Does the division of housework differ between first and second unions? Evidence from Germany

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Abstract: Given the huge increase in divorce rates, re-partnering is becoming an increasingly frequent event. The aim of this paper is to answer the question of whether household work is divided differently in first and second unions and to identify the sources of time allocation differences between two consecutive partnerships. Answering this question contributes to the household economic debate about the transferability of marriage-specific skills, and the possible costs of marital specialization in terms of foregone future earnings. Using fixed-effects regression analysis to capture unobserved heterogeneity, we compare the division of household work among couples in the German Socio-Economic Panel whose members have experienced two consecutive partnerships, covering the observation period 1991 to 2008. Time devoted to childcare is distinguished from other domestic tasks. Our results show that both men and women tend to participate more in their second unions than in their first ones, but women's and men's second unions differ. While women do more childcare after re-marriage, men do more housework. There are fewer marriage-specific investments in men's second unions and the impact of individual bargaining power increases from women's first to second unions.

Key-words: divorce, time-use, housework, work division, marriage, remarriage

JEL classification: D13 - J12

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1. Introduction

Divorce rates have been increasing across Europe for decades and are still doing so. Alongside the rise in formal divorces, the number of non-marital unions and their risk of dissolution is increasing as well. These demographic patterns of more flexible partnership dissolution and formation provide new insights into the remarriage market and tend to change the economic framework of marriage markets, as the market for remarriage appears less constrained today than some decades ago. Secondly, as marriage-for-life is becoming a rather scarce event, investments during marriage are less likely to yield long-term returns. Marriage-specific skills acquired during one union due to marital specialization are not necessarily transferable to the next one.

Despite these common trends, there are very few studies on remarriages in economics, except for some theoretical papers on the remarriage market (Chiappori Weiss, 2006). Empirically, very little information is available about these new partnerships, whether they share common traits of behaviour with the first ones or whether they differ radically in terms of work division.

The first objective of our paper is therefore to identify the sources of domestic time allocation differences between first and second unions in Germany. It aims to answer the following question: Do people behave differently in their first and second (marital) union and, if so, why? People may allocate their time in the same way or they may change for many reasons. One possible reason is that "learning-by-doing" may occur between the two partnerships: unequal task sharing in the first union might lead, for instance, to more equal sharing in the second one. Another possible reason is that people adjust their behaviour to the new partner.

The second aim of the paper is to raise the question of investment in marriage-specific skills in a context of greater uncertainty about partnership duration. And thirdly, a new partnership corresponds to a new bargaining power relationship that is also likely to affect the sharing of housework. We compare the impact of bargaining power indicators on housework division in first and second unions.

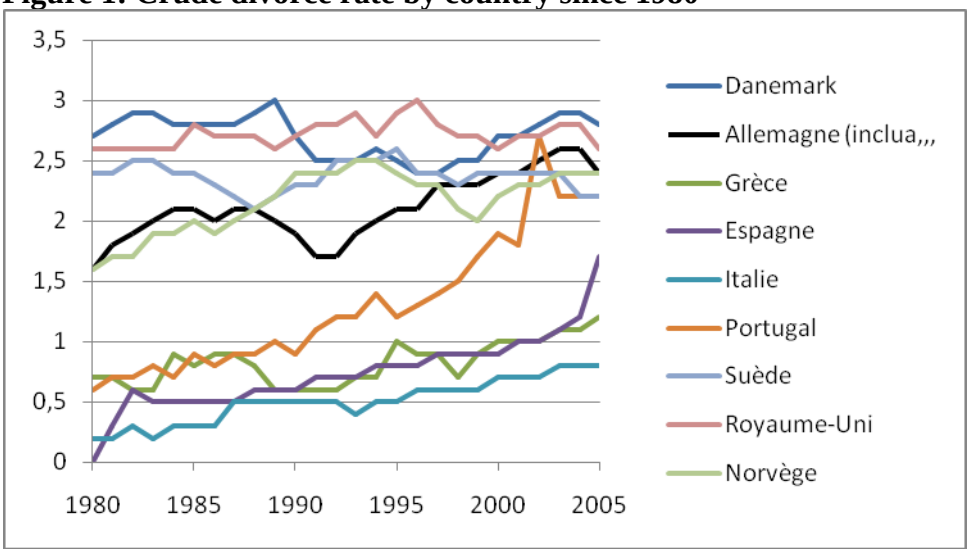
This article focuses on the time spend on housework and the division of housework between partners as a proxy for marriage-specific investment and couple specialization. We measure the sharing of household work between the female and the male partner of a heterosexual couple. In a world where dual earners are becoming the predominant family model, the work division between spouses is more easily observed through the allocation of time to non-market activities than through the division between market and non-market activities. Moreover, the exact numbers of hours spent in market work are not freely determined by individuals themselves, since they are sensitive to country-specific work legislation, particularly across Europe.

Using the German Socio-Economic Panel (SOEP), we are particularly interested in the work division of the same individual with two different partners in two consecutives unions. In this article, we will first present the conceptual framework and our theoretical assumptions. We will then summarize the main findings of previous studies before introducing our data and methodology. Finally, our results are presented and interpreted.

2. Divorce, separation and repartnering

While divorce rates remain more or less constant at high levels in the Nordic countries (Denmark, Sweden and Norway), they are steadily increasing in southern European countries such as Greece, Portugal, Italy and Spain where divorce was still a scarce event at the beginning of the 1980s (see Figure 1). In Germany, we observe a renewed increase starting in the early 1990s and showing an upward trend until 2003; 28.7 percent of the 1989 marriage cohort was already divorced after 15 years of marriage. Alongside the increase in divorces, the numbers of non-marital unions have been increasing throughout Europe. In Germany, the total first marriage rate for women was 0.54 in 2006 (Dorbritz 2008). While statistics on non-marital union separations are quite scarce[1], trends show that separation rates have increased as well. Because of the changing patterns of union status and union dissolution, both marital and non-marital unions must be taken into account when studying partnership histories. If divorce and separation are counted together, first union dissolution is no longer rare and is becoming a quite likely event in an individual's life cycle. It is expected to become even more frequent with the ongoing increase in separations in southern European countries.

