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Matthijs Kalmijn

Christiaan Monden

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The Division of Labor and Mental Health Outcomes at the Couple Level: Effects of Equity or Specialization?

Matthijs Kalmijn & Christiaan Monden¹

Tilburg University, The Netherlands

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Abstract

This paper studies the effect of the division of labor within households on husbands' and wives' depression. Economic theory argues that specialization enhances mental health, whereas other, more psychological theories argue that equity matters most for mental health. We analyze two waves of the National Survey of Families and Households ($N = 2,299$). We use data on both spouses in a couple and we have detailed information on hours spent on domestic and paid labor. Using this more comprehensive design, we find clear evidence for the equity hypothesis, but hardly any support for the positive health effects of specialization. When the total number of hour spent on paid and domestic labor is more equally distributed between husband and wife, both report lower levels of depression.

Keywords

Division of labor, domestic labor, specialization, equity, depression, mental health

¹ Matthijs Kalmijn is professor and Christiaan Monden is assistant professor, both in the Department of Social and Cultural Sciences at Tilburg University. Authors contributed equally and are listed alphabetically. Address correspondence to both authors: m.kalmijn@uvt.nl and c.w.s.monden@uvt.nl. Address: P.O. Box 90153, 5000 LE Tilburg, Netherlands.

Introduction

Production arrangements in marriage have changed dramatically over the past decades. In the United States, about 70 percent of married women aged 25-55 work for pay and more than half of all married women in that age group work full-time (Cohen & Bianchi 1999). Men's participation in household labor and child care has also increased, mostly in relative terms, because wives spend less time on domestic labor, but also in absolute terms, because men are now spending more time on domestic labor (Sayer, Bianchi, & Robinson 2004).

From the moment these changes began, there has been debate about the consequences of this transition (Gjerdingen, McGovern, Bekker, Lundberg, & Willemsen 2000; Goldscheider & Waite 1991; Ross, Mirowsky, & Huber 1983; Shelton & John 1996). The debate has centered around the question of whether or not a modern division of labor is good or bad for marriage. Some authors argued that the erosion of role differentiation or specialization in households was undermining the cohesion of modern marriage (Becker 1981; Parsons 1949). Other authors emphasized the positive effects of this transition by pointing to the greater degree of gender equality that characterizes modern production arrangements in marriage (Bernard 1976). The two perspectives can also be found in the literature on women's roles. In the more pessimistic perspective, it is argued that working for pay and caring for the children is experienced as a 'double burden' by women, whereas in the more optimistic perspective, it is argued that the combination of paid and domestic work is an enrichment of women's lives. In the former case, authors speak of 'role combination strain,' in the latter case, authors speak of 'role enhancement' (Barnett & Marshall 1992; Bratberg, Dahl, & Risa 2002; Cramm, Blossfeld, & Drobnic 1998; Fokkema 2002; Waldron, Weiss, & Hughes 1998)

Empirical studies have addressed the debate by examining effects of production arrangements on a range of outcomes, including marital satisfaction (Frisco & Williams 2002; Kalmijn 1999; Wilkie, Ferree, & Ratcliff 1998), divorce (Poortman & Kalmijn 2002; Rogers 2004; South 2001), psychological stress (Bird 1999), depression (Glass &

Fujimoto 1994), and general health (Stolzenberg 2001). Studies on health and well-being come in two forms. First, there are studies focusing on the effect of the division of *household* labor on health. These studies generally show that doing household labor is associated with poorer health (Bird & Fremont 1991; Glass & Fujimoto 1994). In addition, equal sharing of household labor is associated with better health (Bird 1999). Second, there are studies examining the effects of the division of *paid* labor on health. There seems to be consensus that married women who work do not have poorer health. Studies either find no effect or a positive effect of employment on married women's health, in contrast to what traditional arguments about the benefits of specialization suggest (Kessler & McRae 1982). Findings on the effects of women's employment on the health of the husband are less clear. Some authors find a significant negative effect of the wife's employment on the husband's health (Stolzenberg 2001), but several others find no effect (Glass & Fujimoto 1994; Orbuch & Custer 1995; Rosenfield 1992).

We reexamine these issues by looking at the division of paid and domestic labor simultaneously. In combining these forms of labor, we are able to separate two theoretically important effects: the effect of specialization (or role segregation) and the effect of equity. With specialization, we refer to a situation where the two partners produce different goods. With equity, we refer to a situation where the efforts of the two partners in the production process are equal. Specialization and equity can vary independently. Equity exists not only in the most modern arrangement where both partners work for pay and both engage to the same extent in household labor. Equity also exists in the most traditional arrangement where only the husband works for pay and the wife does all the household work.² A lack of equity occurs when the wife works for pay and the husband does not help out in the household, or when the wife does not work for pay and also does not contribute to household work.

² In the literature, equity arguments have often been applied to household labor only. Lennon and Rosenfield (1994), for example, find that both men and women find it fair if women do twice as much household labor as men. To account for this "unequal" outcome, they invoke theories about marital power and gender ideology (p. 525), while ignoring the fact that the men in their sample also do 60% of the paid working hours (p. 515).

Our central question is which aspect of production is most important to well-being: specialization or equity? According to psychological theories about close relationships, it is especially equity which improves mental health (Sprecher 1986). According to economic theories of marriage, however, it is especially specialization which is beneficial to mental health (Becker 1981). In the empirical literature, equity and specialization have often been regarded as each other's opposites, which has made it difficult to test their effects. Our contribution is that we develop (partly) uncorrelated measures of these two aspects of production arrangements, which allows us to conduct independent tests of the two hypotheses in one analysis. The test is obtained from an analysis of couples from a large-scale panel in the United States.

Theoretical background and hypotheses

To understand the link between well-being and work arrangements in marriage, we focus on two simple principles: the principle of specialization and the principle of equity. According to the first, it can be argued that dividing tasks over husbands and wives is more efficient than an arrangement where husbands and wives spend their time doing similar things. If persons invest their time in specific tasks, they are able to specialize, which increases the returns from those investments. The clearest example of this is paid labor, where labor market experience leads to a direct increase in wages and where part-time work and career interruptions have negative effects on wages (England & Farkas 1986; Waldfogel 1997). Hence, a situation where one spouse works forty hours and the other has no paid work yields more household income than a situation where both spouses each work twenty hours.³ Specialization is also possible for household labor, although there is no monetary payoff here. If one person specializes in household labor or child rearing, one could argue that he or she is able to be more 'productive' in this respect than when couples share domestic labor. Simple examples of such higher levels of productivity are a cleaner house and better meals. Whether specialization also produces 'better' children is unclear. Studies have not consistently found negative effects of

³ In some countries, these effects can sometimes be counteracted by taxation practices.

maternal employment on child outcomes (Bogenschneider & Steinberg 1994; Waldfogel, Han, & Brooks-Gunn 2002).

