

Honey, I'll Be Working Late Tonight.

The Effect of Individual Work Routines on Leisure Time Synchronization of Couples

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Abstract

German time use data for 2001/02 are used to assess the impact of work characteristics on the private life of couples and more specifically on the joint (1) leisure and (2) non-market time. The paper aims at identifying pure effects by creating pseudo couples so as to separate marital preferences from the pure work effects. While shift work negatively affects joint leisure most predominantly, more flexible employment contracts increase joint non-market time by facilitating the balance between work and life. Active coordination of couples mitigates negative job characteristics. Further evidence is provided that the husband's working schedule is most influential for determining the household's schedule.

Keywords: Time Use, Time Allocation, Family Economics, Flexibility, Synchronization, Simultaneity, Leisure, Endogeneity

JEL Classification: D13, J12, J16, J22

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1 Introduction

In the course of globalization, an increased competition between firms in the growing product market and consequently a more pronounced interaction with international enterprises induces firms to seek higher flexibility in their labor relations within the limitations of the national legal system. Rigidities in labor relations in general impose obstacles that lead to a malfunctioning of the labor market and thus to structural unemployment. In order to decrease unemployment in an efficient way, political actors in Germany have acknowledged the need to macerate these rigidities in order to render the labor market more functional. In this respect, also more flexibility in the labor relations is necessary so that employers can better respond to changes in the economic environment but also to provide better possibilities to employees to balance work and private lives.

Flexible work arrangements are wide-spread in Germany and comprise i.e part-time work, flexitime or marginal employment. Their importance grew over the last decades especially since they are viewed as creating employment stimuli to women who are still able to balance work and private life. This paper investigates the effect of working arrangements on the private life of married couples in Germany so as to shed light on their possibilities to balance work and private life as well as the limitations imposed by society. The family as the fundamental unit of all economic activity is the ultimate object of concern here (Couprie 2007).

The availability of new data sources attracted more and more the interest of researchers in recent years to study the timing of activities within households in order to investigate the division of gender roles in more detail. In this respect, it is a recognized fact that apart from paid work, unpaid work within the household context must be thoroughly analyzed in order to better understand the labor market participation decision of women which is of great concern to both policy makers and researchers (Apps 2004, Apps and Rees 1997, Becker 1981, Bird et al. 1984, Gershuny and Sullivan 1998, Hersch and Stratton 2000, van Klaveren and Maassen van den Brink 2007). Other studies investigate more generally the link between market and household work (Apps and Rees 1996, Becker 1965, Gronau 1977, 1980). Moreover, the development of leisure time across the past decades (Alesina et al. 2005, Aguiar and Hurst 2006, Bittman and Wajcman 2000, Hallberg 2003, Jenkins and Osberg 2005) as well as the timing of market work and its development have been closely studied (Hamermesh 1998, 1999). Yet, to my knowledge, a thorough analysis of the impact of working conditions on the couple's private life is absent so far.

The basic aim of this paper is to identify the pure effects of work characteristics on a couple's private life. This question is approached twofold by investigating the effect on (1) joint leisure of the spouses during a standard workday and on (2) joint non-market time in which, more generally, the impact on the entire family life is regarded. The analysis is based on German time use data for the year 2001/02. Some working conditions such as flexitime or part-time work grant more flexibility to the workers as to schedule working hours which might facilitate the organization of schedules of the family yet others such as self employment or a second job put an additional restriction to the available time that can be spend with the spouse and thus negatively affects private life. A person's work characteristics and the impact on the couple's joint free time can however not be thought of as being entirely exogenously determined. A job might be chosen as a result of the person's preferences for spending time with the spouse. In order to separate the effect of the working conditions that are induced by marital preferences for joint time and

to identify the pure effects, I will create pseudo couples that are by construction unable to coordinate their respective schedules and that serve as appropriate control groups. The impact of the working arrangements can consequently be understood as benchmark on the general organization of time across a standard work day within society.

While shift work negatively influences joint leisure of the spouses, no significant effect is found when non-market work is analyzed. In general, shift work detaches the person's schedule from the societal timing of activities which is at the clear expense of joint leisure without harming household tasks and family life. In this respect, pure leisure is inferior to non-market time during the standard workweek. Flexibility in the sense of non-standard work such as part-time or marginal employment does not affect joint leisure but leads to more joint non-market time especially for women, which emphasizes the claim that the balance between work and life is facilitated by such arrangements. Robust across all specifications is that people working during weekends have always significantly less leisure or non-market time with the spouse. An active coordination of schedules among the partner seems to attenuate in particular those work arrangements that impose the highest strain and restriction of time on the private life such as shift work, self employment and second jobs. Besides, further evidence is provided that women adjust their schedules to match their husbands' which was already found by Bird et al. (1984) for the US.

The paper is organized as follows: I will present the conceptual framework in the next section on which the following empirical investigations in built on. The data set as well as the variables used are described in section 3. An overview about the timing of activities of couples during the standard work week and also the sample analyzed in more detail is presented in the subsequent section. Chapter 5 shows and discusses the estimation results. After analyzing the correlation results, a stronger focus is laid on finding pure effects for (1) joint leisure and (2) joint non-market time and the separation of marriage induced endogeneity. In this respect, the two different approaches to find pseudo couples will be presented, namely (i) random matching and (ii) nearest neighbor matching and the respective estimation results will be illustrated. Finally, section 6 concludes.

2 Conceptual Framework

In this section, a simple theoretical model is presented on which the following empirical investigations are grounded. It follows Hamermesh (2000). I regard a two-person household consisting of a husband (m) and a wife (f). Each day is divided into T equally spaced time units $t = \{1, \dots, T\}$. To keep things simple, I assume that each person can at each time unit t decide to work (n_t) or to enjoy free time (ℓ_t). These variables are dummies taking the value 1 if time is spent on the respective activity and 0 otherwise. For the whole day, each of the spouses $s = \{m, f\}$ faces the following time constraint:

$$T = \sum_{t=1}^T \ell_t^s + \sum_{t=1}^T n_t^s. \quad (1)$$

I assume furthermore that the household maximizes its utility according to the following utility func-

tion:

$$U = U(L^m, L^f, L^J; X), \quad (2)$$

with $X = X^m + X^f + X^J$ describing the value of the household's consumption consisting of the husband's (X^m) and wife's (X^f) separately but also the consumption of goods that both enjoy (X^J) jointly. $L^s, s = \{m, f\}$ is a vector that captures each partner's choice of free time for each time unit t for the whole day that is spent without the partner.¹ Additional utility will be derived from spending leisure time together with the partner which is denoted by the vector L^J in the utility function. Jenkins and Osberg (2005) find empirical evidence that people who spend time with "suitable leisure companions" derive a higher degree of satisfaction from leisure activities and Sullivan (1996) finds that spending leisure with the partner is most utility enhancing. The elements of the utility function captured by equation (2) can consequently be defined as:

$$L^m = L^m \left((1 - n_1^m) n_1^f, \dots, (1 - n_T^m) n_T^f \right) \quad (3)$$

$$L^f = L^f \left(n_1^m (1 - n_1^f), \dots, n_T^m (1 - n_T^f) \right) \quad (4)$$

$$L^J = L^J \left((1 - n_1^m)(1 - n_1^f), \dots, (1 - n_T^m)(1 - n_T^f) \right). \quad (5)$$

The utility function of the household as presented by equation (2) is maximized subject to the time constraint given by equation (1) and to a household budget constraint which is defined as:

$$X = \sum_{t=1}^T \left(w_t^m n_t^m + w_t^f n_t^f \right) + V, \quad (6)$$

with w_t^s denoting the exogenously given hourly wage rate and V other sources of non-labor income of the household. As before, X denotes the value of the consumption of the household members. The budget constraint allows for different hourly wages throughout the day in order to account for i.e. overtime premia. Each individual decides to work in the labor market during the t -th time unit if the offered market wage exceeds his reservation wage, i.e. $w_t^s > w_t^{res}$.

3 Data and Variables

This paper is based on the German Time Use Data (*Zeitbudgeterhebung*) for the year 2001/02 conducted by the Statistische Bundesamt (2003). The data contains information about the activities that every household member engages in for every 10 minute time interval of the day. Respondents were asked to fill in time diaries for three consecutive days. In order to capture the time use pattern in the most accurate and unbiased way possible, the sample is evenly distributed across the whole year. The dataset used here has the advantage over surveys conducted in other countries such as for example the American Time Use Survey (ATUS) that diary information is available for *all* household members which is crucial for the purpose of this paper.

¹It shall be noted that capital letters refer to vectors whereas lower case letters denote realizations of this vector for a specific time unit t that can take the values 0 or 1.

In this paper, I restrict the attention to married or cohabiting couples aged between 21 and 64 with at least one full-time employed spouse. Furthermore, I only consider observations during the standard workweek (Monday - Friday). By doing so, I account for the fact that time that can potentially be spent with the spouse outside the workplace is scarce during the workweek which requires the spouses to coordinate their schedules.² I delete couples that report to be on vacation and since the aim of this paper is to analyze joint time, I also eliminate those who are not at the same location for at least one time unit during the day so that spending joint time is impossible. One diary day will be treated as one observation so that I finally analyze 8356 observations stemming from 2202 households.

