

**HOUSEWORK, EARNINGS, AND NATION: A CROSSNATIONAL INVESTIGATION
OF THE RELATIONSHIP BETWEEN WOMEN'S EARNINGS AND THEIR TIME
SPENT ON HOUSEWORK**

NOTE: We thank Paula England for valuable feedback on an earlier version of this paper.

ABSTRACT

Previous crossnational research on the relationship between women's earnings and housework has focused on the "economic dependence" and "gender display" models, both based on measures of women's earnings relative to their male partners'. Using data on women employed full time from the former West Germany, Sweden, and the U.S., we perform the first crossnational test of the "autonomy" model based on women's *individual* earnings. We find that this "autonomy" model performs better than earlier models in both European countries, and as well as them in the U.S. In all three countries, women's time spent doing routine household chores is negatively associated with their individual earnings, but not with their male partners' earnings.

INTRODUCTION

For all the political and cultural differences among the nations of the world, two kinds of gender disparity appear to be universal. One, women earn less money than men, on average. Two, women spend more time on domestic labor than do men. The relationship between these two ubiquitous features of social life has intrigued scholars for decades. The first wave of quantitative studies investigating the relationship between women's earnings and time spent on housework used data from one country, usually the U.S. (e.g. Brines 1994). Over the last decade, research has broadened to include data from multiple nations (e.g. Bittman, England, Sayer, Folbre, and Matheson 2003; Evertsson and Neramo 2004).

In this study we continue this second wave of crossnational scholarship by analyzing the relationship between women's earnings and housework using data from three countries: the former West Germany, Sweden, and the U.S. Our study departs from the tradition in this line of inquiry in one crucial respect, however. To date, crossnational studies of the relationship have assumed that women's time spent on domestic labor is associated with their earnings relative to their male partners', and then looked for crossnational differences in this association. Prior research has not taken into account the possibility that in at least some countries, what may be just as important are women's individual earnings.

Here we perform the first crossnational test of the hypothesis that women's own, absolute earnings may be as good or better predictors than their relative earnings of their time spent on housework. Our investigation is motivated by recent findings that women's housework time in the U.S. was negatively associated with their own earnings and not with their male partners' (Gupta 2006). We perform the first crossnational comparison to date of the importance of absolute and relative earnings in models of women's housework time. For each of the three

countries in our study, we examine how earlier models based on women's relative earnings fare upon the incorporation of women's absolute earnings. Further, our introduction of women's absolute earnings into the customary models allows us to examine the consequences of earnings disparities *among* women for their time spent on housework. Finally, for the first time in the crossnational literature, we determine whether women's time spent on domestic chores is associated with *men's* earnings in some countries and not others.

Our selection of the three western countries named above is motivated by the growing scholarly interest in potential connections between gender equality at the national and household levels (e.g. Fuwa 2004). Researchers have become especially interested in differences across countries in the degree of government promotion of gender egalitarianism, and how this variation may be associated with differences in the gender dynamics of household labor. The countries we have selected are characterized by different levels of gender egalitarianism at the national level. They also feature varying degrees of state encouragement of gender equality through law and policy. We test country-specific hypotheses regarding the relationship between women's housework and earnings that are sensitive to these differences, though our models do not include macro measures of gender equality or government policy.

BACKGROUND

Two distinct approaches have characterized previous crossnational studies of the relationship between women's economic resources and their time spent doing housework. In the line of inquiry we follow here, researchers have applied to multiple countries the two leading individual-level models originally developed using data from the U.S. (Bittman et al. 2003; Evertsson and Neramo 2004). These models are often referred to as the "economic dependence" and "gender display" hypotheses. The second kind of crossnational research has focused instead

on the connection between gender equality at the national level and the relationship between women's resources and time spent on domestic labor at the individual or household level (e.g. Fuwa 2004; Geist 2005). The studies based on this idea of "micro-macro linkage" have assumed implicitly that the economic dependence model applies in every country, and that national context affects only the degree to which it does so. Despite this important difference between the two approaches, they are both founded on the relationship between women's housework and their *relative* resources, i.e. their resources compared to their male partners'. Our objective is to introduce into the crossnational literature a model of women's housework time based on their own earnings.

The "economic dependence" and "gender display" models

In its focus on women's relative resources, the crossnational literature has followed the lead of earlier research using data from the U.S. (Akerlof and Kranton 2000; Brines 1994; Greenstein 2000). Two theories have dominated this scholarship. The first appears in different forms as the "economic dependence," "relative resources," "bargaining," or "economic exchange" argument. It proposes that the more money individuals make compared to their partners, the greater negotiating power they have in housework negotiations, and the less time they spend on housework (Blumberg and Coleman 1989; England and Farkas 1986; Huber and Spitze 1983; see also Bittman et al. 2003, pp. 188-189 for a lucid summary of bargaining models, and Breen and Cooke 2005, pp. 44-50 for a related game theoretic approach). Because women's earnings are typically lower than their male partners', they spend more time doing housework. The second theoretical framework is described variously as "gender display," "doing gender," or "gender deviance neutralization." In contrast to the first, it predicts gender-specific shapes of the relationship between earnings and housework: Women with unusually high relative earnings will

do more housework than other women, and men whose relative earnings are unusually low will spend less time on housework than other men. The motivation in both cases is to protect their own and their partners' gender identities from the threat posed by their gender-atypical relative earnings (Brines 1994).

The quantitative research based on these models has yielded mixed evidence in the case of women. There appears to be a leaning towards the dependence hypothesis among studies using data on U.S. women (Brines 1994; Bittman et al. 2003; Parkman 2004), though at least one study found evidence for gender deviance neutralization (Evertsson and Neramo 2004). To our knowledge there have been only two crossnational studies employing both the dependence and display models. In their analysis of data from Australia and the U.S., Bittman et al. (2003) found that Australian women's housework followed the predictions of the dependence model up to the point where their earnings were equal to their husbands', but conformed to the display hypothesis if their earnings exceeded their husbands'. That is, the time spent on domestic labor by women decreased with their relative earnings so long as they earned less than their husbands, but increased if they earned more. By contrast, the dependence model fit the relationship between U.S. women's relative earnings and housework time throughout the range of relative earnings. Bittman et al. (2003) explained this difference by noting that women who earned more than their husbands were especially unusual in Australia, with its institutionalization in the past of the male breadwinner ideal. In the apt terminology of Greenstein (2000), they therefore had a greater compulsion to neutralize their deviance.