Figure 1: Crude divorce rate by country since 1980



Source: Own calculations based on Eurostat data..

The first consequence of the higher frequencies of divorce and union dissolution and the rising probability of repartnering is, generally, that people more often experience several unions during their life time.

This is also the case in Germany, where divorce and separation rates are increasing as in other European countries. A rising number of first unions are dissolved, and repartnering is becoming more frequent (divorcees and stepchildren are less stigmatized). Divorced men in particular have an economic incentive to remarry (or to have children), as this reduces the alimony they have to pay to their former wife, and recent changes in the maintenance law have given more priority to the new family. At the same time, there is a disincentive for

[1] Statistics on the dissolution of non-marital partnerships cannot be calculated from the classical family status (single, couple, widowed, divorced) – used for instance in national census or administrative register data – but must be based on survey data, either longitudinal or retrospective.

divorced women to move in with a new partner or to remarry as they may lose their eligibility for maintenance payments from their former husband.[2]

3. Conceptual framework and assumptions

3.1 Different partnership, different partner?

Why should the division of housework in the second partnership differ from that in the preceding one? The reasons are manifold.

The most obvious reason why the housework division is likely to be different is simply that one partner has changed. The amount and division of work within the couple is the outcome of two persons' preferences and of negotiation, and a new partner is likely to have different tastes and characteristics. There is also a process of adaptation to the new spouse. If the new partner participates more (or less) or participates with a higher (or lower) productivity in domestic chores, the other partner will adapt and compensate by reducing (or increasing) his or her participation to obtain the same level of household production. The intra-household allocation may change. Moreover, the level of production may be different, because of the changing family composition for instance.

Whether the new partner is similar or different to the former one depends on the matching process. On the one hand, the matching process may allocate a partner very similar to the first one (in terms of socio-economic characteristics) due to homogamy or positive assortative matching. It is well known that partners tend to match with partners of similar age, level of education, ethnicity, and, consequently, also earnings. Because of his/her similar characteristics this new partner is likely to behave like the former one, also with regard to time allocation. On the other hand, Becker (1973) advances that greater differences in the relative abilities/skills of the partners will result in complementarities and generate greater gains from specialization. For more diverse couples in terms of education, age and wages, we should observe more specialization, in which case His theory predicts negative assortative matching on spouses' wages in order to maximize the gains from specialization. But this prediction has found relatively weak empirical support (Zhang and Liu 2003) and positive assortative matching is usually observed (Nakosteen, Westerlund & Zimmer 2004).

There is empirical evidence that homogamy decreases from first to subsequent unions, because of different matching processes. The re-marriage market is smaller than the first-marriage market (fewer singles available at each age) and persons looking for a new partner have to extend their criteria. The likelihood of finding someone far from one's own characteristics is therefore higher. For instance, the observed differences in age and in educational level are larger (Bozon 1991). Muller and Pope (1980) also found, from a 1970 Survey, that only 30 percent of remarried women have a husband with an equivalent occupational status, whereas 50 percent "marry up" and the remaining 20 percent marry down. These results suggest that specialization based on complementarities should be higher in second unions. But more recently, Aström et al. (2009) from Swedish register data, find evidence for a similarity (using unmeasured earnings indicators) between the successive partners of women who experienced two successive unions. Duncan and Hoffman (1985) also

[2] In principle, these incentives or disincentives are gender neutral. However, the majority of maintenance payers are men, since they were the main earners in the dissolved household, and the majority of maintenance recipients are women, as the former main carers.

found a positive correlation between the incomes of two successive husbands. However, these studies did not test for men who experienced two successive marriages.
We will address the following questions here, taking into account the two sides of the remarriage market, from the woman's and the man's point of view: 1) Do second unions show a more egalitarian time use than first ones? 2) And, with respect to time use, do women's second unions differ from men's?

3.2 The experience of marital failure and the investment in marriage-specific skills

Another reason for the change in the division of housework, put forward by both sociologists and economists, is that there may be some learning-by-doing after a marital separation. If one partner was doing most of the household workload, he/she may wish to participate less in the second partnership. This requirement could be stipulated even before the formation of the new match[3]. Women who experienced an unfair first marriage in terms of housework division may be more selective for the second partner. Sullivan 1997 described this phenomenon with the expression "Once bitten twice shy". On the contrary, men who have suffered from disputes about participation in domestic tasks may invest more in the second union. Aughinbaugh (2010) states "the failure of household production to bring returns upon the end of a previous marriage may make women less likely to reduce their labour supply in second and higher marriages". Consequently, they may be less likely to increase their non-market work since they may evaluate the cost of being out of the labour force (opportunity cost) differently in their second marital union.

In economics terms, the first union may be seen as a marital apprenticeship period during which at least one of the partners acquires marriage-specific capital (raising children, cooking). In the event of separation, these investments in household production are at least partially lost. This previous failure may make people behave more carefully in their second partnership. This idea can be translated into a greater expected probability that the marriage will end for remarried people since they have already experienced a marital dissolution. Becker et al. (1997) argue that the possibility of divorce may discourage the specialization and the accumulation of marriage-specific capital. Partners may allocate and share their domestic time differently in their second partnership because they are more wary. Because of this wariness, they choose to be less specialized in the second partnership than in the first one, all others things being equal. The level of specialization should increase with the confidence in the new partner and the partnership itself. In our analysis, we will use union duration and marital status as indicators of confidence in the current partnership. For the same level of confidence, do we observe the same time allocation in first and second unions? In other words, are people more wary in their second partnerships?