For the analysis, I aggregate the more than 200 daily activities into four broad categories, namely pure leisure (*L*), paid market work (*MW*), household work (*HP*) and tertiary time (*T*) of which the first three will be more closely studied in this paper.³ Pure leisure (*L*) comprises all activities that nobody can be paid for to do them and that do not have to be undertaken at all. It must be noted here that some household activities such as childcare may provide extra benefits beyond their consumption value (Gørtz 2006, Kerkhofs and Kooreman 2003). Thus, I attribute all those childcare activities like playing or reading with the own children to leisure and the remaining tasks like caring, cooking etc. for the child to household production. Leisure is therefore an aggregate of pure leisure activities that consists apart from playing with the own children of organized leisure activities, sports, reading and writing, watching TV as well as listening to the radio. Market work (*MW*) is composed of all direct job related activities (primary and second jobs), but also of time spent on internships, qualification and education on or for the job, job search, breaks during the workday and travel time related with work. Moreover, household production (*HP*) comprises all activities for which market substitutes can be purchased so that somebody could be paid for to do them but such activities might also be enjoyable. They satisfy the third-party rule by Reid (1934). It can be argued that some household activities such as cooking or gardening are enjoyable to some extent and that the person can derive utility from it. Some people might even consider these partially as leisure. These additional benefits derived are also termed "process benefits" (Juster 1985), "joint production" (Graham and Green 1984, Kerkhofs and Kooreman 2003) or "activity benefits" (Gørtz 2006) in the literature. To incorporate this aspect, I further define a broader activity aggregate, namely non-market time that is the sum of pure leisure and household activities. Finally, tertiary time are those activities that nobody else can do for us because they are essential i.e. sleeping. This aggregate is however left unconsidered in this paper.

The dependent variables of interest in this paper are the minutes that a couple spends *together* on (1) leisure and (2) non-market time. Apart from providing information about the activities that each person engages in during the diary days, the German Time Use Survey provides additional information on who the time unit is spent with and also where so. Therefore, I only define time as being spent together by the spouses if both partners report to have passed the relevant time unit with the spouse and if both indicate the same location. Since I am interested at the effect of workplace characteristics on a couple's private life during the standard workweek, I exclude those joint leisure time observations that are spent during holidays or vacations.

²I exclude couples with two unemployed or two part-time employed partners.

³Commuting or traveling time is added to the activity for which it is used. It must be further noted that an aggregation of the activities into the broad measures is inherently arbitrary. See also Burda et al. (2007).

To analyze in how far specific work characteristics affect a couple's private life, I use a bunch of variables as controls that shall now be described. Accordingly, I include a service sector dummy as working hours in this sector are generally more likely to change which might negatively influence the free time that a couple can spend with each other and a higher degree of coordination is necessary for them to adjust their mutual schedules. Shift work clearly represents the highest confinement of time to the couple because the entirely schedules is detached from the general rhythm of time. In contrast to that, flexitime arrangements grant some degree of temporal flexibility to the worker who is in turn better able to adjust his working hours within some predetermined boundaries to the daily needs of the family. However, I expect that the limited flexibility rather influences the timing of market work and household activities but does not necessarily benefit joint time.

As described earlier, I focus on couples with at least one full-time employed spouse without restricting the employment status of the other in any way. Apart from incorporating each person's own work involvement, I also include the employment status of the spouse defining full-time employed as the base category. People who are not full-time employed are potentially more flexible with respect to the timing of their activities across the day and can thus better adjust their schedules to match their partners'. Bird et al. (1984) found in an early study that it is mainly the wife who predominantly adjusts her working schedule because the husband's occupation delivers generates the higher level of income and prestige and thus his working schedule predominantly influences the entire household management as well as its timing during the workweek. According to this line of reasoning, a positive effect of part-time work, non-employment and marginal employment on joint leisure and non-market time is expected, especially for women. Yet, it could also be argued that people who are employed but not on a full-time basis – and this generally holds for women – have a double burden because besides their work involvement they additionally need to take care of household and children. In the sociological literature this problem is also termed as working 'double shifts' (Bittman and Wajcman 2000). So, even if one of the spouses in dual earner households does not work full-time, being employed adds additional activities to the list of the already existing tasks which need to be organized and which thus further restrict the available time. According to this line of reasoning, part-time and marginal employment rather reduces the couple's joint leisure time. Since the broader aggregate of non-market time incorporates household work, no additional negative effects are expected. In the empirical analysis, we will see which of the two opposing lines of argument prevails for explaining the final effect on leisure or whether they cancel each other out.

I also include information about the person's position in the job and more precisely, I add dummies denoting whether a person is employed as civil servant and one for being self employed. Both of these groups are particular with respect to the work involvement and can be clearly distinguished from dependent employees and workers who constitute the reference category. Working schedules of civil servants are comparatively stable and short and they are co-moving with the general flow of time within society which further facilitates coordination amongst couples and thus, I anticipate a positive effect on leisure and non-market time. Self employed on the contrary have in general a higher degree of responsibility and are thus generally more involved in their work which limits the available joint time. I also add a dummy accounting for whether or not the person is having a second job. Since the day has only 24 hours, it immediately follows that working longer hours on the labor market reduces available time

for activities outside the workplace. A second job is therefore expected to have a clear negative effect. A dummy variable indicating whether the individual is working during weekends either on a regular basis or just from time to time is added because it can be assumed that people who work during weekends are more closely attached to the labor market and thus have a lower preference for leisure and *ceteris paribus* spend less time in the company of the spouse.

Apart from these broad workplace characteristics, I include an additional measure to capture changes in working hours per person derived from exploiting the time diary dimension that reveals the actual market work schedule.⁴ For that purpose, I define a non-routine measure that describes the degree with which the individual's working schedule changes per time unit for the two reported workweek days. This index is defined as follows:

$$\phi_i = 1 - \frac{2 \sum_{t=1}^{144} n_{it}^r}{\sum_{t=1}^{144} n_{it}^1 + \sum_{t=1}^{144} n_{it}^2}, \quad (7)$$

with n_{it}^r being a dummy variable taking the value 1 if the person is working during the same time unit on both workdays and 0 otherwise and thus depicts the minutes of routine work (Hamermesh 2005). n_{it}^1 and n_{it}^2 are also dummies that indicate whether the person generally worked during each time unit per day. Consequently, the denominator specifies the total minutes that a person devotes to market work during both reported workdays. In words, the index presented by equation (7) can be interpreted as the fraction of a person's total working time during two workdays that is not spent routinely during the same time unit. It can thus be understood as the degree of changeability of working hours and adds an additional dimension to the estimation, namely the timing dimension. The closer ϕ_i is to 1, the more the working hours change during the two work days.

In addition to the workplace characteristics, I use demographic information about gender, age, the level of education as well as about the number of children and their age in two groups. Apart from that, I use a dummy describing whether the person perceives that he or she does not spend enough time with the family to control for the general perception of free time. I control for further household characteristics such as how much time is needed on average to get to the closest stop of public transport, the size of the apartment in m² and whether financial help is received by others. In order to account for differences in market and non-market time across the workweek resulting from other factors than shall be analyzed here, I further add workday dummies.

4 Describing the Data

4.1 Time Dimension

Before describing the sample used for the analysis of this paper in more detail, let us first take a closer look at the timing dimension of leisure, non-market time and market work. These graphs can be thought of as illustrating the general rhythm of time of these activities across the standard workday. Let us start with figure 1 which reveals the distribution of pure leisure. In general, pure leisure is predom-

⁴Only those couples are kept for which two days of market work during the standard work week are reported for both spouses.

inantly enjoyed in the evening after work and is most probable between 8 pm and 10 pm. In addition, the figure shows the distribution of leisure that both partners spend simultaneously which does not mean that they necessarily do so with each other but also the fraction that is indeed enjoyed jointly is depicted. Especially during the peak time, simultaneity of such activities is particularly high. To make the distinction even clearer, table 4 summarizes the percentage of joint and simultaneous leisure for each hour. The last column further shows the fraction of simultaneous time that is actually enjoyed jointly and it reveals that during the peak time, only a maximum of about 60% of simultaneous time is enjoyed together with the spouse. A recent strand of the literature analyzes whether couples actively synchronize their schedules or whether simultaneous time is just a result from the general organization of activities across an average workday. Yet, these studies lack information on whether time is indeed enjoyed together with the spouse so that joint time is generally proxied by simultaneous leisure which, as is revealed by figure 1 greatly overestimates the true amount of joint time and thus upward biases any results obtained on this basis (Hamermesh 2000, van Velzen 2001, Hallberg 2003, Lesnard 2004, van Klaveren et al. 2006, van Klaveren and Maassen van den Brink 2007).