In the second crossnational study using both the dependence and display models, Evertsson and Neramo (2004) employed data from Sweden and the U.S. for the period 1974 to 2000. They found that the square term in relative earnings indicating display was significant in

the U.S. from 1981 to 2000, though it decreased in magnitude over the years. By contrast, the association between housework and relative earnings among Swedish women conformed to the dependence hypothesis throughout the study period. The authors' interpretation of the differences in their findings for Sweden and the U.S. was similar to that of Bittman et al. (2003). They noted that couples in which the woman's earnings exceeded the man's were less common in the U.S. than in Sweden, which could lead to gender display among some women in the U.S. and not in Sweden. They also observed that social policies designed to reduce the work–family conflict in Sweden may foster more egalitarian attitudes and reduce the need for gender deviance neutralizing behavior.¹ Still, the overall conclusion from this study was that housework is gendered even in Sweden; women do the bulk of it independent of their relative resources. In a subsequent longitudinal analysis, this conclusion was strengthened. Support for the dependence model weakened over time, and increases in women's relative resources between 1991 and 2000 were followed by only small reductions in their share of housework (Evertsson and Nermo 2007). A study by Halleröd (2005) using Swedish data from 1998 also yielded weak support for the economic dependence model.

In the case of former West Germany, two recent longitudinal studies yielded qualified evidence for the dependence model. Schulz and Blossfeld (2006) found that newlyweds were more likely to divide housework equally in cases where the wife had substantially greater earnings than the husband. They concluded that women in Germany needed a resource-advantage over their husbands to overcome the normative traditional role expectations and enforce an egalitarian division of housework during the early stages of marriage. A second study showed, however, that with increasing marriage duration, these women took over larger shares of

¹ The two studies employed different U.S. datasets: Bittman et al. used the National Survey of Families and Households (NSFH), while Evertsson and Nermo (2004) analyzed data from the Panel Study of Income Dynamics (PSID).

housework, and that no economic effect remained significant after controlling for the presence and ages of children (Grunow, Schulz, and Blossfeld 2007). Two other studies using data from both former East and West Germany did not find an association between economic dependence and share of housework in either region (Künzler, Walter, Reichart, and Pfister 2001; Lewin-Epstein, Stier, and Braun 2006). The most recent study by Geist (2007), however, yielded some support for the dependence model in both the former East and West, with a stronger association between dependence and housework in the latter. Our overall assessment is that the dependence model has weak support for German women.

The “autonomy” alternative

Recent studies using data from the U.S. National Survey of Families and Households (NSFH) have shown that women’s time spent on housework is negatively associated with their absolute earnings, but is not related to their husbands’ earnings (Gupta 2006, 2008). Moreover, for women employed full time, the relationship observed in earlier research between women’s housework time and their relative earnings disappears upon accounting for their absolute earnings (Gupta 2007). Based on these results, Gupta (2007) argued that both the dependence and display models underestimate the degree to which women may exercise economic “autonomy” in their households. Neither theory allows for the possibility that women deploy their own earnings, separately from their partners’, for the purpose of reducing their housework time. To put it differently, both the dependence and display models understate the role of women as independent economic agents in their households.

It is not clear from these studies what mechanisms would lead to an independent association of women’s own earnings with their housework time. It could be that women use market goods and services to substitute for some of their housework, thereby reducing the extent

to which they have to bargain over it, or the degree to which they have to practice gender display. This conjecture is consistent with several studies demonstrating a link between women's own earnings or income and household expenditures on substitutes for housework, such as prepared meals and cleaning services (Cohen 1998; Oropesa 1993, Soberon-Ferrer and Dardis 1991; Treas and de Ruijter in press). But there are other possibilities: Perhaps women with higher earnings feel less compulsion to do household chores, or have lower standards for outcomes such as cleanliness. Or it could be that women feel freer to buy out their housework if they themselves earn more. It is even possible that the relationship between women's earnings and housework time operates in the reverse causal direction from the one implied by the autonomy, dependence and display models. That is, women's time spent on domestic labor may contribute to the gender gap in earnings (Baxter 1992; Hersch and Stratton 1997, 2002; Noonan 2001; Shelton and Firestone 1989; Stratton 2001).

Is the autonomy model a credible alternative to the dependence and display hypotheses for countries other than the U.S.? To answer this question, we perform the first crossnational test of the three models using data from two other western countries, Sweden and Germany, in addition to data from the U.S.² (For reasons discussed below in the Data section, we restrict our analysis of German data to the region formerly known as West Germany.) Further, following Gupta (2007), we test the autonomy model against the dependence and display models for women employed full time in all three countries. No crossnational study to date has conducted such a test. Indeed, only Bittman et al. (2003) and Evertsson and Neramo (2004) have explicitly tested both the dependence and display hypotheses in a crossnational setting.

² Geist (2007) included both individual and relative earnings in an analysis of German women's housework, and found an association between individual earnings and partnered women's time spent on housework in both the former East and West. This analysis did not include a test of the display hypothesis, however. An earlier study by Halleröd (2005) using Swedish data from 1998 did not test the autonomy hypothesis explicitly, but did conclude that women's access to spending money was related to lower levels of housework.

Hypotheses

To arrive at our hypotheses, we begin with the logic of previous crossnational studies by confining our attention to the dependence and display models and considering the extent to which high relative earnings for women are unusual in each country. (Recall that both Bittman et al. [2003] and Evertsson and Neramo [2004] argue that the less common high relative earnings are among women in a given country, the more likely they are to practice gender display there.) An important consideration here is the crossnational variation in the rates of women's labor force participation and full-time employment. Sweden is a "dual earner" society that provides substantial subsidies for child care and other benefits in order to maximize the rates of women's employment, and of full-time or long part-time work (i.e. 75 percent of full-time) among those employed. Of the three countries in our study, it has the highest rates of labor force participation. The Swedish government also attempts to promote more egalitarian gender relations at home with its parental leave policies which benefit both fathers and mothers. By contrast Germany, with its joint taxation of married couples, limited state provision of child care, and strong normative orientation towards in-home maternal care for young children, is described in the literature as a "male breadwinner regime," and has the lowest rates of full-time employment among women. The "market-oriented" approach of the U.S., which stresses equal opportunity for paid work but lacks state provision of care services, has lower rates of women's labor force participation than Sweden but higher rates than Germany.³ (See Orloff 2002 for an overview of the relevant literature.)

Given these national differences, we are not surprised that complete economic dependence of women on their male partners is much less prevalent in Sweden, with just 6

³ Mandel and Semyonov (2005, 2006) provided an important counterpoint to this comparison of the three countries. They found that parental leave policies in countries like Sweden are associated with larger gender gaps in earnings, and that women's access to managerial positions tends to be lower in those countries.

percent of the women in our data from that country making zero earnings, compared to more than 20 percent for the other two nations. Further, women who are primary breadwinners—that is, whose earnings exceed their male partners’—are slightly more common in Sweden, comprising 23 percent of our sample of partnered women, compared to about 21 percent in both the U.S. and former West Germany. These results from our samples from Sweden and the U.S. are comparable to those of an earlier study by Hobson (1990). We therefore expect, following the argument advanced by Bittman et al. (2003) and Evertsson and Neramo (2004), that the dependence model would apply to Sweden, and that the display model may be more relevant for the U.S. and former West Germany.