However, being specialized might also serve as an insurance against the risk of future divorce, since specialization increases the gains from marriage. People may opt for a specialization strategy to increase household productivity, and thereby the gains from marriage.

Whether people in second unions choose to increase or decrease intra-household specialization relative to the level chosen in their first union provides evidence about the

[3] However, the amount of domestic participation may be uncertain information and may only be revealed once the partners live together.

relative magnitudes of the two competing forces: the risk of divorce (i.e. less specialization) or the gains from marital (i.e. more) specialization.

3.3 The experience of marital failure and bargaining power

Lastly, the experience of a former union dissolution may alter the threat point of a new relationship, since partners who have already experienced (or whose spouses have already experienced) a marital dissolution may have a greater expected probability that the new marriage will end as well. Hence bargaining power, all others being things equal, may have a greater significance in the second union.

We will answer the following question: Does individual bargaining power have the same impact in first and second unions? For this purpose, we use two indicators of bargaining power: the potential wage gap and the age difference between the spouses.[4]

4. Previous empirical findings

Very few studies, to our knowledge, analyze the dynamics of the division of domestic labour by union order. In the only existing longitudinal study for Germany, Schulz (2010) revealed the dynamics of couples' time-use decisions over the course of the relationship. Whereas about half of the couples exhibit an egalitarian division of housework (the core chores in our definition) at the beginning of their relationship, over time, the arrangements shift systematically towards a more traditional pattern. After 14 years of marriage, the majority of couples (85 percent) had converged to a traditional work division - independently of the spouses' economic resources. Particularly with the birth of a child, women take over larger shares of household work.

We counted three studies in English-speaking countries. Sullivan (1997) used one of the waves of the British Household Panel Survey (BHPS) to show that women's second unions tend to be more egalitarian because of greater male participation, but that men's second unions are not. The study used a question about the total number of domestic working hours devoted to cooking, cleaning and laundry asked directly to the respondent, very similar to the question used in the GSOEP questionnaire. Although we know that such replies are open to criticism, a micro-data panel provides a rare opportunity to obtain dynamic time-allocation information. The other study performed by Ishii-Kuntz and Coltrane (1992) in North America also showed that remarried men participate more in five domestic tasks (cooking, meal cleanup, shopping, laundry and housecleaning) than men in their first unions. The authors take account of family composition and analyze male participation for the following four family types: first married couples with biological children, remarried couples with biological children only, remarried couples with step-children only, remarried with biological and step-children. They find that fathers with only biological children (and not step-children) are those who participate most. They also mention that remarried women spend more time on housework, especially those who have step-children. Lastly, in a more recent article, Aughinbaugh (2010) studied women's labour market participation by marital status and marriage order using the US Panel Study of Income Dynamics for the years 1979 to 2001. After controlling for background characteristics, she shows that women's labour market

[4] Podor's (2011) findings also suggest that a couple's sharing rule is more affected by the difference in ages and wages than the difference in education.

participation remains stable between first or higher-order marriages, but that hours spent at work differ. In higher-order marriages, women's working hours are higher. This article only focuses on women and the data have the drawback of observing only women, and only very few in two consecutive marriages (n=77). However, the results differ when unobserved heterogeneity is taken into account, and by the form of unobserved heterogeneity. For this reason, we will pay particular attention to this econometric problem.

5. Data, sample and method

Time-allocation patterns within couples and the female housework share have been addressed by many studies, in both economics and sociology. Based mainly on time-use data, most of the empirical specifications are generally cross-sectional. But even when the covariates introduced in the models are numerous and measured accurately, housework division remains largely unexplained (that is, the R^2s are relatively small). One reason is that housework division depends on a lot of determinants (age, stage in the life-cycle, partner's characteristics and union-specific public goods such as children) and also on unobserved factors such as the preference for having a clean home, ironed clothes or spending time with children.

The main difficulty of such studies is to isolate and eliminate the unobserved effects that may create selection bias. For instance, a lot of articles have tried to identify whether married or cohabiting couples behave differently in terms of work division. But as people who decide to marry are different from those who decide to live together without marrying, this raises the problem of comparability. Recent papers use propensity score matching to find a couple whose characteristics are similar to those of the observed couple except with respect to marital status (Barg and Beblo 2010). In this manner, and with some additional assumptions, the remaining difference in work division may be attributed to marital status. However, this approach raises other problems that are difficult to solve, such as possible bias due to unobserved heterogeneity.

Since union duration may be long, individuals must be observed over a long period to compare their behaviour in one partnership and then the subsequent one. Only panel data with information on time-use are able to provide observations of the same individual in different partnerships. Panel data offer the additional methodological advantage of using fixed-effect models to capture potential unobserved heterogeneity. After controlling for all possible observable and unobserved characteristics (using fixed-effect models), does an effect remain, i.e. a difference in behaviour associated with being in a second union rather than a first one?

The German Socio-Economic Panel (GSOEP) is probably the best data source for studying this question. The GSOEP is an annual micro-data panel based on annual interviews of individuals and households since 1984 in West Germany and since 1990 in East Germany.[5] It is well suited for our analysis as it follows the participants over time, even in the case of household dissolution. When a household dissolves, all members, including any potential new partners, are re-interviewed in their new living circumstances. Although not as informative as a time-use survey regarding individual use of time, the GSOEP has the advantage of containing many additional socioeconomic variables. It includes various individual characteristics that are likely to affect both an individual's re-partnering match and intra-family work division. Survey participants provide information about their living circumstances in each year, such as whether they live with a partner, and their formal family

[5] For a detailed description of the data set see Wagner et al. (2007).

status. This information is available over a long period of time, enabling us to obtain a reasonable number of respondents who experience two unions within the observation period.