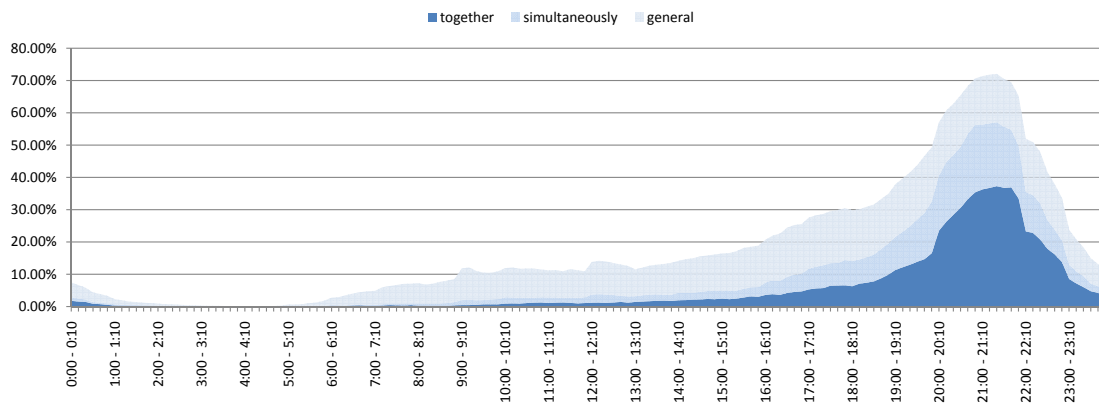


Figure 1: Distribution of pure leisure

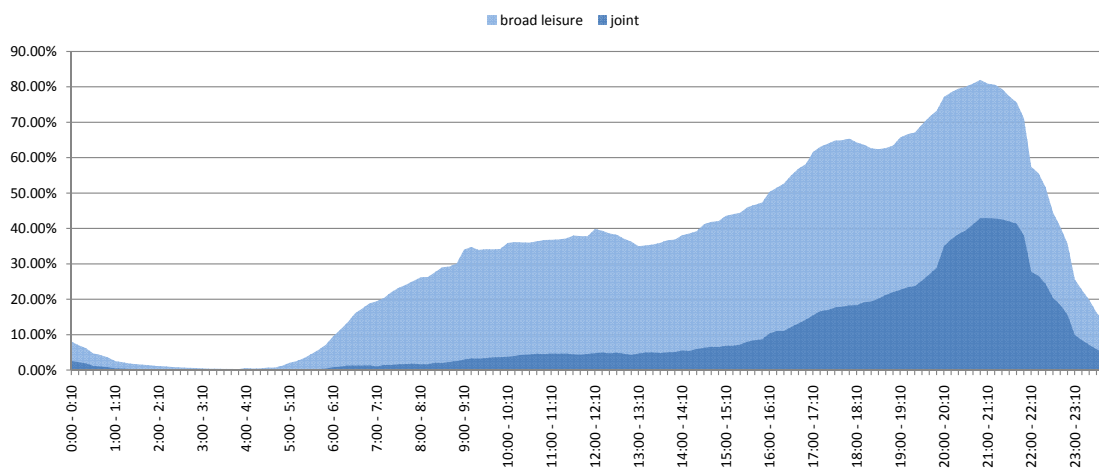


Figure 2: Distribution of non-market time

Moreover, the distribution of non-market time over the standard workday is depicted in figure 2. While

pure leisure is mainly concentrated in the evening hours after work is done, we can see now that including household work widely spreads out the average distribution of these more generally defined activities. The highest concentration occurs between 4 pm and 10 pm. To a lower extent but still at a pronounced degree, non-market time starts already at 6 am and gains more and more weight in the course of the day. As before, the graph furthermore presents the distribution of joint non-market time that both spouses spend with each other. Accordingly, we see that the distribution closely resembles the one for joint leisure yet with more mass in the left-hand tail. To make it even clearer, the first two lines of table 7 show the average minutes that (real) couples spend on joint leisure and, more generally, on joint non-market time. Accordingly, on average about 86 minutes are enjoyed together on pure leisure and even more than 2 hours on joint non-market time during the standard workday. In section 5.2 we will introduce pseudo couples that rather constitute benchmark cases to capture the general flow of time of activities that are enjoyed simultaneously by randomly united people. For those couples, an amount of more than 100 minutes of common leisure and more than double that amount of time is simultaneously spent on non-market time. These findings emphasize the differences in the concentration of both activity aggregates over the workday and also highlight the difference in simultaneous and joint time as well as the strong upward biases introduced by erroneously analyzing joint and not simultaneous time.

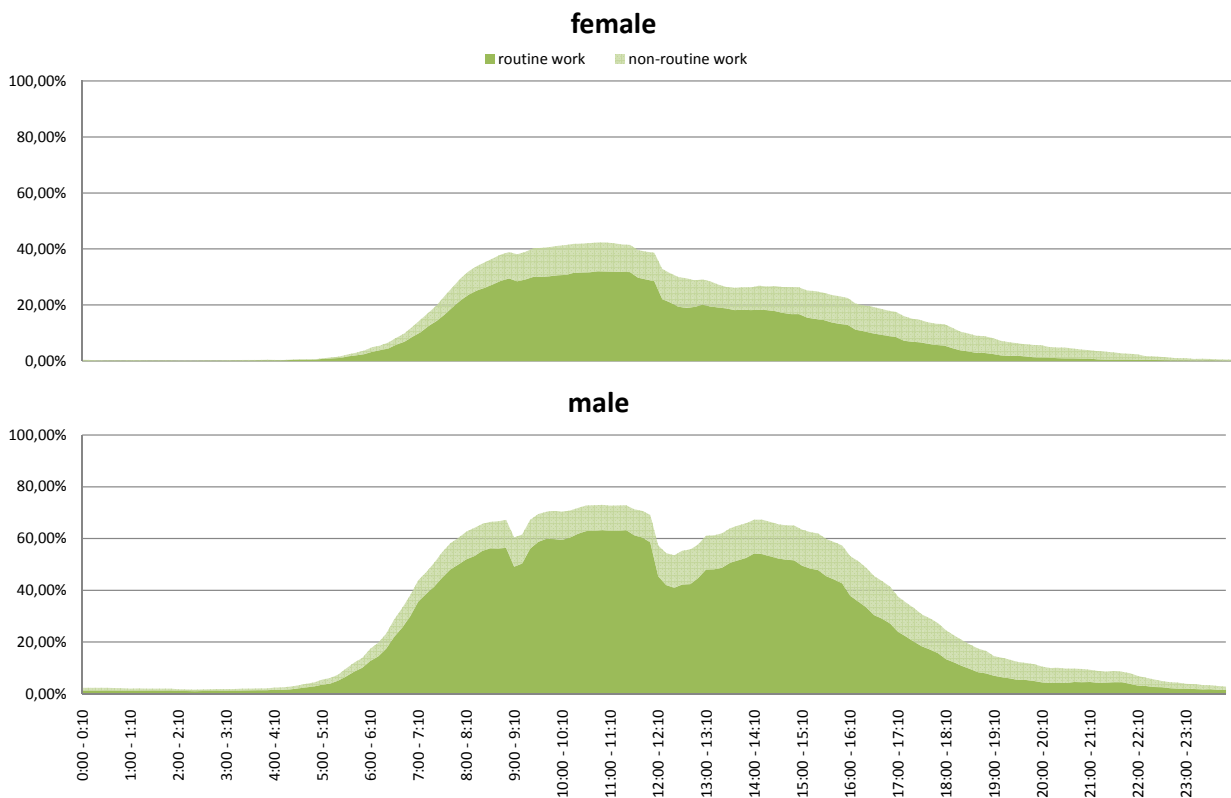


Figure 3: Distribution of work.

In this paper, the ease to balance work and private life as well as the limitations imposed by work conditions shall be investigated so that I will now describe the distribution of working hours over the standard workday. I will do so separately for men and women as the labor supply decision between them is entirely different. Figure 3 shows that the average workday starts slowly at about 5 am and finishes

at about 7 pm with some mass in the later evening hours especially in the case of men. Due to the still comparatively high non-employment rate of married women on the extensive margin and the very low fraction of full-time employment at the extensive margin, an entirely different picture is obtained for men and women. Women are more likely to work in the morning hours before noon as during these hours it is generally easier to find childcare facilities so that women can work and earn additional household income during these hours. After noon, the distribution of work decreases evenly. Men, on the contrary, are by construction almost all full-time employed as we will see in section 4.2 so that apart from a lunch-time slump we find a rather uniform distribution during the peak working hours which phases out only slowly in the evening hours. Additionally to showing this rather standard picture of the distribution of work over a day, figure 3 further reveals the routine and non-routine working hours for each time unit. In general one can deduce from the figure that changes in working schedules are in relative terms highest after the standard workday which means later in the evening. Routine work on the other hand is most pronounced for both men and women in the morning hours before noon.

4.2 Composition of the Sample

The sample selected for the analysis of this paper shall now be described in more detail. Table 5 shows that on average the husbands of the sample are older than the wives and are better educated on average. As noted earlier, the labor force participation decision and also the hours worked differ substantially between men and women which is a well-established fact in labor economics. While by construction almost all men are full-time employed and part-time, marginal or even non-employment are practically non-existent, we find that about half of the wives are part-time or marginally employed and only about one quarter works full-time. Despite the fundamental differences in the labor market attachment, women are more likely to have a second job. Just from these first descriptive statistics it seems as if the traditional gender roles still prevail among German couples so that men are the major breadwinners of the family and women are the managers of the household and work generally less so that they can in general only earn additional income. Hence, the specialization of tasks still seems to hold which was already mentioned by Bird et al. (1984).