Hypothesis 1: Germany—display; Sweden—dependence; U.S.—display

Next, we incorporate into our hypotheses the autonomy model based on women’s own, rather than relative, earnings. As we discussed earlier, the recent research based on this model does not establish the mechanism by which women’s earnings are associated with less time spent on housework. To the extent that this relationship is due to spending on housework substitutes, however, it is useful to consider national differences in the prevalence of market substitution.⁴ In the U.S., 8 percent of married and cohabiting couples hire housekeeping services, and nearly all couples consume meals not prepared at home (Treas and de Ruijter, in press). The proportion of German households employing cleaning persons regularly was about 7 percent in 2005, and virtually no households reported doing so in Sweden in the year 2000 (author calculations based on SOEPinfo <http://panel.gsoep.de/soepinfo2007/>, accessed 04/2007, and from the Swedish Level of Living Survey, 2000). Because of relatively high labor costs in Germany, there is a considerable black market for domestic services, and the actual rates of their utilization may be

⁴ Our own experience with the three countries suggests that it is culturally more acceptable to purchase substitutes for cooking and cleaning in the U.S. than in the two European countries, though we do not have concrete data for this conjecture.

higher than those reported (Schupp 2002). This may also be the case in Sweden. In recent years, tax incentives in Germany and Sweden for purchasing household services from registered firms have likely led to increases in the use of domestic services in both countries, though this period is not captured in our data.

Spending on meals eaten out of the home constituted a higher proportion of total household expenditures in the U.S., at 5.6 percent in 2000, compared to less than 4 percent in the two European countries in the late 1990s and early 2000s (Statistisches Bundesamt 2005; Statistics Sweden 2003). Based on this admittedly limited information, we speculate that the autonomy model is more applicable to the U.S. case than to the others. However, given that previous research has applied the model only to the U.S., we are especially interested in the possibility that it applies to at least one of the other two countries.

Hypothesis 2: Germany—display; Sweden—dependence; U.S.—autonomy

Hypothesis 3: Autonomy in the U.S. and at least one of the other two countries

Clearly this is not an exhaustive set of hypotheses. Given that we are testing three models on data from three countries, there are several other possible permutations. In our judgment, however, the hypotheses stated above emerge most organically from the existing research. We do want to explicitly consider one other alternative, namely that the same model describes the relationship between women's earnings and housework time in every country. (This is in fact the unstated assumption of the large number of crossnational studies in the micro-macro linkage line of argument, as we discuss below.) Given the findings of Bittman et al. (2003) and Evertsson and Neramo (2004), this may appear unlikely. Nevertheless we consider this hypothesis of universality to be a theoretically important alternative to the ones proposed above, because it implies that the household level processes that generate the relationship between women's

earnings and housework could transcend national context. We do not see a theoretically compelling *a priori* reason to privilege one of the three models as the universal candidate.

Hypothesis 4: The same model (dependence, display, or autonomy) applies in all three countries.

Before we move on, we want to mention the second major strand of thinking in the crossnational housework literature, though we do not directly infer hypotheses from it. This is the “micro-macro linkage” argument. (Fuwa 2004:752) The idea is that gender inequality at the macro, or national, level may influence the association between women’s resources and the division of housework (Blumberg 1984; Blumberg and Coleman 1989; see also Rodman 1967 and Sanchez 1994). If women benefit from these resources in terms of reduced time spent on housework, macro inequality may diminish that advantage. That is, inequality at the national level may offset the impact of women’s resources on the division of housework. Conversely, a greater degree of societal gender equality may augment the relationship.⁵ Though some analyses have yielded evidence consistent with the linkage hypothesis with regard to women’s relative income or earnings (e.g. Geist 2005; Knudsen and Wærness 2007), others have been unable to confirm it (e.g. Baxter 1997; Fuwa 2004).⁶ Additionally, in a counterpoint to Blumberg and Coleman (1989), Calasanti and Bailey (1991) suggested that women’s economic power at the household level was more pertinent in countries like the U.S., where women may have to use

⁵ Though research based on the linkage argument tends to test hypotheses about the associations between women’s resources and housework, it does not make clear why macro gender equality should influence these relationships and not operate simply to raise or lower the time spent on housework by women, or for that matter by their male partners. The linkage studies have themselves documented such national differences in women’s housework time, as have others (e.g. Davis and Greenstein 2004). While Blumberg and Coleman do not themselves specify whether their proposition concerns levels of housework or the association between resources and housework, it has often been taken to imply the latter (e.g. Fuwa 2004). Note that a stronger relationship between women’s resources and housework in more egalitarian countries implies a *greater* penalty there, in terms of time spent on housework, for women with low resources. We thank Paula England for pointing this out in a personal communication.

⁶ Some of these latter studies do support Blumberg and Coleman’s hypothesis with regard to measures other than women’s relative income or earnings. For example, Fuwa (2004) found that women’s employment hours and egalitarian gender ideology had a larger negative association with women’s share of household labor in countries with higher levels of macro gender equality.

their individual economic resources to compensate for greater inequality at the macro level, compared to the more gender-egalitarian Sweden.

Studies based on the linkage idea share an important characteristic with the research we discussed earlier, namely the assumption that what matters for women's housework are their relative rather than own economic resources. None of the existing studies based on the linkage argument has tested the hypothesis that national context may affect the relationship between women's housework and their own, rather than relative, resources. But even within the framework of relative resources, the crossnational studies inspired by the linkage argument have ignored the gender display model. They have taken for granted that the linear and negative relationship between women's relative resources and housework time proposed by the economic dependence model applies in every country. In other words, they have assumed implicitly that national context affects only the magnitude of the association between relative earnings and housework time, not its fundamental shape in the manner proposed by the display hypothesis.⁷

We note here another possibility that research based on the linkage argument has not considered: Whether women's own earnings are more or less important than their relative earnings in a particular country may itself be suggestive of the influence of national context. Women's absolute earnings may matter more than their relative earnings in countries characterized by greater equality at the macro level. In such nations, women's individual resources may have greater significance and worth independently of their male partners'. On the other hand, it could be argued that women's absolute earnings may be more important than their

⁷ However, the two approaches may have some conceptual overlap that has not been explored by studies in either vein. Recall the argument of Bittman et al. (2003) and Evertsson and Neramo (2004) that display is more likely in countries where high relative earnings for women are especially unusual. Such countries are likely to be those with lower overall gender equality. So we might say, in the spirit of the micro-macro linkage argument, that women's resources are sufficiently undervalued in lower equality countries to change the shape of the relationship between their earnings and housework from dependence to display. In other words, in countries with sufficiently low levels of overall gender equality, the necessity for women to practice gender display could be greater than it is in more egalitarian countries.

relative earnings in cases of greater macro inequality, if women in those conditions had a greater need to deploy their own earnings to reduce their housework. Previous research inspired by the linkage hypothesis does not account for this possibility because it focuses solely on the dependence model. Therefore the linkage approach is not suited to our purpose here, which is to test explicitly in a crossnational setting all three contending individual-level models of the relationship between women's earnings and housework time.

