home life than Japanese women do (Yu, 2005).

Other factors may also help explain Taiwanese women's greater social agency when it comes to balancing work and home life. A weaker connection in Taiwan between gender and such routine housework as cooking and cleaning facilitates women's working outside the home (Kan et al., 2019). Further, highly educated Taiwanese women have a declining interest in adhering to traditional gender roles (Jao & Li, 2012). Compared to their Japanese counterparts, Taiwanese women also have greater relative earnings and higher occupational status (Yu, 2009) as well as more economic opportunities (Jao & Li, 2012). Moreover, Taiwanese women hold higher levels of education than do Taiwanese men (Chang & England, 2011). Like Taiwanese women, American women have similarly outpaced men in the acquisition of advanced degrees (United States Census Bureau, 2019) and have greater expectations overall regarding their partners' participation in housework (Greenstein & Teachman, 2009). For these reasons, we may anticipate that the effects of educational attainment on housework participation among married women are greater among Taiwanese and American women than among Japanese women. We have therefore formulated the following hypothesis:

Hypothesis 2a: Among married women and women with children in Taiwan and the United States, levels of educational attainment correlate inversely with these women's hours of housework participation, especially among married women without children.

Hypothesis 2b: There is no association between educational attainment and housework participation for Japanese married women with and without children.

Data and methods

For the Japanese data, we used the 2006 Survey on Time Use and Leisure Activities (STULA) (Statistics Bureau Japan, 2016). The STULA collected time diaries for two consecutive days, using a two-stage stratified sampling method. All household members 10 years of age and above in the sample were asked to complete the survey. Foreigners living in Japan were also included in the survey. The Japanese sample included 38,952 observations for the first diary day, which was chosen for the analysis.

For Taiwan, we used the 2004 Taiwan Social Development Trends Survey (TSDTS) (Directorate-General of Budget, 2013). The TSDTS, which collected face-to-face surveys from non-institutionalised Taiwanese people 15 years of age and above, included 4,780 observations. The survey collected data in all 22 administrative divisions of Taiwan. However, it divided the Taipei data into two categories: the city and the suburbs.

For the American models, we use the 2004–2006 American Time Use Survey (ATUS) (Bureau of Labor Statistics, 2016), which includes a sample of 10,561 non-missing observations. Using a stratified three-stage sampling technique, the Census Bureau interviewed residents of the US who were at least 15 years of age in 50 states and one federal district. The ATUS used the Current Population Survey (CPS) as the sampling frame, and the Census Bureau interviewed selected members of households two to five months after the completion of the CPS.

We used several sample selection steps to produce our final analytic sample, and we include three main subsamples within models: non-married women without children, married women without children, and married women with children. We did not perform an analysis for non-married women with children because the Japanese dataset lacks sufficient observations for the subsample. We also restrict our sample to women ages 20 through 59 years of age. Additionally, we recoded the weights based on the original survey weights, scaled to the original sample size where needed.

Dependent variables

The dependent variables are represented by an aggregate measure of the time spent by women on indoor housework, such as cooking, cleaning, and doing laundry. Minutes on a diary day serve as measures for housework participation in all three countries. This type of housework is traditionally associated with women. Due to differences in the cultural associations of shopping with gender (Hamlett et al., 2008) and the differences in how grocery shopping is done in three countries, we decided to restrict housework to indoor routine tasks only, which all three cultures associate more closely with women than men.

Table 1 summarises descriptive statistics for housework time among women in Japan, Taiwan, and the US. The table shows that there is little difference in the amount of housework that non-married women do across countries, but there are great differences among non-married and married women. In Japan and the US, non-married women spent about 57–58 min daily on housework, while non-married women in Taiwan spend a little more—65 min. In the US, married women spend at least twice as much time on housework as non-married women, whereas Japanese and Taiwanese spend three times more than their non-married counterparts. Moreover, married women do more housework in East Asian countries than in the US.

Table 1. Descriptive statistics for 20- to 59-year-old women in Japan, Taiwan, and the U.S.