Dividing tasks is also more efficient in terms of time. When both partners work and when they both are responsible for household chores and rearing children, the time pressure that couples experience is considerable. This is partly the result of dual-earner couples spending *more* hours on paid labor than single-earner couples. But even when the spouses in dual-earner couples both work part-time, the usage of time can be less efficient. Certain time costs of work do not depend on working hours and therefore make part-time work more intensive. Examples of such fixed time costs (of work) are travel time, working extra hours at home, out-of-work meetings with colleagues, and worrying about work issues. Related to this is that the transaction costs are higher when there is role sharing. The management of time becomes more complicated when both partners work and more things have to be discussed with the partner. Role sharing can be seen as a large and continuous series of small agreements, whereas role differentiation or specialization means one simple agreement.

From the arguments above, one can also expect effects on well-being and mental health. If productivity is higher due to specialization, this can lead to a better quality of life, which in turn can have positive effects on well-being. In our view, a more important argument lies in the time and transaction costs. Specialization leads to a more efficient use of time and to lower transaction costs. This leads to less stress and therefore to higher levels of well-being and better mental health. Hence, our first hypothesis is: *the more specialization there is in the household, the better the mental health of the couple.*

The second main argument about the link between the division of labor and well-being lies in the notion of equity (Walster, Walster, & Berscheid 1978). The most basic definition of equity is a situation where the efforts of two spouses in the production of household goods are equal. A more complex definition takes into account the abilities of the two persons and argues that the input of the two spouses should be measured relative

to their abilities (Homans 1961).⁴ For example, when someone is ill, fewer hours of (paid or domestic) work are needed to achieve equity. Research has shown that people perceive a situation without equity as unfair (Lennon & Rosenfield 1994). An important assumption is that the rewards of the production in the household are distributed equally. When one spouse does all the paid and domestic work, this will not be considered unfair if he or she also gets most of the benefits. In marriage, the rewards of the collective production tend to be distributed equally, which is why a difference in effort is considered unfair.⁵

The relation of equity to well-being and mental health also exists. Research has shown that a lack of equity leads to negative emotions, and these in turn have a negative effect on health, especially on depression (Sprecher 1986). A lack of equity is also associated with a decline in marital satisfaction (Van Yperen & Buunk 1990), and a low degree of marital quality can in turn lead to poorer health (Kiecolt-Glaser & Newton 2001). Our second hypothesis is therefore as follows: *the more equity there is in the household, the better the mental health of the couple*. Previous research has not yet tested this hypothesis directly because most studies focus on measures of *perceived* fairness and not on measures of the actual division of labor in the household (Lennon & Rosenfield 1994; Sprecher 1986). A known drawback of focusing on perceived fairness is that negative emotions and health problems may bias the views that a person has on the contribution of the spouse to the relationship. Dissatisfaction with the spouse may result in a perception of inequity when there is in fact equity. Relating behavioral measures of equity to health outcomes is therefore an important additional test of equity theory.

Possible negative equity effects are not limited to the person who contributes the most. The person who does less than his or her share may also experience negative effects. Research has shown, however, that the effects are not fully symmetric in strength and nature (Sprecher 1986; Vaananen, Buunk, Kivimaki, Pentti, & Vahtera 2005). We can

⁴ The concept of equity in exchange is the same as the concept of distributive justice used in other studies (e.g., Homans, 1961).

⁵ This assumption has been challenged in two settings: for poor working class families in the beginning phase of the Industrial Revolution and in less developed countries in contemporary times. Research in these settings suggests that men have a larger share of the total household consumption (Young 1952).

make a distinction between underbenefiting (in which a person does more work than the spouse) and a situation of overbenefiting (in which the spouse does more work).

Underbenefiting leads to anger and depression, especially among women, whereas overbenefiting leads to anger and guilt, especially among men. The negative mental health effects seem stronger, however, for underbenefiting than for overbenefiting but there are no good theoretical explanations for why this is so.

A qualification to the equity argument as formulated above lies in the degree to which the costs of different types of efforts can be compared. We assume that an hour of household labor is the same effort as an hour of domestic labor. Much of the critique on the traditional division of labor has focused exactly on this assumption. Labor is not only a cost factor, it also yields private benefits and these benefits may be different for different types of labor. Work can be intrinsically rewarding, it can be a form of social integration, and it can yield prestige. Authors have argued that the private rewards of household work are lower than the private rewards of paid work because household labor is associated with less prestige. Other authors have questioned this by arguing that the amount of prestige obtained from paid work varies from job to job. It seems plausible that a surgeon receives more prestige in society than a housewife, but whether a construction worker also receives more prestige than a housewife is unclear.⁶

Data, design, conceptualization, and measures

We use data from waves 1 and 2 of the *National Survey of Families and Households* (NSFH) (Sweet & Bumpass 1996). The first was collected in 1987 and 1988 and was based on a national probability sample of adults in the United States. It included a main cross-section sample of 9,643 households plus a double sampling of African Americans, Puerto Ricans, Mexican Americans, single-parent families and families with stepchildren, cohabiting couples and recently married persons (N = 13,007). The response rate was

⁶ Along these lines, studies have shown that the health effects of paid and domestic work depend on the quality of the work being done (using concepts called 'role quality'). Problematic in these studies is that the measures of role quality are very close conceptually to the outcome measures of well-being.

74%. Primary respondents and their spouses were again interviewed between 1992 and 1994 (N = 10,005). The interval between the waves is 5.8 years on average. Excluding respondents who had died, the response rate for the second wave was 82%.

From the original data, we selected respondents between 25 and 60 years of age who participated in the second wave and who were married with the same person in the two waves. After excluding respondents with missing data on key variables, the number of couples in this subset is 2,299. Cohabiting couples are also included and we use the term husband and wife to refer to the spouses in these couples. We include a dummy-variable to control for the difference between married and cohabiting couples.

Design

The design we apply is to regress mental health measures of husband and wife on aspects of the division of labor in marriage. One important advantage of the data we use is that we have independent reports of the respondent and the spouse on health and the division of labor. Moreover, we have panel data so that we can control for the possibly confounding effects of prior health of both spouses. More specifically, we regress husband's and wife's mental health in Wave 2 on the division of labor in Wave 2 while controlling for the general health of husband and wife in Wave 1.⁷

Conceptualizing equity and specialization

The data contain detailed measures of labor and these measures are obtained from independent interviews of the husband and the wife. Paid labor is measured as the number of hours worked for pay in a normal week. Household labor is measured by asking how much time the person spends per week on 10 different household tasks (preparing meals, doing the dishes, cleaning, outdoor repairs, washing, shopping, child

⁷ Unfortunately, mental health was not included in the spouses' interview in Wave 1. General health is available for both partners in the Wave 1 interview. Prior poor health is an important control variable because poor health in Wave 1 predicts loss of job between Wave 1 and Wave 2, but Wave 1 depression does not.

care, doing the bills, car maintenance, and driving for errands).⁸ We summed the number of hours across tasks to obtain a measure of household labor. Both measures are truncated at 100 hours.