When it comes to more detailed workplace characteristics, table 5 portrays the relevant descriptive statistics. It must be noted, however, that the reported percentages must be regarded with caution as these represent averages for the whole sample population including the non-employed who are mainly women. If only employed women are considered, the statements made here hold through. The table shows that more men in the sample work as civil servants or are self employed as compared to women. Men are also more likely to work shifts or have jobs with flexitime arrangements. Besides, it is a well known fact that the service sector's is the most labor intensive which is confirmed here as both men and women work to the largest proportion in this sector if they are employed. Employment in the agricultural sector is, on the contrary, negligibly low. It shall furthermore be mentioned that work during weekends either on a regular or on a more sporadic basis is more probable for men who are in general more attached to their job which could explain this high percentage of weekend work. Finally, men report to a higher extent to not have enough time for their families as a result of being the major breadwinners of the household and hence not very often at home. Household characteristics are also

presented in the table so that we can deduce that the couples analyzed here have on average more than one child living in the same household who are to a higher probability aged between 6 and 17 years. They households live in apartments that have on average 119m². About 28% of the households report that their friends cannot be reached afoot. The nearest public transport stop can on average be reached afoot in about 6 minutes.

Let us now concentrate on describing the index on the degree of non-routine working hours as defined by equation 7. Hamermesh (2005) terms the changes in the daily routine of all activities for the whole day as a person's taste of variety. Here, I only focus on the degree of non-routine with respect to working hours so that deviations in this context rather reflect the work involvement stemming from i.e overtime work or other factors that affect the daily individual work schedule. We can infer from table 5 that the timing of market work related activities during two reported work days changes on average by about 23% for men and by 29% by women. The higher degree of changeability for women can be primarily explained by the high percentage of marginal and part-time employment which will be controlled for. Partly, the higher percentage of non-routine work of women reflects the fact that women need to adjust their schedules to meet daily needs of the household. As dependent variables, I use the couple's minutes of joint leisure and joint non-market time. According to table 5 the couples spend on average 81 minutes together on leisure related activities and about 139 minutes on joint non-market time during the standard workweek.

5 Results

5.1 Initial Correlation Results

In this section, the determinants of joint leisure and joint non-market time shall be analyzed in detail within a simple estimation framework in order to find first correlations between work arrangements of each person and the time he or she spends with the spouse neglecting potential endogeneity issues for the moment. The following equation will be estimated by simple OLS:

$$L^J = \phi \beta_1 + \mathbf{Z}\beta_2 + \mathbf{X}\beta_3 + \mathbf{H}\beta_4 + \epsilon, \quad (8)$$

where the vector L^J denotes joint time in minutes for each individual,⁵ ϕ captures the degree of non-routine work as defined by equation (7), \mathbf{Z} is a matrix of working conditions, \mathbf{X} contains individual information and \mathbf{H} are household characteristics. The estimated coefficients thus indicate changes in minutes of each person's time spent together with the spouse that will be transformed to elasticities in order to make them comparable across specifications.

Due to the natural time restriction per day, the more time a person spends working, the fewer time can potentially be attributed to activities outside the workplace and hence to the time spent with the spouse. It follows that ϕ and L^J in equation (8) are simultaneously determined and ϕ is therefore endogenous. Not accounting for the simultaneity leads to biased estimates, yet suitable instruments that

⁵To be clear, joint time comprises both activity aggregates that have been introduced and described earlier, namely joint leisure and joint non-market time.

are highly correlated with ϕ but not with L^J are not available in the dataset so that instrumental variable estimation cannot be applied here. In order to deal with the simultaneity bias, I apply a trick. In a first step, ϕ is regressed on some personal and household characteristics for men and women separately.⁶ The predicted values obtained will be sorted and each person's degree of non-routine working hours (ϕ_i) will be substituted by the value of the nearest neighbor. Thereby, I obtain a vector ϕ^* and can circumvent the simultaneity bias without losing the variance of the original variable.

Work Characteristics

I will start with analyzing the effects on the narrow aggregate – on joint leisure. Estimation results are presented in table 1 for men and women separately because their labor supply decision and hence their labor market attachment is fundamentally different. At first glance we cannot find many significant influences of the working conditions of both men and women on determining joint leisure. The only work condition that has the same significant influence on men and women likewise is shift work. The normal rhythm of time is changed which might influence the organization of activities within the household but which is at the clear expense of joint leisure during the workweek. In contrast to that, a second job increases the hours of work which consequently reduces the time for other activities. Thus, we find a negative effect of a second job on joint leisure which is only significant for men. Similarly, people who work during weekends either sporadically or regularly are found to have less joint leisure although a significant influence is only observed for women. It could be argued that people who also work during weekends are generally more attached with their jobs, which leaves them with lower time for their partners and family. Being employed in the service sector does not significantly influence jointness.

Married women are the main managers of the household (Bird et al. 1984, Floro 1995, Gershuny and Sullivan 1998) and work full-time to only a low percentage which leads itself to higher fluctuations in working hours. But after controlling for employment status, which itself does not notably affect joint leisure of men or women, I find that a higher extent of non-routine work has a negative influence. The effect is however only significant for women. It can be argued that women adjust their working hours to the daily needs of the family which might explain this result.

The last four columns of table 1 show the estimated elasticities for the workplace characteristics on the broader measure of non-market time, which is time that the spouses do not only spend on leisure but also on household work together. Analyzing the effects of working arrangements on this activity aggregate allows us to make more general statements not only on the pure leisure decision of the spouses but more universally on time spent outside the workplace that comprises all family members as well. Since the tasks of women are split between market work and taking care of household and children, only focusing on the impact of market work conditions on leisure neglects part of the picture and explains the few significant estimates in the case of women. Apart of that, we can investigate the different

⁶The regressors used in this step are besides the socio-economic variables such as education dummies, age, work characteristics, information about children living in the household, I added the hours that a person usually works per week as well as the hours he or she would like to work, a dummy indicating whether the questionnaire was filled in during winter months and furthermore some additional household information such as whether a person in need of care is living in the household, whether the household uses regular childcare facilities and an indicator for the fact that childcare facilities cannot be reached on foot.

dep. variable	male		female		male		female	
	coef	std. err.	coef	std. err.	coef	std. err.	coef	std. err.
	leisure				non-market time			
ϕ^*	-0.006	(0.011)	<i>-0.029</i>	(0.012)	-0.004	(0.010)	<i>-0.026</i>	(0.010)
shift work	<i>-0.018</i>	(0.008)	<i>-0.010</i>	(0.005)	-0.001	(0.007)	-0.004	(0.005)
flexitime	-0.015	(0.018)	-0.013	(0.012)	-0.012	(0.017)	-0.009	(0.011)
part-time empl.	-0.001	(0.002)	0.010	(0.015)	-0.001	(0.001)	0.001	(0.013)
marginally empl.	<i>0.003</i>	(0.002)	0.010	(0.018)	0.002	(0.002)	0.020	(0.016)
not working	-0.001	(0.004)	0.017	(0.023)	-0.002	(0.003)	0.017	(0.021)
service sector	-0.008	(0.019)	0.036	(0.037)	-0.015	(0.017)	0.030	(0.034)
second job	<i>-0.017</i>	(0.006)	<i>-0.017</i>	(0.014)	<i>-0.015</i>	(0.006)	<i>-0.022</i>	(0.013)
civil servant	0.011	(0.008)	0.002	(0.004)	<i>0.016</i>	(0.007)	<i>0.008</i>	(0.004)
self empl.	-0.013	(0.008)	0.003	(0.005)	<i>-0.020</i>	(0.007)	0.001	(0.005)
same building	-0.001	(0.007)	-0.001	(0.004)	0.001	(0.006)	0.001	(0.004)
weekend work	-0.040	(0.028)	<i>-0.032</i>	(0.013)	<i>-0.065</i>	(0.025)	<i>-0.025</i>	(0.012)
job in health sec.	0.002	(0.003)	-0.004	(0.004)	0.001	(0.002)	-0.003	(0.004)
N	4178		4178		4178		4178	
R ²	0.071		0.069		0.100		0.097	

- Italics represent significant coefficients to the level of 10%.

Table 1: Estimated elasticities of Workplace Characteristics by sex on joint leisure and joint non-market time.

importance weights laid on leisure and non-market time by the partners of married couples during the standard workweek.

From the first glimpse, one can already notice that more effects of working conditions are found to have a significant influence. Unlike in the narrower case of pure leisure, non-market time is less concentrated to a short time interval during the evening hours which might already lead to a higher explanatory power of the regressors. As for the narrow definition of leisure, I find that a second job reduces the time that both partners can spend on non-market time as the time available for other activities is highly restricted but this time the effect is significant for both husband and wife. Furthermore, self employed men and those who work during weekends are generally more involved in their work and thus have less time that can be spent with their wives. Weekend work is also found to have a negative influence on non-market time for women though to a lower extent. In contrast to that I find a positive effect of being a civil servant which can be explained by the higher degree of temporal work routine which requires less coordination of the schedules by the spouses to the advantage of family life. A high degree of temporal non-routine working hours has the same significant negative effect on this measure for women as it had on joint leisure. It can be argued, that the temporal changeability index (ϕ^*) picks up the high degree of changes in working hours additional to marginal or part-time employment which is rather important among women. Finally, it has to be pointed out that although shift work decreased joint leisure of the partners it has no noticeable effect on non-market time for both men and women. In general, shift work leads to schedules that differ from the general rhythm of time within a society which is however only at the expense of pure leisure activities that the partners can enjoy during the standard workday. Yet, it is not so disruptive as to destroy the complete organization of non-market

activities of the spouses so that joint family tasks are not affected. In such cases, managing household tasks is of paramount importance to such couples so that pure leisure activities are rescheduled and are of comparatively lower importance.