	(1) HW (min. a day)	(2) Education (years)	(3) Paid Work (min. a day)	(4) HI	(5) PI	(6) Weekday	(7) Age (years)	(8) Employed	(9) Urban
Japan 2006				(in 10,000 JPY)					
1 NM Women	56.6 (1.6)	13.3 (0.0)	312.2 (4.6)	531.1 (7.4)		0.7 (0.0)	33.3 (0.2)	0.8 (0.0)	0.5 (0.0)
2 M Women w/o C	192.7 (2.8)	12.7 (0.0)	209.1 (4.2)	606.7 (6.9)		0.7 (0.0)	46.6 (0.2)	0.7 (0.0)	0.5 (0.0)
3 M Women w/ C	236.0 (1.9)	12.9 (0.0)	166.7 (2.8)	655.9 (4.6)		0.7 (0.0)	42.2 (0.1)	0.6 (0.0)	0.5 (0.0)
Observations	38,952	38,952	38,952	38,952		38,952	38,952	38,952	38,952
Taiwan 2004				(in 1000 NTD)					
1 NM Women	65.2 (2.7)	13.4 (0.1)	302.4 (7.2)		272.5 (5.7)	0.7 (0.0)	31.3 (0.3)	0.8 (0.0)	0.4 (0.0)
2 M Women w/o	196.9 (3.4)	10.2 (0.1)	259.3 (6.2)		263.8 (5.8)	0.7 (0.0)	45.7 (0.2)	0.7 (0.0)	0.3 (0.0)
3 M Women w/ C	267.8 (4.8)	12.0 (0.1)	232.9 (6.9)		259.7 (6.6)	0.7 (0.0)	36.2 (0.2)	0.6 (0.0)	0.3 (0.0)
Observations	4,780	4,780	4,780		4,780	4,780	4,780	4,780	4,780
US, 2004–2006				(in USD)					
1 NM Women	57.8 (1.8)	14.1 (0.0)	252.3 (5.0)	46,623 (693.6)	27,296 (522.2)	0.7 (0.0)	38.5 (0.3)	0.8 (0.0)	0.7 (0.0)
2 M Women w/o C	106.7 (2.6)	14.1 (0.2)	230.2 (5.3)	71,782 (833.1)	27,000 (560.9)	0.7 (0.0)	44.8 (0.2)	0.8 (0.0)	0.7 (0.0)
3 M Women w/ C	139.7 (1.8)	13.7 (0.0)	166.7 (3.1)	65,903 (533.3)	20,873 (350.3)	0.7 (0.0)	36.9 (0.1)	0.6 (0.0)	0.7 (0.0)
Observations	10,561	10,561	10,561	10,561	10,561	10,561	10,561	10,561	10,561

Standard errors in parentheses. HW—‘housework’; HI—‘household income’; PI—‘personal income’; NM women—‘non-married women without children’; M women w/o C—‘married women without children’; M women w/ C—‘married women with children’.

Independent and control variables

We measured the main independent variable—education—as years spent in school. Since the meaning of educational attainment as a category and as a concept differs across the societies analysed, we opted to compare these three cultural contexts using years of education rather than a categorical education variable. We also controlled for the time spent on paid work and whether the respondent is employed. Cultural differences in the meaning of employment status as a category and as a concept also make it preferable to use the most basic version of employment classification (i.e. employed or not employed).

Control variables include household and personal income, which is measured in 10 thousand Japanese yen in Japan, one thousand New Taiwan dollars in Taiwan, and in US dollars in the US for the descriptive statistics. In Japanese data, only data on household income were available. In Taiwanese data, only data for personal income were available. In the US data, however, both household and personal income measures were available. In models, we recoded all income variables into income quartiles to make comparison across cultural contexts possible. The models for Japan control only for household income, whereas models for Taiwan control only for personal income. This situation complicates the comparison across these two countries. However, we ran both models with personal and household income measures for the US, and the results for the association between educational attainment and housework participation did not change. We also do not anticipate a change for the other two countries. Women’s personal income decreases

as they move through life-course stages; [Table 1](#) reports lower levels of personal income among married women, especially among those with children, compared to non-married women both in the US and in Taiwan. On the other hand, household income increases with changes in life-course stages.

Additionally, we tried to capture the effects of age on the data by using age in years as a variable. We sorted the data for women into four age groups: 20–29, 30–39, 40–49, and 50–59 years of age. The youngest group serves as the reference category.

We also control for whether the subject completed the diary day on a weekday or on the weekend (1=‘Monday to Friday’, 0=Saturday or Sunday). Another variable controlled for whether the respondent resides in an urban area. [Table 1](#) shows that more women reported that they reside in urban areas in the US than in Japan or Taiwan.

