Reciprocal Relations Between Working Time Arrangements and Work-Family Conflict Over Time

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Abstract Thus far, many studies on the relationship between working time arrangements and work-family conflict have been cross-sectional in nature, where the direction of influence is difficult to interpret and causal conclusions cannot be drawn. The few existing longitudinal studies on this topic have mainly focused on the normal direction of the causal relationship, that is, on the impact of working time arrangements on work-family conflict over time. To date, however, the reverse relationship, that is, the effects of work-family conflict on adjustments in work schedules and working hours over time, is less clear. Because work-family conflict is highly prevalent in the working population, further insight in this reverse relationship is invaluable to gain insight into secondary selection processes, which may have significant undesirable/unintended implications for labor force participation. Based on data from the ongoing Maastricht Cohort Study, the impact of various characteristics of working time arrangements (e.g., work schedules, working hours, overtime work, and hours control) both in the etiology and consequences of conflict between work and family life over time was investigated in several longitudinal studies, on which will be reported and reflected in this chapter.

1 Work-Family Conflict

1.1 Definition and Prevalence

Considerable changes in labor force demographics and family composition have taken place in the past few decades, making the challenge of adequately balancing

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work and family roles one of today's central concerns for individuals (Valcour 2007). Multiple role pressures experienced by men and women render work-family conflict virtually inevitable (Greenhaus 1988). Work-family conflict is defined as a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect (Greenhaus and Beutell 1985). Research suggests that conflict between work and family is reciprocal in nature, in that work can interfere with family and family can interfere with work (Allen et al. 2000; Frone et al. 1992a). Besides being reciprocal in nature, three major forms of work-family conflict can be distinguished, that is time-based conflict, strain-based conflict, and behavior-based conflict (Greenhaus and Beutell 1985). Reported prevalences of work-family conflict range from about 10 % to about 41 % (e.g., Frone et al. 1992a; Jansen et al. 2004; Kinnunen and Mauno 1998). These large differences in prevalences may amongst others depend on different definitions and operationalizations of work-family conflict, different settings and different gender distributions. Data from the fifth European Working Conditions Survey, in which a specific operationalization for work-family conflict was used, show that in 2010 some 18 % of workers indicate they have problems with their work–life balance (European Foundation for the Improvement of Living and Working Conditions 2012).

1.2 Antecedents of Work-Family Conflict

Many studies and reviews have examined possible antecedents of work-family conflict (e.g., Byron 2005; Eby et al. 2005). Findings from the meta-analytic review by Michel et al. (2011) amongst others indicate that, based on 1080 correlations from 178 samples, work role stressors, work role involvement, work social support, and work characteristics were associated with work-to-family conflict. Family role stressors, family social support, and family characteristics were associated with family-to-work conflict. Results further indicated that internal locus of control and negative affect/neuroticism were associated with both work-to-family conflict and family-to-work conflict. Demographic variables (marital status, parental status, and gender) were found to be significant and meaningful moderators of many work domain/work-to-family conflict and family domain/family-to-work conflict relationships. Findings from this review further suggested that work role stressors and work social support were also associated with family-to-work conflict; and that family role stressors, family role involvement, family social support, and family characteristics were associated with work-to-family conflict (Michel et al. 2011). As such, the two directions of work-family conflict appear to have both common and different antecedents (e.g., Byron 2005; Michel et al. 2011). Whereas there is an extensive literature on antecedents of work-family conflict, it should be noted however, that most studies relied on cross-sectional analyses, thus prohibiting assertions on causality of relations between antecedents and work-family conflict (Casper et al. 2007).

1.3 Consequences of Work-Family Conflict

While conflict between work and family life is undesirable in itself, work-family conflict may also be related to other adverse outcomes. Various studies and reviews have reported on outcomes associated with work-family conflict (e.g., Allen et al. 2000; Amstad et al. 2011; Eby et al. 2005; Jansen et al. 2003a; 2006; Pisarski et al. 2006). Consequences of work-family conflict can roughly be divided into three distinct categories: work-related, family-related, and domain-unspecific outcomes (Amstad et al. 2011; Bellavia and Frone 2005). Without intending to be fully exhaustive, some examples of outcomes within the three categories are mentioned here as an illustration. Examples of work-related outcomes of work-family conflict are lower job satisfaction (e.g., Gao et al. 2013), elevated need for recovery from work (e.g., Jansen et al. 2003a), burnout (e.g., Peeters et al. 2005), sickness absence (e.g., Clays et al. 2009; Jansen et al. 2006; Lidwall et al. 2010), and intentions to turnover (e.g., Fuss et al. 2008; Grandey and Cropanzano 1999; Greenhaus et al. 1997, 2001). Family-related outcomes of work-family conflict amongst others include lower family satisfaction (e.g., Eby et al. 2005) and marital satisfaction (e.g., Voydanoff 2005). Examples of domain-unspecific outcomes comprise life satisfaction (e.g., Perrewé et al. 1999), prolonged fatigue (e.g., Jansen et al. 2003a), and depressive complaints (e.g., Wang et al. 2012). The meta-analysis by Amstad et al. (2011), with mainly cross-sectional primary studies included, reported that both directions of work-family conflict were consistently associated with all three types of outcomes. Both directions of work-family conflict showed stronger relationships to same-domain outcomes than to cross-domain outcomes, indicating that work interference with family was more strongly associated with work-related than with family-related outcomes and that family interference with work was more strongly associated with family-related outcomes than with work-related outcomes. Again, it should be noted that, also with regard to the outcomes of work-family conflict, more studies were based on a cross-sectional than on a longitudinal design.

2 Role of Working Time Arrangements in Work-Family Conflict

A wide range of factors from the work environment have been linked with work-family conflict. A specific and important component of the work domain involves the role of working time arrangements in work-family conflict, since the amount of time demanded by work and the pattern of timing of work within the day and week are among the most obvious ways in which work may affect private life.

2.1 Conservation of Resources Theory

To structure the relationship between working time arrangements and work-family conflict, the Conservation of Resources theory (COR theory) (Hobfoll 1989; Hobfoll and Shirom 2001) constitutes an appropriate theory and framework, already applied to work-family conflict in earlier studies (e.g., Adkins and Premeaux 2012; Dugan et al. 2012; Grandey and Cropanzano 1999; Jansen et al. 2003a; Nohe et al. 2015). The COR theory proposes that individuals strive to obtain, retain, protect, and foster those things they value. These valued entities are termed resources, and include objects, conditions, personal characteristics and energies (Hobfoll 2001; Hobfoll and Shirom 2001). According to COR theory, psychological stress occurs when individuals are threatened with resource loss, lose resources, or fail to gain resources following resource investment (Hobfoll 1989). As more conflict and/or demands are experienced in one domain, fewer resources are available to fulfill one's role in another domain (Grandey and Cropanzano 1999). When the COR theory is applied to the concept of work-family conflict, it proposes that conflict results in stress because resources, of time and energy for example, are lost in the process of juggling both work and family roles (Grandey and Cropanzano 1999). If work-family conflict sustains, that is, when depleted resources are maintained and/or when there is a lack of resource gain, then adverse consequences with regard to for example mental health and sickness absence might develop (e.g., Jansen et al. 2003a, 2006). As applied to the concept of time, COR theory proposes that people feel stress when their time is depleted or threatened with depletion (Dugan et al. 2012). Time has been put forward as a major component of the experience of work-family conflict, since it is a finite resource upon which competing life domains place simultaneous and incompatible demands (Greenhaus and Beutell 1985). For example, frequent overtime work might tap available resources and leave fewer resources available for family demands. Hence, in the case of frequent overtime work, work-family conflict might be considered a reaction to the situation where the resources of the employee are being threatened, depleted or even lost because of the longer time spent at work and the prolonged effort investment. Other aspects of working time arrangements, for example those reflecting control over working hours, may add to employees' resources and constitute resource gains. Consistent with COR theory it would therefore be invaluable to distinguish between relevant characteristics of working time arrangements, that might deplete or add to employees' resources.