In the first set of the analyses, we do not include measures of the time spent on child care. This is only applicable to couples with children, and we first want to estimate the two effects for all couples. In subsequent analyses, we zoom in on couples with children and we include the child care measures.

To develop measures of specialization and equity, we used transformations on the four inputs of husband and wife: P_h (paid hours of husband), P_w (paid hours of wife), D_h (domestic hours of husband), and D_w (domestic hours of wife). We define the total number of hours as $T_{hw} = (P_h + D_h + P_w + D_w)$. Our measure of equity is as follows:

$$\text{EQUITY} = 1 - |(P_h + D_h) - (P_w + D_w)| / T_{hw}$$

Equity varies from 0 (no equity) to 1 (full equity).

Specialization is measured by using the concept of segregation. In the literature on ethnic groups, segregation indices have been developed to assess the degree to which groups live in different neighborhoods (Lieberman & Carter 1982; Massey 1990). The distribution of ethnic groups across neighborhoods is a similar concept analytically as the distribution of spouses across tasks. The more segregation there is, the greater the degree of specialization (i.e., the more often spouses do different things in the household). Operationally, specialization is measured by using the index of dissimilarity. In the present context, this is defined as follows:

$$\text{SPECIALIZATION} = |(P_h / (P_h + D_h)) - (P_w / (P_w + D_w))|$$

⁸ As has been noted in earlier studies of the NSFH, there were many missings on the specific items in the first Wave 2 (ref). In Wave 2 data the number of missings is much lower (%) and acceptable. We use Wave 2 information on household tasks only.

Specialization ranges from 0 (full role sharing) to 1 (full role segregation or specialization).⁹ A few examples illustrate our two measures and show that the two dimensions are independent. A common example is the following.

	husband	wife
domestic labor	10	40
paid labor	40	10

This traditional production arrangement has a specialization score of 0.60 and an equity score of 1 (highly specialized but fully equal). Another example is:

	husband	wife
domestic labor	10	30
paid labor	40	30

Here, the wife works for pay as well and reduces her domestic hours compared to the previous situation, but the husband does not change his behavior. This is a common experience as well. The specialization score is 0.30 and the equity score is 0.80. Hence, compared to the previous situation, there is less specialization, but there is also less equity. This has also been called the transitional stage, i.e., a stage in between the traditional and the modern stage (Ross et al. 1983). Finally, we can look at a pattern where the husband works for pay less and contributes substantially to the household:

	husband	wife
domestic labor	20	30
paid labor	35	30

The specialization score drops to a low of 0.14 and the equity score increases again, to 0.96.

⁹ For more than two tasks (tasks 1 to j), the formula is: $\frac{1}{2} [\text{Sum}_j (X_{jh} - X_{jw})]$, where X is the proportion of the husband's (or wife's) time spent on task j.

Although the equity score runs from 0 to 1, it tends to be left skewed, with most values on the right side, because low scores present extremely unequal situations whereas moderately high scores (0.50-0.70) represent divisions of labor that, normatively speaking, are still quite unequal. In the following pattern the specialization score 0.50 is and equity is 0.67.

	husband	wife
domestic labor	0	40
paid labor	40	40

Measures of mental health

We use two measures of health that were reported by both spouses in the second wave: depression as the dependent variable and general health as a control.

The *depression* scale is an abbreviated version of the Center for Epidemiologic Studies Depression Scale (CES-D), a commonly used measure of depressed mood that has high construct validity and internal consistency (Radloff 1977). Respondents reported the number of days during the previous week that they experienced the following: “you were bothered by things that usually don’t bother you?,” “you felt lonely?,” “you felt you could not shake off the blues, even with the help of your family or friends?,” “your sleep was restless?,” “you felt depressed?,” “you felt that everything you did was an effort?,” “you felt fearful?,” “you had trouble keeping your mind on what you were doing?,” “you talked less than usual?,” “you did not feel like eating, your appetite was poor?,” “you felt sad?,” and “you could not get going?.” The weighted answers (not at all = 0, 1-3 days = 1, 4-6 days = 2, everyday = 3) were summed. In both waves, the reliability coefficient was high ($\alpha = 0.92$).

Poor health was based on the single item health question: “Compared to other people your age, how would you describe your health? Very poor, poor, fair, good, excellent.”

This frequently used health question predicts mortality in longitudinal research (Idler & Benyamini 1997) and correlates with more objective health indicators (Ferraro & Farmer 1999). By convention, we dichotomized the skewed response into poor health versus fair, good, or excellent health.

In all models, we control for a measure of general health in Wave 1. This is important, because health impairments of one of the spouses will influence the arrangement in the household. For example, if a husband is handicapped, he will not be able to work for pay and the wife may work more hours. An especially attractive feature is that we can control for the health of both spouses in Wave 1. Unfortunately, we do not have prior measures of depression for both so that we can only use general health measures as controls.

Control variables

The other control variables are the respondent's age, age squared, race/ethnicity (black versus all others), highest completed education, presence of children under 18 years of age, and income. Age and education are measured in years. Income is the annual household income at Wave 1. The measure is logged to avoid extreme incomes from having too much weight. Missings are assigned the mean income and a binary variable is included indicating whether income was missing. Race and the presence of children are dichotomous variables.

Analyses and results

We start out by replication prior results. To do this, we first present regression models in which the husband's and wife's depression (2 equations) are regressed on the four ingredients of the couple measures: the husband's working hours, the wife's working hours, the husband's domestic hours, and the wife's domestic hours (Table 2). After this, we estimate models in which the two production measures are included: specialization and equity (Table 3). These models include controls for the total number of paid hours and domestic hours. To test for asymmetry in the equity effect, we also use an alternative

measure of equity that allows us to estimate effects of underbenefiting and overbenefiting separately (using splines in Table 4). This is based on a measure of equity that is simply the proportion of the total couple time that the wife spends on domestic plus paid labor. Finally, we replicate the analysis for couples with children (Table 5).¹⁰ Table 1 reports the means and standard deviations of all variables.

Descriptive results

Before presenting our results, we show some descriptive statistics on the division of labor in our sample. In the analytic sample of couples, the average degree of specialization is 0.38, the degree of equity is 0.79 and the correlation between the two is -0.28 . Figure 1 and 2 show the distribution of the specialization score and equity score respectively. Complete specialization is very rare as are highly unequal patterns of labor division. Note that relatively high scores on the equity measure represent divisions of labor that many people would, probably, find quite unequal.

