Social Indicators Research
https://doi.org/10.1007/s11205-018-2031-z

Does Flexibility Help Employees Switch Off from Work? Flexible Working-Time Arrangements and Cognitive Work-to-Home Spillover for Women and Men in Germany

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Accepted: 9 November 2018

Abstract
The present study investigates the effects of flexible working-time arrangements on cognitive work-to-home spillover for women and men in Germany. It analyzes (1) how schedule control, i.e. flexitime and working-time autonomy, and the lack of control, i.e. fixed schedules and employer-oriented flexible schedules, are related to work-to-home spillover and (2) whether these relationships are mediated by job pressure and overtime hours. The multivariate analyses based on the German Socio-Economic Panel Study in 2011 and 2012 show that employees have the most spillover with working-time autonomy and employer-oriented schedules and the least with flexitime and fixed schedules. Working-time autonomy is related to a higher cognitive work-to-home spillover, but only for men, and mainly due to overtime hours. Working-time unpredictability and unreliability seem to be reasons for higher spillover with employer-oriented schedules. This, however, is the case mostly for women, i.e., only women are likely to experience cognitive spillover with employer-oriented flexible schedules—above and beyond job pressure and overtime hours. Moreover, women, but not men, seem to suffer less with flexitime. This study provides evidence to show in which way distinct flexible working-time arrangements contribute to work-to-home spillover and reinforce gender inequality.

Keywords Work-to-home spillover · Flexible working-time arrangements · Schedule control · Job pressure · Overtime hours · Gender

1 Introduction

Due to the prevalence of internet-based technologies, boundaries between work and home are becoming blurred for more and more employees and work can easily interfere with the home domain. As a consequence, employees risk experiencing cognitive work-to-home

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s11205-018-2031-z) contains supplementary material, which is available to authorized users.

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spillover, i.e., they are unable to switch off from work in the non-work domain (Westaby et al. 2016). This can impact employees' physical and mental health (Cropley and Millward 2009). In Germany, for example, the number of work days missed because of mental health problems has increased dramatically in recent years (TK 2017). The interference of work in the home domain can also burden family relationships (Cinamon et al. 2008; Matthews et al. 1996).

Flexible working-time arrangements are key for employees' work-life balance and health (Ala-Mursula et al. 2002; Ala-Mursula et al. 2004; Dex 2002; Russell et al. 2009). When employees have schedule control, i.e. control over the timing and duration of work, they can determine the timing and duration of exposure to work and the timing and amount of recovery Nijp et al. 2012). Schedule control might therefore help employees switch off from work and might reduce cognitive work-to-home spillover. Recent research, however, indicates that benefits with schedule control depend on the way control is actually arranged at the workplace (Brannen 2005; Lott 2015; Lott and Chung 2016; Chung and van der Horst 2018a). Employees can more often benefit from flexitime, where they control the starting and ending times of the work day within a given time frame, than from working-time autonomy, where they have complete control over their work schedule.

So far, previous studies on conflicts between work and home life (e.g. Galvin and Schieman 2012; Schieman and Glavin 2008; Schieman and Young 2010; Schieman 2013) have analyzed employees' perceived schedule control, which was measured on a scale from no to full control, but have neglected the role of employees' actual working-time arrangements. Looking at distinct working-time arrangements has three main advantages: First, employees might under- or overestimate their control and their assessment of control might be biased. Second, when analyzing working-time arrangements, information is provided on how schedule control is actually arranged at the workplace level, i.e. in the form of flexitime or working-time autonomy. This is crucial for practitioners who aim to support employees and need to know how exactly to do so. And third, different forms of not having control can be considered. In Germany, the majority of employees have fixed schedules, where the employers set a fixed work schedule, and around a quarter have employer-oriented flexible schedules, where the employers have control over the work schedule and change schedules on a short notice (Lott and Chung 2016). Employees with fixed schedules and employees with employer-oriented flexible schedules might both perceive a lack of schedule control, but time demands such as working-time unpredictability and unreliability are higher with employer-oriented flexible schedules (Golden and Kim 2017) and schedule unpredictability and unreliability makes the organization of work and home life extremely challenging (Clawson and Gerstel 2014). Notten et al. (2017) showed that high levels of time demands translate into perceived stress.

This paper thus asks: How are flexitime, working-time autonomy, fixed schedules and employer-oriented flexible schedules related to cognitive work-to-home spillover? And are these relations different for women and men? Because women often take over the "second shift" at home (Hochschild 1989) and, thus, (must) identify more with the home domain (Bielby and Bielby 1989), they might benefit more from flexitime and working-time autonomy and might feel greater strain with employer-oriented flexible schedules (Chung and van der Lippe 2018). Combining work and home life is difficult and stressful when schedules can change on short notice. These gender differences might be considerable in a country like Germany, which can be assigned to the 'traditional' working-time regime—with low gender equality and a relatively higher level of work-to-home spillover (Hagqvist et al. 2017), along with the prevalence of a traditional division of work between women and men, and high working-time flexibilization as a result of women working part-time (Chung

and Tijdens 2013; OECD 2017). Thus, studying the role of distinct flexible working-time arrangements for women's and men's work-to-home spillover is crucial for understanding the (re)production of gender inequality in a society.

Why employees experience spillover when using flexible working-time arrangements? This is a further question explored in this paper. Besides working-time unpredictability and unreliability, overtime hours and job pressure might be reasons for work-to-home spillover. Long and intense work hours often go along with flexible working-time arrangements, especially working-time autonomy (Chung and van der Horst 2018a; Lott and Chung 2016; Warr 1987). To what extent job pressure and overtime hours mediate the relation between distinct flexible working-time arrangements and cognitive work-to-home spillover, however, is less known.

Using data from the German Socio-Economic Panel in 2011 and 2012, this study contributes to the literature on flexible working and work-to-home spillover in three ways. First, the study differentiates between arrangements related to schedule control, namely flexitime and working-time autonomy, and the lack of schedule control, i.e. fixed schedules and employer-oriented flexible schedules, and analyzes their relation with cognitive work-to-home spillover. Second, it examines job pressure and overtime hours as mediators for the association between these arrangements and spillover. And third, gender differences in the relations between working-time arrangements and spillover are analyzed.