For our analysis, we chose an observation period of 19 years, from 1991 to 2009. We selected a sample of married or cohabiting individuals aged 20-60 who are no longer enrolled in education or an apprenticeship. We further selected those respondents who have experienced at least two subsequent partnerships within the observation period, i.e. those whose union was dissolved at least once (whether by death of a partner or divorce/separation). The second union does not have to follow immediately, but must start within the observation period. In total, we ended up with 781 individuals who fulfill these criteria. On average, they are observed for 3.3 years in their first union and 4.2 years in the second. Note that both partnerships may be censored by the observation window – the first union being typically left-censored and the second typically right censored.

The time use information in GSOEP is drawn from a set of items in the questionnaire where respondents are asked to report the average amount of time per day spent on employment, housework, errands, gardening, repairs, childcare and hobbies or other leisure activities. The time-use data in the GSOEP are based on the following questions: "What does a typical weekday look like for you? How many hours per day do you spend on the following activities? 1) job, apprenticeship, second job (including travel time to and from work), 2) errands (shopping, errands, citizen's duties), 3) housework (washing, cooking, cleaning), 4) childcare, 5) education or further training, studying (also school, college), 6) repairs on and around the house, car repairs, garden work, 7) hobbies and other free-time activities"[6]. Hours are reported for weekdays, Saturdays, and Sundays separately by both the man and the woman, but annual data is available for weekdays only. For this reason, we concentrate on time uses on weekdays. To deal with the few respondents who report simultaneous activities totalling more than 24 hours per day, we restrict the sum of all work activities to 18 hours per day (thereby allowing at least 6 hours of physical rest). We treat time spent on paid employment as given and, if necessary, downscale other family work activities as these are more often performed simultaneously

We use two measures of non-market work which differ in scope: the first definition called "housework" includes all the time devoted to domestic tasks except childcare. It includes the "core chores" such as washing, cooking and cleaning covered in category 3 of the SOEP time-use item (these are sometimes called "feminine tasks" in sociology) as well as the tasks covered by categories 2 (shopping, errands) and 6 (repairs and gardening). Parenting time is necessarily changed after a first marital dissolution and repartnering, and separated parents may have to share the time spent with the children of their first union. As time with children may be central to negotiations after a separation, and desired for itself, childcare is a very specific form of time-use. Additionally to stepchildren, people may have new children in the new partnership. For all these reasons, we think that time spent with children must be distinguished from the rest of housework. However, it is interesting to analyze, for a similar family composition, whether parents devote more, as much, or less time to childcare in first and second unions. For this reason, we also use a second measure specifically for time spent on childcare (category 4).

[6] In the years 1991 to 1997 the wording of the time use question differed marginally. But the items we are interested in throughout this paper were unaffected.

Different variables are analysed: the individual hours of household work (according to the two measures) and the woman's share of household work (woman's hours divided by total household work, i.e. woman's plus man's hours).

6. First and second unions in the GSOEP: Some descriptives

When comparing the aggregate means in Table 1, descriptive analyses do not seem to reveal remarkable differences in the work division of couples in their first and second unions, at first glance at least. If at all, women's labour market hours are slightly lower in their second unions, while their housework hours remain about the same, except under the extended definition including childcare. Overall childcare time is longer, by around 35 minutes daily, for women in second unions compared to women in their first partnership. However, we can assume that this effect is essentially a structural one, since the same figures calculated on mothers only (following line), show very similar hours spent on childcare, whatever the woman's partnership order.

As illustrated in Table 1, first and second unions also differ, at both individual and couple level, with regard to other socio-economic characteristics which may be directly or indirectly linked to the observed time uses. Individuals in their second partnership are, of course, older, and are more likely to be highly educated (longer time spent in education). The magnitude of the effect is relatively weak but as the trend during the last decade has been towards a lengthening of time spent in education, it might be significant. Second union partners are also less likely to be married and more likely to have formed their partnerships recently. Partly because of these life-cycle effects, they are also more likely to be well-off (high non-labour income and large average dwelling size) and women are less likely to work full-time. The average hourly wage of those who are employed is higher in second partnerships than in first ones.

Table 1: Women's and men's characteristics in first and second unions

	First union		Second union women		Second union men	
	Women	Men	Women	Male partner	Female partner	Men
Time use per weekday						
Core housework hours	2.43	0.78	2.27	0.77	2.32	0.88
Errands, repairs, gardening hours	1.58	1.52	1.63	1.59	1.60	1.60
Childcare hours	3.05	0.93	3.52	1.02	3.00	0.87
Childcare hours (persons with children only)	5.29	1.60	5.34	1.67	5.25	1.52
Working hours	6.05	8.88	5.67	8.92	5.75	8.79
Working hours (persons in employment only)	8.34	9.86	7.93	9.90	8.01	9.81
Individual characteristics						
Age	31.78	34.32	38.09	39.38	36.60	40.56
Years of schooling	11.91	11.95	11.89	12.20	12.10	12.17
Full time employed	0.48	0.85	0.41	0.85	0.43	0.84
Hourly labour income (of employed)	10.53	13.25	13.47	16.49	13.87	18.27
Potential hourly labour inc. (predicted)	9.02	12.06	11.02	15.18	11.13	15.48
Couple characteristics						
Non-labour household income (net)	336.38		508.43		438.90	
Married	0.62		0.50		0.47	
Couple formation before 2000	0.85		0.50		0.47	
No. of household members	3.10		3.21		2.93	

No. of children in the household aged below 3	0.16	0.16	0.16
No. of children in the household aged 3-5	0.21	0.19	0.16
No. of children in the household aged 6-11	0.35	0.35	0.23
No. of children in the household aged 12-16	0.21	0.28	0.20
Living in East Germany	0.31	0.27	0.22
Size of the dwelling (in m^2)	88.38	106.23	101.91
Observations	2859	2131	2071