DATA

Sample

Our analytic samples for all three countries consist of women employed full time and in marital or cohabiting households with male partners. As is typical in the quantitative housework literature, we excluded women who were disabled or had disabled partners. Our restriction to women employed full time ameliorates potential biases introduced by unobserved characteristics that may be related to both earnings and housework, such as preferences for market versus domestic labor. Previous research does not account for these biases because it typically includes women of every employment status. Further, there may be normative or cultural differences across countries in women's preferences for domestic and market work that we cannot specify in our models. Our restriction to women employed full time should help mitigate this problem. Finally, by restricting the variance in employment hours, we minimize the likelihood that any association between earnings and housework is simply picking up an indirect effect of employment hours – and thus available time at home – on housework. On the other hand, this restriction limits the generalizability of our results to women employed full time. We therefore perform separate tests of all our hypotheses on samples of all women from the three countries, and discuss the results in our conclusion.

Features of the samples specific to each country are described below.

Former West Germany

The German data are derived from the 1999 wave of the German Socio-Economic Panel (GSOEP), a nationally representative, longitudinal household survey. Data are collected annually. The GSOEP began in 1984, and since June 1990 has included residents of the former East Germany (GDR). Because prior research has demonstrated persistent regional differences in Germany several years after unification (Geist 2003, Cooke 2006), we restrict our sample to the former West Germany. Our analytic sample consists of 413 women living in former West Germany. The women's ages range from 18 to 65. We excluded women in couples in which one or both partners were disabled or in military service, and women with missing information on the dependent or any independent variables. The age restriction and other exclusions collectively lead to our dropping 116 women from the set of all 529 women employed full time.

Sweden

The data for Sweden come from the Swedish Level of Living Survey (LNU) for the year 2000. The LNU is based on a random sample of 1/1000 of the Swedish population between 18-75 years of age. The non-response rate in 2000 was 23.4 percent (Gähler 2004). Our sample is derived from the 864 women employed full time and in marital or cohabiting relationships with male partners. The Swedish data includes register data on annual earnings and self-reported survey data on ordinary weekly work time, which leads to a mismatch in a few cases. We therefore excluded 17 women who reported working for pay more than 35 hours per week in the survey, but who had zero annual earnings according to the register data. This leaves us with 847 women in the final sample whose ages range from 19 to 65.

United States

For the U.S. the sample is drawn from women in the 1999 wave of the Panel Study of Income Dynamics (PSID). Of the 956 women employed full time in married or cohabiting couples, we are missing information on men's education for 51 women and on women's earnings for 16. Upon excluding these cases, we obtain an analytic sample of 876 women. Information on earnings and work hours for 1999 was collected retrospectively two years after the interview that year, i.e. in 2001. This likely introduces recall errors in the earnings data. However, if this measurement error is randomly distributed, it should bias the coefficients of our earnings measures towards zero, thereby giving us conservative estimates of their coefficients. A more unfortunate consequence of the retrospective earnings data is that we can include in our sample only those respondents who were married or cohabiting two years after the survey year, participated in individual interviews in 2001, and whose partners were also interviewed in 2001. This means that we lose most of the women who were cohabiting in 1999. The women are between 18 and 65 years of age.

Measures

The dependent variable in all our analyses is the number of woman's weekly hours spent doing housework. Our main independent variables are the woman's and male partner's annual labor earnings and woman's relative share of couple's total earnings. We converted annual earnings for all three countries to U.S. dollars using exchange rates in mid 1999. We control for both partners' employment hours, both partners' years of education and woman's age in years. Additional controls include both partners' occupation in the form of an indicator variable identifying professional occupations. We control also for the number of children as well as the presence of children under 6 years of age. Country-specific characteristics of these measures are described below.

Former West Germany

The dependent variable was constructed from responses to a question about the number of hours usually spent on washing, cooking, and cleaning on a typical weekday, Saturday and Sunday. We constructed our measure of weekly housework hours by multiplying the response for a typical weekday by 5 and adding the responses for the two weekend days. The annual labor earnings and weekly employment hours of both partners were obtained from the GSOEP's 2000 Cross-National Equivalent File, which contains data lagged by one year. In addition to the controls described above, we included an indicator variable distinguishing cohabiting from married women.

Sweden

The dependent variable in the analyses is the weekly hours spent on housework, defined as shopping, cooking, doing the dishes, laundry and cleaning. We summed the responses to three separate questions. The earnings measure includes labor market earnings as well as compensation for loss of earnings due to sick leave and parental leave. The information on employment hours and housework hours refers to the weekly hours usually spent on these activities at the time of the interview. The information on earnings also refers to the annual earnings in the year of the interview. As with former West Germany, we distinguish between cohabiting and married women with a dummy variable.

United States

Unlike the data from the two European countries, our measure for weekly hours spent on housework in the U.S. is obtained from a single question in the PSID on time spent cooking, cleaning, and doing other work around the house. Also in contrast to the other countries, we are

not able to control for marital status (i.e. whether married or cohabiting) in the U.S. because there are too few cohabiting women, as we explain above in our description of the sample.

ANALYSIS

Models

We perform our analyses in three steps. First, we follow the existing literature in testing the economic dependence and gender display models (Hypothesis 1) using the specification below:

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_i^2 + \beta_T T_i + \beta_Z Z_i + \varepsilon_i \quad (1)$$

Here Y_i is a woman's housework hours and X_i is her share of the couple's total earnings, a commonly used measure of dependence. (Some studies have used the equivalent ratio of the difference between partners' earnings and the sum.) The linear term represents the dependence effect. Its coefficient will be negative if partners' housework hours are inversely related to their shares of couples' total earnings. The second-order term captures the curvilinearity in the relationship between relative earnings and housework that characterizes gender display. In the case of women, the coefficient will be positive if women with unusually high relative earnings do more housework than other women. Following Brines (1994), we use orthogonalized polynomials in woman's share of couple's total earnings to reduce the collinearity between the linear and quadratic terms. The model controls for couple's total earnings T_i . Other controls are represented by the term Z_i .

Next, we introduce the autonomy model by adding the measures of woman's and male partner's absolute earnings that have been omitted by earlier crossnational studies. This is equivalent to disaggregating couple's total earnings T_i in equation (1) into its constituents W_i and

M_i , or woman's and male partner's absolute earnings. The resulting model below is our test of Hypotheses 2 and 3.