2 Job Pressure, Overtime Hours and Cognitive Work-to-Home Spillover

Job pressure and overtime hours are threats to employees' work-life balance as well as their emotional, mental and physical health and well-being (Bakker and Geurts 2004; Burchell 2006; Kattenbach et al. 2010; Krause et al. 2005). Job pressure is the stress resulting from a quantity of work that does not match the time scheduled for it (Koltai and Schieman 2015) and, thus, can lead to the feeling of being overwhelmed by the workload and lacking time to complete work tasks (Schieman 2013). Job pressure can also be caused by interruptions of the workflow (Grzywacz and Marks 2000a), since individuals who are interrupted work faster and therefore experience more time pressure and more stress (Mark et al. 2008).

Job pressure and overtime hours can cause mental strain and have been found to be associated with distress and poorer physical health (Burchell et al. 2002; Burchell 2006; Robinson and Godbey 1997; Roxburgh 2004; Shields 1999). Stress, exhaustion, fatigue, anxiety and depression after the workday can reduce the quality of life at home (Green 2004; Kattenbach et al. 2010; Macky and Boxall 2008; Roxburgh 2004). Employees who must deal with job pressure and who work longer hours have fewer resources and less time to perform activities outside the work role (Crouter 1984; Kopelman et al. 1983) and need more time to recover from work. As a consequence, work effort accumulates (Bakker and Geurts 2004), as do health problems and conflict between the work and home domains (Skinner and Pocock 2008; Steiber 2009; White et al. 2003).

Conflicts between work and home life exist when employees are not able to switch off from work in the non-work domain (Westaby et al. 2016). They then experience strain-based work-to-home conflict, i.e. work-to-home spillover on a cognitive level which is produced by "emotional interference" of work in the home life (Greenhaus and Beutell 1985; Greenhaus and Parasuraman 1987, p. 44), i.e. stressors of the work domain produce stressful situations in the home domain. According to the spillover theory, negative emotions such as strain, stress or fatigue from the work domain spill over to the home domain

despite physical and temporal boundaries between work and home and can hinder employees' ability to detach from work (Staines 1980; Westaby et al. 2016).

Cognitive work-to-home spillover is related to sleep disturbances, poor sleep quality and dysphoria and cardiovascular diseases (Cropley and Millward 2009). Conflicts between work and home life go along with stress, job-burnout and depression (Allen et al. 2000; Eden 2001). As a "chronic stressor", the interference of work in home life can repeatedly and enduringly impair mental health (Schieman 2006), is associated with health-diminishing behaviors such as alcohol consumption (Frone et al. 1998) and strain in marriages (Matthews et al. 1996), and impacts on the relationship between parents and children (Cinamon et al. 2008).

3 The Role of Flexible Working-Time Arrangements for Cognitive Work-to-Home Spillover

Flexible working arrangements can enable employees to align their work with their private life and can help employees manage their lives more efficiently (Perrons 1998). Studies show that flexible working-time arrangements can lead to a better work-life balance (Dex 2002; Russell et al. 2009; Van der Lippe and Lippényi 2018). Because employees with flexible working-time arrangements determine the timing and duration of work and the timing and amount of recovery (Nijp et al. 2012), flexible working time buffers the effects of longer working hours on work-family balance (Hughes and Parkes 2007). Workers with flexible working arrangements are also healthier (Ala-Mursula et al. 2002; Ala-Mursula et al. 2004; Gregory and Milner 2009). Moreover, flexible working would allow people to maintain their working hours which they would not have otherwise (Chung and van der Horst 2018b).

Flexible working-time arrangements, however, might also have the opposite effect on employees' work outcomes. With flexible working time, the boundaries between the work and home domains are weakened, which can cause work-to-home spillover. Especially in cases where employees are expected to identify more with their work role than with their family role, i.e., in an ideal worker culture (Williams et al. 2013), flexible working-time arrangements might threaten the boundaries between home and work life. Also, flexible arrangements can be used as a performance-enhancing measure, which risks weakening the family role and work-life balance and can cause overtime hours (Chung and van der Horst 2018a; Godard 2001; White et al. 2003).

These risks, however, seem to be rather low for flexitime, which has mostly been found to benefit employees in terms of health and work-life balance (e.g. Ala-Mursula et al. 2002; Ala-Mursula et al. 2004; Galvin and Schieman 2012; Nijp et al. 2012). With flexitime, employees have control over the starting and ending times of their workday within a given time frame, they can adjust their work schedule to non-work activities and, at the same time, rely on a guaranteed schedule. The latter can protect employees from long and intense work hours and role blurring (Brannen 2005; Lott 2015; Lott and Chung 2016). Thus, employees with flexitime might experience less spillover than with fixed schedules, working-time autonomy and employer-oriented flexible schedules.

Hypothesis 1 Employees with flexitime experience the least cognitive work-to-home spillover.

Working-time autonomy, by contrast, gives employees absolute control over scheduling of their working day. There is empirical evidence showing that high levels of autonomy can strain employees' well-being (Kubicek et al. 2014), because autonomy is more likely than flexitime to be accompanied by higher levels of job pressure and overtime hours (Lott and Chung 2016; Van der Lippe and Lippényi 2018; Warr 1987). This is due to the risk of blurring boundaries between work and home life, which is greater with employees' complete autonomy, where it is the individual's own responsibility to manage and maintain the boundaries. Employees with high levels of schedule control more often bring work home (Schieman and Glavin 2008), and high levels of schedule control can cause work-family role blurring (Schieman and Young 2010). Another reason is that working-time autonomy, as opposed to flexitime, is used as a performance-enhancing measure which promises employees complete control, but often obscures employer's control (Brannen 2005). Working-time autonomy might therefore be related to a higher level of spillover than flexitime. It might also be associated with greater spillover than fixed schedules which give employees no control, but do protect boundaries between work and home life.