Personal and Household Characteristics

Now, I want to analyze the influence of personal and household characteristics as well as of partner information on both activity aggregates. The results are presented in table 6 and it can be deduced that the estimated elasticities on joint leisure and non-market time are relatively similar. They shall be thoroughly described in this section and differences between the two definitions shall be uncovered. Accordingly, we find that education is negatively correlated with joint time but significant effects are only obtained for high-skilled women who are more productive and hence more closely attached to the labor market (Fitzenberger et al. 2004) which consequently reduces time on other than market work tasks. For men, on the contrary, educational attainment does neither affect joint leisure nor joint non-market time yet it shall be mentioned that education has no influence at all on determining the broader leisure aggregate. Couples living in the Western part of Germany spend significantly more non-market or leisure time with each other as compared to their counterparts in the East. Moreover, having had a special day, affects joint leisure of men and women and to an even larger extent joint non-market time positively. However, it must be noted, that we do not know in what way the day under investigation was a "special" one so that the potential reasons could range from one of the usual daily agenda items being different to a disturbance of the whole daily routine. Daily travels, although they do not remarkably influence joint leisure, increase joint non-market time for both partners.⁷

Children living in the household are not found to have a significant effect on non-market time but they need a lot of care and attention from their parents which is at the clear expense of pure leisure. The children's age, on the other hand, has no additional impact. Bigger apartments need more time to be taken care of and consequently less time is available that the partners can enjoy for pure leisure activities but also joint non-market time is drastically reduced. Besides, households that receive financial help by others have slightly less joint time. Couples, on the other hand, that do not receive any help, spend on average more time with the spouse on leisure without yet the time spent on joint leisure and household work is not significantly affected.

For the analysis of the balance between work and the private life of couples in the household context, it is not only important to consider the impact of the person's own working conditions together with individual and household characteristics but to also analyze the impact of the work-involvement of the partner. Since only a small fraction of women are full-time employed, their working conditions are not expected to influence the husband's decision of free time to a great deal. However, women who are not employed at all, are most flexible with regard to the timing of activities and thus, the positive effect of a non-working wife on the joint leisure time from the husband's point of view is notable. For women, on the contrary, the working conditions of their husband's play an important role as husbands are the main breadwinners in this sample. I therefore find that women whose partners are self-employed or have a second job have fewer minutes of leisure. As before, husband's who work shifts only influences the

⁷Daily travels are defined to last at least two hours but less than an entire day.

joint leisure decision leaving the more general aggregate of joint non-market time unaffected. Women with husbands who work as civil servants, on the other hand, spend more of their free time with the spouse. For men it is found that being married to a high-skilled woman rather reduces joint time as such women are generally more attached to the labor market and are more likely to work full-time which results in a shortness of time outside the workplace. Such women are generally more restricted in the timing of their activities and are hence less flexible to adjust their time allocation to match their husbands' schedules. All these findings underline the hypothesis by Bird et al. (1984) who claim that the employment schedule of the spouse who provides the most income and prestige is more influential to the general management of the family which is however only true if there are clear gender roles within a household. This claim reaches yet its limits for dual earner households in particular for households with two full-time employed spouses. Wives who work shifts are less able to adjust their schedules to their husbands' at the clear disadvantage of joint leisure but as before, without negatively affecting the time devoted more generally to joint family time.

Until so far, all workplace characteristics have been treated as being exogenous. However, this is not necessarily true as people choose a certain job given their preferences for work but also given their preferences for generally spending time with their partners. It can also be argued that people choose certain jobs because they value joint free time with their spouse not very highly. Thus, working conditions shall be treated as endogenous to the choice of pure leisure and non-market time. Neglecting this source of endogeneity therefore biases the estimated coefficients and leads to watery coefficient estimates, which explains the few significant coefficient estimates obtained in this section. By restricting the sample to those couples who are less likely to choose a job based on their preferences for spending time with their wives i.e. by only considering couples who have lower than tertiary education does not yield more reliable results. Only analyzing those couples who reported to have spent a normal day, on the other hand, does not lead to better results either.

In the following section, the endogeneity problem will be approached by using a thought-experiment in which couples are randomly selected to form new ones that are by construction unable to coordinate their schedules. The thusly created pseudo couples can be understood as control group in order to properly identify the pure effects of working conditions on a couple's private life. By doing so, I can additionally infer the effect of marital preferences added on top (Angrist and Krueger 1999).

5.2 Identification of Pure Effects

In this section, I will present an approach to identify the pure effects of working conditions on both leisure and non-market work and to additionally separate these effects from those induced by marital preferences for spending time with the spouse. So it is possible that some couples coordinate their schedules as to enjoy the maximal amount of time with each other yet others try their best to not spend too much time in the presence of the spouse. These opposing preferences might on average cancel out but lead to larger standard errors that water the precision of the coefficient estimates. In conclusion, only few significant effects are obtained as was the case in the last section. The strategy that I adopt in from now on to circumvent the endogeneity problem described is to set up two kinds of thought-experiments in which the pure effects of a person's work arrangements on the time spent with the spouse are identified and by purging other watering influences.

The pseudo couples are created by two different randomization strategies in which a wife from the sample is matched with a more or less randomly determined husband. The advantage of this approach is that the thusly obtained so-called "pseudo" couples represent appropriate control groups for the purpose of this paper because real and pseudo couples are facing the same constraints imposed by society (van Klaveren and Maassen van den Brink 2007) and the previously obtained results are easily comparable (Angrist and Krueger 1999). Potentially omitted or unobserved variables are furthermore uncorrelated with the variables of interest. In a first approach to create pseudo couples, a wife from the sample will be matched with an entirely randomly chosen husband. The hence created couples will be referred to as 'random' pseudo couples which constitute a benchmark for the further analysis as the general effect of the working conditions on the general organization of leisure are obtained by this technique.

In reality marriage is not a random process but on the contrary, marital matching leads to a selection of the spouse according to some observable characteristics or prestige (Becker 1973, Lam 1988, Chiappori et al. 2005). In a second approach to create pseudo couples, I will account for the selection of the partner by matching each husband in the sample with another husband who is closest with respect to some matching variables.⁸ In a second step, each wife is matched with the nearest neighbor of the own spouse to form a new couple. The matching criterion is like in Hallberg (2003) based on the nearest available person using the Mahalanobis metric in order to define distances to a given set of matching variables. The presented matching algorithm follows Rubin (1979). Couples created by this approach will in the following be called 'nearest neighbor' pseudo couples. The pseudo couples created by the two randomization approaches are by construction not able to coordinate their schedules across the workday and the determinants of time that the pseudo partners *simultaneously* spend outside the workplace can be regarded as exogenous.

The results for the individual's working conditions on simultaneous leisure and non-market time for the two different randomization approaches as well as for real couples are presented in table 2. The estimated coefficients are presented as elasticities for comparison reasons. Let us start with analyzing the results obtained for men. From the first glimpse at the estimation result it gets clear that the determinants slightly differ for real couples, however, not many effects can be identified. More significant effects are obtained for pseudo couples so that endogeneity must be indeed accounted for. The results for the pseudo couples can be interpreted as giving answers to the general effect of work arrangements on the timing of activities outside the workplace and thus about the impact on the general societal rhythm of the activity aggregates. We find, that self-employed spend significantly less time with their spouses on joint leisure as well as on joint non-market work. They have usually more responsibility and are thus more involved in their work so that the time outside the workplace is restricted. Accounting for endogeneity yields more pronounced negative effects which could be seen as evidence that a coordination of schedules among real couples leads to a mitigation of the negative effect as they can schedule their joint time to some extent independently from the general flow of time within the time restrictions of each partner. While no significant effect of weekend work is obtained for the joint leisure decision

⁸The matching variables used are the age, the number of kids and whether at least one child younger than 6 is living in the household, a high-skill dummy, a variable containing the minutes of market work of each person and dummies indicating whether the person is employed, is shift worker, is self-employed and a variable describing the sector that each person is employed in.