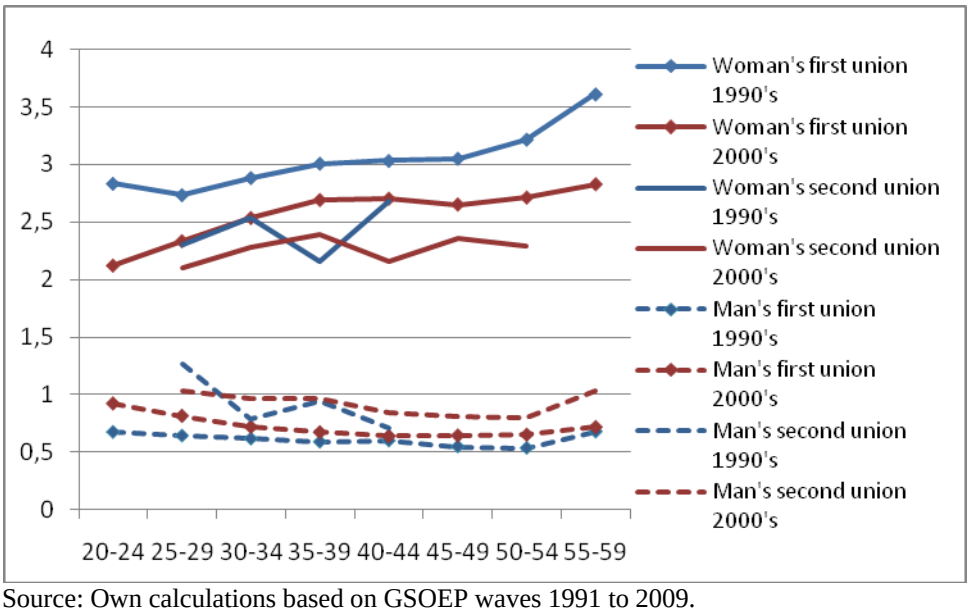
Source: Own calculations based on GSOEP waves 1991 to 2009. Sample means of all observation units within this period where information on both partners of a couple is available.

More particularly, women's second unions differ from those of men. The remarriage market characteristics appear to be gender-specific. For instance, spouses in women's second partnerships show more similarities than spouses in men's second partnerships. The age gap between spouses, around 2.5 years on average in first unions, decreases in women's second unions (to about one year only) but increases for men's second unions (to around four years). The gender hourly wage gap is smaller in women's second unions but higher in men's. Furthermore, women's second households tend to be larger and inhabited by more children above age 6 – presumably because in most cases it is the mother who has custody of the child(ren) born in the first union. This may also be the reason why women spend more time on childcare in their second unions, while men's hours decrease. In view of these observations and other differences observed for women's and men's second partnerships, we analyse separate samples, in all our specifications, according to whose partner (the man's or the woman's) is experiencing a second union.

When differentiating by age and union cohort, as illustrated in Figure 2, we see that the time spent on housework (washing, cooking, cleaning) performed by women increases with age due to a combination of cohort and life-cycle effects. More interesting is the shift in levels by union cohort and from first to second union. On average, women who formed a partnership in the 1990s performed between half an hour and one hour more housework than women who formed their union in the following decade, whatever their age. The time spent on non labour-market work in second partnerships, as far as the sample size allows us to calculate it, is systematically lower, around half a hour less.

For men, all the effects are less pronounced or reversed. There is almost no effect of age (slight decrease with age) and no significant cohort effect. We just notice a reverse effect of union order compared to women; for a constant age and union cohort, men seem to participate more in housework in their second partnership than in their first one.

Figure 2: Male and female participation in housework on a weekday, by union order and year of formation (in hours)



Source: Own calculations based on GSOEP waves 1991 to 2009.

However, given the multidimensional differences between first and second unions described above, we conclude that the question of whether time use and housework division change from one union to the next can only be answered by multivariate regression analysis, taking account of the different matches that women and men may find in their second-union partners.

7. Econometric approach

First, our empirical strategy consists of estimating housework hours for women and men separately, along with the female share in each couple. While controlling for all the structural variables presented in Table 1, we want to determine whether the time devoted to housework and childcare in women's (respectively, men's) second unions differs from the time devoted in their first union. Using a fixed-effect model, we capture the fixed unobserved heterogeneity of the individual observed in both partnerships. Fixed-effect models are based on the idea that differences across time in the housework participation of an individual are regressed against differences across time in the individual variables that vary over time. We assume implicitly that unobserved heterogeneity is constant over time. This assumption may be discussed. To implement such models, observable permanent characteristics (such as education for instance) must be excluded. We introduce the time-varying explanatory factors step by step in order to distinguish different levels of explanation: the individual effect, the partner effect and finally the couple match effect.

The first model, performed separately on the hours of housework, the hours of childcare and the women's share in both household activities, is estimated by fixed-effect regression with only the variable of interest: one dummy indicating whether the partnership is the second union or not. First unions form the reference group. The model then takes into account the union order and the time-constant individual controls. The second model adds some time-varying individual characteristics (age and potential income). As a large share of women have no labour market income because that they are out of labour force, and because labour market status is likely to be endogenous, we estimated their potential wages based on Mincer equations as a proxy of the wage they would earn in case of marital separation. We estimated

potential wages with number of years of education, age, actual experience[7], squared experience and nationality.
The third specification adds the characteristics of the partner (first or second), here again age and potential income. The last model includes all these variables plus the matching and couple covariates such non-labour household income, dwelling size, number of children per age group (below 3, 3-5, 6-11, 12-16), the presence of stepchildren and the location in East or West Germany. The diverse results of previous empirical studies show the pertinence of distinguishing between the two types of second unions, i.e. men's and women's. Another reason for adopting this approach is that information on the new partner's union order is not available in the data.