Hypothesis 2a Employees with working-time autonomy experience a higher level of cognitive work-to-home spillover than employees with fixed schedules and flexitime –due to overtime hours and job pressure.

Moreover, above and beyond job pressure and overtime hours, high levels of autonomy might be related to spillover because autonomy often encompasses high degrees of responsibility and decision-making over the work process (Warr 1987), which can stress employees.

Hypothesis 2b Employees with working-time autonomy experience a higher level of cognitive work-to-home spillover than employees with fixed schedules and flexitime—above and beyond job pressure and overtime hours.

Low levels of control have been found to impair employees' well-being (Kubicek et al. 2014). Cognitive work-to-home spillover might be considerable with employer-oriented working-time flexibility. Work schedules which are changed by the employer on short notice imply high working-time unpredictability and unreliability for employees and contribute to job stress (Notten et al. 2017). Employees with employer-oriented flexibility cannot rely on a steady time frame, like employees with fixed schedules and flexitime, nor do they feel in control of their schedule, like employees with working-time autonomy. Employer-oriented flexible schedules might therefore be strongly related to cognitive work-to-home spillover regardless of higher levels of job pressure and overtime hours.

Hypothesis 3 Employees with employer-oriented flexible schedules experience the highest level of work-to-home spillover—above and beyond job pressure and overtime hours.

4 Gendered Meanings of Working-Time Arrangements

Previous studies have shown that women make use of flexible work arrangements in order to balance the work and home domains whereas men often use it for other purposes (Chung and van der Lippe 2018; Clawson and Gerstel 2014; Van der Lippe and Lippényi 2018).

Women seem to make use of flexible work arrangements in order to control the pace and scheduling of their work tasks, which reduces feelings of time-based conflict (Greenhaus et al. 1989). They have a better work-life balance with flexible work arrangements than do men (Grzywacz and Marks 2000b; Nijp et al. 2012; Schieman 2006), who risk working longer and more intense hours when the boundary between work and home is weakened (Burchell 2002; Lott 2015; Lott and Chung 2016).

These findings are generally explained in terms of the gendered meanings of flexibility (Brandth and Kvande 2016), i.e., they arise as a result of gender-specific identification with work and family roles. Women are more committed and must be more committed to the family role due to the unequal division of unpaid work and job segregation in the workplace (Bielby and Bielby 1989). Women still take on the lion's share of housework and childcare (van der Lippe et al. 2011) and, thus, (must) identify more with roles outside of work and engage in family roles more often than men, who feel greater work devotion and for whom work is a greater source of identity (Bielby and Bielby 1989; Duxbury and Higgens 1991; Schieman et al. 2006). Moreover, even though women experience higher levels of work-to-home conflict than men (Notten et al. 2017; Steiber 2009), they might have less spillover with flexitime and working-time autonomy than men, since they use and must use flexibility to fulfill duties outside the workplace (Kim 2018; Kurowska 2018). Due to their engagement in and identification with the home domain, women, rather than men, might be successful boundary crossers (Clark 2000; Hilbrecht et al. 2008; Sullivan and Lewis 2001). Thus, women might have less work-to-home spillover with flexitime and working-time autonomy. Men, by contrast, might experience higher levels of spillover because of long and intense work hours. Because of their stronger identification with work, they might also experience greater spillover above and beyond job pressure and overtime hours due to high degrees of responsibility and decision-making over the work process (Warr 1987) which accompany working-time autonomy.

Hypothesis 4a Men with flexitime and especially working-time autonomy experience a higher level of cognitive work-to-home spillover than women—due to overtime hours and job pressure.

Hypothesis 4b Men with flexitime and especially working-time autonomy experience a higher level of cognitive work-to-home spillover than women—above and beyond job pressure and overtime hours.

Because men identify stronger with the work role than women, they might also experience greater spillover with fixed schedules than their female counterparts. With employer-oriented flexible schedules, by contrast, women might feel greater strain and spillover than men. Since women must take over the second shift (Hochschild 1989) at home and must manage paid work and duties outside paid work, working-time unpredictability and unreliability might be a greater burden for them.

Hypothesis 4c With fixed schedules, men are more likely to have cognitive work-to-home spillover than women.

Hypothesis 4d With employer-oriented flexible schedules, women are more likely than men to have cognitive work-to-home spillover—above and beyond job pressure and overtime hours.

5 Data, Measurements and Method

The present study uses the German Socio-Economic Panel (SOEP; http://www.diw.de/soep), a representative panel study of German households. The SOEP started in the Federal Republic of Germany in 1984 and was expanded in 1990 to include the territory of the former German Democratic Republic (Haisken-DeNew and Frick 2005). In the SOEP, more than 12,000 households and 32,000 persons are currently interviewed on a yearly basis. The SOEP encompasses several samples for groups of the German population, e.g., individuals with migration backgrounds and higher income households that were underrepresented in the primary sample in 1984 and that were added over the course of the panel study. Household and personal questionnaires are the same for all SOEP samples. In 2012, samples for households with children (birth cohorts 2007, 2008, 2009 and 2010) in low-income households, single-parent households, and households with more than one child were included. These samples were designed in accordance with the other SOEP samples (DIW Berlin 2017) and are fully comparable to them. One difference, however, is that the 2012 samples encompass information on job pressure and spillover that was not observed for the other samples in the same year. For the analysis, the 2011 and 2012 samples which include the most recent information on job pressure and spillover are pooled and a control for all SOEP samples—along with demographic and household characteristics (e.g. household income, number of children and age of youngest child)—is introduced in the models (see below). This ensures that the results are not biased by the different samples.

The sample of the analysis encompasses employed respondents from 25 to 55 years of age with contracted work hours. Employees without contracted hours were excluded from the analysis because formal working-time arrangements might be less important for their work process. Respondents who were younger than 25 and older than 55 years of age were also excluded for the analysis. Their motivation to work and work behavior might be different from employees in the prime working age. Finally, because the self-employed have control of their working time per se, they were also not considered. The sample for this study contains 8960 observations (4284 men and 4610 women). 5051 employees were observed in 2011 and 3843 in 2012.