Models

To analyse the effects of gender, marital status, and education on participation in routine housework, we ran the models separately for non-married women, married women without children, and married women with children in each of the three countries. For each of the life-stage models, we tried two main variations of models: (1) a model without control variables, with only the education variable, and (2) a model with all control variables. We employed OLS regression for the analysis. In the analysis of time-diary data, OLS often generates more unbiased estimates compared to Tobit (Stewart, 2013). We use official STULA, TSDTS, and ATUS survey weights scaled to the sample size.

Results

We produced the model estimates for Japan, Taiwan, and the US to analyse the effects of educational attainment on the time spent by women on routine housework, cooking, and cleaning. [Tables 2–5](#) summarise the coefficients of the OLS regressions for each country. Two of the tables apply to the US. [Table 4](#) employs household income for the income quartile variables, whereas [Table 5](#) employs the personal income variable. To capture and compare marital/parental status differences in the association between educational attainment and housework participation, these models divide into subsamples the following groups: non-married women without children, married women without children, and married women with children. Overall results show that there are cultural variations in the effects of transitions to marriage and childbearing on the association between education and housework participation. Hypotheses 1a and 1b hold for all groups only among American women. They also hold for non-married women without children in all cultural contexts. For married women with children in Taiwan and Japan, we observed results confirming Hypotheses 2a and 2b. The results in detail are discussed below.

The results in [Table 2](#) through [Table 5](#) show that on average, non-married Japanese, Taiwanese, and American women have lower participation in housework associated with increases in their educational levels. For example, Model 2 in [Table 2](#) shows that non-married Japanese women with a college education (16 total years of education) spend on average at least 6.4 min less (4 years * –1.6) than non-married women with only a high-school education (12 total years of education). Thus, generally speaking, more highly educated non-married women do less housework than do those with

Table 2. Regression coefficients, Japanese Women, 2006.

	(1) NM women w/o C	(2) NM women w/o C	(3) M women w/o C	(4) M women w/o C	(5) M women w/ C	(6) M women w/ C
Education	-10.58*** (0.80)	-1.60* (0.75)	-2.26 (1.43)	0.52 (1.30)	2.30 ⁺ (1.27)	0.13 (1.18)
Paid Work		-0.10*** (0.01)		-0.28*** (0.01)		-0.31*** (0.01)
Employed		-22.45*** (6.32)		-22.40*** (6.61)		-4.32 (4.55)
Household Income: Bottom Quartile		Ref.		Ref.		Ref.
25–49 percentile		-17.96*** (3.43)		-1.91 (7.23)		5.60 (5.61)
50–74 percentile		-12.65* (4.95)		3.05 (7.62)		8.18 (5.54)
Top Quartile		-23.11*** (3.64)		-8.39 (7.93)		9.03 (5.62)
Weekday		8.15** (2.77)		48.45*** (4.59)		50.59*** (3.27)
Age Category: Age 20–29		Ref.		Ref.		Ref.
Age Group, 30–39		35.62*** (3.64)		29.32** (10.62)		42.28*** (6.41)
Age Group, 40–49		83.81*** (5.21)		76.86*** (11.27)		101.54*** (6.56)
Age Group, 50–59		93.08*** (4.71)		66.03*** (9.36)		83.91*** (6.71)
Urban		-4.48 ⁺ (2.64)		10.28* (4.43)		6.74* (3.27)
Constant	197.02*** (10.94)	103.22*** (10.22)	221.38*** (17.44)	166.52*** (19.17)	206.25*** (16.53)	172.91*** (15.96)
Observations	11,344	11,344	9699	9699	17,909	17,909
R-squared	0.04	0.29	0.00	0.28	0.00	0.23

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. NM women w/o C—'non-married women without children'; M women w/o C—'married women without children'; M women w/ C—'married women with children'.

fewer years of education. The results for non-married women without children, overall, confirm Hypothesis 1a: with higher levels of education, women reduce their participation in housework regardless of the cultural context.

In contrast, among married women, the resulting effects of educational attainment on housework participation were distinct in Japan and Taiwan. The results for Japan and Taiwan contradict the expectations laid out by previous research as to the inverse association between education and housework participation. Thus, according to the data, in contrast to US women, Japanese married women participate in housework regardless of their educational level. (The coefficients in Models 4 and 6 in Table 2 cannot be significantly distinguished from zero.) This finding confirms Hypothesis 2b with regard to the association between education and housework participation among married Japanese women.