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_i^2 + \beta_W W_i + \beta_M M_i + \beta_Z Z_i + \varepsilon_i \quad (2)$$

Finally, we complete our test of Hypothesis 4 by performing a test of the autonomy model by itself, just as equation (1) does for the dependence and display models. The required specification is:

$$Y_i = \beta_0 + \beta_W W_i + \beta_M M_i + \beta_Z Z_i + \varepsilon_i \quad (3)$$

RESULTS

Descriptives

[Table 1 here]

Table 1 shows weighted means and standard deviations for all variables used in our analyses.⁸ We note that the U.S. has a higher variance for a number of these, while Sweden has the lowest. This is true of the dependent variable as well as most of the key earnings variables, and is also the case for important controls such as women's employment hours and education. The U.S. also has the highest means for weekly housework hours and absolute earnings, and has the highest proportions of women and male partners in professional occupations. As for women in the two European countries, those in Sweden report spending a little more time weekly on housework than their counterparts in former West Germany. Swedish women rank lower, however, on all the absolute earnings measures as well as proportion of women in professional occupations. The two countries have comparable proportions of women living in cohabiting

⁸ Weighting the U.S. cases for the descriptives gives us about one hundred fewer women than the number we use in our unweighted analyses. This is because the PSID, a longitudinal survey, assigned weights equal to zero to cases missing in one or more years prior to 1999, the year we use. Since our analysis does not depend on the longitudinal character of the PSID, we retain these cases in our multivariate models.

unions. Women employed full time in Germany are on average younger and have fewer children compared to Sweden and the U.S.

Multivariate results

Hypothesis 1: Germany—display; Sweden—dependence; U.S.—display

[Table 2 here]

Following the earlier crossnational literature on the relationship between women's earnings and housework, our first multivariate model incorporates only women's earnings relative to their male partners'. The results are displayed in Table 2. We note that women's shares of couples' total earnings are negatively associated with their time spent on housework in both former West Germany and the U.S., but not in Sweden. Furthermore, the squared term in women's shares is not associated with their housework in any of the three countries. In substantive terms, this means that the relationship between women's relative earnings and their housework conforms to the dependence model in former West Germany and the U.S. for women employed full time. As for Sweden, neither of the two models prominent in the existing literature applies there, because neither the linear nor square term in women's shares is significant. Our findings to this point rule out our first hypothesis, because we do not find evidence for gender display in the relationship between women's relative earnings and their housework in any of the three countries.

Hypothesis 2: Germany—display; Sweden—dependence; U.S.—autonomy

Hypothesis 3: Autonomy in the U.S. and at least one of the other two countries

[Table 3 here]

Next, we depart from prior research by adding to the model women's absolute earnings, as well as their male partners'. Mechanically, this is accomplished through the disaggregation of

the measure of couples' total earnings in Model I into its constituents. Table 3 shows the results. We note first that the addition of women's own earnings to the model alters our findings for the two European countries. We see that former West German women's relative earnings are no longer associated with their time spent on housework. In other words, the dependence model no longer applies there. Women's housework does vary inversely with their absolute annual earnings, however, with every additional thousand dollars corresponding to a reduction of five minutes per week in their time spent on domestic labor. This means that the autonomy model supplants the dependence model for former West Germany. We observe in Table 3 the same relationship between women's own earnings and their time spent on housework in Sweden, though its magnitude is smaller there, with every additional thousand dollars corresponding to four and a half fewer minutes. Substantively, this means that the autonomy hypothesis applies to Sweden upon the addition of women's absolute earnings to the model; recall that neither the dependence nor display models fits the Swedish data in the model containing only women's relative earnings (Table 2).

By contrast to the changes in our findings for the European countries resulting from our addition of women's absolute earnings to the model, those for the U.S. remain the same. That is, women's housework time varies inversely with their relative earnings, and has no association with their own earnings. This finding for the U.S. is at odds with Gupta's (2007) study for U.S. women employed full time. Differences between the NSFH data used in that study and the PSID data employed in ours may account for this discrepancy. The PSID housework data are obtained from responses to a single retrospective question about all housework, while those in the NSFH come from separate questions for different household chores. We do not believe, however, that data differences are ultimately the main culprit; rather, we suspect that our results for the U.S.

are susceptible to outliers. We examine this possibility in our discussion of the robustness of our findings at the end of the Results section.

On the face of it, the results shown in Table 3 contradict our two hypotheses for the model employing both women's relative and their absolute earnings. We find that the autonomy model fits both of the European countries, so that neither country conforms to the prediction of our second hypothesis. Moreover, the autonomy model does not fit the data in the U.S., the one country in which we expected it to do so; instead, the dependence model continues to work there.

Hypothesis 4: The same model (dependence, display, or autonomy) applies in all three countries.

[Table 4 here]

Finally, we consider our hypothesis that the same model describes the relationship between women's earnings and their time spent on domestic labor in all three countries. We have already ruled out the dependence and display models in this regard (see Table 2). For the sake of completeness, we present in Table 4 the results of a model incorporating only women's absolute earnings as well as their partners'. Women's absolute earnings are negatively associated with their time spent on housework in all three countries. We interpret this to mean that the autonomy model describes quite well the relationship between women's earnings and housework in all three countries. We had arrived at this conclusion already for the two European countries in our discussion of Table 3. Here we see that the model works for the U.S. too, though the coefficient of women's own earnings is smaller than it is for the other countries. (However, it doubles in magnitude upon exclusion of the women with the highest 1 percent of earnings.) Finally, we observe that women's housework is nowhere associated with their male partners' earnings.

Control variables

Neither women's nor their male partners' weekly employment hours are associated with women's housework. This is due primarily to the restriction of our sample to women employed full time. Education also does not appear to play much of a role in our models, with the important exception of male partners' education in the U.S., which is negatively associated with women's housework. Excluding this variable from the model shown in Table 4 does not change our finding for men's earnings, which remain statistically insignificant, but does increase the magnitude of the negative coefficient of women's own earnings. This is likely due to the positive correlation between women's earnings and their male partners' education. The U.S. model is also exceptional for its evidence of a negative relationship between women's occupation and housework for professional women. Not surprisingly, the negative coefficient of women's earnings in Table 4 increases in magnitude upon the exclusion of their occupational status. With regard to family type and composition measures, we observe that Swedish cohabiting women spend less time on housework than their married peers, whereas there is no such difference in former West Germany. In all three countries, women's time spent on housework is positively associated with the number of children in their households.

Robustness: Revisiting FT women in the U.S.

We mentioned in our discussion of the nested model for the U.S., shown in Table 3, that our results for that country are sensitive to outliers. Our consideration of the potential importance of outliers is motivated by Gupta's (1999) finding that the gender display observed by Brines (1994) for men in the U.S. disappeared upon the exclusion of the men with the highest three percent of the distribution of relative earnings. Of the three countries, the U.S. has the most skewed distribution of women's annual earnings: The 99th percentile in our sample is 163 thousand dollars, while the maximum value is 600. When we exclude the women with the top

two percent of individual earnings, none of the three measures of earnings in Table 3 achieves statistical significance (results not shown). We see the same phenomenon if we exclude the 58 women, or about seven percent of our sample, whose relative earnings exceed 91 percent.