5.1 Measurement of Cognitive Work-to-Home Spillover

Steiber (2009) showed empirically that strain-based and time-based conflicts between work and home are distinct concepts and that control over work has different outcomes for the two types of conflict (Chung 2011). The present study therefore focuses only on strain-based conflicts and, more precisely, on the cognitive spillover of work to the home domain, i.e. when employees perceive difficulties switching off from work outside work. Similar to McGinnty and Calvert (2009), subjective indicators are used and perceived cognitive spillover is measured via a sum index of four variables from the short instrument of the effort-reward imbalance scale by Siegrist et al. (2008): "I am often already thinking about work-related problems when I wake up", "When I come home, it is very easy to switch off from thinking about work", "Work seldom lets go of me; it stays in my head all evening" and "If I put off something at work that needs to be done that day, I can't sleep at night". The internal consistency within these items is strong, with a Cronbach's Alpha being 0.76. The items are (1) strongly disagree, (2) disagree, (3) agree, and (4) strongly agree for all variables, expect for the question "When I come home, it is very easy to switch off from thinking about work" where the scale is reversed. The four variables were summed up to a

sum index which was subsequently transformed by subtracting the minimum and dividing by the maximum value to a range between 0 and 1.

5.2 Measurement for Job Pressure

Job pressure is measured in terms of two variables: time pressure ("Because of the high volume of work, there is often high time pressure") and interruptions ("I am often interrupted and distracted while working"). Due to a rather weak internal consistency within these items (Cronbach's Alpha is 0.50), they are introduced separately in the models. Respondents could answer that they do or do not experience these forms of job pressure. The items of each variable are (0) no and (1) yes.

5.3 Measurement for Overtime Hours

Flexible working-time arrangements, especially working-time autonomy, can be related to long working hours (Chung and van der Horst 2018a; Lott and Chung 2016). In order to assess the role of flexible working-time arrangements for work-to-home conflict above and beyond long working hours, a measure for overtime hours is used. Overtime hours are measured in terms of the difference between contracted working hours and hours that individuals actually work on average per week. Since individuals can actually work less than their contracted work hours, the values for overtime hours can be negative.

5.4 Measurement for Flexible Work Arrangements

Previous research on work-to-home conflict and spillover has focused on the role of work hours and vacation hours for work-to-home conflict (Notten et al. 2017; Ruppanner 2013) and neglected the role of flexible working-time arrangements. Unlike previous studies (e.g. Schieman and Glavin 2008; Schieman and Young 2010) which measured employees' perceived level of schedule control on a scale from 'no control' to 'complete control', this study uses a measure for employees' actual flexible work arrangements. In doing so, the analysis differentiates between two forms of schedule control, i.e. flexitime and working-time autonomy, and two forms of the lack of control, i.e. fixed schedules and employer-oriented flexible schedules. The survey question for employees' working-time arrangements was: "Nowadays, there are a number of different types of working hours available. Which of the following possibilities is most applicable to your work?". The items were (1) "fixed daily working hours" (fixed schedules), (2) "Working hours fixed by employer, which may vary from day to day" (employer-oriented flexibility), (3) "flexitime within a working hours account and a certain degree of self-determination of daily working hours within this account" (flexitime), and (4) "no formally fixed working hours, decide my own working hours" (working-time autonomy). The reference category is fixed schedules.

5.5 Controls

Because higher-status employees are more likely to have job control and higher levels of job pressure (Kelly and Moen 2007; Ortega 2009; Schieman 2006), employees' status must be considered. I therefore control for income, education and workplace position. Income is measured by individual annual pre-tax labor income (adjusted for price changes), including

all wages and benefits. Education is measured by primary, secondary, and tertiary education. Workplace position is measured by employees' job authority, i.e., no job authority, management tasks, and extensive leadership. Status also depends on the duration of working time per week. Employees who do not work full-time are often stigmatized at the workplace (Williams et al. 2013). Thus, a variable is used for full-time, part-time, and marginal employment, i.e. so-called "mini jobs" with a wage threshold of 450 euros and generally exempt from insurance, with the exception of pension insurance (but with the option of exemption from pension insurance on application). Moreover, I control for the status position using the ISCO-88 classification with the following items: (1) legislators, senior officials, managers, (2) professionals, (3) associate professionals, technicians, (4) clerks, (5) service workers, (6) craft and similar jobs, (7) plant and machine operators and assembly line operators, and (8) elementary workers. The reference category is service workers. The article also controls for whether employees have a second job and/or a permanent contract. Temporary employment is often related to longer working hours (White et al. 2003) and is a stressor to employees' well-being and health (Mauno et al. 2017). Furthermore, I control for the sector in which the worker is employed based on the NACE (Rev. 2) 1-digit classification: i.e., retail; health/education; metal, chemical, and electronic industries; service industries; and lastly, insurance and banking sectors. Because work conditions are different between the public and the private sector, a control was included for public sector.

Not only the work situation, but also the household context affects individuals' health and well-being. Employees who are the main breadwinners in the household, because they take on the financial responsibility for their families, might experience greater mental strain and work-to-home spillover. The financial situation of the household might also influence employees' mental health and work-to-home spillover. In particular, financially precarious situations might add to feelings of stress. I therefore control for the yearly total post-tax household income. The household income is equivalence-scaled using the modified OECD scale. Because childcare adds to the daily workload, the analyses control for the number of children (no children, one child, two children, and three or more children) and for very young children (0–2 and 3–4 years) in the household. Moreover, in Germany, marriage discourages women's full-time employment through the split-taxation system and reinforces a traditional allocation of work in couples (Sainsbury 1999). I therefore control for marital status. Two variables for age and age-squared were used in the models. Finally, because women have less access to schedule control (Table 1), there is a control for gender all models in Table 2. In addition, I control for the different samples of the data that were

Table 1 Working-time arrangements for German employees, women and men

	All	Men	Women
Working-time arrangement			
Fixed	41.66	40.13	43.19
Employer flex	20.66	18.98	22.36
Flexitime	26.48	27.73	25.23
Autonomy	11.20	13.16	9.22
N	8894	4284	4610
Chi squared test		***	

SOEP 2011, 2012; column percentages weighted with cross-sectional weight; gender difference sign. (chi2 test) at the 99.9%-level

included in the analyses. Table 5 shows all variables used in the analyses. Table 1 in the online appendix shows a correlation matrix of selected variables.