Replications

Table 2 reports the effect of husband's and wife's paid and domestic hours on depression. We begin our discussion with effects of domestic labor. The results clearly show a positive relation between ego's number of domestic hours and own depression. For both men and women, more hours of domestic work is associated with higher levels of depression. This is consistent with earlier analyses. There are also what we can call crossing effects. For women, we observe an increase in depression when the husband spends more hours doing domestic labor. This effect is less strong among men. This is not consistent with expectations since one would expect wives to be less depressed when husbands spend time on domestic labor. Perhaps one could argue that the causality runs the other way around—husbands do more in the household when their wives are

¹⁰ This analysis does not include the measures of child care since there are too many missing values on these variables. Nevertheless, we think that the division of child care will be closely related to the division of household labor.

depressed—but we control for prior health, which makes this alternative interpretation less likely, though not impossible.

We now turn to the effects of paid labor. As expected, the effect of on husbands depression score is negative as would be expected. In other words, the more hours husbands work, the less depressed they are. Additional analyses show that this mainly reflects the positive effects of being employed. When we include a binary variable for employment, the effect of husband's hours of paid work is not negative, but even positive and significant. In other words, employment per se is positive for health, but working long hours is negative. Further analyses using quadratic terms of paid hours (when excluding the employment variable), confirm this. When we look at the wife's employment, we find no effect. This is in line with previous studies, which rarely show that wife's employment matters for health outcomes. We finally find one crossing effect. Husbands report higher levels of depression the more hours their wife works for pay. This is in line with what one would expect if couples have traditional preferences regarding the division of labor. However, we do not find the other crossing effect: Wives are not more depressed when the husband works less. Perhaps the preferences of the husbands are more traditional than the preferences of the wife.

We control for prior poor health to make the interpretation of the effects of labor on depression more straightforward. However, the health effects are also noteworthy. Ego's poor health in Wave 1 increases ego's depression in Wave 2. There are also crossing effects. Husband's prior poor health increases wife's depression, but no crossing effect is found for husbands. This is also in line with a traditional scenario in which women are more sensitive for other people's problems than men (Beutel & Marini 1995; Umberson, Chen, House, Hopkins, & Slaten 1996). We also find asymmetric crossing effects for education: His education affects her health, but her education does not affect his health. This is in line with notions that the husband's resources are more important for the health of the household than the wife's resources (Monden, Van Lenthe, De Graaf, & Kraaykamp 2003).

Specialization versus equity

What are the effects of specialization and equity? Table 3 shows their separate and simultaneous effects, while controlling for total hours the couple spends on paid labor and domestic labor. We see that specialization has a significant negative effect in Model 3. Only for husbands and only when controlled for equity, we find that the more specialization, the lower the depression. The overall support is weak, however, since the effect is marginally significant and is not present for the wife. The support for the equity hypothesis, on the other hand, is stronger. Husbands and wives report lower levels of depression the more equal the division of labor at the couple level. Equity seems to have a stronger effect on husbands' depression than on wives'. An additional test of this difference shows that the equity effect is indeed stronger for men ($p = 0.0379$).¹¹

We also observe an interesting difference between husband and wives in the control variables. Wife's depression is associated with husband's prior health and education in addition to her own prior health and education. Such crossing effects are not significant for men. This is in line with the regression results in Table 2.

Overbenefiting and underbenefiting

Low equity increases husbands' and wives' depression. However, our equity measure does not differentiate between couples in which the wife works substantially more hours than the husband and couples where the husband's share in total labor is much larger than his wife's. To what extent is the equity effect asymmetric? Table 4 reports the results from two alternative models which estimate the effect of the wife's share in total hours the couple spends on paid labor and domestic labor. Model 1 uses quadratic effects for the wife's share in total hours of paid and domestic labor, while controlling for total hours of paid labor and total hours of domestic labor. Figure 3 presents the non-linear effects of this model. For both husbands and wives, we find a U-shaped effect. Ego's

¹¹ This was tested using a seemingly unrelated regression model because the observations of husbands and wives are not independent.

depression increases when the arrangement is less equal, regardless of whether this is to the advantage or disadvantage of ego. The effect seems stronger for husbands, in line with the linear models in Table 3.

Finally, we look at overbenefiting and underbenefiting directly by using spline regression in Model 2. Spline regression is a regression model which estimates different linear slopes for different ranges of the independent variables. In this case, we distinguish two ranges in the independent variable *wife's share*. The first range is 0-0.50 and refers to underbenefiting for the husband or overbenefiting for the wife. The second range runs from >.50-1 and refers to situations where the husband overbenefits and the wife underbenefits. For the equation of wife's depression, wife's underbenefiting is defined as:

$$(P_w + D_w) / T_{hw} - 0.5 \quad \text{for } P_w + D_w > P_h + D_h$$

and wife's overbenefiting is defined as:

$$0.5 - (P_w + D_w) / T_{hw} \quad \text{for } P_w + D_w < P_h + D_h$$

For the equation of husband's depression, the definition is reversed. Hence, husband's underbenefiting is defined as:

$$0.5 - (P_w + D_w) / T_{hw} \quad \text{for } P_w + D_w < P_h + D_h$$

and husband's overbenefiting is:

$$(P_w + D_w) / T_{hw} - 0.5 \quad \text{for } P_w + D_w > P_h + D_h.$$

In words, the effect of wife's underbenefiting represents deviations away from equity in the direction of a situation where the wife puts in more hours than the husband. The effect of wife's overbenefiting represents deviations away from equity in the direction of a situation where the wife puts in less hours than the husband. The signs of these effects are expected to be equal, but the magnitude may differ.

For husbands, we see significant effects of underbenefiting and overbenefiting. In other words, the more unequal the division of labor, the higher his depression, and this is also the case when the division of labor is to his advantage. The effect of overbenefiting seems stronger than the effect of underbenefiting. To test whether overbenefiting has a stronger effect, we perform an F-test for the differences in steepness of the two slopes.

This yields a marginally significant result ($p=0.098$), meaning that underbenefiting affects husband's depression approximately as much as overbenefiting does.

For wives, we only find a significant effect of overbenefiting. The effect of underbenefiting is in the expected direction, but not statistically significant. This latter finding is not as expected. However, a test for the difference in the steepness of the two slopes is not significant ($p=0.17$). Taking into account the results in Table 3, this means that there is a linear equity effect; overbenefiting and underbenefiting are equally important for wife's depression.