In other words, neither the dependence nor the autonomy models is robust to the exclusion of outliers in the nested model shown in Table 3. We conclude that this model is not the best way to arbitrate between the dependence and autonomy hypotheses for the U.S. We therefore checked each model separately for robustness to outliers. The dependence model for which we found evidence in Table 2 continues to hold upon the exclusion of women in the U.S. with the highest one percent of relative earnings (these were all women who contributed 100 percent of couples' total earnings), and even upon the exclusion of women with relative earnings greater than 90 percent. Likewise, the autonomy model for the U.S. in Table 4 is very stable to the exclusion of the women with the highest one percent of absolute earnings; indeed, the coefficient of women's earnings nearly doubles from its value of -0.026 in the table (results not shown). This implies that the women with the very highest earnings are dampening the magnitude of the relationship between own earnings and time spent on housework that obtains among the great majority of women in the U.S.

We conclude that both the autonomy and dependence models are resilient to the exclusion of outliers in the U.S. data. We do not therefore have a reason to prefer one over the other in the case of the U.S. based on this inspection. To arbitrate between the two models, we turn to the raw data. Figures 1 and 2 present the bivariate associations in the U.S. between women's housework hours and their relative and absolute earnings, respectively. The patterns of association visible in these figures lead us to question the wisdom of using the ratio of women's earnings to couples' total earnings to fit the data, as both the dependence and display models do.

The straightforward measure of women's absolute earnings appears to us to be the more conservative choice. We note also that the model in Table 4 employing only the simplest measures in individual earnings performs quite well, in terms of explained variance, compared to the models in Tables 2 and 3 that specify relative earnings. We are inclined therefore to prefer the autonomy model on grounds of parsimony. We leave it to the reader to decide which model better describes the U.S. data, autonomy or dependence; in our judgment the evidence is weighted in favor of the first.

DISCUSSION

Our research question was the same one posed by earlier crossnational studies of the relationship between women's earnings and their time spent on housework, namely whether this association varies by national context. The fundamental difference between our analysis and earlier research is our incorporation of women's own earnings. By contrast, the crossnational research to date has focused on the dependence and display models based on women's earnings relative to their male partners'. Prior scholarship has assumed that national context either helps determine which of these two models describes the relationship between women's earnings and housework, or that it modifies the degree to which the dependence model does so. For the first time in the crossnational literature, we have tested the autonomy model based on women's absolute earnings against these two existing models. To account for unobserved national differences in women's preferences for paid employment versus domestic labor, we restricted our sample to women employed full time in all three countries.⁹

⁹ We replicated our analyses on two other samples, all women and all women with positive earnings. While our findings for the equivalents of Tables 2 and 3 are more complex than the ones we present here for women employed full time, the results for the equivalent of Table 4 are substantively identical. That is, women's housework time is negatively associated with their individual earnings in all three countries, and is nowhere related to their male partners' earnings. Further, the differences in explained variance between the models shown in Tables 2 through 4 are small, and the patterns evident in Figures 1 and 2 for women employed full time are also evident in the samples of all women and all women with positive earnings.

Our summary evaluation of our findings is that the autonomy model performs at least as well as the dependence and display models in all three countries. This is not quite in line with our hypotheses. Based on earlier research, we expected each of the three models to apply to at least one of the three countries in our study. When tested explicitly against the autonomy model, however, the display hypothesis does not appear to be valid in any of the countries. Autonomy also trumps dependence in the two European cases. However, the dependence model fits the U.S. data even when we specify women's absolute earnings. This result is at odds with Gupta's (2007) analysis, which used data from the National Survey of Families and Households (NSFH), and showed that neither the dependence nor display models applied upon the addition of women's own earnings.¹⁰ Even so, we believe that the autonomy hypothesis is at least as credible for the U.S. as the dependence model. Most fundamentally, we are inclined to follow Gupta's (2006) argument: If women's housework time is not related to their male partners' individual earnings, as seen in Table 4, then the validity of the relative earnings measures typically employed by the dependence and display models is questionable. These measures implicitly assume that the associations of housework with each partner's earnings are equal in magnitude and have the same sign, which is manifestly not the case.

If indeed the autonomy model describes the relationship between women's earnings and housework time in some countries, then the existing crossnational research has overlooked an important aspect of the microeconomics of housework. Women's own earnings are at least as important theoretically and empirically as their earnings relative to their male partners'. As Gupta (2007) has argued, both the dependence and display models underestimate women's independent economic agency in their households. We add here that this agency may be a

¹⁰ We note that the NSFH housework data were obtained from several separate questions about specific types of housework, and are therefore probably better than our PSID data, which were obtained from a single question about all kinds of domestic labor.

common feature of women's household behavior across national contexts. The second aspect of our results we want to emphasize is that women's time spent on housework is not associated anywhere with their male partners' earnings, as can be seen in Table 4. We had hoped that men's earnings would matter in a country like Sweden, with its more deliberate state promotion of gender equality. This is not the case, however. Regardless of national context, the relationship between earnings and women's time spent on housework appears to be driven entirely by women's own earnings. These results emphasize the importance of women's own earnings as determinants of their circumstances independently of national context. They suggest that the universality of the gender gap in domestic labor extends to key aspects of the economics of heterosexual couple households.

We also want to mention two other theoretical implications of our findings that are outside the immediate purview of our study. First, the crossnational literature to date has assumed that national context affects the relationship between women's earnings and housework primarily by affecting their bargaining power or propensity for gender display. By contrast, our analysis suggests that women's own earnings provide them an avenue to escape, or at least mitigate, the dynamics of bargaining and display. We do not have the data to determine exactly how this works, though we suspect that some of it is due to women deploying their own earnings to purchase substitutes for housework, such as prepared food. If this surmise is correct, women's housework embodies a complex interplay among three social arenas: nation, household, and market. Women's earnings may enable them to import goods and services from the market into the household in order to reduce their domestic labor. The degree to which this is possible may depend on national context, either through variation in cultural norms regarding the acceptability of market substitutes or through differences in their availability. To put it another way, the

market may be a source of consumption for the purpose of reducing women's performance of domestic labor. The size and normative acceptability of this consumption may vary by national context.