However, the results for Taiwanese married women are not as straightforward. Although married Taiwanese women without children reduce their time spent on housework when they increase their educational attainment (Models 3 through 4 in Table 3), this trend does not apply to married Taiwanese women with children when we control for other variables (Models 6 in Table 3). Although the association between educational

Table 3. Regression coefficients, Taiwanese Women, 2004.

	(1) NM women w/o C	(2) NM women w/o C	(3) M women w/o C	(4) M women w/o C	(5) M women w/ C	(6) M women w/ C
Education	-11.22*** (0.65)	-5.95*** (0.85)	-4.99*** (0.82)	-2.38** (0.85)	-7.25*** (1.32)	0.83 (1.37)
Paid Work		-0.12*** (0.01)		-0.24*** (0.02)		-0.27*** (0.02)
Employed		0.81 (8.31)		-17.80* (8.61)		-75.55*** (12.58)
Personal Income:						
Bottom		Ref.		Ref.		Ref.
Quartile						
25–49		-11.76 ⁺ (6.48)		-17.39* (7.20)		-16.32 (11.32)
percentile						
50–74		-5.37 (7.49)		-22.25* (9.13)		-37.09** (12.59)
percentile						
Top Quartile		-12.61 (7.74)		-27.30*** (8.20)		-37.56** (11.89)
Weekday		15.48** (5.25)		24.68*** (5.72)		46.94*** (8.03)
Age Category:						
Age 20–29		Ref.		Ref.		Ref.
Age Group,		31.60*** (6.34)		49.04*** (14.12)		14.71 (10.04)
30–39						
Age Group,		60.86*** (6.98)		52.79*** (12.82)		20.41 ⁺ (11.46)
40–49						
Age Group,		75.11*** (8.68)		34.90** (13.26)		8.78 (14.92)
50–59						
Urban		-2.45 (4.61)		-1.12 (5.27)		-8.06 (7.50)
Constant	203.02*** (8.73)	140.01*** (13.73)	216.36*** (8.69)	216.24*** (16.53)	325.97*** (16.19)	314.68*** (18.39)
Observations	1354	1354	1949	1949	1477	1477
R-squared	0.18	0.34	0.02	0.31	0.02	0.38

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. NM women w/o C—'non-married women without children'; M women w/o C—'married women without children'; M women w/ C—'married women with children'.

attainment and housework participation for these women is similar to the association shown for American women when models do not control for other variables (Model 5), the association is rendered negligible when control variables are added into the model (Models 6). The personal income variable absorbs most of the effect of the education variable, as shown in the full models. These results confirm Hypothesis 2a for Taiwanese married women without children but not for Taiwanese married women with children. The housework participation of Taiwanese married women with children, just like of their Japanese counterparts, does not depend on the level of their education. Additionally, although income level is not as important for non-married Taiwanese women, it becomes more important with marriage and motherhood. Overall, these results suggest that cultural differences help to determine the effect of women's educational attainment on housework participation.

We also find that the association between Japanese married women's educational attainment and housework participation results in patterns contrary to the expectations among American and Taiwanese women, following the expectations of Hypothesis 2b and negating the expectations of Hypothesis 1b. Unlike American married women, Japanese married women do not decrease their engagement in housework even when they

Table 4. Regression coefficients, American women with household income quartiles, 2004–6.