The expected values of the spline models are also presented in Figure 4, which reveals a pattern very similar to the quadratic model in Figure 3. The more unequal the division of labor, the higher the depression, but the effect is not fully symmetric.

Finally, we replicate the models with specialization and equity, as well as the spline models, for couples with children living at home (Table 5). The results of these models are even stronger as the preceding results. First, there is a marginally significant negative effect of specialization on husband's depression. Second, there are strong effects of equity on both husbands and wives. Third, the effect is stronger for husbands than for wives ($p=0.031$).¹² Fourth, the slopes in the spline regression models for overbenefiting and underbenefiting do not differ significantly in steepness. In other words, increases equally with higher underbenefiting and higher overbenefiting. This holds true for both husbands and wives.

Weighting types of labor

Our approach is a contribution to the literature in that we combine domestic and household labor in calculating equity. Previous studies generally measured equity only in terms of household labor. A possible criticism of our approach is that we treat the two

¹² This was tested using a seemingly unrelated regression model because the observations of husbands and wives are not independent.

forms of labor as having the same costs and benefits. This assumption can be questioned. Ideally, one would like to weight the different types of labor in order represent how much costs and benefits they entail. Domestic labor would then receive a lower weight than paid labor. What our approach does is to use a weight of 1 in calculating equity. One can question this assumption, but it is a better approach than the weight of 0, which is implicitly applied in previous research.

To improve our test of the equity effect, we conducted additional analyses in which we vary the relative weight of the household variable in the equity measure:

$$\text{EQUITY}_p = 1 - |(p P_h + D_h) - (p P_w + D_w)| / T_{hw}$$

where $T_{hw} = p P_h + D_h + p P_w + D_w$

The weight p varies from 0 – 1 which reflects that one hour of paid labor has lower costs (or higher benefits) than one hour of household labor.

In Table 6, we present the results of the linear equity model for different values of p . The results show that the regression coefficient of equity depends on the relative weight assigned to paid work and domestic work. As paid labor and domestic labor are weighted more equally, the equity effect becomes stronger—more negative. There is no significant equity effect when the weight of paid labor is 0. This is in line with prior research that found no or little evidence of equity effects when only taking into account domestic labor.

Figure 5 shows that the relationship between the weight of paid labor relative to domestic labor on the one hand and the equity effect on depression on the other hand, seems to be non-linear. The highest equity effect for husbands is found when paid labor and domestic labor are weighted exactly equally. When paid labor is given a lower weight, the effect of equity increasingly declines and is no longer significant when paid labor is perceived as being at least four times as rewarding as domestic work (weight $p=0.25$). For wives, equity affects their depression only when p is higher than 0.4. That is, when domestic labor is seen as being at least two-and-a-half times as costly or less rewarding than paid labor, wife's depression is not affected by the couple's labor arrangement. The strongest

equity effect for wives is found when the weight of one of paid labor is 0.67.

Interestingly, the effect of equity seems to decline if the relative weight of paid labor is closer to one. However, the coefficient for equity in a model where paid labor is weighted by $p=0.67$ does not differ significantly from the coefficient for equity in a model where both types of labor are weighted equally.¹³

Although the line for wives in Figure 5 differs from that of husbands, the equity effect is only significantly lower for wives when paid labor and domestic labor are weighted equally. In all other cases, the difference between the husband's and wife's equity effect is not statistically significant.

Conclusion – to be elaborated

In this study, we analyzed the mental health effects of specialization and equity in the labor arrangement of couples. We examined paid labor and domestic labor simultaneously. Economic theory predicts a health enhancing effect of specialization, but we found weak support for this hypothesis. Only for husbands is higher specialization weakly associated with lower levels of depression. Strong evidence was found for the more psychological equity hypothesis that unequal distributions of labor within households are detrimental for husband's and wife's mental health. However, we did not find support for the expectation that one's depression increase more when one is underbenefiting—ego puts in more hours of labor than ego's partner does—than when one is overbenefiting.

The simultaneous use of paid labor and domestic labor is an important strength of this paper. We used independent measures of equity and specialization. Moreover, we were able to show to what extent the implicit assumption about the relative weights of paid and domestic labor affect the outcomes of our analyses.

- Good data (couple data, control prior health)

¹³ This was tested using a X^2 test ($p=0.43$) after seemingly unrelated estimation in Stata.

Theoretical:

- Equity effects = simple and clear theory
- New evidence using hard measures of equity (rather than perceived)
- One puzzle: stronger effects for husbands
- Prior studies: genders differ only in the type of outcome, not in their overall effect of equity
- Specialization effects can be debated theoretically:
- Indirect effects (via income and via total hours) versus direct effects of specialization. One could argue that by controlling for total hours of labor and income, our tests of the specialization hypothesis became conservative—or restrictive in comparison to the test of the equity hypothesis. Part of the health enhancing effect of specialization runs through the positive health effects of having to work less hours when one is specialized and/or having a higher returns—higher income, cleaner house, better meals—to one hour of labor. Additional analysis showed that the specialization effect indeed is significant for husbands when total hours of domestic labor are not included in the model. However, there is not evidence for an indirect effect through total hours of paid labor or income. For wives, we did not find any indirect effects.
- Stress versus health
- Weighing types of labor

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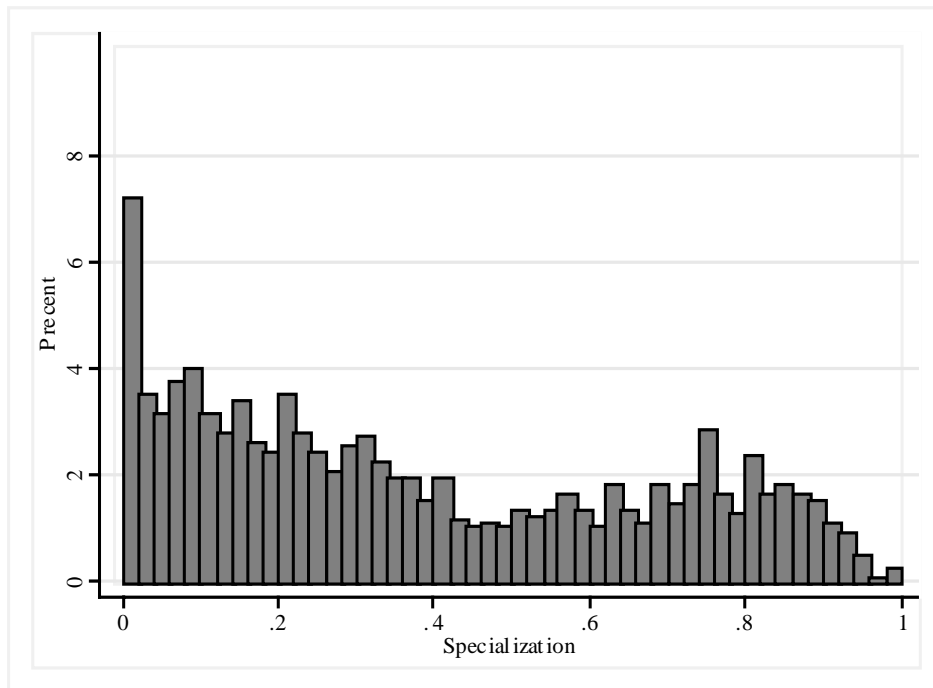