5.6 Models

Mediation analyses were conducted based on a pooled sample for 2011 and 2012 (Tables 2 and 3). First, linear regression models with robust standard errors were estimated for cognitive work-to-home spillover only with working-time arrangements and controls. The mediator variables 'overtime hours', 'time pressure' and 'interruptions' were then introduced separately in the models. Finally, linear regression models were estimated that include all mediators. To test whether effect sizes of coefficients between models for women and men are significantly different, the models were fully interacted by gender and the two-way interaction (working-time arrangements and gender) is presented in Table 4. Also, to test whether effects are significantly different within one

Table 2 OLS regression models for cognitive work-to-home spillover. Data source: SOEP 2011 and 2012

	Model 1	Model 2	Model 3	Model 4	Model 5
Working-time arrangements					
Fixed schedules	Ref	Ref	Ref	Ref	Ref
Employer flex	0.046***	0.031***	0.031***	0.042***	0.021***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Flexitime	0.011	0.008	0.002	0.000	-0.004
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Autonomy	0.034***	0.016	0.029***	0.030***	0.015
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Overtime hours		0.008***			0.006***
		(0.00)			(0.00)
Time pressure			0.153***		0.125***
			(0.00)		(0.00)
Interruptions				0.106***	0.063***
				(0.01)	(0.01)
Female	0.035***	0.040***	0.027***	0.036***	0.034***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.281***	0.262***	0.227***	0.257***	0.209**
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
R-squared	0.07	0.10	0.17	0.12	0.20
N	8894	8894	8894	8894	8894

OLS regression models; unweighted; dependent variable: work-to-home spillover; controls: full-time/part-time, marginal/irregular employment, no job authority/managerial tasks/extensive leadership, individual labor income, compensatory time off, legislator/senior officials/manager, professionals, associate professionals/technicians, clerks, craft and other, service workers, plant and machine operators/assembly line operators, elementary workers, public/service/health and education/retail/insurance and banking/metal/chemistry/electric sectors, second job, permanent contract, job change, organizational size, age, age squared, low/middle/high education, annual household income, married, no child/one child/two children/three and more children, age of the youngest child 0–2 years/3–4 years, sample

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

Table 3 OLS regression models for cognitive work-to-home spillover for women and men. Data source: SOEP 2011 and 2012

	Men Model 1	Women Model 2	Men Model 3	Women Model 4	Men Model 5	Women Model 6	Men Model 7	Women Model 8	Men Model 9	Women Model 10
Working-time arrangements										
Fixed schedules	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Employer flex	0.026**	0.059***	0.011	0.045***	0.015	0.041***	0.022*	0.056***	0.003	0.034***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Flexitime	0.024*	−0.002	0.018	−0.002	0.013	−0.008	0.009	−0.008	0.001	−0.010
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Autonomy	0.054***	0.018	0.028*	0.010	0.046***	0.017	0.044***	0.019	0.022	0.012
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Overtime hours			0.007***	0.009***					0.005***	0.006***
			(0.00)	(0.00)					(0.00)	(0.00)
Time pressure					0.148***	0.156***			0.120***	0.129***
					(0.01)	(0.01)			(0.01)	(0.01)
Interruptions							0.107***	0.103***	0.068***	0.057***
							(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.203*	0.423***	0.169	0.418***	0.115	0.378***	0.188	0.404***	0.099	0.372***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.09)	(0.10)	(0.10)	(0.10)	(0.09)
R-squared	0.07	0.10	0.10	0.13	0.16	0.20	0.11	0.14	0.20	0.22
N	4284	4610	4284	4610	4284	4610	4284	4610	4284	4610

OLS regression models; unweighted; dependent variable: work-to-home spillover; controls: full-time/part-time, marginal/irregular employment, no job authority/managerial tasks/extensive leadership, individual labor income, compensatory time off, legislator/senior officials/manager, professionals, associate professionals/technicians, clerks, craft and other, service workers, plant and machine operators/assembly line operators, elementary workers, public/service/health and education/retail/insurance and banking/metal/chemistry/electric sectors, second job, permanent contract, job change, organizational size, age, age squared, low/middle/high education, annual household income, married, no child/one child/two children/three and more children, age of the youngest child 0–2 years/3–4 years, sample

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

Table 4 OLS regression models for work-to-home spillover with interaction terms. Data source: SOEP 2011 and 2012

	Model 1	Model 2	Model 3	Model 4	Model 5
Working time arrangements					
Fixed schedules	Ref	Ref	Ref	Ref	Ref
Employer flex	0.026**	0.011	0.015	0.022*	0.003
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Flexitime	0.024*	0.018	0.013	0.009	0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Autonomy	0.054***	0.028*	0.046***	0.044***	0.022
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.220	0.249	0.263	0.216	0.273*
	(0.14)	(0.14)	(0.14)	(0.14)	(0.13)
Employer flex*female	0.032*	0.034**	0.026*	0.035**	0.031*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Flexitime*female	−0.027	−0.021	−0.021	−0.017	−0.011
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Autonomy*female	−0.036*	−0.018	−0.029	−0.025	−0.010
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Overtime hours		0.007***			0.005***
		(0.00)			(0.00)
Time pressure			0.148***		0.120***
			(0.01)		(0.01)
Interruptions				0.107***	0.068***
				(0.01)	(0.01)
Constant	0.203*	0.169	0.115	0.188	0.099
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
N	0.09	0.12	0.18	0.13	0.21
R-squared	8894	8894	8894	8894	8894