Secondly, in order to test our theoretical assumptions, we perform additional estimations. To assess the effect of confidence on investment in marriage-specific skills, we measure the returns of two indicators in the two consecutive unions: an indicator of the partnership duration (whether the partners have been living together for at least five years[8]) and the marital status of the partnership (whether the couple is married or not). We compare the statistical significances and the magnitudes of these effects in separate regressions of first and second unions.
These proxies aim to capture the degree of uncertainty about the current partnership and whether people are more risk-averse or not in their second unions. For a same level of confidence, do the partners invest equally in marriage-specific capital in their first or subsequent partnerships?

Thirdly, the use of bargaining power can change between first and second unions. We use two proxies of bargaining power: age gap and potential wage gap between partners. For the same level of bargaining power, do couples allocate their time differently in a first or a second union? Following the same estimation process, we perform the last estimations by adding these indicators and the interaction term with union order.

8. First results

8.1 First union versus second union

In all the specifications, fixed-effects regressions are performed to account for individual heterogeneity. According to the estimations (Table 2, specification 1, first line), women do not change their housework hours when remarried, but they devote significantly more time to childcare. This result holds and becomes even more pronounced when taking the woman's characteristics into account in specification 2) (such as her age, nationality and potential wage). This increase in childcare remains even after controlling for the partner's and the couple match characteristics (as measured by the formal status and the duration of the relationship, and the number of children by age group). The woman's share is slightly higher in second unions in specification 1, but after controlling for the woman's, her partner's and the couple's characteristics, the female share no longer differs between first and second unions. In our final and preferred specification 4, the amount of household work remains

[7] Actual experience is calculated as the number of years since labour market entry, minus the number of years of unemployment and out of labor force.
[8] Unfortunately, our data do not allow us to calculate the precise couple duration for unmarried couples, but they enable us to build a dummy indicating whether the couple has lived at least five years together.

unchanged for women in their second union, but more time is spent on childcare. The woman's share remains stable, however. We can only speculate about the reasons for this. Perhaps the new partner participates more than the first one, or perhaps the increase in the woman's participation is not large enough to change the division of tasks significantly.

In men's second unions, the division of housework changes. Re-married men invest significantly more time in household tasks than first-married ones, even after controlling for individual, partner and match characteristics. This increased involvement tends to decrease the woman's share significantly, by 4%.

We thus conclude that partners in their second partnerships tend to participate more in housework, be it the woman or the man. But only for men's second unions is the division more egalitarian.

Table 2: Second union effects on household work hours

	Women's first and second unions				**Men's first and second unions**			
	Housework		Childcare		Housework		Childcare	
Second union effect in FE-model with...	Hours	Share w	Hours	Share w	Hours	Share w	Hours	Share w
1) only time-constant individual controls	-.058	.012	**.388***	**.027****	**.138***	-.007	-.044	-.013
2) TV individual controls	-.118	-.012	**.876****	.020	**.356*****	**-.054*****	-.033	-.028
3) + TV partner's controls	-.096	-.008	**.978*****	.020	**.325*****	**-.050*****	-.113	-.028
4) + TV couple match controls	-.146	.003	**.671*****	.021	**.220****	**-.036****	.002	-.006
No of observations	3071	3056	3071	3056	3217	3195	3217	3195
No of groups	392	392	392	392	399	399	399	399

*Significant effects are presented in bold with * when significant at the 1% level, ** at 5%, *** at 10%.*
[TV= Time-varying
Housework = cleaning, cooking, laundry, errands, repairs, gardening]

8.2 Control variables

As outlined in section 7, a list of covariates was introduced step by step in the models.
Because of the possible endogeneity of actual wages, we decided to use potential wages to estimate the bargaining power of each partner, especially in a context where separation and divorce is a realistic threat point and probably expected with a higher probability by partners in a second union. Defined as the wage the partner would be able to earn following separation if he/she returned to the labour market, the potential wage gives an idea of his/her bargaining power. The effect of the potential partner's wage is directly correlated to the time spent on domestic work. We observed in table 3 that a higher potential wage tends generally (but significant results are not observed in every specification) to decrease the partner's own housework participation (and tends to increase labour market participation), as predicted by household economic theory. The higher the woman's bargaining power, the less she will

participate in domestic and parental work. This relation is also true for men. Note that woman's age has a positive impact on the sharing of housework in men's second unions.
Being married tends to be correlated with a more traditional work division, that is, lower male participation in domestic tasks or higher female participation. The number of children in each age group (particularly in the youngest 0-2 age bracket) is related to more female housework time and increased gender inequality. The effect of children on male participation is visible only for parental tasks. But it seems that the larger investment in care of children aged 3-5 is offset by less time spent on domestic tasks.

The dwelling size increases housework load. Higher non-labour incomes permit a more equal sharing of household work, probably because substitutes for domestic tasks performed by women can be bought on the market. Couples living in the eastern part of Germany are slightly more egalitarian.

Table 3: Other effects on household work (in final specification of Table 2)

	Women's first and second unions				**Men's first and second unions**			
	Housework		Childcare		Housework		Childcare	
Other covariates	Hours	Share w	Hours	Share w	Hours	Share w	Hours	Share w
Woman's potential wage	-.001	-.002	**-.029**	-.000	.002	-.001	-.003	-.001
Woman's Age	-.009	.000	-.012	.001	-.011	**.004**	-.006	.000
Man's potential wage	.002	**.003**	.012	.001	-.001	-.000	-.000	-.000
Man's Age	.017	.001	.020	-.000	-.0214	.003	-.003	.002
Formally married	.098	**.027**	**.462**	.009	**-.240**	**.031**	**.196**	.017
No. of children aged < 3	**.879**	**.052**	**5.116**	**.133**	-.0936	**.065**	**.209**	**.181**
No. of children aged 3-5	**.415**	**.035**	**2.710**	**.076**	**-.149**	**.050**	**1.225**	**.135**
No. of children aged 6-11	**.251**	**.022**	**1.768**	**.072**	-.027	**.028**	**.913**	**.095**
No. of children aged 12-16	.128	**.025**	**.654**	**.056**	-.087	.012	**.767**	**.044**
No. of stepchildren	-.447	-.011	-.379	-.047	-.046	.009	.357	**-.060**
Dwelling size	**.004**	-.000	-.000	.000	**.003**	-.000	-.061	.000
Non labour income	**.000**	**-.000**	.000	**-.000**	**.000**	-.000	**-.000**	.000
East	-.334	**-.118**	.22	-.016	**1.088**	**-.100**	.000	.017
Intercept	**2.973**	**.570**	.130	**.503**	**3.013**	**.413**	.384	.456
No of observations	**3071**	**3056**	**3071**	**3056**	**3217**	**3195**	**3217**	**3195**
No of groups	**392**	**392**	**392**	**392**	**399**	**399**	**399**	**399**