dep. variable	real			pseudo		
	together	random	nearest neighbor	together	random	nearest neighbor
	leisure			non-market time		
<i>men</i>						
ϕ^*	-0.004 (0.011)	-0.004 (0.008)	0.000 (0.008)	-0.007 (0.010)	0.003 (0.006)	0.001 (0.006)
not working	-0.001 (0.003)	<i>0.004</i> (0.002)	0.002 (0.002)	-0.001 (0.003)	<i>0.021</i> (0.002)	<i>0.008</i> (0.002)
marginally empl.	<i>0.003</i> (0.002)	0.001 (0.001)	0.002 (0.001)	0.002 (0.002)	<i>0.007</i> (0.001)	<i>0.006</i> (0.001)
part-time empl.	0.000 (0.002)	0.001 (0.001)	0.000 (0.001)	0.000 (0.002)	<i>0.002</i> (0.001)	<i>0.003</i> (0.001)
shift work	<i>-0.020</i> (0.008)	<i>-0.023</i> (0.006)	<i>-0.028</i> (0.006)	0.000 (0.008)	0.003 (0.005)	-0.001 (0.005)
flexitime	-0.011 (0.019)	0.018 (0.014)	-0.004 (0.014)	-0.002 (0.017)	-0.017 (0.010)	-0.014 (0.010)
service sector	-0.006 (0.019)	-0.018 (0.014)	-0.023 (0.014)	-0.021 (0.018)	-0.013 (0.011)	-0.013 (0.011)
civil servant	0.011 (0.008)	<i>0.021</i> (0.006)	<i>0.016</i> (0.006)	<i>0.016</i> (0.008)	<i>0.019</i> (0.005)	<i>0.016</i> (0.005)
self empl.	<i>-0.014</i> (0.008)	<i>-0.023</i> (0.006)	<i>-0.024</i> (0.006)	<i>-0.020</i> (0.008)	<i>-0.029</i> (0.005)	<i>-0.034</i> (0.005)
second job	<i>-0.018</i> (0.007)	0.001 (0.005)	-0.005 (0.005)	<i>-0.014</i> (0.006)	0.000 (0.004)	-0.002 (0.004)
same building	-0.002 (0.007)	-0.006 (0.005)	-0.008 (0.005)	0.001 (0.006)	-0.003 (0.004)	-0.003 (0.004)
weekend work ?	-0.033 (0.028)	<i>-0.041</i> (0.021)	<i>-0.039</i> (0.021)	<i>-0.066</i> (0.026)	<i>-0.049</i> (0.016)	<i>-0.046</i> (0.016)
job in health sec.	0.002 (0.003)	-0.001 (0.002)	<i>0.003</i> (0.002)	0.002 (0.003)	0.000 (0.002)	0.001 (0.001)
R ²	0.067	0.057	0.073	0.090	0.194	0.157
N	4031	4031	4031	4031	4031	4031
<i>women</i>						
ϕ^*	<i>-0.026</i> (0.012)	-0.007 (0.009)	-0.003 (0.009)	<i>-0.025</i> (0.011)	-0.004 (0.007)	0.004 (0.007)
not working	0.031 (0.023)	0.008 (0.017)	0.015 (0.017)	0.033 (0.021)	<i>0.084</i> (0.013)	<i>0.072</i> (0.013)
marginally empl.	0.015 (0.019)	0.016 (0.014)	0.014 (0.014)	<i>0.033</i> (0.017)	<i>0.054</i> (0.011)	<i>0.045</i> (0.010)
part-time empl.	0.011 (0.015)	0.010 (0.010)	<i>0.024</i> (0.011)	0.007 (0.014)	<i>0.033</i> (0.008)	<i>0.039</i> (0.008)
shift work	-0.007 (0.006)	<i>-0.011</i> (0.004)	<i>-0.011</i> (0.004)	-0.003 (0.005)	0.000 (0.003)	-0.003 (0.003)
flexitime	-0.010 (0.012)	-0.002 (0.009)	<i>-0.019</i> (0.009)	-0.005 (0.011)	0.006 (0.007)	-0.003 (0.007)
service sector	0.044 (0.038)	-0.010 (0.028)	0.017 (0.029)	0.043 (0.035)	0.032 (0.022)	0.034 (0.021)
civil servant	0.002 (0.005)	0.000 (0.003)	0.003 (0.003)	<i>0.007</i> (0.004)	-0.001 (0.003)	<i>0.007</i> (0.003)
self empl.	0.003 (0.005)	0.001 (0.004)	0.004 (0.004)	-0.002 (0.005)	-0.001 (0.003)	<i>0.005</i> (0.003)
second job	-0.017 (0.015)	<i>-0.026</i> (0.011)	-0.008 (0.011)	<i>-0.027</i> (0.014)	<i>-0.022</i> (0.008)	-0.013 (0.008)
same building	0.000 (0.004)	0.000 (0.003)	-0.002 (0.003)	0.000 (0.004)	0.002 (0.002)	0.001 (0.002)
weekend work ?	<i>-0.034</i> (0.014)	<i>-0.026</i> (0.010)	<i>-0.029</i> (0.010)	<i>-0.025</i> (0.013)	<i>-0.019</i> (0.008)	-0.010 (0.008)
job in health sec.	-0.005 (0.004)	0.000 (0.003)	0.003 (0.003)	-0.003 (0.004)	-0.003 (0.002)	<i>0.004</i> (0.002)
R ²	0.063	0.059	0.065	0.090	0.163	0.135
N	4031	4031	4031	4031	4031	4031

- Italics represent significant values to the level of 10%.

- Standard errors in brackets.

Table 2: Elasticities of work characteristics for real and pseudo couples with respect to joint or simultaneous leisure time.

of real couples, the broader definition of non-market time delivers, however, strongly negative effects which are further confirmed by the results of the pseudo couples. In contrast to that I find that husbands with a second job are found to have significantly less joint leisure and joint non-market time yet this result is not confirmed by the pseudo couples. Husbands who are employed as civil servants, on the contrary, have significantly more common leisure and also more common non-market time with the (pseudo) wife which is robust in all specifications. In general, civil servants have very steady working hours that are strongly in line with the societal organization of activities which facilitates the coordination of the spouses' schedules. Like in the previous section, I find that due to the working schedules of shift workers who are detached from the societal flow of time which is at the clear expense of joint leisure of couples within the workweek. It is possible that such couples substitute joint leisure away from the workweek toward the weekend and rather focus on more pressing activities during the workweek that involve family care. This explanation is underlined by the fact that shift work has no effect at all on determining joint non-market time which does not only involve time that is merely spent with the spouse but more generally with other household members on tasks that involve the whole family. In addition to the effects described so far, I find that the employment status of the husband determines joint non-market time leaving joint leisure unaffected. Husbands who are less than full-time employed are found to have more non-market work but also slightly more leisure. These effects should however not be over-interpreted as by construction almost all men are full-time employed.

What can be concluded from these first results for men? The simultaneity of leisure and non-market activities between the pseudo spouses can be understood as mirroring the general societal rhythm of time during the standard workweek. In section 4.1 we have seen that pure joint leisure is predominantly enjoyed during evening hours and is highly concentrated to a short time interval. Joint non-market time is also mainly concentrated to take place after work but is much more spread out across the day. Different working conditions that are discussed in this paper perturb the general flow of time. These deviations are in line with the hypotheses suggested in section 3. The working schedule of civil servants is characterized by a generally higher routine and it is highly in line with the general organization of activities across the workday. Self-employed and employees having a second job as well as those who work during weekends, on the contrary, are due to their relatively high work involvement more restricted both in the quantity and the choice of timing of activities outside the job as compared with the general societal trend. Shift work presents a special case though. While pure leisure of the spouses is drastically restricted, joint non-market time is left unaffected. The general organization of family time is not perturbed which shows that shift work is rather family friendly, so that it can be argued that in this respect, pure joint leisure is inferior to non-market work. In contrast to the pseudo couples, real couples can coordinate their schedules so that the limitations to joint leisure and joint market work imposed by the working conditions can be attenuated but depending on the spouses' preferences for being with each other they could also be aggravated. From the results obtained so far, it can be concluded that the estimated coefficients of those conditions that perturb the general timing of activities within a society mostly are mitigated in the case of real couples which might be seen as evidence that a coordination of time allows them to schedule activities outside the job more freely.

The labor supply decision of married women in this sample is utterly different from men with only 25% of the wives being full-time employed. Therefore, it is not surprising that their work characteristics do

not seem to influence the time spent on joint leisure with the husband much. Women are in general the managers of the household and are hence mainly in charge of housework in general so that in order to better describe the effect of their working conditions on their private lives, household activities shall be included and a broader measure of joint non-market time shall be analyzed. Accordingly, many more effects of their working conditions have a significant influence. Robust to all specifications is that regular or sporadic weekend work results in less leisure but also in less non-market time with the partner. Unlike for men, we find an even stronger negative influence for real couples and compared with completely randomly united pseudo couples taking marital matching into account already strengthens the negative influence.

A second job generally restricts the non-market time and I therefore find that in general joint leisure and joint non-market time are negatively affected. When marital matching is accounted for, however, noticeable effects on joint leisure vanish and joint non-market time is still strongly reduced. As for men, shift work has a negative but – due to the lower percentage of labor force participation and consequently the lower percentage of shift work among women – a less pronounced impact on joint leisure resulting from the staggered working schedules of the partners that are more detached from the general societal organization of activities across a standard workday. But again, joint non-market time is not affected which suggests that pure leisure of the spouses is considered as inferior to other more general non-market work related tasks and pure leisure is therefore intertemporally substituted. In general, the employment status of wives has no strong impact on explaining the joint leisure decision of the couple which is mutually decided upon by both partners. The amount of jointness is set determined by the spouse with the more binding time restriction which is essentially the husband. Joint non-market time, on the other hand, which includes also those activities that are typically performed by women is found to be heavily affected by the employment status. Women, who work less than full-time or not at all, are more flexible in organizing their tasks across the day which facilitates the balance between work and private life. Therefore, marginal or part-time employment but more importantly non-employment leads to more time with the partner outside the job. The organization of their major activities across the workday coincides with the general timing within society to a great deal. Accounting for marital matching, however attenuates these effects and marital preferences water them to such an extent that no effects can be identified any longer.