Figure 1 Distribution of couples' specialization of domestic labor and paid labor

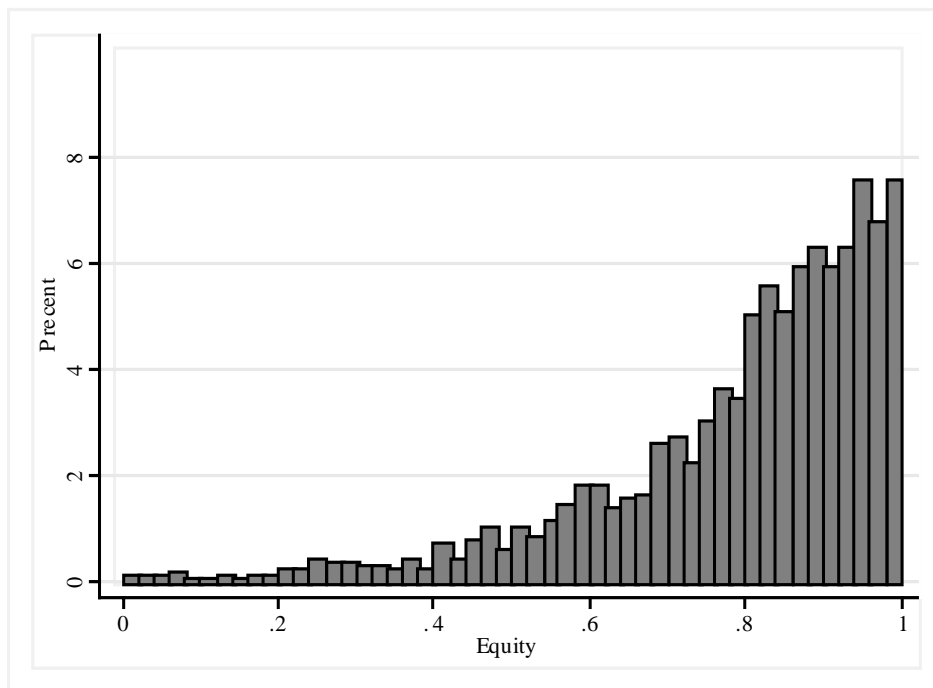


Figure 2 Distribution of couples' equity in the division of domestic labor and paid labor

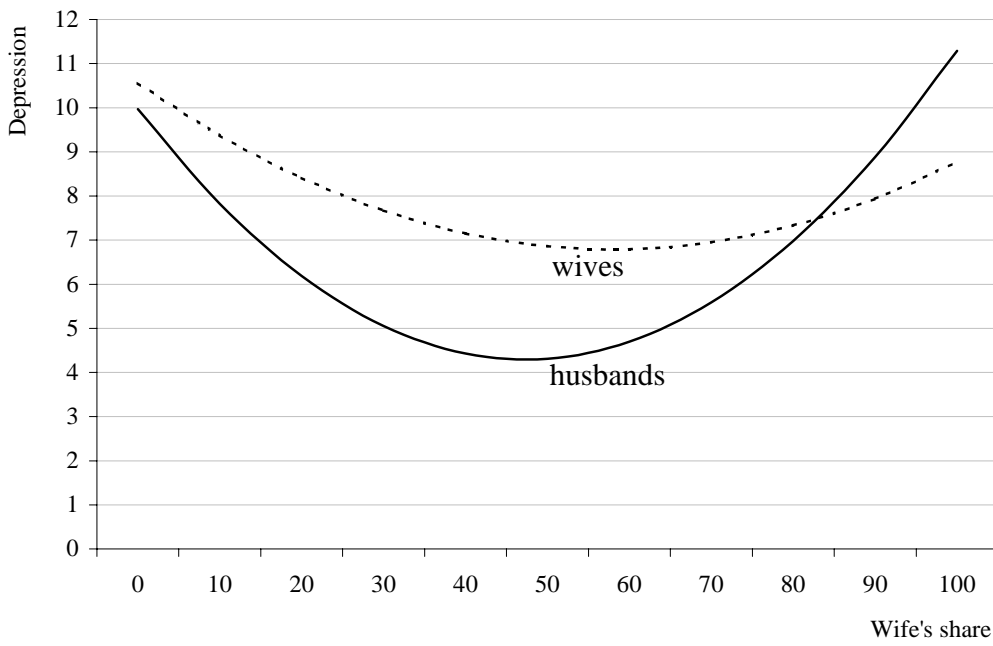


Figure 3 Wife's share in total hours of labor and husbands' and wives' depression

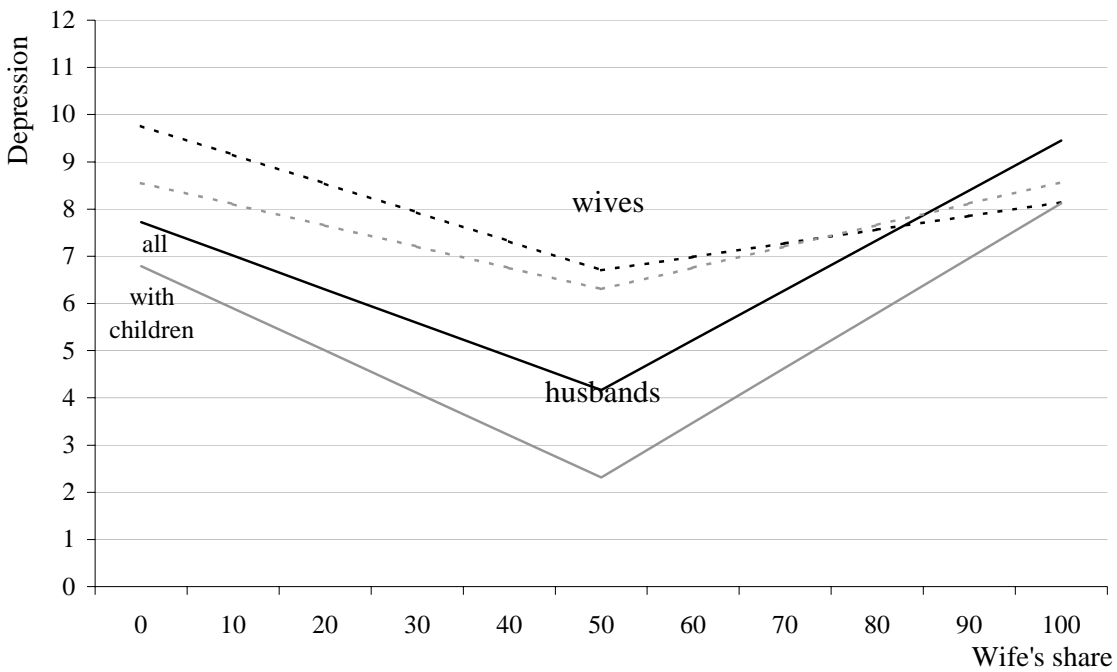


Figure 4 Effects of underbenefiting and overbenefiting on depression for husbands and wives, all couples and couples with children (grey lines)