[Note: bold = statistically significant at a level of at least 10%]

8.3 Marriage-specific skills and bargaining power by union order

There is a substantial variation in the work division of second unions which may have several sources. We compare the importance of the investment in household skills measured by the

time spent on housework and childcare in first and second unions. To answer the question of whether people invest in these skills in the same way from one union to the next, we test two proxy variables of confidence in the partner: the union duration and the marital status of the partnership.
When female domestic hours and the female share in housework hours are regressed on the above-mentioned indicator variables separately for women in their first and second unions (table 4), we find that for women, couple duration has no effect on the quantity of non-labour market hours but has a decreasing effect on woman's housework share in the second compared to the first union. We then observe what we expected: the usual increase in intra-household specialization with union duration is less pronounced in a second partnership than in a first one for women. We do not find any differences by union duration on the time spent on childcare in the first or second unions.

As union duration increases, men in their first union are likely to reduce the time devoted to domestic work and childcare, in accordance with the process of increasing couple specialization. More surprisingly, this effect is not found for the second partnership, as if the process of specialization had been halted and was no longer sensitive to union duration. As a consequence, the woman's share remains stable or decreases from men's first to second union. Intra-household specialization is also weaker for men's second unions compared to first ones.
Hence, for a same level of confidence in the couple, marital specialization, i.e. the usually observed increase in female participation in domestic tasks, is always lower in second unions than in first ones. The investment in marriage-specific skills is slowed down. This result suggests that the threat of divorce is perceived more strongly by men than by women in their second union. One exception remains for remarried men, who participate even less in housework in their second marriage than in the first.

Table 4: Union confidence and specialization : Did the estimated effect increase ↑, decrease ↓ or remain statistically significant → ?

	First Union		**Second union**		**Variation**	
Women	Hours	Share w	Hours	Share w	Hours	Share w
Housework						
Married	ns	0.066	ns	ns		↓
Union duration (> 4 yr)	ns	ns	ns	-0.026		↓
Childcare						
Married	ns	ns	ns	ns		
Union duration (> 4 yr)	ns	ns	ns	ns		
Men	Hours	Share w	Hours	Share w	Hours	Share w
Housework						
Married	ns	ns	-.367	ns	↓	
Union duration (> 4 yr)	-0.239	0.029	ns	0.035	↑	→
Childcare						
Married	ns	ns	0.249	ns	↑	
Union duration (> 4)	-0.214	0.035	ns	ns	↑	↓

[Note: separate FE estimations for women in first union, men in first union, women in second union and men in second union. Same controls. All preceding covariates are included]
[Note: Only parameters significant at a level of at least 10% are reported]

Lastly, we analyze the impact of bargaining indicators such as the age gap between spouses and wage differences. The age gap reflects their respective "chances" or "values" on the marriage market. The difference in potential wages reflects their labour market values.

Concerning the effect of bargaining power, we find the difference in potential wages to have an escalating effect on the female share of housework in women's second unions. For a same level of wage difference, women in their second partnership participate more, whether in housework or childcare time, than women in their first partnership. The higher the man's wage potential with respect to that of his new spouse, the more the female partner takes over proportionately. Labour market bargaining power has more impact on second partnerships.
For men, this effect tends to be reversed, with no effect of the wage differential on their domestic and childcare participation, and only a positive effect on the woman's share in their first unions. Labour market bargaining power seems to be weaker.

The difference in ages, as an indicator of the relative attractiveness outside the couple, remains a significant predictor of the domestic and childcare hours performed by women in their first relationship. The older the man relative to his spouse in their first union, the fewer hours she invests in household production (domestic tasks or childcare). The woman's share also decreases. But these effects are not visible for second unions. Marriage market bargaining power is reduced for women, perhaps because they have already separated once.
In men's second unions, the age gap has no effect on non-labour market work.[9]

Table 5: Bargaining power in two subsequent unions

	First Union		**Second union**		**Variation**	
Women	Hours	Share w	Hours	Share w	Hours	Share w
Housework						
Wage difference (M-F)	-0.032	ns	0.017	0.002	↑	↑
Age difference (M-F)	-0.073	-0.009	ns	ns	↑	↑
Childcare						
Wage difference (M-F)	ns	-0.002	0.020	0.001	↑	↑
Age difference (M-F)	ns	-0.008	ns	ns		↑
Men	Hours	Share w	Hours	Share w	**Hours**	**Share w**
Housework						
Wage difference (M-F)	ns	0.002	ns	ns		↓
Age difference (M-F)	ns	ns	ns	ns		
Childcare						
Wage difference (M-F)	ns	ns	ns	ns		
Age difference (M-F)	ns	ns	ns	ns		

[Note: separate FE estimations for women in first union, men in first union, women in second union and men in second union. Same controls.]
*[Note: ns = not statistically significant at a level of at least 10%; other estimated effects are presented in bold when significant at the 5% level, with * when significant at the 1% level.]*

9 Conclusion

[9] Also the number of (step) children seems to affect the male hours and the female share of housework. Whereas living with own children from the former union has a significantly positive effect on the man's housework time (including childcare), an increasing number of stepchildren lowers the share of the woman's housework time in her second union.