On grounds of the particular labor supply decision and the differences in the determinants of joint leisure and joint non-market time for married women discussed so far, it stands to reason that they rather adjust their schedules to their husband's to maximize the amount of joint time during the standard workweek. I want to shed more light on this hypothesis in the remainder of this section. A first indication is the degree of non-routine of working hours of women (ϕ^*). I control for this variable in addition to the different employment status in order to capture the influence of daily changes in working hours that are due to potentially unexpected duties that prevent temporal work routine. Since pseudo couples are by construction unable to adjust their mutual schedules, no effect shall be identified which is indeed confirmed by table 2. And it must also be noted that significant results are only obtained for women which underlines the adaptation hypothesis.

In order to find further evidence to support the female adjustment hypothesis that has already been proposed by Bird et al. (1984), it must be rather the husband's working conditions that influence com-

	leisure			non-market time		
	real	pseudo		real	pseudo	
	together	random	nearest neighbor	together	random	nearest neighbor
<i>men - characteristics of wives</i>						
part-time empl.	0.011 (0.015)	0.011 (0.010)	<i>0.029</i> (0.010)	-0.000 (0.014)	<i>0.046</i> (0.007)	<i>0.047</i> (0.008)
marginally empl.	0.025 (0.017)	<i>0.032</i> (0.012)	<i>0.036</i> (0.013)	<i>0.033</i> (0.016)	<i>0.071</i> (0.009)	<i>0.058</i> (0.009)
not employed	<i>0.048</i> (0.022)	0.024 (0.015)	<i>0.040</i> (0.015)	<i>0.041</i> (0.021)	<i>0.106</i> (0.012)	<i>0.088</i> (0.012)
shift work	<i>-0.012</i> (0.005)	<i>-0.014</i> (0.004)	<i>-0.012</i> (0.004)	-0.004 (0.005)	-0.003 (0.003)	-0.002 (0.003)
flexitime	-0.007 (0.012)	0.002 (0.009)	-0.014 (0.009)	-0.001 (0.011)	<i>0.011</i> (0.007)	0.002 (0.007)
service sector	0.041 (0.037)	0.002 (0.009)	0.033 (0.028)	0.047 (0.035)	0.031 (0.021)	<i>0.041</i> (0.021)
civil servant	0.003 (0.004)	0.000 (0.003)	0.003 (0.003)	<i>0.007</i> (0.004)	-0.001 (0.003)	<i>0.006</i> (0.003)
self-employed	-0.002 (0.005)	-0.003 (0.004)	-0.000 (0.003)	-0.003 (0.005)	0.000 (0.003)	<i>0.006</i> (0.003)
second job	-0.020 (0.014)	<i>-0.028</i> (0.011)	-0.004 (0.011)	<i>-0.014</i> (0.006)	<i>-0.025</i> (0.008)	-0.011 (0.008)
R ²	0.067	0.060	0.074	0.090	0.194	0.157
N	4031	4031	4031	4031	4031	4031
<i>women - characteristics of husbands</i>						
part-time empl.	0.000 (0.002)	0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)	<i>0.003</i> (0.001)	<i>0.004</i> (0.001)
marginally empl.	<i>0.004</i> (0.002)	0.001 (0.001)	<i>0.002</i> (0.001)	0.002 (0.001)	<i>0.008</i> (0.001)	<i>0.006</i> (0.001)
not employed	0.001 (0.003)	<i>0.007</i> (0.002)	<i>0.004</i> (0.002)	0.002 (0.003)	<i>0.023</i> (0.002)	<i>0.010</i> (0.002)
shift work	<i>-0.022</i> (0.008)	<i>-0.027</i> (0.006)	<i>-0.030</i> (0.006)	-0.007 (0.007)	-0.002 (0.005)	-0.005 (0.005)
flexitime	-0.020 (0.018)	0.019 (0.014)	-0.007 (0.014)	-0.007 (0.017)	-0.014 (0.011)	-0.015 (0.010)
service sector	-0.006 (0.019)	-0.010 (0.014)	-0.019 (0.014)	-0.010 (0.018)	-0.009 (0.011)	-0.011 (0.011)
civil servant	<i>0.015</i> (0.008)	<i>0.022</i> (0.006)	<i>0.017</i> (0.006)	<i>0.020</i> (0.008)	<i>0.020</i> (0.005)	<i>0.017</i> (0.005)
self-employed	<i>-0.017</i> (0.008)	<i>-0.032</i> (0.005)	<i>-0.029</i> (0.006)	<i>-0.027</i> (0.007)	<i>-0.036</i> (0.004)	<i>-0.042</i> (0.004)
second job	<i>-0.018</i> (0.007)	-0.001 (0.005)	-0.005 (0.005)	<i>-0.016</i> (0.006)	-0.001 (0.004)	-0.003 (0.004)
R ²	0.063	0.056	0.065	0.090	0.163	0.135
N	4031	4031	4031	4031	4031	4031

- Italics represent significant values to a level of 10%.

Table 3: Elasticities of Work Characteristics of the partner for real and pseudo couples with respect to joint or simultaneous leisure time and joint or simultaneous joint non-market time.

mon leisure or non-market work of women. By contrast, since it is the women who potentially adjust their schedules and who are on average less attached to the labor market in general, their work characteristics shall not influence the husband's decision to a great extent. These hypotheses are confirmed by table 3. For husbands the working conditions of their wives are actually noticeable only if they are so restrictive that an adjustment is strongly impeded and thus affects the whole family life. This is true for husbands whose wives have a second job. Shift work, as before, only affects joint leisure. The

adaptation hypothesis is further underlined by the higher degree of flexibility with respect to the timing of activities of wives resulting from their low degree of full-time employment. Hence, working less than full-time leads not only to more joint leisure but more importantly to significantly more joint non-market time. These working arrangements therefore enhance the balance between work and private life as women can more easily adjust their own schedules.

Let us finally take a quick look at the opposite case, namely the impact of the husband's working condition from the wife's perspective. Now, the husband's working conditions indeed influence common time spent with the spouse outside the workplace. Basically, previous results are confirmed so that in particular women with self-employed husbands have particularly less joint leisure and also joint non-market time because the time that they could potentially spend outside the workplace is generally limited but also an adjustment of schedules is restricted. As real couples can coordinate themselves the strongly negative impact of the pure effects that were identified here is mitigated which could be seen as further evidence to support the female adaptation hypothesis. In contrast to that, being married to a civil servant leads to more joint time of the spouses as their schedules are distinctly in line with the general societal rhythm. Their working schedules are rather fixed so that coordination with the partner is potentially easy and enjoying joint time with family and spouse is facilitated. Interestingly, we find that marital preferences mitigate the pure effect also in this case. Like in the previous specifications, shift work of the husband reduces the wife's joint leisure but again, no impact on joint non-market time is obtained.

It can be concluded, that evidence for the female adaptation hypothesis is found via two major channels. First, the husband's decision for joint time is only influenced by the work characteristics of their wives if the impact is disruptive as in the case of shift work or generally restricts the available time as in the case of a second job. Or on the contrary, if working hours leave enough flexibility to ease coordination and which facilitates an adjustment of their own schedules to their husband's. Already Bird et al. (1984) note that the occupation of the husband provides the most status, income, and prestige and consequently his employment schedule influences the household management and the couple's free time. This fact seems to still hold nowadays which is further emphasized by the strong significance of work characteristics of husband's work arrangements on common leisure and non-market time from the wife's perspective. As compared to the general organization of leisure time throughout a standard workday, however, marriage leads to a mitigation of the pure effects imposed by work arrangements because the partners are able to actively coordinate their schedules.

6 Conclusion and Discussion

This paper analyzes the balance between work and life by investigating how different work arrangements affect the private life of married or cohabiting couples using the German Time Use data for the year 2001/02. This question is approached by analyzing in how far (1) joint leisure and (2) joint non-market time are affected. The major aim of this paper is to solve the endogeneity issue between the preferences for work and spending time together with the partner in order to find the pure effects of the working conditions independent of any perturbing influences resulting from marital preferences. Hence, a thought-experiment is conducted in which pseudo couples are created in two different ways:

by matching each wife to a (i) randomly attributed husband and (ii) husband who is closest with respect to some predetermined characteristics to the own. The hence created pseudo couples serve as appropriate control groups for the purpose of this paper as they are exposed to the same societal constraints. The estimated effects of the characteristics of work present a benchmark to understanding their general impact on the societal organization of common leisure and non-market time across the standard workday. Since the pseudo spouses are unable to actively coordinate their schedules, it is able to single out the marriage induced effect that is added on top of the pure effects.

When only joint pure leisure of the partners is concerned, I find robust negative effects of shift work for men and women likewise which is due to the fact that the entire schedules is detached from the general organization of activities. For men, I can additionally identify that self employed and those who report to work during weekends enjoy less joint leisure with their wives, the schedule of civil servants on the other hand potentially allows the couple to spend more time with each other as their schedules co-move with the general flow of time within society. In contrast to that, only few effects of working conditions are identified in the case of women which is explained by a low percentage of full-time employment and a relatively high share of non-employment. Accordingly, only those job attributes matter that are so disruptive to the general timing of events, such as a second job or weekend work, to have a recognizable negative effect on the couple's joint leisure. Not accounting for the endogeneity of marital preference leads to downward biased effects so that real effects are underestimated if any can be identified at all. Opposing marital preferences for joint leisure increase the standard errors and thus lower the precision of the coefficient estimates. But then, it could be argued that since real partners are able to actively coordinate their schedules that the strong negative pure effect of those working conditions that impose the highest strain on the private life such as shift work, self employment and second jobs, can be mitigated.