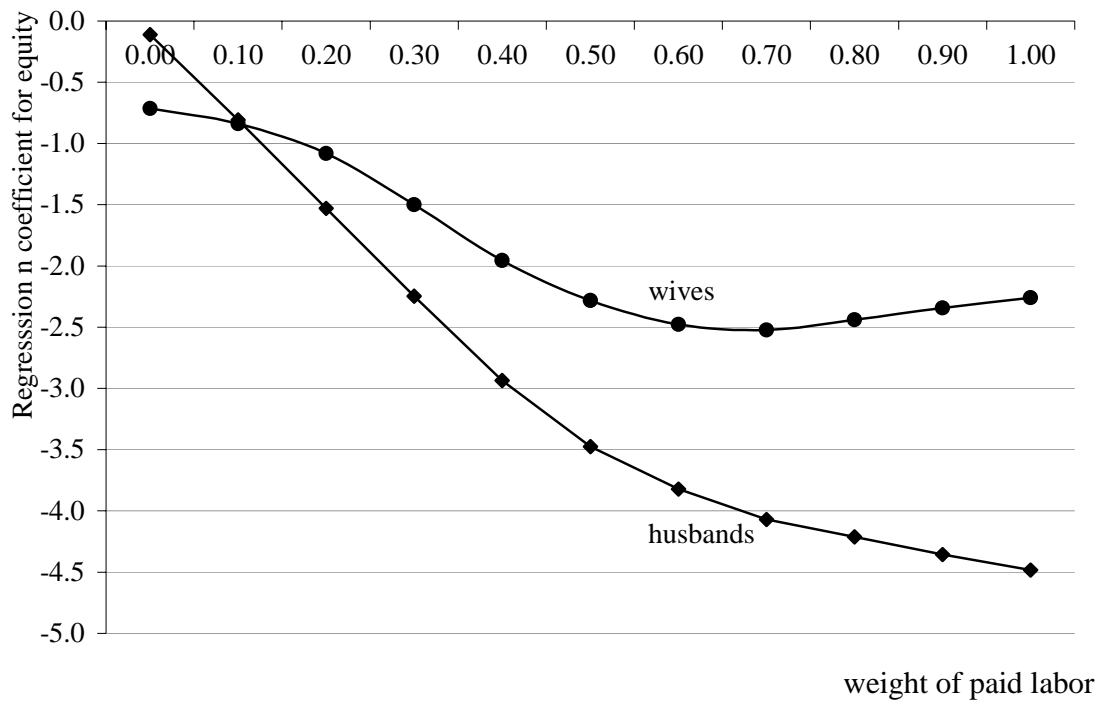


Figure 5 Size of the equity effect by weight of paid labor

**Table 1. Descriptive statistics for dependent and independent variables,
U.S. men and women aged 25-60 in 1993-1994**

	husbands			wives		
	mean / proportion	standard- deviation	range	mean / proportion	standard- deviation	range
depression	6.59	6.44	0-36	8.43	7.46	0-36
poor health	0.13		0-1	0.15		0-1
prior poor health	0.20		0-1	0.19		0-1
age	41.61	8.16	25-60	39.46	7.82	25-60
black	0.14		0-1	0.13		0-1
education	13.72	2.82	0-20	13.41	2.47	0-20
log income (\$)	10.50	0.77	0-13.8			
children age < 19 present	0.70		0-1			
cohabitation	0.06		0-1			
paid hours	44.39	17.88	0-100	26.14	20.25	0-100
domestic hours	19.70	14.07	0-100	37.15	21.20	0-100
total domestic	56.85	25.51	8-165			
total paid	70.53	27.03	0-180			
total children	19.52	21.18	0-160			
specialization	0.38	0.29	0 - 1			
equity	0.79	0.18	0 - 1			
n	2,299					

Income and prior poor health are measured at wave 1, all other variables are measured at wave 2

Table 2. Regression of depression on husbands' and wives' paid and domestic labor

	depression			
	husbands		wives	
	b	s.e	b	s.e
<i>wife</i>				
age			-0.015	0.024
non_white			0.202	0.461
education	-0.024	0.068	-0.227	0.078 *
prior poor health	0.345	0.379	3.704	0.436 *
<i>husband</i>				
age	-0.054	0.019 *		
non_white	0.327	0.389		
education	-0.162	0.061 *	-0.139	0.070 *
prior poor health	3.125	0.393 *	0.909	0.451 *
<i>household</i>				
income	-0.288	0.190	-0.392	0.218 ~
children<19 present	0.184	0.345	0.001	0.403
cohabitation	0.547	0.569	1.287	0.655 *
<i>division of labor</i>				
paid hours husband	-0.016	0.008 *	0.000	0.009
domestic hours husband	0.029	0.010 *	0.025	0.011 *
paid hours wife	0.016	0.007 *	-0.007	0.008
domestic hours wife	0.013	0.007 ~	0.023	0.008 *
constant	12.925	2.062 *	16.080	2.346 *