2.2 Components of Working Time Arrangements

With regard to working time arrangements, a distinction can be made between work schedules (e.g., shift work vs. day work) on the one hand, and actual working hours (e.g., fulltime vs. part-time) on the other. Work-family conflict among shiftworkers

is thought to arise predominantly because shiftwork involves working and living patterns diverging from community rhythms of social, recreational and domestic activity (Loudoun and Bohle 1997; Walker 1985). With regard to day workers specifically, subgroups of working hours may be defined with increased risks of work-family conflict. One distinction can be made between fulltime and part-time workers. Of course work schedules and working hours are very interrelated with one another, implying that when studying work schedules, the working hours should be taken into account, and vice versa. Moreover, one should consider that working time arrangements mainly concern structural components of work. Both structural and content components, such as job demands, however, are critical to an understanding of the impact of work on employees and their families (Barnett 1998). Job demands often differ between shift workers and day workers (e.g., Bøggild et al. 2001; Jansen et al. 2003b, c) and between fulltime and part-time workers (Barnett and Gareis 2000). Employees with longer working hours may experience more conflict due to higher job demands compared to employees who average lower working hours. Because job demands are in themselves important factors affecting employees' resources, they should be controlled for when studying the effects of working time arrangements on work-family conflict. The same goes for characteristics of the private situation, where for example the degree of responsibility for housekeeping may influence the relation between working time arrangements and work-family conflict. Further, health status could be a potential confounder because, drawing on COR theory, health status will determine part of the energy levels, or resources, employees have left for juggling demands between work and family life (Jansen et al. 2004).

2.2.1 Work Schedules

The term 'shift work' is used to refer in general to a way of organizing daily working hours in which different persons or teams work in succession to cover more than the usual 8 h day, up to and including the whole 24 h (Costa 2003). Definitions for the term 'shift work' are usually very broad. In fact there are thousands of shift systems that may differ widely with respect to their structure (Costa 2003). In some cases shift work overlaps partially with concepts of irregular, unusual, or non-standard working hours. In some cases the term flexible or irregular work is unjustly used as synonymous to shift work. Many types of shift work exist and they can roughly be categorized as permanent versus rotating, continuous versus discontinuous, with or without night work (International Agency for Research on Cancer Working group on the evaluation of carcinogenic risks to humans 2010). Shift systems can also differ widely in relation to other organizational factors (Costa 2003; International Agency for Research on Cancer Working group on the evaluation of carcinogenic risks to humans 2010), such as amongst others, the length of a shift cycle, the duration of shifts, the number of workers/crews who alternate during the working day (e.g., two-shift, three-shift, four-shift, five-shift work schedules), start and finish time of the duty periods, speed

and direction of shift rotation, number and position of rest days between shifts, and the (ir)regularity of shift schedules. All of these factors can be combined in various ways depending on the demands specific to the occupation (International Agency for Research on Cancer Working group on the evaluation of carcinogenic risks to humans 2010).

2.2.2 Working Hours

As with work schedules, also for working hours many definitions and characteristics exist. One commonly used distinction is between fulltime and part-time work. However, the mere distinction between fulltime and part-time work is probably insufficient. Part-time work may encompass working hours close to the fulltime standard and others that are extremely low (Bielenski et al. 2002). One way to account for this heterogeneity is to divide the part-time category into e.g. low and high part-time jobs depending on the hours worked per week. Whereas work schedules are mainly dictated by the company or organization itself, for working hours employees' own preferences and choices play a much more prominent role. As such, also the distinction between voluntary and involuntary fulltime and part-time work is valuable (e.g., Albertsen et al. 2008).

Another component of working hours constitutes overtime work. Overtime work is defined by the European Foundation for the Improvement of Living and Working Conditions (2007) as work performed by an employee in excess of the normal hours of work which has been officially requested and approved by management. It is work that is not part of an employee's regularly scheduled working week for which the employee may be compensated. This definition however may lead to an underestimation of the actual prevalence of overtime, as in many situations, such as unforeseen periods of high workload, much overtime work occurs unexpectedly and unofficially. Apart from high workload situations requiring overtime, employees may work overtime also for financial reasons or for intrinsic motivational reasons or to enhance prospects for advancement (Bakhuys Roozeboom 2009; Caruso 2006).

Flexibility is another component of working hours that may be related to balancing work and family life. Positive flexibility refers to possibilities for employees to use flexible working time for one's own needs, whereas negative flexibility refers to situations where working time flexibility for the employee is actually dictated by one's tasks or supervisor, e.g. unforeseen changes in working time schedules. Thus, to an individual, flexibility can mean both desirable and undesirable working hours. At best, it offers employees possibilities to adjust working hours to suit personal and family needs. At worst, it implies that one has to be flexible to meet the demands of the employer, without having a say oneself (Pärnänen et al. 2007). Apart from flexibility, the predictability of working hours can be of relevance. Predictability refers to scheduled working hours that do not change at short notice and that are predictable for the employee well in advance. In public discussions on working time, inflexible working hours are often seen as a difficult arrangement for

achieving a work-life balance. However, predictable working hours, like flexibility, also have a positive and negative side. When working times are fixed, employees may not have many possibilities of being flexible, e.g., start slightly later, even in the case of small family emergencies. On the other hand, employees can rely on not being forced to stay longer hours at work or having to reorganize childcare arrangements at short notice because of sudden changes in working time schedules (Pärnänen et al. 2007).

2.3 *Literature Findings on Associations between Working Time Arrangements and Work-Family Conflict*

To date, a very large number of studies have explored associations between characteristics of working time arrangements and work-family conflict. In this paragraph only results and conclusions from a few reviews will be highlighted. The meta-analytic review of work-family conflict and its antecedents by Byron (2005) showed that the number of hours spent on work was more positively related to work interference with family than to family interference with work and the number of hours spent on nonwork was more positively related to family interference with work than to work interference with family. Michel et al. (2011) reported in their meta-analytic review on antecedents of work-family conflict that work-time demands were associated with work-to-family conflict. Albertsen et al. (2008) conducted a literature review summarizing the scientific literature about the consequences of long and nonstandard working hours and employee influence over working hours on different measures of work-life balance. Results amongst others indicated that a higher number of working hours and overtime work were associated with less work-life balance in female and gender-mixed groups. For men, however, results were less conclusive. Evidence was reported that different kinds of nonstandard working hours, defined as work outside ordinary daytime 0800–1800, had a negative influence on work-life balance. Employee influence over work schedule was associated with better work-life balance in a range of studies. But, as Albertsen et al. (2008) noted, clear conclusions are difficult to draw due to the methodological problems of some studies. Nijp et al. (2012) conducted a review to assess the empirical evidence between employee work-time control and amongst others work-non-work balance. Moderately strong positive cross-sectional associations were reported between global work-time control and work-non-work balance. Intervention studies included in the review, found that global work-time control was moderately associated with better work-nonwork balance. Limited to moderately strong positive cross-sectional associations were found between multidimensional work-time control and work-nonwork balance. Moderately strong positive associations were reported between flexitime and work-nonwork balance. Nijp et al. concluded that whereas work-time control may be a promising tool for maintaining workers' work-nonwork balance, the current state of evidence allows however only

very limited causal inferences. It is important to note that the findings in primary studies and the reviews described often cannot be readily compared, amongst others due to the varying definitions and operationalizations used for both work-family conflict and characteristics of working time arrangements across studies.

2.4 *Need for Longitudinal Studies on the Role of Working Time Arrangements in the Etiology of Work-Family Conflict*

The vast majority of primary studies included in the reviews described above, consisted of cross-sectional studies, as such precluding the possibility to make causal assertions regarding the nature of the relationships observed (e.g., Allen et al. 2013). Casper et al. (2007) reported in their methodological review of work-family research published in industrial-organizational psychology and organizational behavior journals in the period 1980–2003, that nearly 90 % of the work family research was based on cross-sectional studies. Almost all of the reviews described, call in their suggested directions for future research for more longitudinal studies in the work-family research field. Longitudinal studies can provide insight into the time sequence between working time arrangements and the onset of work-family conflict and allow studying exposure before effect, and as such investigate the normal causal relation. Criteria for causal inference, such as those proposed by Hill (1965), can offer guidance. Among these, the temporality criterion, requiring that exposure must precede disease/outcome, is essential. The extent to which other criteria—such as minimal bias, strength of the association, consistency of findings with those from previous research, consistency of findings within a study, and dose-response relation—are satisfied can vary greatly from study to study (Checkoway et al. 2004). Thus, for example, an observed adverse effect of an occupational exposure that is unlikely to be an artifact of confounding or other biases may indeed be causal, regardless of the magnitude of the effect estimate. A statistically precise dose-response gradient and coherence with other research would add further support for a link. It is important to realize that a single epidemiologic study of occupational exposures, or other factors, can seldom provide a conclusive answer to the question of causation (Checkoway et al. 2004). All in all, causal inferences cannot be proven, but can be made plausible by ruling out alternative explanations (Zapf et al. 1996). Whereas cross-sectional designs are by no means capable of addressing the temporality criterion, longitudinal studies are. However, both cross-sectional and longitudinal studies can be limited when it comes to selection effects and the impact of changes in exposure taking place before or during the time of study.