OLS regression models; unweighted; dependent variable: work-to-home conflict; models fully interacted by gender; controls: full-time/part-time, marginal/irregular employment, no job authority/managerial tasks/extensive leadership, individual labor income, compensatory time off, legislator/senior officials/manager, professionals, associate professionals/technicians, clerks, craft and other, service workers, plant and machine operators/assembly line operators, elementary workers, public/service/health and education/retail/insurance and banking/metal/chemistry/electric sectors, second job, permanent contract, job change, organizational size, age, age squared, low/middle/high education, annual household income, married, no child/one child/two children/three and more children, age of the youngest child 0–2 years/3–4 years, sample

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

model, Chi squared test based on the predictive values were estimated. The indirect effects of the explanatory variables were estimated based on the models including the control variables. The standard errors together with the z-test and p-values for these indirect effects were computed using the delta method and two regression coefficients were multiplied, for example the effect of working time autonomy on overtime hours and the effect of overtime hours on work-to-home spillover. The proportion of the each working time arrangement explained by overtime hours and job pressure is calculated by dividing the indirect effect by the estimated total effect.

6 Results

6.1 General Results

The present study expects that employees suffer the least from flexitime and the most from employer-oriented schedules. It is also expected that fixed schedules are the second best and working-time autonomy the third best arrangement in terms of cognitive work-to-home spillover. Table 2 shows the results for working-time arrangements (Model 1), including overtime hours (Model 2), time pressure (Model 3) and interruptions (Model 4) as mediator variables. Model 5 encompasses all mediator variables. The regression model with all controls is shown in Table 2 in the online appendix.

It should be noted that in all models, effect sizes are small. Some arrangements, nevertheless, have statistically significant effects. Also, the estimated effects are aggregate effects for employees as whole, i.e. the differences between arrangements can be more considerable for some employees than others. Also, all mediator variables are positively related to work-to-home spillover across all models.

Employer-oriented flexible schedules are positively related to cognitive work-to-home spillover. The effect is statistically significant at the 99.9%-level across all models and effect sizes change only slightly between the models (Table 2). The effect of employer-oriented flexible schedules, however, is not significantly different from that of working-time autonomy in Model 1 (Prob > F = 0.2243) and that is consistent across all other models. Employer-oriented flexible schedules and working-time autonomy contribute to work-to-home spillover to a similar extent. Hypothesis 1 is partly confirmed. Employees with employer-oriented flexible schedules experience a higher level of cognitive work-to-home spillover than with fixed schedules and flexitime, but not higher than employees with working-time autonomy. Also, employees with employer-oriented flexible schedules experience spillover above and beyond job pressure and overtime hours. The effect of employer-oriented schedules is still statistically significant at the 99.9%-level, when all mediator variables are included in Model 5, and only 54% of the effect of employer-oriented flexibility on spillover is indirect via overtime hours and job pressure. The indirect effects of employer-oriented flexibility via overtime hours and time pressure are 0.014 (statistically significant at the 99.9%-level) and via interruptions 0.003 (statistically significant at the 95%-level. In other words, as expected, working-time unpredictability and unreliability seem to put strain on employees.

Cognitive work-to-home spillover is also higher with working-time autonomy. The effect is statistically significant at the 99.9%-level and effect sizes change only slightly in Models 1, 3 and 4. Working-time autonomy, however, is not statistically significant when overtime hours are included in Model 2. Thus, the effect is mainly mediated by overtime hours. The significant (at the 99.9%-level) indirect effect of working time autonomy via overtime hours is 0.018 and similar to the direct effect (0.016). 53% of the effect of working time autonomy on spillover is indirect via overtime hours alone. Hypothesis 2a is partly confirmed. Employees with working-time autonomy have more spillover than with fixed schedules and flexitime. The positive relation between working-time autonomy and spillover is mediated by overtime hours, but not job pressure. Unlike what was expected in Hypothesis 2b, employees do not experience spillover with autonomy above and beyond overtime hours.

Flexitime is significantly different to employer-oriented flexible schedules and working-time autonomy in Model 1 (employer-oriented flexible schedules: Prob > F = 0.0000,

working-time autonomy: Prob > F = 0.0077) and across all other models—except in Model 2 where overtime hours are introduced as the mediator for working-time autonomy (Model 2). Flexitime, however, is not statistically significant when compared to fixed schedules. Hypothesis 1 is partly confirmed. Employees with flexitime are less likely to have cognitive work-to-home spillover compared to working-time autonomy and employer-oriented schedules, but not to fixed schedules.

6.2 Gender Differences

Table 3 shows the results for women's and men's work-to-home spillover. The differences between women and men are tested in interaction models (Table 4). The regression model with all controls is shown in Table 3 in the online appendix.

Working-time autonomy is related to work-to-home spillover only for men. The effect is statistically significant at the 99.9% level in Model 1 and when either time pressure (Table 3, Model 5) or interruptions (Table 3, Model 7) are included. Working-time autonomy is only statistically significant at the 95%-level with overtime hours as mediator (Table 3, Model 3) and the indirect effect of working time autonomy via overtime hours is with 0.026 (significant at the 99%-level) similar to the direct effect (0.028). Also, working time autonomy is not significant when all mediator variables are included in Model 9 and 59% of the effect of working time autonomy on spillover is indirect via overtime hours and job pressure.

Men suffer not only more from working-time autonomy, but also from flexitime. Flexitime is positively related to work-to-home spillover for men. The effect is statistically significant at the 0.95%-level (Table 3, Model 1). As soon as the mediator variables are introduced in the models, the effect is not significant, but remains positive. The significant (at the 99.9%-level) indirect effect of flexitime is 0.006 via overtime hours, 0.011 via time pressure and 0.015 via interruptions (Models 3, 5 and 7). 95% of the effect of flexitime on spillover is indirect via these variables (Table 3, Model 9). For women, the effect of flexitime, even though statistically not significant and very small, is negative across all models. As opposed to men, women seem to suffer less with flexitime. Hypothesis 4a is confirmed, but Hypothesis 4b is not. With flexitime and working-time autonomy, women are less likely than men to have cognitive work-to-home spillover. For men, spillover with working-time autonomy is mainly driven by overtime hours and with flexitime by job pressure and, to a smaller extent, overtime hours.