Housework time allocation choices differ significantly between first and second unions, but also between women's second unions and men's second unions. While women do more childcare after remarriage, men do more housework. According to Becker et al. (1977), people are more reluctant to invest in marriage-specific capital when they anticipate a marital dissolution, but whether a previous marital dissolution has a similar effect for people in their second partnerships could not be confirmed empirically. In fact, female second unions are as specialized or even more so than first ones. Men, however, are likely to spend more time on domestic tasks in their second marriages, thereby reducing intra-household specialization.

This suggests that it is not so much the individuals on the "second-hand marriage market" who act warily, but rather the new partners. For this reason we observe reduced specialization among couples where the man is in a second union, and more specialization in couples where the woman is in a second union. This relative under-specialization of men (or over-specialization of women) with respect to first unions may be interpreted as a sort of quasi-wage that a second-time partner has to pay in his/her second marriage (Grossbard-Shechtman, 1984).
Our predictions are that this quasi-wage will decline over time as divorce and remarriage rates increase, and that it will vary systematically by country or region with differing norms with regard to divorce.

This result is also confirmed with the estimated effects of the intra-couple wage difference as a bargaining power indicator. A high potential wage gap between husband and wife tends to increase female non-labour market participation in women's second unions, and decrease it in men's second unions. Furthermore, the same level of bargaining power has a smaller impact on household time allocation in second unions. This finding is consistent with more rational decision-making on time allocation in second unions, particularly for the new partner who takes the risk of matching with someone who has already separated (at least once). These precautions may be prompted by a potentially negative signal of divorce and separation, or by the presence of a child from the previous union.

Our results suggest that re-married couples have time use patterns that are systematically different from those of first-married couples, even after controlling for individual, partner, and couple characteristics as well as unobserved heterogeneity. They diminish the economic efficiency of household specialization and point up the asymmetric risk for those who invest domestic labour in the event of divorce or separation.

References

Åström J., Nakosteen R.A., Westerlund O., Zimmer M.A., 2009 "Twice Chosen: Spouse Matching and Earnings Among Women in First and Second Marriages" *Umeå Economic Studies* 795, Umeå University, Department of Economics.

Aughinbaugh A., 2010, « The effect of remarriage on women's labor supply », *Journal of Population Economics* 23(4), p. 1151-1176.

Barg K. and M. Beblo, forthcoming, « Does "sorting into specialization" explain the differences in time use between married and cohabiting couples? An empirical application for Germany », *Annales d'Economie et de Statistique*.

Becker G. S., 1965, « A theory of the allocation of time », *Economic Journal*, 75, p. 493-517.

Becker G. S., 1973, « A theory of Marriage: Part I. », *Journal of Political Economy* 81(4):813-46.

Blair S. L. and D.T. Lichter, 1991, « Measuring the Division of Household Labor: gender segregation of Housework Among American Couples », *Journal of Family Issues*, 12(1), p. 91-113.

Bozon M. 1991, "Women and the age gap between spouses: an accepted domination?", *Population*: An English Selection.

Brousse C., 2000, « La répartition du travail domestique entre conjoints reste très largement spécialisée et inégale », in France, portrait social 1999-2000, Paris, Insee, p. 137-151.

Chiappori P.-A. and Y. Weiss, 2006, "Divorce, Remarriage, and Welfare: A General Equilibrium Approach," *Journal of the European Economic Association*, vol. 4(2-3), pages 415-426.

Chiswick, C. U. and E. Lehrer, 1990, "On Marriage-Specific Human Capital: Its Role as a Determinant of Remarriage" *Journal of Population Economics* 3, 193-213.

Dorbritz, J., 2008, Germany: Family diversity with low actual and desired fertility. *Demographic Research* 19(17): 557-598.

Gronau R., 1997, « The theory of home production : the past ten years », *Journal of Labor Economics*, 15(2), p. 197-205.

Grossbard-Shechtman, S. 1984. "A Theory of Allocation of Time in Markets for Labor and Marriage." *Economic Journal* 94:863-82.

Ishii-Kuntz M. and S. Coltrane, 1992, « Remarriage, stepparenting and household labor », *Journal of Family Issues*, 13(2), p 215-233.

Mueller, Charles W. and Hallowell Pope. 1980. Divorce and Female Remarriage Mobility: Data on Marriage Matches After Divorce for White Women. *Social Forces* 58, 726-738.

Nock S. and M. Brinig, 2002, « Weak men and disorderly women : divorce and the division of labor » in A. W. Dnes and R. Rowthorn (eds), *The Law and Economics of Marriage and Divorce*, Cambridge, Cambridge University Press, p. 171-210.

Podor M. (2011), « Intra-household allocation of time-use between couples », Working paper presented at Iatur conference in Oxford, August 2011.

Ponthieux S. and A. Shreiber 2006, « Dans les couples de salariés, la répartition du travail domestique reste inégale », Données sociales, La société française, Insee, p. 43-51.

Schulz, F., 2010, *Verbundene Lebensläufe. Partnerwahl und Arbeitsteilung zwischen Ressourcenverhältnissen und traditionellen Geschlechterrollen,* Wiesbaden.

Shelton B. A., Daphne J., 1996, « The division of household labor », *Annual Review of Sociology*, 22, p. 299-322.

Sullivan O., 1997, « The division of housework among "Remarried" Couples », *Journal of Family Issues*, 18, 2, p. 205-223.

Wagner G., J. R Frick. and J. Schupp, 2007, The German Socio-Economic Panel Study (SOEP): Scope, Evolution and Enhancements, *Schmollers Jahrbuch* 2007, 1 , p. 139-170.