2.5 Possibility of a Reciprocal Relation?

While many studies on the relationship between working time arrangements and work-family conflict have been cross-sectional in nature, or have mainly focused on the normal causal relationship, that is, the impact of working time arrangements in the onset of work-family conflict over time (e.g., Grice et al. 2008; Jansen et al. 2003a, 2004), the possibility of a potential reciprocal relation has been rather overlooked so far. That is, the reverse relationship, or the effects of work-family conflict on adjustments in working time arrangements, is less clear. Earlier studies showed that work-family conflict is related to intentions to turnover (e.g., Fuss et al. 2008; Grandey and Cropanzano 1999; Greenhaus et al. 1997, 2001), indicating that a common response to high work-family conflict may be a desire to flee the situation. Employees may seek alternative employment with companies that offer arrangements that are (more) supportive of a good work/non-work balance (Allen et al. 2000). On the other hand, it is also likely that employees encountering work-family conflict seek ways to adapt their current job or work situation to better reconcile work and family life. One way to adapt might be by adjusting their working time arrangements, since (a) the amount of time demanded by work and the pattern or timing of work within the day are among the most obvious ways in which work can affect family life, and (b) working time arrangements, in essence, can be subject to change when necessary or requested (Jansen et al. 2010). Although many studies have suggested a reciprocal relation, longitudinal studies addressing this suggested relation are lacking.

2.6 Requirements Data Infrastructure for Studying Reciprocal Relations

To explore the role of working time arrangements in the onset of work-family conflict as well as the notion of reciprocal determinism in the relationships between working time arrangements and work-family conflict adequately, several requirements concerning study design and study population should be fulfilled. First, a large and heterogeneous study population is required, because this allows studying the effects of various characteristics of working time arrangements, and would ensure variation in risk factors and outcomes. Second, a longitudinal design is necessary to gain insight in causal relations. It is likely that different components of working time arrangements show a different time course of cause and effect in relation to work-family conflict. Furthermore, one specific exposure measure may show different time courses of cause and effect as well, depending on the particular outcomes under study. This would require multiple repeated measurements of both exposure and outcome variables over time (Jansen 2003). Moreover, such data infrastructure should also carefully consider the thorough measurement of relevant confounders or mediating factors, which should be taken into account when

studying the relation between working time arrangements and work-family conflict. That is, specific working time arrangements, such as shift work or long working hours, are closely associated with other job characteristics (Albertsen et al. 2008). Long working hours for instance are often associated with high job demands, but at the same time with good possibilities for development, and high influence at work (Härmä 2006). Job demands also often differ between shift workers and day workers (e.g., Bøggild et al. 2001; Jansen et al. 2003b, c). Therefore, multivariable analyses controlling for other possible influential work and family factors are, in most cases, a necessary requirement (e.g., Albertsen et al. 2008). Furthermore, a prospective design enables examination of the impact of changes or transitions in working time arrangements on (changes in) work-family conflict, which is also an important prerequisite for examining causality. Finally, prospective studies also allow investigation of reciprocal relations, e.g., to explore the possibility that those employees struggling to combine work and family life may adjust their work schedules or working hours as a means to reduce work-family conflict (Jansen 2003). The ongoing prospective Maastricht Cohort Study (Kant et al. 2003) constitutes a well-suited data infrastructure to examine such reciprocal relations between working time arrangements and work-family conflict over time.

3 Maastricht Cohort Study

3.1 Background

During the nineties of the twentieth century there was frequent report of fatigue as a common health complaint among employees (Meijman and Schaufeli 1996, Mounstephen and Sharpe 1997). To study the different aspects of fatigue in relation to work, a national concerted research action on Fatigue at Work was set up by the Netherlands Organization for Scientific Research in 1995. As part of this concerted research action, Maastricht University conducted a large-scale prospective cohort study, the so-called Maastricht Cohort Study on 'fatigue at work' (MCS) (Kant et al. 2003). The primary aim of the MCS was to investigate the prevalence and incidence of prolonged fatigue in the work situation, and additionally to study risk factors in both onset and course of prolonged fatigue and the determinants for sickness absence and work disability. By now the MCS has added substantial scientific insight concerning the magnitude, diagnosis, etiology, prognosis, effects and treatment of fatigue among employees. These insights have been implemented in several randomized controlled trials, in order to come up with concrete preventive measures (e.g., Kant et al. 2008; Lexis et al. 2011). To date, many projects and studies, based on the MCS data, have demonstrated clear short-term and mid-term health effects of the psychosocial work environment. Given the high impact of the psychosocial work environment on health complaints, it can be expected however that the psychosocial work environment also plays an important

role in the etiology and course of long-term health outcomes. The extensive follow-up period of the MCS, from 1998 onwards, also facilitates such studies. As such, the MCS becomes exceedingly suitable for answering research questions related to factors affecting sustainable work across the whole work career.

Because of the wide diversity of working time arrangements, their important implications for health and wellbeing, as well as their potential for change, the subject of working time arrangements has received much attention already from the start of the MCS. As such, different projects, based on the MCS data infrastructure, have focused on the (reciprocal) relations between several aspects of working time arrangements, work-family conflict and health outcomes in particular.

3.2 Study Design and Population

In May 1998, a total of 26,978 employees from 45 different companies and organizations received a letter at home, inviting participation, and the self-administered baseline questionnaire. Included were men and women, aged 18–65 years, with a minimum employment of 16 h/week. Temporary workers were excluded from the study because they (may) change jobs frequently and because accurate data on sick leave and work disability would be difficult to obtain. Altogether, 12,161 employees completed and returned the baseline questionnaire (response rate 45 %). Twenty-one questionnaires were excluded from analysis due to technical reasons, resulting in a baseline population of 12,140 (73 % men and 27 % women), including 687 occupations and job titles. Overall, the study population is heterogeneous with respect to demographics, health status, domestic and social factors, and work related factors (Kant et al. 2003; Mohren et al. 2007). Employees received the self-administered questionnaires every four months in the period 1998–2001. Once a year employees received an extensive questionnaire with items on work-related factors, demographics, non-work-related factors and health factors. Twice a year employees received a short questionnaire, capturing mainly (health-related) outcome measures. From 2001 onwards, the participants were followed at irregular time intervals, that is, in 2002, 2008, 2012, and 2014.

3.3 Assessments

A broad range of exposure and outcome variables, amongst others in the domains of the (psychosocial) work environment, mental and physical health, demographic factors and characteristics of the private situation are measured on an individual level by means of self-administered questionnaires. Additional data on sick leave and work disability were gathered by record linkages to company sick leave and work disability registry systems; data on organizational characteristics were obtained by questionnaires and by interviews with a company's personnel manager

(Kant et al. 2003). Further, information about vital status during follow-up is determined through record linkage between the MCS study population and the Dutch Municipal Population Registries. For deceased workers the underlying cause of death can be obtained through record linkage with data on cause-specific mortality from Statistics Netherlands.

3.3.1 Assessment of Working Time Arrangements

The questionnaires of the MCS capture a wide range of items on working time arrangements, where we distinguished between characteristics of work schedules and working hours. As regards work schedules, employees first provided information about their work schedule (day work vs. shift work). As regards shift work types employees could indicate whether they were involved in two-, three-, four-, five- or irregular shift work, or whether they exclusively worked during evenings or nights. As an example, three-shift work, also referred to as 3 × 8 semi-continuous shift work, involves a 24 h production Monday through Friday done by three teams of employees, generally working 8 h shifts (Van Amelsvoort et al. 2006). In three-shift work, teams are switched as a rule every week. Five-shift work involves full continuous shift work, spread over seven days including five alternating teams, generally working 8 h shifts. Employees working irregular shifts are involved in frequently deviating working hours, which can vary substantially every week. As regards working hours, employees were asked for their working hours/week, frequent overtime work, number of overtime hours a week, compensation of overtime, familiarity with work roster one month in advance, the ability to take a day off when wanted, whether employees had changed their working hours during the past year and whether or not this change was at own request. Flexible working hours, defined as flexible start and ending times of the working day, were also inventoried. Finally, commuting time to work was queried.