To describe the effect of the working conditions on the private life in more general, I further analyzed the impact on joint non-market time which comprises leisure and household work. By doing so, not only the time spent with the partner is regarded but with the whole family and thus gives a different dimension to the question at hand. Interestingly, shift work does not have significant negative influence anymore which indicates that time is rather spent for family and household purposes at the expense of joint pure leisure. In this respect, pure leisure is inferior to the more general non-market time. Robust to previous findings is, however, that people who work during weekends spent not only less leisure with their partners but also less joint non-market time. In addition, not full-time employed have significantly more joint non-market time which is particularly true for women. Marginal or part-time employment are often understood as granting the person flexibility to better balance work and private life which is confirmed by the findings of this study although joint leisure time is not significantly affected.

Apart from identifying the pure effects of work arrangements on the private life so as to shed more light on the possibilities of couples to balance work and life in more detail, a further hypothesis is tested. Bird et al. (1984) already argue that it is the occupation of the husband which is most influential in determining the couple's free time as it provides the most income and prestige in the case of the US in the 1980s. Consequently, women rather adjust their timing because their main role in the household is that of managers of the family. Evidence for this hypothesis to still hold in Germany are found as the work characteristics of the wife do not influence the minutes of joint time of the husbands to a great

deal only if adjusting the schedules is rendered very difficult. By contrast, working conditions of the husband are important for the determination of leisure from the wife's perspective. Finally, a lower degree of temporal work routine negatively affects joint time a higher degree of coordination of the couples is needed to balance work and family life which can be understood as a further emphasis of the female adaption hypothesis.

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Appendix

hour	together	simult.	fraction
1	1.17%	1.86%	62.74%
2	0.23%	0.44%	53.12%
3	0.04%	0.13%	34.37%
4	0.02%	0.03%	57.14%
5	0.00%	0.00%	0.00%
6	0.10%	0.14%	68.57%
7	0.29%	0.50%	57.14%
8	0.41%	0.90%	45.78%
9	0.32%	1.22%	26.14%
10	0.69%	2.25%	30.67%
11	1.12%	2.80%	40.09%
12	1.17%	2.95%	39.73%
13	1.30%	3.49%	37.37%
14	1.78%	3.78%	47.20%
15	2.30%	4.63%	49.66%
16	2.92%	5.81%	50.34%
17	4.40%	9.52%	46.25%
18	6.22%	13.45%	46.23%
19	8.75%	17.52%	49.97%
20	15.66%	29.58%	52.93%
21	31.75%	51.27%	61.92%
22	34.11%	51.58%	66.12%
23	16.67%	25.11%	66.40%
24	5.13%	7.78%	65.97%

- "fraction" refers to the fraction of time spent together with the spouse (column 2) relative to simultaneous leisure time of the partners (column 3).

Table 4: Percentage of leisure spend with the partner, simultaneously and fraction of joint and simultaneous leisure.

	female		male	
	mean	std. dev.	mean	std.dev.
<i>time use dimension</i>				
minutes of joint leisure	81.443	79.161	81.443	79.161
minutes of joint non-market time	138.827	124.885	138.856	124.993
degree of work variability	0.287	0.392	0.228	0.309
<i>demographic indicators</i>				
age	42.365	8.009	45.021	8.319
west	0.816	0.387	0.816	0.387
low skilled	0.043	0.203	0.021	0.143
medium skilled	0.710	0.454	0.514	0.500
high skilled	0.242	0.428	0.462	0.499
<i>work information</i>				
not employed	0.257	0.437	0.038	0.190
full-time	0.257	0.437	0.942	0.234
part-time employed	0.315	0.465	0.011	0.103
marginally employed	0.172	0.377	0.010	0.099
second job	0.260	0.439	0.140	0.347
civil servant	0.066	0.248	0.183	0.387
employee	0.511	0.500	0.294	0.456
worker	0.072	0.258	0.326	0.469
self employed	0.086	0.280	0.157	0.364
shift work	0.087	0.281	0.172	0.377
flexitime	0.268	0.443	0.493	0.500
fixed wrk hrs	0.205	0.404	0.262	0.440
agriculture	0.009	0.092	0.035	0.184
industrial sect.	0.041	0.199	0.371	0.483
service sect.	0.522	0.500	0.546	0.498
same building	0.052	0.222	0.143	0.350
weekend work	0.312	0.464	0.731	0.444
job in health sector	0.062	0.241	0.027	0.162
travel	0.166	0.372	0.203	0.402
extraordinary day	0.502	0.500	0.481	0.500
<i>household information</i>				
# of kids	1.507	1.055	1.507	1.055
kid younger than 6	0.213	0.410	0.213	0.410
kid aged 6-17	0.444	0.497	0.444	0.497
size of apart.	118.910	43.527	118.910	43.527
min. to pub. trans.	6.381	7.442	6.381	7.442
no walk to friends	0.276	0.447	0.276	0.447
not enough time for family	0.234	0.423	0.398	0.490
N	4178		4178	

Table 5: Summary Statistics.

	leisure				non-market time			
	male		female		male		female	
	coef	std. err.	coef	std. err.	coef	std. err.	coef	std. err.
<i>personal characteristics</i>								
low skilled	-0.000	(0.002)	0.004	(0.003)	-0.003	(0.002)	0.003	(0.003)
high skilled	-0.021	(0.016)	-0.019	(0.010)	-0.003	(0.015)	-0.022	(0.009)
age	0.112	(0.172)	0.018	(0.171)	0.046	(0.157)	0.051	(0.156)
West Germany	0.076	(0.035)	0.079	(0.035)	0.069	(0.032)	0.064	(0.032)
too few time for family	-0.040	(0.013)	-0.024	(0.009)	-0.020	(0.012)	-0.012	(0.008)
special day	0.101	(0.015)	0.084	(0.016)	0.157	(0.014)	0.129	(0.014)
travel	0.008	(0.008)	0.008	(0.007)	0.027	(0.007)	0.033	(0.006)
<i>household information</i>								
number of kids	-0.062	(0.030)	-0.063	(0.030)	-0.016	(0.027)	-0.027	(0.027)
kid aged 0-5	-0.016	(0.014)	-0.020	(0.014)	-0.001	(0.013)	-0.000	(0.013)
kid aged 6-17	-0.017	(0.022)	-0.017	(0.022)	-0.020	(0.020)	-0.010	(0.020)
size of apart.	-0.199	(0.048)	-0.178	(0.048)	-0.157	(0.044)	-0.133	(0.044)
fin. help received	-0.007	(0.003)	-0.007	(0.003)	-0.005	(0.003)	-0.005	(0.003)
no help received	0.038	(0.017)	0.040	(0.017)	0.010	(0.015)	0.017	(0.015)
min. walk to public transport	-0.029	(0.013)	-0.030	(0.013)	-0.028	(0.012)	-0.029	(0.012)
cannot walk to friends	0.002	(0.009)	0.001	(0.009)	0.008	(0.008)	0.006	(0.008)
<i>partner information</i>								
low-skilled	0.004	(0.003)	-0.000	(0.002)	0.002	(0.003)	-0.002	(0.002)
high-skilled	-0.017	(0.010)	-0.017	(0.016)	-0.017	(0.009)	0.001	(0.014)
part-time empl.	0.008	(0.015)	-0.001	(0.002)	-0.006	(0.013)	-0.000	(0.001)
marginally empl.	0.021	(0.017)	0.004	(0.002)	0.021	(0.015)	0.002	(0.001)
not employed	0.041	(0.022)	0.001	(0.003)	0.030	(0.020)	0.002	(0.003)
shift work	-0.014	(0.005)	-0.021	(0.008)	-0.007	(0.005)	-0.007	(0.007)
flexitime	-0.010	(0.012)	-0.020	(0.018)	-0.004	(0.011)	-0.015	(0.017)
service sector	0.042	(0.037)	-0.003	(0.019)	0.029	(0.033)	-0.011	(0.017)
civil servant	0.003	(0.004)	0.014	(0.008)	0.007	(0.004)	0.022	(0.007)
self-employed	-0.002	(0.005)	-0.016	(0.007)	-0.004	(0.005)	-0.028	(0.007)
second job	-0.018	(0.014)	-0.018	(0.006)	-0.022	(0.013)	-0.016	(0.006)
N	4178		4178		4178		4178	
R ²	0.071		0.069		0.100		0.097	

– I furthermore added dummies for the workdays with Friday being the base category, as well as one accounting for the missing apartment size.

– Italics represent significant values at a 10 % level.

Table 6: Estimation Results for personal and household characteristics as well as partner information.

	narrow	broad
real	81.661 (79.085)	136.126 (125.309)
random	101.813 (73.320)	242.496 (144.472)
nearest neighbors	102.766 (75.035)	240.652 (137.203)

– Standard deviations in brackets.

Table 7: Average minutes of joint leisure (narrow) and of joint non-market time (broad) for real and pseudo couples.