Second, if women do purchase market substitutes for housework using their own earnings, those with higher earnings have an advantage over their peers who earn less. This potential source of inequality *among* women has been overlooked by prior research in its focus on women's earnings relative to their male partners'. To get a sense of the magnitude of this disparity, we used the coefficients reported in Table 4 to calculate the predicted values of time spent on housework for women in each country at the 10th and 90th percentiles of their own earnings, holding everything else constant. The difference between the two values is highest in former West Germany: Women whose earnings are at the 10th percentile of the distribution of women's own earnings spend 2.2 more hours per week on housework than those whose earnings are at the 90th percentile. The corresponding gaps for Sweden and the U.S. are 1.5 and 1.2 hours per week, respectively. (The gap for the U.S. nearly doubles to 2.2 hours per week if we exclude the women with the highest 1 percent of earnings.) These disparities suggest that women employed full time with low earnings are at a greater disadvantage in reconciling their work-family conflicts, even in a country like Sweden.

A primary limitation of our study is that we cannot determine how women's earnings translate into less time spent on domestic labor. As we mentioned earlier, we suspect this is due at least in part to women's use of market substitutes for housework. Even if this is the case, however, we cannot determine the mechanism by which only women's earnings contribute to such purchases, and it is possible that it is different in each country. To address this issue would

require data from each country with information on household expenditures and financial management in addition to the time and earnings data we have used here.

Our study demonstrates the importance of women's own earnings to their time spent on housework in a crossnational setting. A logical extension would be to replicate our analysis using data from several countries. Such a test would help determine whether one or the other of the three models is applicable across many countries, or if the validity of each is dependent on national context. This would be especially interesting to know for the newcomer to the literature, the autonomy model. Specifically, we are curious if there are countries in which men's earnings matter to women's housework. Further, with comparable data on housework and earnings for several nations, we could determine if the relationship between women's own earnings and their time spent doing domestic chores varies in magnitude by country. Such variation could yield valuable insight into national differences in the ways in which women may use their own earnings to reduce their time spent on housework.

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TABLE 1

Descriptives (weighted)

	GERMANY (former West)		SWEDEN		U.S.	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Dependent variable						
Weekly housework hours	12.61	6.70	13.30	6.92	15.11	10.07
Independent variables						
Woman's share of couple's annual earnings	46.48	21.71	47.26	18.07	46.98	20.75
Woman's annual earnings (thousands of U.S. dollars)	29.84	15.50	26.34	11.00	36.52	37.09
Man's annual earnings (thousands of U.S. dollars)	36.83	22.03	32.56	18.11	43.69	44.99
Couple's annual earnings (thousands of U.S. dollars)	66.68	30.40	58.90	22.84	80.20	61.88
Control variables						
Woman's weekly employment hours	41.80	5.79	40.12	3.14	41.92	7.94
Man's weekly employment hours	39.22	15.77	37.37	11.60	40.60	14.61
Woman's age (years)	38.00	10.53	41.63	10.73	41.85	9.00
Woman's years of education	12.58	3.08	13.04	2.72	12.83	3.69
Man's years of education	13.40	3.57	12.48	2.92	13.35	3.18
Woman's occupation (professional = 1)	0.26		0.18		0.46	
Man's occupation (professional = 1)	0.34		0.25		0.40	
Number of children	0.29	0.62	0.84	1.04	0.92	1.04
Child under 6 present (yes = 1)	0.07		0.14		0.21	
Cohabiting (yes = 1)	0.39		0.34			
<i>N</i>	413		831		777	

Sources: Former West Germany—1999 German Socio-economic Panel; Sweden—2000 Swedish Level of Living Survey; U.S.—1999 Panel Study of Income Dynamics.

Note: Weighting yields about a hundred fewer cases for the U.S. than we use in the multivariate analyses; see Footnote 8. The earnings for all three countries were converted to U.S. dollars using exchange rates in mid 1999.

TABLE 2

Dependence and display models (relative earnings only)

	GERMANY (former West)			SWEDEN		U.S.		
	B	S.E.		B	S.E.	B	S.E.	
Woman's share of couple's total Earnings	-1.112	0.472	*	-0.658	0.589	-1.876	0.553	***
Woman's share squared	0.448	0.485		-0.346	0.416	0.153	0.461	
Couple's total earnings	-0.001	0.013		-0.042	0.012	***	-0.009	0.005
Controls								
Woman's weekly employment Hours	0.009	0.057		-0.101	0.060		0.009	0.054
Man's weekly employment hours	0.019	0.027		-0.001	0.025		-0.003	0.029
Woman's age	0.133	0.037	***	0.093	0.024	***	0.196	0.039
Woman's years of education	-0.108	0.111		-0.169	0.103		0.026	0.073
Man's years of education	-0.130	0.108		-0.137	0.100		-0.595	0.134
Woman's occupation (professional = 1)	-1.004	0.651		-0.845	0.604		-1.211	0.664
Man's occupation (professional = 1)	-1.136	0.656		0.225	0.538		-0.697	0.638
No. of children	2.310	0.690	**	2.481	0.309	***	1.252	0.329
Child under 6	-0.924	1.605		-0.245	0.809		0.595	0.843
Cohabiting	-0.527	0.737		-1.553	0.509	**		
Constant	11.160	2.917	***	18.719	3.223	***	15.149	3.276
N	413			831			876	
R-squared	0.173			0.222			0.109	

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

TABLE 3

Nested models (relative and absolute earnings)

	GERMANY (former West)		SWEDEN		U.S.			
	B	S.E.	B	S.E.	B	S.E.		
Woman's share of couple's total Earnings	0.425	0.926	0.044	0.990	-1.737	0.656	**	
Woman's share squared Couple's total earnings	0.076	0.530	-0.535	0.483	0.125	0.465		
Woman's annual earnings	-0.073	0.036	*	-0.073	0.029	*	-0.012	0.007
Man's annual earnings	0.040	0.025		-0.023	0.023		-0.007	0.008
Controls								
Woman's weekly employment Hours	0.013	0.058		-0.099	0.060		0.010	0.054
Man's weekly employment hours	0.023	0.027		0.002	0.025		-0.003	0.029
Woman's age	0.141	0.037	***	0.095	0.024	***	0.195	0.039
Woman's years of education	-0.073	0.111		-0.160	0.103		0.027	0.073
Man's years of education	-0.135	0.107		-0.135	0.100		-0.594	0.134
Woman's occupation (professional = 1)	-0.961	0.649		-0.732	0.609		-1.213	0.664
Man's occupation (professional = 1)	-1.119	0.653		0.122	0.538		-0.700	0.638
No. of children	2.320	0.703	***	2.496	0.310	***	1.249	0.330
Child under 6	-0.464	1.618		-0.254	0.811		0.593	0.844
Cohabiting	-0.460	0.731		-1.491	0.517	**		
Constant	9.836	2.935	***	18.018	3.275	***	15.038	3.275
N	413			831			876	
R-squared	0.179			0.223			0.109	