3.3.2 Assessment of Work-Family Conflict

In the baseline questionnaire of the MCS (May 1998) and in the follow-up waves until May 2000 work-family conflict was assessed with the following yes/no item: 'Are you able to adequately combine work and family life?' The convergent validity of this measure was tested by comparison with a shortened 11-item version of the Survey Work-home Interaction Nijmegen (SWING) (Geurts et al. 2005; Van der Hulst and Geurts 2001; Wagena and Geurts 2000), which was included in the cohort questionnaires as of follow-up wave May 2000. The Cochran-Armitage test for trend revealed that our general one-item measure of work-family conflict showed a significant trend ($p < 0.001$) with all items of the SWING, indicating that our operationalization was sufficiently broad to represent an overall measure of work-family conflict. The SWING is a questionnaire designed to measure directions and domains of work-family conflict. To assess the direction of conflict from work

to family, that is, work-home interference, we used the shortened version (Cronbach's alpha 0.81) of the scale work-home interference from the SWING. An example item is 'How often do your working hours cause difficulties in meeting the demands at home?' All six items were scored on a four-point scale ranging from 'seldom or never' to 'very often'. The total score on the scale work-home interference ranged from 6 to 24. To date there are no existing cutoff points for classifying employees with marked work-home interference as measured with the SWING. Therefore, when applicable, the upper tertile of the scale (total score ≥11) was used to define a contrast between employees with high versus low-medium work-home interference.

With regard to the MCS findings on work-family conflict described in the upcoming paragraphs, the term work-family conflict will be used to indicate general conflict between work and family where the directions of conflict are not separated. The term work-home interference will be used to refer to the direction of interference from work to home.

3.4 The Role of Working Time Arrangements in the Onset of Work-Family Conflict: Findings in the MCS

Several studies of the MCS were designed to expand the understanding of the role of working time arrangements in the onset of work-family conflict. Drawing on COR theory, we hypothesized that demanding characteristics of working time arrangements, such as shift work or overtime work, would be risk factors in the onset of work-family conflict over time, whereas supportive or facilitating elements, such as flexible working hours or the ability to take a day off when wanted, would be protective against work-family conflict.

3.4.1 The Role of Work Schedules

Because shift work involves working and living patterns diverging from community rhythms of social, recreational and domestic activities (Loudoun and Bohle 1997; Walker 1985), conflict between work and family would be more likely to arise among shift workers as compared to day workers. We observed that men involved in shift work (without distinguishing between specific shift types) had a significantly higher risk of developing work-family conflict after one year follow-up as compared to male day workers (RR 1.80, 95 %CI 1.32–2.46), after adjusting for age, presence of a long-term illness and educational level. For women the association between shift work and work-family conflict over one year follow-up just failed to reach statistical significance (RR 2.15, 95 %CI 0.99–4.68) (Jansen et al. 2003a).

In another study from the MCS the focus of outcome was exclusively on the direction of conflict from work to family, that is, work-home interference (Jansen

et al. 2004). First, cross-sectional analyses were conducted to compare work-home interference among shift workers versus day workers. In this particular study the term shift work captured three-shift, four-shift, five-shift and irregular shift work; all including frequent night work. Logistic regression analyses showed that shift work was associated with higher work-home interference in men (OR 2.44, 95 %CI 1.98–3.00) and women (OR 2.14, 95 %CI 1.30–3.51) as compared to day work, adjusted for age, presence of a long-term illness, educational level, psychological job demands, decision latitude, emotional and physical demands, dependent children and housekeeping responsibility. Second, Poisson regression analyses were conducted over eight months of follow-up. Similar findings were found in these analyses (n = 5308) where shift work was associated with somewhat higher work-home interference after eight months follow-up, even when additionally adjusted for baseline work-home interference levels (Jansen et al. 2004). While in these studies a rather broad definition of shift work was used, it should be noted that specific shift work types, or shift schedule characteristics might be particularly associated with difficulties in combining work and family life.

In another MCS study the focus was on the impact of the direction of shift rotation among three-shift workers in relation to work-family conflict (Van Amelsvoort et al. 2004). In this study a subsample of the MCS was selected, including 95 forward rotating three-shift workers and 681 three-shift workers involved in backward rotation. To study the prospective relationship between direction of rotation and work-family conflict data available over 32 months of follow-up were used. The backward rotating three-shift system was associated with a substantially higher risk of work-family conflict during the total observation period. Generally, backward rotating schedules provide employees with a longer span of free time at the end of a complete shift cycle, but allow for less time for rest and sleep between two consecutive blocks of shifts than forward rotation shift schedules do. Nevertheless, a considerable part of the working population continues to work in backward rotating schedules. An important argument often encountered by shift workers is that a backward rotation schedule gives longer coherent periods of time off than a forward rotation schedule, where the free time 'disappears' during the regular work day (Kristensen 2000). Therefore, one might perhaps expect employees in a forward rotation schedule to report more work-family conflict. In contrast, however, we found that the forward rotating workers reported less work-family conflict. Apparently, the 'disappearing' time between consecutive shifts might be valuable for fine-tuning work and family obligations. This study provides additional evidence that optimization of the shift schedule, in terms of direction of shift rotation, might be valuable to decrease the adverse impact of shift work (Van Amelsvoort et al. 2004).

3.4.2 The Role of Working Hours

To investigate the role of working hours in relation to work-home interference, we included day workers only (Jansen et al. 2004). For men, we distinguished fulltime (≥36 h/week) from part-time work (<36 h/week), whereas in women the numbers

allowed to distinguish fulltime workers from low (≤25 h/week) and high part-time workers (26–35 h/week). In men, fulltime work, as compared with part-time work, was not associated with higher work-home interference. In women, a low part-time job protected against work-home interference, whereas a high part-time job was not associated with lower work-home interference compared with fulltime work. Table 1 shows cross-sectional associations between characteristics of working hours and work-home interference for fulltime and part-time workers separately, and stratified for men and women. In male fulltimers, frequent overtime work, number of overtime hours, and an increase of working hours during the past year were associated with more work-home interference, whereas compensation for overtime work, flexible working hours, familiarity with the work roster in advance and the ability to take a day off were associated with less work-home interference. In general, the associations between working hours characteristics and work-home interference were less strong among male part-timers, probably partly due to the smaller numbers of part-time working men. Cross-sectional associations between characteristics of working hours and work-home interference among women revealed that in both fulltime and low part-time workers, overtime work was associated with more work-home interference. The number of overtime hours was associated with more work-home interference and familiarity with the work roster in advance with less work-home interference for high part-time workers. A decrease in working hours was associated with more work-home interference in fulltime workers. High commuting time to work was associated with more work-home interference for low part-time workers (Jansen et al. 2004).

Poisson regression analysis was conducted to study the prospective relationship between (characteristics of) working hours and the continuous score of work-home interference after eight months of follow-up in day workers (Table 2). Fulltime work was associated with higher work-home interference after eight months of follow-up as compared to part-time work. Additional adjustments for baseline work-home interference levels revealed less strong associations. For fulltime workers specifically, all distinguished characteristics of working hours, except for flexible working hours and an increase in working hours at the worker's own request, were associated with work-home interference. Both an increase and decrease of working hours during the past year were related to higher work-home interference among fulltime workers in these prospective analyses. Possible explanations could be that the employees who changed their working hours had not yet adapted to their new working hours, or that the change in working hours was still not enough to adequately combine work and family life. Furthermore, it may be possible that the private situation has become more demanding for employees who had started working fewer hours during the past year. When we specifically studied whether or not the change in hours was the worker's own choice, it was found that working fewer hours at one's own request during the past year was prospectively related to less work-home interference among fulltime workers. When additional adjustments for baseline work-home interference levels were made, the associations generally were less strong. In part-time workers, frequent overtime work and high commuting time to work at baseline were associated with more work-home

Table 1 Cross-sectional associations between working hours and work-home interference (upper tertile) in fulltime and part-time working men and women in day work (adapted from Jansen et al. (2004))