Model also include a dummy indicating mean substitution for income

*N=2,299; * p < .05 (two-tailed), ~ p < .05 (one-tailed)*

Table 3. Regression models of depression on division of labor

	husbands						wives					
	model 1		model 2		model 3		model 1		model 2		model 3	
	b	s.e	b	s.e	b	s.e	b	s.e	b	s.e	b	s.e
<i>wife</i>												
age							-0.017	0.024	-0.016	0.024	-0.017	0.024
non_white							0.177	0.458	0.152	0.458	0.135	0.458
education	0.008	0.068	0.003	0.067	-0.011	0.067	-0.236	0.077 *	-0.238	0.077 *	-0.245	0.077 *
prior poor health	0.361	0.380	0.325	0.377	0.313	0.377	3.709	0.435 *	3.691	0.434 *	3.685	0.435 *
<i>husband</i>												
age	-0.050	0.019 *	-0.051	0.019 *	-0.052	0.019 *						
non_white	0.447	0.388	0.428	0.386	0.404	0.386						
education	-0.187	0.061 *	-0.182	0.060 *	-0.170	0.060 *	-0.128	0.069 ~	-0.127	0.069 ~	-0.120	0.069 ~
prior poor health	3.188	0.393 *	3.125	0.391 *	3.098	0.391 *	0.881	0.450 *	0.850	0.449 ~	0.835	0.449 ~
<i>household</i>												
income	-0.311	0.190	-0.291	0.188	-0.275	0.188	-0.377	0.218 ~	-0.371	0.217 ~	-0.362	0.217 ~
children<19 present	0.078	0.345	0.078	0.342	0.131	0.343	0.037	0.402	0.046	0.400	0.077	0.402
cohabitation	0.698	0.569	0.707	0.564	0.650	0.565	1.237	0.654 ~	1.252	0.652 ~	1.221	0.653 ~
<i>division of labor</i>												
total paid hours	0.001	0.005	0.015	0.005 *	0.011	0.006 *	-0.005	0.006	0.002	0.006	0.000	0.007
total domestic hours	0.017	0.006 *	0.017	0.005 *	0.018	0.005 *	0.024	0.006 *	0.024	0.006 *	0.025	0.006 *
specialization	-0.485	0.510			-0.902	0.512 ~	-0.293	0.584			-0.497	0.590
equity			-4.282	0.784 *	-4.482	0.792 *			-2.080	0.902 *	-2.191	0.912 *
constant	12.870	2.078 *	14.982	2.094 *	15.554	2.118 *	16.203	2.358 *	17.170	2.387 *	17.480	2.415 *

N=2,299; * *p* < .05 (two-tailed), ~ *p* < .05 (one-tailed)

Table 4. Effects of division of paid and domestic labor on depression

	husbands		wives	
	b	s.e	b	s.e
<i>Model 1</i>				
total paid hours	0.013	0.006 *	-0.001	0.007
total domestic hours	0.018	0.006 *	0.027	0.006 *
wife's share	-23.963	4.568 *	-12.998	5.264 *
wife's share squared	25.285	4.334 *	11.208	4.993 *
specialization	-0.453	0.527	-0.599	0.607
<i>Model 2</i>				
total paid hours	0.012	0.006 *	-0.001	0.007
total domestic hours	0.016	0.006 *	0.026	0.006 *
overbenefiting	10.577	1.851 *	6.129	2.224 *
underbenefiting	7.107	1.931 *	2.876	2.128
specialization	-0.663	0.531	-0.722	0.612

Note: All models control for age, ethnicity, income, children aged < 19 in household, prior poor health and education.

** $p < .05$ (two-tailed), $\sim p < .05$ (one-tailed)*

Table 5. Regression models of depression on division of labor for couples with children

	husbands				wives			
	model 1		model 2		model 1		model 2	
	b	s.e	b	s.e	b	s.e	b	s.e
<i>wife</i>								
age					-0.003	0.032	-0.004	0.032
non_white					-0.106	0.527	-0.106	0.528
education	-0.021	0.082	-0.020	0.082	-0.267	0.092 *	-0.267	0.092 *
prior poor health	0.715	0.465	0.742	0.466	3.671	0.523 *	3.672	0.524 *
<i>husband</i>								
age	-0.043	0.025 ~	-0.046	0.025 ~				
non_white	0.634	0.449	0.641	0.449				
education	-0.102	0.075	-0.094	0.075	-0.066	0.085	-0.066	0.085
prior poor health	2.863	0.483 *	2.827	0.485 *	0.637	0.542	0.637	0.544
<i>household</i>								
income	-0.071	0.235	-0.055	0.235	-0.311	0.265	-0.311	0.266
cohabitation	0.867	0.763	0.842	0.763	1.198	0.861	1.197	0.862
<i>division of labor</i>								
total paid hours	0.012	0.007 ~	0.013	0.007 ~	-0.002	0.008	-0.002	0.008
total domestic hours	0.020	0.006 *	0.019	0.007 *	0.019	0.007 *	0.019	0.007 *
specialization	-1.184	0.634 *	-1.003	0.658	-0.891	0.711	-0.888	0.739
equity	-5.142	0.989 *			-2.258	1.110 *		
overbenefiting			11.630	2.379 *			4.495	2.661 ~
underbenefiting			8.959	2.366 *			4.538	2.668 ~
constant	12.737	2.600 *	11.897	2.727 *	16.752	2.892 *	16.739	3.041 *

$N=2,299$; * $p < .05$ (two-tailed), ~ $p < .05$ (one-tailed)

Table 6. Effects of specialization and equity for different relative weights of type of labor

weight of paid labor	husbands				wives			
	specialization		equity		specialization		equity	
	b	s.e	b	s.e	b	s.e	b	s.e
0.00	-0.534	0.584	-0.111	0.645	-0.607	0.668	-0.715	0.738
0.10	-0.713	0.550	-0.808	0.726	-0.529	0.629	-0.839	0.830
0.20	-0.745	0.527	-1.530	0.783 ~	-0.476	0.603	-1.081	0.895
0.25	-0.726	0.520	-1.882	0.805 *	-0.457	0.596	-1.289	0.921
0.30	-0.695	0.515	-2.247	0.822 *	-0.432	0.590	-1.499	0.940
0.33	-0.672	0.514	-2.450	0.829 *	-0.417	0.588	-1.631	0.949 ~
0.40	-0.623	0.511	-2.934	0.840 *	-0.385	0.585	-1.956	0.962 *
0.50	-0.568	0.509	-3.475	0.841 *	-0.347	0.584	-2.281	0.963 *
0.60	-0.559	0.508	-3.823	0.832 *	-0.340	0.584	-2.478	0.954 *
0.67	-0.584	0.508	-3.994	0.826 *	-0.355	0.584	-2.525	0.948 *
0.70	-0.602	0.508	-4.071	0.823 *	-0.366	0.584	-2.522	0.945 *
0.75	-0.639	0.509	-4.152	0.818 *	-0.385	0.584	-2.487	0.940 *
0.80	-0.683	0.509	-4.213	0.814 *	-0.408	0.585	-2.439	0.936 *
0.90	-0.784	0.510	-4.356	0.804 *	-0.454	0.587	-2.344	0.924 *
1.00	-1.184	0.634 ~	-4.482	0.792 *	-0.891	0.711	-2.258	1.110 *

$N=2,299$; * $p < .05$ (two-tailed), ~ $p < .05$ (one-tailed)

Note: All models control for age, ethnicity, income, children aged < 19 in household, prior poor health, education, partner's prior poor health and education, total hours domestic labor, and total hours paid labor