With fixed schedules, women seem to have a higher level of spillover than men (Table 4). The positive effect of women's fixed schedules, however, is only statistically significant when taking all mediator variables into account (Table 4, Model 5). Hypothesis 4c is not confirmed. With fixed schedules, men are not more likely to have cognitive work-to-home spillover than women.

The positive and highly significant effect of employer-oriented flexible schedules on work-to-home spillover exists mainly for women. Across all models for female respondents, the effect is statistically significant at the 99.9%-level (Table 3). When time pressure and overtime hours are not considered (Table 3, Model 1 and 7), the effect is significant both for women (at the 99.9%-level) and men (at the 99%-level and 95%-level), but the effect size is bigger for women according to the significant interaction term (Table 4, Model 1

and Model 4). In contrast to men, women are likely to experience cognitive spillover with employer-oriented flexible schedules above and beyond job pressure and overtime hours. For men, the effect of employer-oriented flexible schedules is mainly mediated by overtime hours and time pressure. When taking overtime hours or time pressure into account, the effect is statistically not significant. The significant (at the 99.9%-level) indirect effects of employer-oriented flexible schedules via overtime hours (0.015) and via time pressure (0.011) are similar to the direct effects (0.011 and 0.015) of employer-oriented flexible schedules (Table 3, Model 3 and Model 5). For men, 88% of the effect of employer-oriented flexible schedules on spillover is indirect via overtime hours and job pressure (Model 9) as opposed to 42% of the effect for women (Model 10). As expected, working-time unpredictability and unreliability mostly seem to put strain on female employees. Hypothesis 4c and 4d are confirmed. With employer-oriented flexible schedules, women are more likely than men to have cognitive work-to-home spillover—above and beyond overtime hours and job pressure.

7 Conclusion and Discussion

The aim of this study was to analyze the relation between distinct flexible working-time arrangements and cognitive work-to-home spillover and reasons for employees' inability to switch off from work. How are flexitime, working-time autonomy, fixed schedules and employer-oriented flexible schedules related to cognitive work-to-home spillover? Are these relations different for women and men? And to what extent do job pressure and overtime hours mediate the relation between flexible working-time arrangements and cognitive work-to-home spillover?

The present study makes three main contributions to existing literature. First, it was shown that working-time autonomy contributes to work-to-home spillover, but only for men. This refines previous studies which showed that complete schedule control is less beneficial for employees than lower levels of control (Schieman and Glavin 2008; Schieman and Young 2010), that gendered meanings of flexibility, i.e., women make more use of schedule control to maintain and manage boundaries between the work and home domains, exist (Bakker and Geurts 2004; Clawson and Gerstel 2014), and that women suffer less with schedule control than men in terms of cognitive spillover (Grzywacz and Marks 2000b; Nijp et al. 2012; Schieman 2006). The study also indicates that flexitime as a form of 'regulated' schedule control where employees have control over the starting and ending times of their workdays and, at the same time, can rely on a guaranteed time frame, is more beneficial for employees than working-time autonomy and that it is primarily women who benefit from flexitime. Second, the analyses disentangled, at least to some extent, the reasons for employees' cognitive spillover with working-time autonomy. Men with working-time autonomy have difficulties switching off from work mainly due to overtime hours and they suffer with flexitime mainly due to time pressure and interruptions. Because women (must) take over most responsibilities at home (Bielby and Bielby 1989; Kurowska 2018; van der Lippe et al. 2011) and, thus, (must) identify more with roles outside of work (Bielby and Bielby 1989; Duxbury and Higgens 1991; Schieman et al. 2006), they are more experienced border-crossers and managers of borders and might keep themselves

more distant to work than men. The later are more likely to have spillover with autonomy, but they are less likely to experience negative career outcomes compared to their female counterparts (Chung 2018a, b; Lott and Chung 2016). Future research is needed to further reveal the reasons for the gendered meanings of working-time autonomy and men's long work hours and high level of spillover with autonomy. It could be that men have difficulties handling autonomy, but it could also be that employers' hidden control, i.e. a performance-enhancing work organization (Pongratz and Voss 2003), are driving factors for men's long work hours. This, unfortunately, cannot be disentangled with the data.

Third, the present study showed the value of differentiating between different forms of lack of control. Interestingly, employees also benefit from fixed schedules regarding work-to-home spillover. Fixed schedules are predictable and reliable. Employer-oriented flexible schedules are the most problematic—but only for female employees. Women (and not men) are likely not to switch off from work with employer-oriented flexible schedules above and beyond job pressure and overtime hours. Whereas men experience spillover because of overtime hours and job pressure, working time uncertainty and unpredictability seem to primarily put strain on female employees. This might be due to the unequal allocation of unpaid work in couples. Organizing work around responsibilities and duties at home is stressful when the work schedule can be changed on a short notice and women must think more about their work schedule and how to organize work around family demands. Considering that access to family-friendly policies is restricted in female-dominated sectors (Chung 2018a, b) and that more women than men have employer-oriented flexible schedules, this finding is disturbing with regard to gender inequality.

This study's limitations should be mentioned. First, the only data used is cross-sectional data. Thus, the results might be biased by time-constant unobserved heterogeneity and selection effects, even though there were controls for various factors. Second, the analysis accounted for employees' status by controlling for job authority, work position, education and income. However, status differences might not have been fully captured. The measure for job authority does not capture very fine gradations of authority and only differentiates between management and extended leadership positions. Third, boundaries between work and home can easily become blurred if employees work from home. Unfortunately, a control for telework could not be integrated in the model, since working from home was only observed for a subsample of the data. And finally, it should be noted that the effects of flexible working-time arrangements on spillover are rather small. The estimated values, however, are aggregate values for employees as a whole. The difference between flexible arrangements might be more considerable for some employees than others, e.g. with regard to workplace position or fields of activity. Future research should therefore scrutinize the role of flexible work arrangements for different status groups and different tasks. To this end, more extensive data is needed.