	Men		Women		
	Fulltime work (≥36 h/week) (n = 3402)	Part-time work (<36 h/week) (n = 204)	Fulltime work (≥36 h/week) (n = 494)	High part-time work (26–35 h/week) (n = 286)	Low part-time work (≤25 h/week) (n = 559)
	OR[a] (95 % CI)	OR[a] (95 % CI)	OR[a] (95 % CI)	OR[a] (95 % CI)	OR[a] (95 % CI)
Frequent overtime work					
Yes	2.99 (2.48–3.60)	2.36 (0.99–5.60)	1.89 (1.12–3.19)	1.72 (0.88–3.35)	1.96 (1.16–3.33)
No	1	1	1	1	1
Hours of overtime work a week					
<5	1	1	1	1	1
≥5	2.17 (1.73–2.71)	0.52 (0.06–4.67)	1.78 (0.88–3.60)	4.30 (1.34–13.84)	2.27 (0.72–7.12)
Compensation for overtime hours					
Time	0.57 (0.38–0.85)	0.46 (0.07–3.12)	0.75 (0.29–1.91)	0.35 (0.10–1.23)	1.28 (0.40–4.13)
Time and/or money	0.70 (0.50–0.97)	0.11 (0.05–2.46)	0.92 (0.31–2.74)	0.33 (0.05–2.04)	0.42 (0.10–1.69)
Money	0.46 (0.27–0.77)	[b]	2.42 (0.44–13.26)	0.40 (0.04–4.56)	1.67 (0.32–8.70)
No	1	1	1	1	1
Flexible working hours					
Yes	0.82 (0.68–0.98)	1.06 (0.67–1.67)	1.40 (0.97–2.03)	0.63 (0.34–1.19)	0.97 (0.64–1.47)
No	1	1	1	1	1
Work roster known 1 month in advance					
Yes	0.62 (0.51–0.76)	0.61 (0.22–1.73)	0.54 (0.26–1.14)	0.43 (0.19–0.99)	0.71 (0.32–1.59)
No	1	1	1	1	1
Able to take a day off when wanted					
Yes	0.45 (0.35–0.58)	0.97 (0.33–2.82)	0.85 (0.47–1.54)	0.51 (0.24–1.08)	0.84 (0.47–1.49)
No	1	1	1	1	1
Decrease in working hours					
Yes	1.12 (0.68–1.83)	0.38 (0.13–1.14)	4.92 (1.40–17.23)	0.99 (0.44–2.25)	0.59 (0.24–1.45)
No	1	1	1	1	1

(continued)

Table 1 (continued)

	Men		Women		
	Fulltime work (≥36 h/week) (n = 3402)	Part-time work (<36 h/week) (n = 204)	Fulltime work (≥36 h/week) (n = 494)	High part-time work (26–35 h/week) (n = 286)	Low part-time work (≤25 h/week) (n = 559)
	OR[a] (95 % CI)	OR[a] (95 % CI)	OR[a] (95 % CI)	OR[a] (95 % CI)	OR[a] (95 % CI)
Increase in working hours					
Yes	2.17 (1.66–2.82)	2.25 (0.40–12.65)	1.52 (0.75–3.06)	1.04 (0.44–2.45)	1.30 (0.61–2.77)
No	1	1	1	1	1
Commuting time to work					
<30 min	1	1	1	1	1
≥30 min	1.00 (0.84–1.19)	1.16 (0.51–2.64)	1.38 (0.83–2.31)	1.23 (0.61–2.46)	2.83 (1.54–5.20)

[a]Adjusted for age, presence of a long-term illness, educational level, psychological job demands, decision latitude, emotional and physical demands, having dependent children and responsibility for housekeeping
[b]Data not available, because the sample size was too small

interference after eight months of follow-up, whereas compensation of overtime, flexible working hours and the ability to take a day off when wanted, were associated with less work-home interference. After additionally adjusting for baseline work-home interference levels, overtime work was still associated with more work-home interference, whereas the ability to take a day off when wanted and increased working hours per week during the past year were associated with less work-home interference (Jansen et al. 2004). As described, overtime work was prospectively related to higher work-home interference. Prolongation of the work day could, in line with the COR theory, deplete time and/or energy resources available for family activities, which was also shown in the cross-sectional analyses, where particularly for women with a low part-time job, overtime work and high commuting time fostered work-home interference. Possibly, these women had already anticipated work-home interference and selected part-time work as an option to reduce it. Due to the prolonged working day, their carefully selected fit between work and family was compromised and work-home interference became more likely to develop. The opportunity to take a day off when wanted, indicating autonomy or control over working hours, could provide employees with better possibilities to combine work and family life and was found to be protective against work-home interference. Flexible working hours were not consistently associated with less work-home interference. In a study by Smith Major et al. (2002), the relation between long work hours and time-based work interference with family was not moderated by schedule flexibility as well. One explanation could be that flexible working hours do not provide a solution for employees with structural time conflicts between work and family, because the actual hours that need to be spend at work still remain similar. Flexible hours may provide a solution when employees encounter occasional time conflict situations however (Jansen et al. 2004).

Table 2 Working hours as risk factors for work-home interference (continuous score) after eight months of follow-up in day workers (adapted from Jansen et al. (2004))

	Day work (n = 4336)					
	Model 1[a]			Model 2[b]		
	β	SE	P value	β	SE	P value
Fulltime versus part-time work	0.059	0.015	<0.0001	0.015	0.011	0.180
	Fulltime work (≥36 h/week) (n = 3422)					
	Model 1[a]			Model 2[b]		
	β	SE	P value	β	SE	P value
Frequent overtime work	0.126	0.011	<0.0001	0.039	0.009	<0.0001
≥5 h of overtime work a week	0.030	0.009	0.001	0.004	0.008	0.641
Overtime hours compensated	−0.064	0.018	<0.0001	−0.017	0.014	0.247
Flexible working hours	−0.001	0.009	0.939	0.006	0.007	0.438
Work roster known 1 month in advance	−0.059	0.013	<0.0001	−0.009	0.010	0.374
Able to take a day off when wanted	−0.068	0.015	<0.0001	−0.012	0.012	0.313
Decrease in working hours	0.067	0.029	0.022	0.046	0.023	0.047
Decrease in working hours at own request	−0.152	0.073	0.038	−0.062	0.063	0.320
Increase in working hours	0.083	0.016	<0.0001	0.018	0.012	0.145
Increase in working hours at own request	−0.012	0.037	0.751	0.013	0.029	0.668
≥30 min commuting time to work	0.033	0.010	0.001	0.011	0.008	0.178
	Part-time work (<36 h/week) (n = 914)					
	Model 1[a]			Model 2[b]		
	β	SE	P value	β	SE	P value
Frequent overtime work	0.140	0.021	<0.0001	0.071	0.017	<0.0001
≥5 h of overtime work a week	0.067	0.041	0.100	0.014	0.034	0.688
Overtime hours compensated	−0.088	0.042	0.035	−0.037	0.035	0.287
Flexible working hours	−0.030	0.015	0.047	−0.020	0.012	0.088
Work roster known 1 month in advance	−0.049	0.027	0.075	0.009	0.022	0.676
Able to take a day off when wanted	−0.095	0.024	<0.0001	−0.040	0.019	0.033
Decrease in working hours	−0.004	0.028	0.889	0.009	0.022	0.676
Decrease in working hours at own request	−0.077	0.105	0.460	−0.160	0.097	0.099
Increase in working hours	−0.001	0.032	0.973	−0.056	0.025	0.027

(continued)

Table 2 (continued)

	Day work (n = 4336)					
Increase in working hours at own request	−0.047	0.073	0.518	0.006	0.065	0.924
≥30 min commuting time to work	0.064	0.023	0.005	0.019	0.018	0.301

[a]Adjusted for gender, age, presence of a long-term illness, educational level, psychological job demands, decision latitude, emotional and physical demands, responsibility for housekeeping and having dependent children

[b]Additionally adjusted for continuous baseline work-home interference levels

From these studies it can be concluded that working time arrangements may have both beneficial and adverse effects on work-family conflict and/or work-home interference under specific conditions. Demanding aspects of working time arrangements, such as for example overtime work and shift work, went together with higher conflict, whereas characteristics of working time arrangements reflecting control and predictability were protective against work-home interference (Jansen et al. 2004).