	(1) NM women w/o C	(2) NM women w/o C	(3) M women w/o C	(4) M women w/o C	(5) M women w/ C	(6) M women w/ C
Education	–2.66*** (0.75)	–1.77* (0.81)	–7.42*** (1.01)	–4.86*** (1.08)	–7.04*** (0.60)	–5.48*** (0.65)
Paid Work		–0.12*** (0.01)		–0.20*** (0.01)		–0.22*** (0.01)
Employed		13.89* (5.60)		9.15 (6.89)		–10.19* (4.04)
Household Income:						
Bottom Quartile		Ref.		Ref.		Ref.
25–49 percentile		2.25 (5.00)		–8.32 (8.59)		–0.39 (5.44)
50–74 percentile		6.79 (5.50)		0.39 (7.85)		–4.10 (5.20)
Top Quartile		–2.40 (9.63)		–4.65 (9.34)		–12.70* (6.24)
Weekday		–8.87* (4.46)		23.00*** (5.95)		18.66*** (3.62)
Age Category:						
Age 20–29		Ref.		Ref.		Ref.
Age Group, 30–39		28.33*** (6.76)		13.80 (10.01)		20.22*** (4.79)
Age Group, 40–49		35.64*** (5.72)		39.83*** (8.99)		34.43*** (5.14)
Age Group, 50–59		42.74*** (5.28)		45.55*** (8.25)		46.09*** (7.26)
Urban		3.56 (4.17)		9.14 ⁺ (5.15)		–2.91 (3.45)
Constant	110.17*** (10.83)	79.87*** (12.25)	217.35*** (14.54)	160.34*** (17.74)	239.85*** (8.58)	227.17*** (9.35)
Observations	2619	2619	2307	2307	5635	5635
R-squared	0.00	0.11	0.02	0.15	0.02	0.15

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. NM women w/o C—‘non-married women without children’; M women w/o C—‘married women without children’; M women w/ C—‘married women with children’.

have higher educational levels. Moreover, unlike Taiwanese married women with children, differences in income levels do not account for the association in the expected direction.

Additionally, our results indicate that the negative educational gradient’s magnitude increases among married women relative to single women in the US. This trend is not present in the two studied East Asian contexts. These results might reflect differences in household composition: compared to households in the US, those in such East Asian countries as Japan and Taiwan include a higher number of single people residing with their parents (Yasuda et al., 2011). Multigenerational households can share housework among members, whereas single women living alone cannot.

Table 2 through Table 5 show that the effect of household income is more applicable to non-married Japanese women, but not to American non-married women. Non-married Japanese women without children are even more likely not to engage in housework if they reside in households with higher household income. The same is not true for non-married American women. For non-married Taiwanese women, only women in the second quartile (25th to 49th percentiles for personal income) do significantly less housework than non-married women in the lowest income quartile. For

Table 5. Regression coefficients, American women with personal income variables quartiles, 2004–6.

	(1) NM women w/ o C	(2) NM women w/ o C	(3) M women w/ o C	(4) M women w/ o C	(5) M women w/ C	(6) M women w/ C
Education	–2.66*** (0.75)	–1.71* (0.81)	–7.42*** (1.01)	–4.51*** (1.07)	–7.04*** (0.60)	–6.26*** (0.60)
Paid Work		–0.12*** (0.01)		–0.20*** (0.01)		–0.22*** (0.01)
Employed		124.82* (56.96)		–2.20 (45.74)		–26.19 (35.13)
Personal Income:						
Bottom		Ref.		Ref.		Ref.
Quartile						
25–49		–116.57* (57.06)		16.68 (45.97)		13.64 (35.30)
percentile		–109.00+ (56.87)		11.54 (45.43)		15.49 (35.13)
50–74						
percentile		–107.63+ (56.91)		7.58 (45.39)		18.11 (35.13)
Top Quartile						
Weekday		–8.35+ (4.46)		22.63*** (5.97)		18.90*** (3.63)
Age Category:						
Age 20–29		Ref.		Ref.		Ref.
Age Group,		27.53*** (6.86)		15.11 (9.97)		18.24*** (4.71)
30–39						
Age Group,		34.75*** (5.83)		41.17*** (8.82)		31.39*** (4.98)
40–49						
Age Group,		42.23*** (5.38)		46.77*** (8.05)		43.14*** (7.18)
50–59						
Urban		3.52 (4.17)		9.05+ (5.12)		–4.04 (3.43)
Constant	110.17*** (10.83)	80.38*** (12.74)	217.35*** (14.54)	152.34*** (17.76)	239.85*** (8.58)	236.60*** (9.13)
Observations	2619	2619	2307	2307	5635	5635
R-squared	0.00	0.11	0.02	0.15	0.02	0.15

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. NM women w/o C—‘non-married women without children’; M women w/o C—‘married women without children’; M women w/ C—‘married women with children’.

American women, the association between quartiles of household income with housework participation is not significant when controlled for educational attainment and other independent variables (see Table 4, Model 2). However, the association between personal income and housework participation is on the statistically significant level. Non-married American women who earn more money are less likely to spend more time on housework activities.