Nevertheless, the study has several policy implications. Due to the prevalence of digital technologies, autonomous work arrangements can be made available to more and more employees who are then at risk of experiencing spillover of work in home life. In the light of current debates in Germany, where companies are increasingly calling for deregulation of working-time rules and flexibly adapting working time to the companies' needs, this is alarming. Working-time deregulation might have severe consequences for employees not only in terms of work-life balance, health and family quality, but also in terms of gender equality. Working-time unpredictability and unreliability puts strain primarily on women who often carry a double burden by working in the labor market and, at the same time, at home. Men who cannot switch off from work with working-time autonomy will be even less likely to fulfill childcare and household tasks. This will, in return, exacerbate gender inequality in terms of career outcomes with autonomous working time (Chung 2018a, b; Lott and Chung 2016).

In a digital economy, employees' work-life balance must be supported by the state, the social partners, and companies' work and health protection. Since men are at risk of working longer hours with autonomy, men must be explicitly addressed by these initiatives. Adequate staffing is also needed to reduce overtime hours and job pressure which prevail at many workplaces in Germany, very often due to staff shortages in recent years (Lott and Klenner 2018), and which are the main drivers for men's spillover with unpredictable and unreliable schedules. Adequate staffing prevents long work hours and time pressure. Interruptions can be avoided with adequate and predictable work planning which involves a limited number of tasks or projects which can be easily mastered by employees. Furthermore, regulations and initiatives at the governmental level, at the level of collective agreements, and at the company level are necessary to support working-time predictability and reliability, which is especially crucial for individuals who (must) pursue activities outside the work domain. Such regulations and initiatives are necessary not only to prevent spillover of work in home life, but to foster greater gender equality.

Acknowledgements I would like to thank the reviewers for their comments which helped improving the paper considerably. I would also like to thank Heejung Chung, Tanja van der Lippe and Philipp Lersch for their suggestions.

Appendix

See Table 5.

Table 5 Variables used in the analyses (N = 8960)

	All				Men		Women	
	Mean	SD	Min	Max	Mean	SD	Mean	SD
Work-to-family conflict	0.36	0.23	0	1	0.36	0.22	0.35	0.23
Time pressure	0.59		0	1	0.63		0.56	
Interruptions	0.54		0	1	0.56		0.52	
Overtime hours	3.94	5.54	-36	50	5.05	6.24	2.91	4.58
Working time arrangements								
Fixed schedules	0.44		0	1	0.41		0.45	
Employer-oriented flexible schedules	0.21		0	1	0.20		0.22	
Flexitime	0.24		0	1	0.26		0.23	
Working-time autonomy	0.11		0	1	0.13		0.10	
Work volume								
Full-time	0.68		0	1	0.96		0.41	
Part-time	0.27		0	1	0.03		0.49	
Marginal/irregular employment	0.05		0	1	0.01		0.10	
Job authority								
No authority	0.80		0	1	0.72		0.87	
Management tasks	0.19		0	1	0.26		0.12	
Extensive leadership	0.01		0	1	0.02		0.01	
Individual annual pre-tax labor income	31,198.94	23,227.9	97.94	460,000	41,101.5	25,170.92	21,996.6	16,625.75
Compensatory time off	0.38		0	1	0.35		0.49	
Status classes								
Armed forces	0.04		0	1	0.07		0.01	
Legislators, senior officials, manager	0.05		0	1	0.06		0.03	
Professionals	0.19		0	1	0.20		0.18	
Associate professionals, technicians	0.26		0	1	0.19		0.33	
Clerks	0.11		0	1	0.08		0.15	

Table 5 (continued)

	All				Men		Women	
	Mean	SD	Min	Max	Mean	SD	Mean	SD
Service workers	0.11		0	1	0.04		0.17	
Craft and similar jobss	0.12				0.22		0.03	
Plant and machine operators and assembly line operators	0.06		0	1	0.11		0.01	
Elementary workers	0.06		0	1	0.06		0.07	
Sectors								
Public	0.26		0	1	0.21		0.30	
Service	0.04		0	1	0.03		0.24	
Health and education	0.22		0	1	0.10		0.34	
Retail	0.12		0	1	0.07		0.16	
Insurance and banking	0.04		0	1	0.03		0.04	
Metal	0.10		0	1	0.18		0.04	
Chemistry	0.02		0	1	0.03		0.01	
Electric	0.02		0	1	0.03		0.01	
Company size								
< 20	0.24		0	1	0.29		0.28	
20–200	0.26		0	1	0.26		0.26	
200–2000	0.22		0	1	0.24		0.21	
> 2000	0.28		0	1	0.31		0.25	
Second job	0.08		0	1	0.07		0.10	
Permanent contract	0.86		0	1	0.89		0.84	
Job change	0.15		0	1	0.12		0.18	
Age	41.53	7.64	25	55	41.63	7.59	41.43	7.69
Age squared	1783.23	626.92	625	3025	1790.82	624.47	1776.17	629.16

Table 5 (continued)

	All				Men		Women	
	Mean	SD	Min	Max	Mean	SD	Mean	SD
Education								
Low	0.25		0	1	0.31		0.19	
Middle	0.50		0	1	0.43		0.56	
High	0.25		0	1	0.26		0.25	
Yearly total post-tax household income	22,393.48	11,912.44	2843.291	483,833.3	22,232.5	10,233.02	22,543.08	13,283.51
Married	0.64		0	1	0.72		0.57	
Children								
No child	0.35		0	1	0.32		0.34	
One child	0.24		0	1	0.19		0.29	
Two children	0.25		0	1	0.27		0.24	
Three and more children	0.16		0	1	0.25		0.13	
Age of the youngest child								
0–2 years	0.10		0	1	0.14		0.05	
3–4 years	0.12		0	1	0.15		0.12	

SOEP Data 2011 and 2012

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