3.5 Reversed Relation Between Work-Family Conflict and Working Time Arrangements: Findings in the MCS

Apart from studying the normal causal relation regarding the impact of working time arrangements in the etiology of work-family conflict, in the MCS the reverse relation was also investigated, to find out whether employees struggling to combine work and family life have a higher probability of adjusting their working time arrangements over time. When considering adjustments of working time arrangements as a means to solve or mitigate work-family conflict, the distinction between work schedules and working hours is relevant again. A switch from shift work to day work may be more difficult to realize in daily practice, will probably take a longer period of time, and may also have more financial consequences compared to adjustments in the number of working hours/day or week or quitting overtime work. Additionally, when studying the impact of work-family conflict on adjustments in working time arrangements, gender differences should also be taken into account, because of reported differences between men and women in the prevalence, onset, and consequences of work-family conflict (e.g., Frone et al. 1992b; Jansen et al. 2003a), as well as different choices between men and women with respect to working hours and schedules (Bielenski et al. 2002; Corral and Isusi 2005; Leufkens 2009; Siermann 2009). For example, while the proportion of couples with two partners having a paid job increased from 46 % in 1992 to 66 % in 2007 in the Netherlands, it is noteworthy that in 92 % of dual-income couples, the male partner was working fulltime and the female partner part-time (Leufkens 2009). Based on

data of the MCS, we found that high work-home interference among day workers was associated with an increased probability of changing working hours over eight months of follow-up (Jansen et al. 2004). In these analyses, however, no further specification as to the direction of this change in hours could be made. Furthermore, we observed among three-shift workers that work-family conflict was associated with an increased risk of leaving the shift work job over time (Van Amelsvoort et al. 2004). While we had, therefore, already found indications for the existence of a reverse relation between working time arrangements and work-family conflict, insight into the exact time frame when these adaptations occur and what specific components of working time arrangements are being adapted, in particular, were areas that needed further clarification.

3.5.1 Adaptation of Work Schedules

In a separate study of the MCS, multivariable survival analyses using Cox regression analyses were performed to study the effects of work-family conflict on changes in work schedules and working hours (Jansen et al. 2010). For these analyses, the reference group consisted of employees not being a 'case' of work-family conflict at baseline (May 1998). To assess the effect of work-family conflict on changes in work schedules (analyses conducted among males only), we modelled the time from shift work at baseline to a switch to day work over a total period of 32 months follow-up. Table 3 shows that work-family conflict was associated with a significantly increased risk of changing from shift work to day work over 32 months follow-up in male three-shift workers, but that work-family conflict was not significantly associated with a higher risk of changing from shift to day work in five-shift workers and irregular shift workers, after adjusting for age, educational level, and the presence of a long-term illness (Jansen et al. 2010). One explanation for the higher probability of changing from shift to day work especially among three-shift workers, might be that three-shift work in our study is generally characterized by a slower speed of shift rotation, more frequently a backward as

Table 3 Work-family conflict as a predictor of a change from shift work to day work over 32 months follow-up among men (adapted from Jansen et al. (2010))

		n	Change from shift work to day work RR[a] (95 % CI)
Work-family conflict among three-shift workers	Yes	242	1.77 (1.19–2.63)
	No	485	1
Work-family conflict among five-shift workers	Yes	149	1.32 (0.78–2.24)
	No	783	1
Work-family conflict among irregular shift workers	Yes	77	0.81 (0.50–1.31)
	No	374	1

[a]adjusted for age, educational level, and presence of a long-term illness

opposed to a forward rotating shift schedule (Van Amelsvoort et al. 2004), and greater working hours/week than five-shift work or irregular shift work, factors that in addition to difficulties in combining work and family life may further increase the probability to decide to leave shift work.

3.5.2 Adaptation of Working Hours

To examine whether work-family conflict predicted a reduction of working hours, analyses were conducted among day workers only, with stratification for gender and working hours. As shown in Table 4, work-family conflict among female fulltime workers was associated with an almost three-fold higher risk of reducing working hours over one-year of follow-up, but was not significantly associated with reducing work hours in fulltime working men, after adjusting for age, educational level, and the presence of a long-term illness. In part-time workers, work-family conflict was associated with a significantly increased risk of reducing working hours over one-year follow-up, both in women and men, even after adjusting for age, educational level, and the presence of a long-term illness. Possibly, for some part-time workers the already realized fewer working hours earlier proved insufficient to better combine work and family life, resulting in a higher probability of further reductions in working hours. Although the number of men working part-time was rather small, and, therefore, these findings should be interpreted with

Table 4 Work-family conflict as a predictor of a reduction in working hours over one and two year follow-up, according to fulltime and part-time employment in day workers (adapted from Jansen et al. (2010))

	n	Reduction in working hours over one year follow-up	Reduction in working hours over two year follow-up
		RR[a] (95 % CI)	RR[a] (95 % CI)
Fulltime workers (≥36 h/week)			
Work-family conflict among men			
Yes	434	1.34 (0.81–2.22)	1.53 (1.05–2.21)
No	4572	1	1
Work-family conflict among women			
Yes	82	2.80 (1.42–5.54)	2.13 (1.24–3.66)
No	721	1	1
Part-time workers (<36 h/week)			
Work-family conflict among men			
Yes	15	4.03 (1.28–12.68)	4.54 (1.64–12.56)
No	238	1	1
Work-family conflict among women			
Yes	73	1.99 (1.04–3.82)	1.68 (0.95–2.97)
No	1061	1	1

[a]adjusted for age, educational level, and presence of a long-term illness

caution, results were striking. While adjustments were made for age, educational level and the presence of a long-term illness, alternative reasons, other than work-family conflict, for this increased probability of further reductions in working hours cannot be ruled out (Jansen et al. 2010).

It appeared valuable to examine different time lags with respect to adjustments in working hours among day workers as a consequence of work-family conflict, because, then, further differential effects emerged regarding the role of gender. Whereas the effects of work-family conflict on a reduction of working hours were substantial and significant among women when a one-year follow-up was considered, effects decreased after two years of follow-up, but, nonetheless, remained significant. For men a different picture appeared. While among male fulltime workers, work-family conflict was not associated with reducing working hours over one year of follow-up, significant effects appeared when a two-year follow-up period was considered. These findings indicate that generally women, compared to men, appeared to adjust their working hours faster as a consequence of work-family conflict (Jansen et al. 2010).

Apart from differential time lags in which adaptations in working hours are being made, gender differences also emerged when the magnitude of the reduction in working hours was investigated. That is, besides effects of work-family conflict on a general reduction in working hours, we also examined whether work-family conflict predicted a change specifically from fulltime (≥36 h/week) to part-time (<36 h/week) work at one year follow-up. These analyses demonstrated that work-family conflict among fulltime day workers predicted a change to part-time work between article baseline and one year follow-up in women, but not in men, after correction for age, educational level, and the presence of a long-term illness. When a two-year follow-up period was considered, effects decreased among women and remained non-significant in men, after correction for age, educational level, and the presence of a long-term illness. These findings indicate that besides reducing working hours faster as a consequence of conflict between work and family life, the magnitude of the adjustment is also larger among women than men (Jansen et al. 2010). Naturally, within couples, decisions on the hours that might be worked are not usually taken by individuals in isolation but rather in the context of households as a whole (Bielenski et al. 2002), and employees' decisions towards labor participation depend on the division of roles among the members of the household. Since in nearly all EU countries women still take up the main share of unpaid household, family work and child care (Bielenski et al. 2002; Corral and Isusi 2005), the prevalence of women in part-time jobs is high. It may be hypothesized that for example in a dual-income couple dealing with work-family conflict, the female partner will reduce working hours first as a means to better reconcile work and family life. If this adaptation, however, over time appears to be insufficient to better balance work and family life, the male partner might consider adjusting working hours thereafter. Hence, examining adjustments in working time arrangements among couples rather than in individuals may be an interesting avenue for further research to gain a better understanding of gender differences in the relationship between work-family conflict and working time arrangements.

These studies provide evidence for a longitudinal relation between work-family conflict and subsequent changes in working time arrangements, indicating that employees try to adapt to work-family conflict by switching from shift to day work, and by reducing working hours over time. As such, these studies clearly illustrate important secondary selection processes taking place both in shift and day workers (Jansen et al. 2010). While work-family conflict has in earlier studies been shown to be a risk factor for adverse outcomes, for example, related to poorer health or increased sick leave (e.g., Allen et al. 2000; Jansen et al. 2003a, 2006, Lidwall et al. 2010), these studies add that work-family conflict moreover has significant implications for labor participation, in terms of adjustments of working time arrangements over time.

4 Implications for Research and Practice

Based on data from the ongoing MCS, the role of various characteristics of working time arrangements was investigated in several longitudinal studies, demonstrating a clear reciprocal relation, indicating that working time arrangements play a significant role both in the etiology and in the consequences of conflict between work and family life over time, with relevant differences in these relations for men and women.