The effects of other control variables are similar for the three countries, except for weekend as compared to weekday participation. Most women in the three countries are likely to perform more housework on weekdays than on weekends, except for non-married American women, who are significantly more likely to do housework on weekends than on weekdays. The results for American non-married women reflect the weekly time constraints of participation in the labour market (Kolpashnikova & Kan, 2020b). This result suggests that the participation of non-married American women in housework depends on their weekday work schedules. The results that incorporate an age variable show that age affects women’s participation in housework in a similar way: older women in all three countries do more housework than women in the youngest age group.

Consequently, the results in Japan are starkly different from those in the US and in Taiwan with regard to the association of educational attainment and housework participation among married women. As we suggest in this paper's Hypothesis 2b, higher levels of education are not associated with fewer hours of housework for married Japanese women.

The results suggest that marriage effectively reverses the pattern of association between education and housework participation for Japanese married women. Societal expectations might push these married women to devote more time to housework than non-married women, mostly because patriarchal societies push many married women and mothers out of the workforce. Therefore, the institutions of marriage in Japan and motherhood in Taiwan might still be 'site[s] for doing gender' (West & Zimmerman, 1987) and 'gender factor[ies]' (Berk, 1985).

Overall, the results show that the structures of the Japanese labour market and the institution of marriage in Japan place higher expectations on married women regarding their performance of housework compared to non-married women and men. Women in the US or even in Taiwan do not face the same societal expectations. Although married Taiwanese mothers deal with similar challenges in the labour market, high levels of personal income seem to be associated with a reduction in housework participation for Taiwanese mothers. In contrast, higher levels of household income in Japan do not translate into fewer hours of housework by women. These results also contrast with the effects of socio-economic status in the West, where high educational and income levels alleviate the housework burden for women, albeit not to the extent that women and men share equally in responsibility for the home. One potential factor that may help to explain cultural variations in income's effect on housework is the use of outsourcing services. In Japan, outsourcing housework remains uncommon, regardless of the ability to afford such services (Iwai, 2017).

The results presented in this paper are robust to the use of other estimation models, such as negative binomial or Poisson regressions. They are also robust if we exclude correlates of socioeconomic status other than education (household income and personal income). We ran a set of additional robustness checks. The main claims of this paper do not change when we use education as a categorical variable, nor do the results change when we add to the models other available household variables, including the youngest child's age, co-residence with parents, and spousal absence. The robustness checks for spousal education do not alter our argument but provide interesting results for future investigation. Similarly, the interaction of the educational variable with employment data does not change this paper's conclusion, but this relationship might be worth future investigation. The results of these robustness checks are available upon request.

Discussions and conclusions

Many of the assumptions implicit in housework research often neglect the social contexts navigated by women in non-Western countries. This study therefore set out to test whether the inverse relationship between educational attainment and housework participation documented in studies of women in the global north also holds true for Japanese and Taiwanese women across three life stages: single adulthood, marriage, and motherhood. The results of the present study show that educational level does not affect the

time spent on domestic labour among married Japanese women with and without children or among married Taiwanese women with children.

Educational attainment is associated with a reduction in housework among women primarily in the global north, limited to the US in this analysis. For East Asian cultures, we find evidence that the path to equality can be more culturally specific than many researchers of housework had previously assumed. Thus, efforts to increase educational attainment among women will not necessarily lead to a reduction in their unpaid labour in the home because the transition to certain life stages—especially to marriage or motherhood—may also serve as a transition to robust gender factories that place higher expectations on East Asian women than women in western societies experience.

A critical limitation of this research comes from the need to harmonise the data across three different countries with agencies that use different methods of collecting time-use data. Given the discrepancies between the three surveys, we could not add many household composition variables to our models. We ran a set of robustness checks, and none changed the results. However, considering the original data's limitations, the impact of household structure on the relationship between housework participation and education may be absorbed into the error term.

Another limitation is that the data did not allow the use of spousal data for all three countries. The addition of data for couples usually increases the accuracy of results on housework participation. Moreover, the differential effects on housework participation of homogamy and heterogamy in different cultural contexts are undeniable. Future research can explore this avenue in tandem with analyses of the educational levels of both spouses.

Future research on women's housework participation could benefit from the development of theoretical frameworks that consider contextual nuances. Specifically, we urge housework researchers to consider cultural and social factors when analysing gender inequality. At times, these factors' effects are more influential than are economic resources.

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