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

TABLE 4

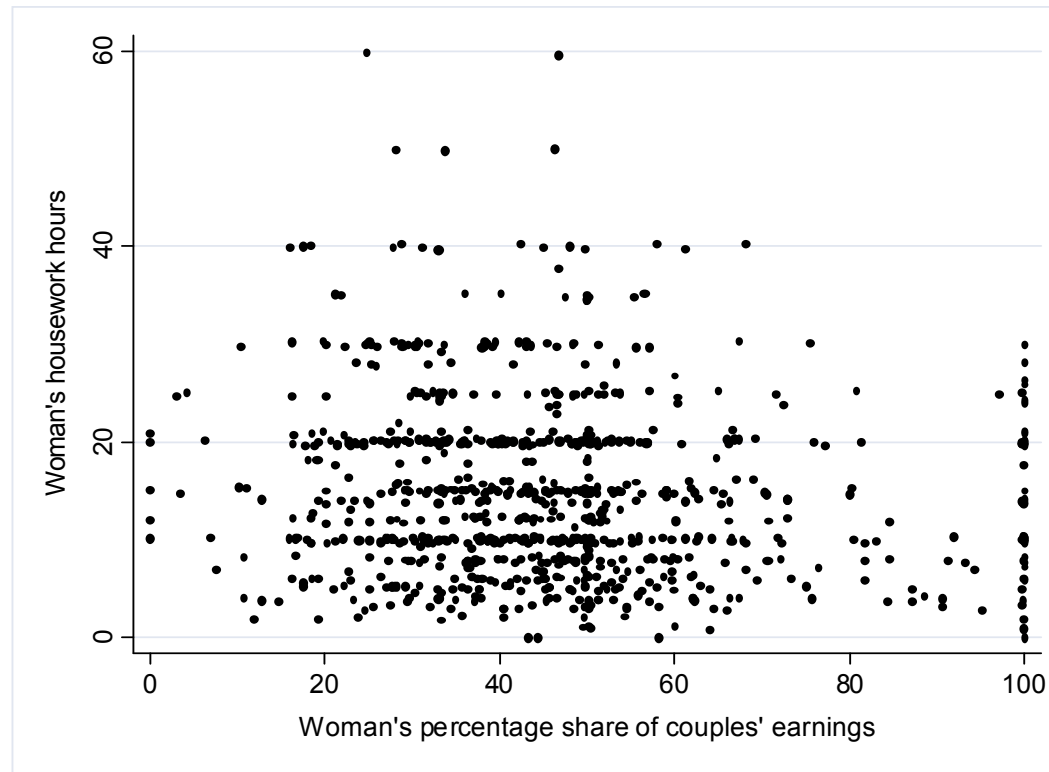
Autonomy model (absolute earnings only)

	GERMANY			SWEDEN			U.S.		
	B	S.E.		B	S.E.		B	S.E.	
Woman's annual earnings	-0.059	0.020	**	-0.074	0.022	***	-0.026	0.008	**
Man's annual earnings	0.029	0.017		-0.013	0.014		0.004	0.005	
Controls									
Woman's weekly employment Hours	0.016	0.058		-0.102	0.060		-0.004	0.054	
Man's weekly employment hours	0.015	0.025		0.016	0.022		0.031	0.022	
Woman's age	0.142	0.037	***	0.092	0.024	***	0.192	0.039	***
Woman's years of education	-0.074	0.111		-0.160	0.104		0.031	0.073	
Man's years of education	-0.133	0.105		-0.137	0.100		-0.574	0.135	***
Woman's occupation (professional = 1)	-0.942	0.636		-0.825	0.605		-1.541	0.660	*
Man's occupation (professional = 1)	-1.145	0.649		-0.033	0.535		-0.521	0.632	
No. of children	2.327	0.721	***	2.509	0.309	***	1.287	0.332	***
Child under 6	-0.561	1.572		-0.245	0.813		0.458	0.842	
Cohabiting	-0.463	0.732		-1.603	0.510	**			
Constant	10.171	2.926	***	17.786	3.210	***	13.261	3.276	***
N	413			831			876		
R-squared	0.179			0.220			0.102		

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

FIGURE 1

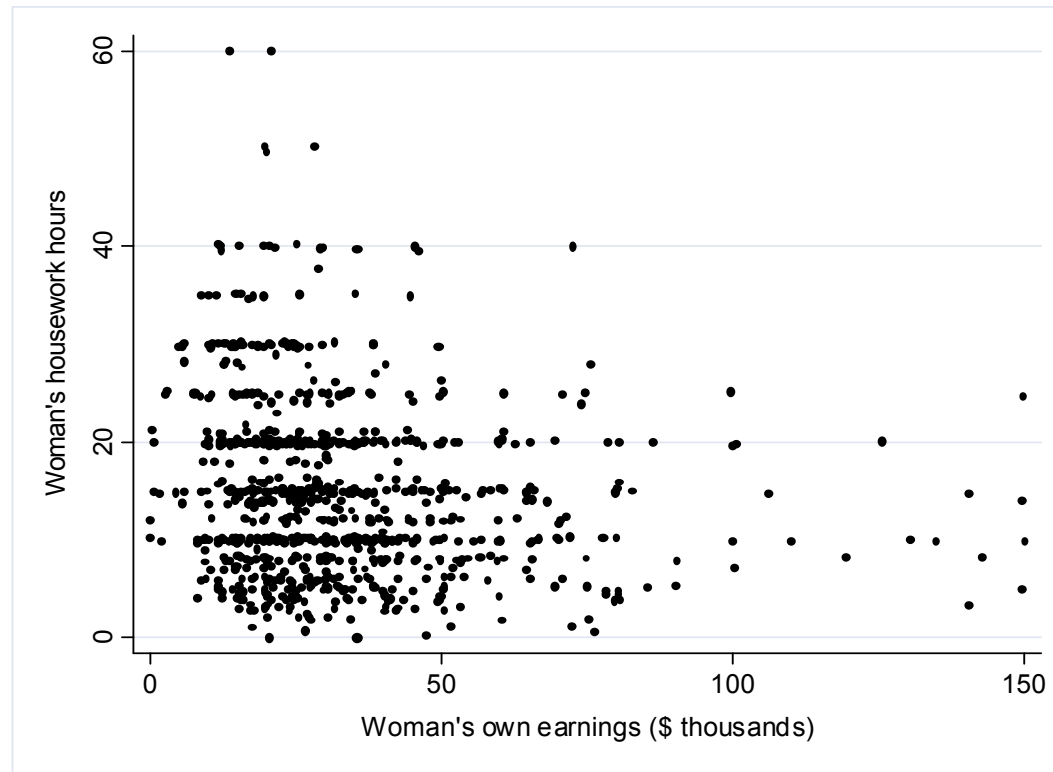
Woman's weekly housework hours versus percentage share of couple's total annual earnings, U.S. only



Note: Housework hours are truncated at 60; very few women spent more hours per week on housework than that.

FIGURE 2

Woman's weekly housework hours versus individual annual earnings, U.S. only



Note: Housework hours are truncated at 60 and individual annual earnings at 150 thousand dollars; very few women fell outside those values.