Several methodological and conceptual issues should be addressed. A first issue concerns the measurement time lag. The ideal time lag for longitudinal research on reciprocal relations between working time arrangements and work-family conflict remains elusive to date. In theory, if the time lag is too short, meaningful outcomes may not have sufficiently unfolded yet. On the other hand, an excessively long time lag may provide more opportunities for adaptations that could negate an anticipated reversed effect (Tang 2014). In the study on the role of working time arrangements in the etiology of work-home interference we used an eight-month follow-up period. Although working time arrangements were clear risk factors for work-home interference after eight months of follow-up, it is likely, however, that different aspects of working time arrangements, such as shift work or overtime work, may have a different time course of cause and effect. For future studies it is valuable to explore different time lags in studies on the impact of working time arrangements in the onset of work-family conflict. When we focused on the reciprocal relation between working time arrangements and work-family conflict, we did explore multiple time lags though and various follow-up periods were explored to obtain more insight into the time period when adaptations occur. When employees consider adjusting their working times to resolve conflict between work and family life, the exploration of different time lags becomes very relevant. That is, a switch from shift to day work may be more difficult to realize in daily practice, will probably take a longer period of time, and may also have more financial consequences compared to a reduction of working hours or quitting overtime work as a means to resolve work-family conflict. Our results suggest that the time lag when adaptations

of working time arrangements are realized sometimes may be rather long and that this time lag appears different when considering the various components of working time arrangements and when considering the role of gender. These findings should be taken into account when designing future prospective studies on consequences of work-family conflict (Jansen et al. 2010). Closely related to the time lag is the time window at which workers are being studied, for example at what point during their career. For example, the average age of the employees in the MCS at baseline measurement in 1998 was 41 years. As such they were already in the middle of an ongoing process both with regard to working time arrangements and combining work and family. In that respect, the term baseline is not a true reference condition, because employees experiencing work-family conflict may have already chosen day work instead of shift work, or part-time work and less overtime work, as an option to reduce work-family conflict. The reciprocal effects between work-family conflict and working time arrangements clearly pointed in this direction. Consequently, a selection bias may have taken place before our baseline measurement and/or during follow-up, reducing all observed associations. Another issue to consider concerns the definitions and operationalizations used to assess work-family conflict and working time arrangements. In the MCS different operationalizations for work-family conflict were used. While in several studies we could rely on the SWING questionnaire to distinguish between the directions of conflict from work to family and vice versa, and incorporate dimensions of time and energy conflict consistent with COR theory, in other studies, however, work-family conflict was measured by only one item asking employees whether they were able to adequately combine work and family life. One-item measures may raise concern about likelier lower reliability and validity, and should be kept in mind when interpreting the results. However, since this measure of work-family conflict showed a significant trend with all items of the shortened SWING (Geurts et al. 2005) on directions and domains of work-family conflict, we assume that our item was sufficiently broad to represent an overall measure of work-family conflict (Jansen et al. 2003a). For future studies it may be valuable to explore the duration, severity, and source of work-family conflict in more detail for understanding its impact further. As regards working time arrangements a broad range of different characteristics were distinguished related to both work schedules and working hours. This distinction was of high relevance because it revealed important differences between specific work-time components in the reciprocal relation with work-family conflict. In recent years, more and more innovative working time arrangements have been introduced, including various types of flexible work arrangements (e.g., Allen et al. 2013; Higgins et al. 2014) such as teleworking, compressed work weeks etcetera. Longitudinal studies are needed to untangle cause-effect relationships between these relatively new flexible work arrangements policies and work-family conflict. Further, although the assessment of working time arrangements can be considered as fairly objective, it should be noted that in the studies on working time arrangements and work-family conflict we used self-reported data only. As such, common method variance, which reflects a systematic method error due to the use of a single rater or single source (Rindfleisch et al. 2008), may have caused an

overestimation of the strength of the observed associations between working time arrangements and work-family conflict. However, this would particularly apply to the cross-sectional analyses, and probably be somewhat less of a problem in the longitudinal analyses, since the time separation reduces the likelihood that the earlier responses and earlier moods will affect later responses (Rindfleisch et al. 2008). But as we cannot fully rule out this potential type of bias the use of multiple sources of data collection might be valuable to further extend this area of research. Another issue to be addressed concerns adjustment for other factors from, for example, the domains of work, health, or personal situation, in studies on working time arrangements and work-family conflict (e.g., Byron 2005; Jansen et al. 2003a, 2004). Factors known to play a role in the etiology of work-family conflict should definitely be taken into account when studying the specific role of working time arrangements in the onset of work-family conflict. However, when studying the reciprocal relation, investigating the impact of work-family conflict on adjustments in working time arrangements, one should be cautious when considering correcting for these factors. Adjusting for these factors would actually mean a correction for the causes or origin of work-family conflict, and, hence, inappropriate for studying consequences of work-family conflict. We therefore sometimes refrained from adjustment or limited adjustments in our studies on the reciprocal relation to age, educational level, and long-term illness. Future studies should reveal which factors play a prominent role in the impact of work-family conflict on changes in working time arrangements that should be taken into account.

Taken together, what do the findings from the MCS contribute to the knowledge and insight into the relation between working time arrangements and work-family conflict? While the majority of studies in this field have relied on cross-sectional designs, investigations on the normal causal relation and the reverse relation have been overlooked so far. The MCS demonstrated however, through applying longitudinal designs, clear reciprocal relations between working time arrangements and work-family conflict over time. While causal inferences cannot (or hardly) be proven (Rothman and Greenland 2005; Zapf et al. 1996), and much debate is ongoing on the (use of) criteria for causality, overall agreement does exist as to the essential prerequisite of temporality. Temporality refers to the necessity for a cause to precede an effect in time. The temporality criterion is inarguable, insofar as any claimed observation of causation must involve the putative cause C preceding the putative effect D (Rothman and Greenland 2005). Our studies met this temporality criterion since they have shown that specific characteristics of working time arrangements proved to be risk factors in the onset of work-family conflict over time, as we excluded prevalent cases of work-family conflict at baseline measurement where possible. Moreover, temporality was also demonstrated in the reciprocal relation, showing that those people struggling to combine work and family life had a higher probability to adjust their work schedules and/or working hours over time compared to those not reporting conflict between work and family life (Jansen et al. 2010; Van Amelsvoort et al. 2004). Furthermore, in these studies various time lags were explored, with relevant differences in time course of cause and effect between men and women for example. Consistency of these reciprocal

relations should be examined in upcoming studies, to explore whether the associations are also observed in different populations and under different circumstances. While our studies had a prospective design, e.g., to investigate the effect of work-family conflict on changes in working time arrangements, a further advancement would be to examine a change in exposure before the actual change in outcome. As regards the reversed relation, this for example implies that a change in work-family conflict should be assessed before the change in working time arrangements. This point is particularly relevant in studies, like the current one, where employees generally have already been in the labor market for quite some years and hence in the middle of an ongoing process both with regard to choices in working time arrangements and combining work and family life. Moreover, whereas thus far the focus within a single study has primarily been on one particular direction of the relation, e.g. the impact of working hours in the onset of work-family conflict over time, ideally the dynamics of the full reciprocal relation covering both directions over time should be incorporated altogether in one study, by combining multiple waves of data over an even longer time span. That is, by studying these dynamics, e.g. investigating the role of working hours in the onset of work-family conflict as well as potential subsequent adaptations of working hours over time as a consequence of work-family conflict, a more comprehensive insight would be obtained. Such longitudinal observational studies, investigating both changes in exposure before changes in outcome and the dynamics between these concepts over time, as well as (natural) experiments, will reveal further details of the causal mechanism and the confounding or mediating factors involved. This knowledge should be gathered first, before effective interventions can be developed and implemented, because they require a full understanding of the multifactorial etiology of work-family conflict and its consequences.

As regards generalizability of the findings, it should be mentioned that findings on associations between working time arrangements and work-family conflict generally are highly context dependent. For example, research has mostly focused on factors in the environment of the person, such as work and home characteristics and only rarely where they joined with other factors, such as roles and cultural contexts (Putnik et al. 2016). The work-home interface is affected by social roles and perception of roles. For instance, the way men and women combine work and home roles may differ depending on their gender role ideologies and their beliefs and norms of appropriate division of work and home tasks (Galovan et al. 2010). Qualitative research has supported this statement, showing that men and women's gender identities can differently impact the combination of work and home duties (Emslie and Hunt 2009). Our findings on changes in working hours should probably also be seen within the context of the Dutch setting, with its one and a half earner model, where in the vast majority of dual-income couples, the male partner works fulltime and the female partner part-time (Leufkens 2009). Moreover, the possibilities to adapt working time arrangements, e.g., start working part-time, are dependent on the job (characteristics) and organizational context. Moreover, these possibilities further depend on the economic situation, financial aspects and the social security system within a country or context. Compared to other European

countries, Dutch women are less inclined to put out a great part of childcare to someone outside of the household and as a consequence, their situation on the labor market is usually adapted to the situation at home (Fokkema 2002). Indeed, we observed that fulltime working women with high work-home interference had a substantially higher probability of changing their working hours over time, compared to those reporting lower work-home interference. For men, similar findings were observed, although the associations were less strong. This secondary selection, where employees have already adapted e.g., their working time arrangements to facilitate combining work and family life, could also be an explanation for the lower proportion of women reporting work-family conflict in the MCS, because it could be argued that this selection might be stronger among women, since women have culturally accepted ways of coping with work-family conflict, for example by working part-time as an option that permits more time for their families.

To conclude, while conflict between work and family is undesirable in itself, studies have also shown that work-family conflict is also a risk factor for other adverse outcomes, for example related to poorer health or increased sick leave (e.g., Jansen et al. 2003a, 2006; Lidwall et al. 2010). Moreover, relevant reciprocal relations between working time arrangements and work-family conflict have been demonstrated, indicating that important secondary selection processes may take place, in terms of reductions in working hours, and transitions with respect to work schedule. For the employee this may be an intended choice, or may be driven by necessity. For the employer or at a society level this process may have substantial and unintended consequences with respect to labor participation, where downshifting and increased mobility or even early exit from the labor force may ensue. When considering the high prevalence of specific working time characteristics, e.g., shift work, and the high prevalence of work-family conflict, as well as the observed effect sizes, the consequences of work-family conflict over time are high beyond expectation and warrant primary prevention of work-family conflict. Since components of working time arrangements have in earlier studies been shown to be clear risk factors in the etiology of work-family conflict and are in essence dynamic and modifiable factors, that can be subject to change when necessary or requested, they may be among the most concrete starting points for actual prevention of conflict between work and family life (Jansen et al. 2010). While the effectiveness of these factors remains to be demonstrated through (natural) experiments first, examples with respect to the role of working hours as preventive measures might include the limitation of overtime work, compensation of overtime work, increasing the control over working hours, by providing employees the opportunity to take a day off when necessary and also by increasing the predictability of working hours, by informing employees about the work roster at an early stage, by providing flexible start and ending times, and/or the ability to reduce the amount of working hours when necessary. However, it should also be kept in mind that the impact of these measures is very context sensitive and should be tailored for specific subgroups. That is the effectiveness, need or use of these measures may be different across the work career, may differ for men and women, is dependent on the specific occupation and or educational level, and as such require a tailored approach.

References

Adkins, C. L., & Premeaux, S. F. (2012). Spending time: The impact of hours worked on work-family conflict. *Journal of Vocational Behavior, 80*(2), 380–389.

Albertsen, K., Rafnsdóttir, G. L., Grimsmo, A., Tómasson, K., & Kauppinen, K. (2008). Workhours and worklife balance. *Scandinavian Journal of Work Environment and Health, 5*, 14–21.

Allen, T. D., Herst, D. E. L., Bruck, C. S., & Sutton, M. (2000). Consequences associated with work-to-family conflict: A review and agenda for future research. *Journal of Occupational Health Psychology, 5*(2), 278–308.

Allen, T. D., Johnson, R. C., Kiburz, K. M., & Shockley, K. M. (2013). Work-family conflict and flexible work arrangements: Deconstructing flexibility. *Personnel Psychology, 66*(2), 345–376.

Amstad, F. T., Meier, L. L., Fasel, U., Elfering, A., & Semmer, N. K. (2011). A meta-analysis of work-family conflict and various outcomes with a special emphasis on cross-domain versus matching-domain relations. *Journal of Occupational Health Psychology, 16*(2), 151–169.

Bakhuys Roozeboom, M. (2009). *Rise in number of overtime hours worked*. European Foundation for the Improvement of Living and Working Conditions: European Working Conditions Observatory. http://www.eurofound.europa.eu/ewco/2009/01/NL0901019I.htm. Accessed 01 June 2015.

Barnett, R. C. (1998). Toward a review and reconceptualization of the work/family literature. *Genetic, Social, and General Psychology Monographs, 124*(2), 125–182.

Barnett, R. C., & Gareis, K. C. (2000). Reduced-hours employment: The relationship between difficulty of trade-offs and quality of life. *Work and Occupations, 27*(2), 168–187.

Bellavia, F. M., & Frone, M. R. (2005). Work-family conflict. In J. Barling, E. K. Kelloway, & M. R. Frone (Eds.), *Handbook of work stress* (pp. 113–147). London: Sage.

Bielenski, H., Bosch, G., & Wagner, A. (2002). *Working time preferences in sixteen European countries*. Luxembourg: Office for Official Publications of the European Communities.

Bøggild, H., Burr, H., Tüchsen, F., & Jeppesen, H. J. (2001). Work environment of Danish shift and day workers. *Scandinavian Journal of Work, Environment & Health, 27*(2), 97–105.

Byron, K. (2005). A meta-analytic review of work-family conflict and its antecedents. *Journal of Vocational Behavior, 67*(2), 169–198.

Caruso, C. C. (2006). Possible broad impacts of long work hours. *Industrial Health, 44*(4), 531–536.

Casper, W. J., Eby, L. T., Bordeaux, C., Lockwood, A., & Lambert, D. (2007). A review of research methods in IO/OB work-family research. *Journal of Applied Psychology, 92*(1), 28–43.

Checkoway, H., Pearce, N., & Kriebel, D. (2004). *Research methods in occupational epidemiology*. New York: Oxford University Press.

Clays, E., Kittel, F., Godin, I., Bacquer, D. D., & Backer, G. D. (2009). Measures of work-family conflict predict sickness absence from work. *Journal of Occupational and Environmental Medicine, 51*(8), 879–886.

Corral, A., & Isusi, I. (2005). *Part-time work in Europe*. Dublin: European Foundation for the Improvement of Living and Working Conditions.

Costa, G. (2003). Shift work and occupational medicine: An overview. *Occupational Medicine, 53*(2), 83–88.

Dugan, A. G., Matthews, R. A., & Barnes-Farrell, J. L. (2012). Understanding the role of subjective and objective aspects of time in the work-family interface. *Community, Work & Family, 15*(2), 149–172.

Eby, L. T., Casper, L. M., Lockwood, A., Bordeaux, C., & Brinley, A. (2005). Work and family research in IO/OB: Content analysis and review of the literature (1980–2002). *Journal of Vocational Behavior, 66*(1), 124–197.

Emslie, C., & Hunt, K. (2009). 'Live to work' or 'work to live'? A qualitative study of gender and work-life balance among men and women in mid-life. *Gender, Work & Organization, 16*(1), 151–172.

European Foundation for the Improvement of Living and Working Conditions. (2007). Overtime. http://eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary/overtime. Accessed 01 June 2015.

European Foundation for the Improvement of Living and Working Conditions. (2012). *Fifth European working conditions survey: Overview report*. Luxembourg: Publications Office of the European Union.

Fokkema, T. (2002). Combining a job and children: Contrasting the health of married and divorced women in the Netherlands? *Social Science and Medicine, 54*(5), 741–752.

Frone, M. R., Russell, M., & Cooper, M. L. (1992a). Antecedents and outcomes of work-family conflict: Testing a model of the work-family interface. *Journal of Applied Psychology, 77*(1), 65–78.

Frone, M. R., Russell, M., & Cooper, M. L. (1992b). Prevalence of work-family conflict: Are work and family boundaries asymmetrically permeable? *Journal of Organizational Behavior, 13*(7), 723–729.

Fuss, I., Nubling, M., Hasselhorn, H. M., Schwappach, D., & Rieger, M. A. (2008). Working conditions and work-family conflict in german hospital physicians: Psychosocial and organisational predictors and consequences. *BMC Public Health, 8*, 353.

Galovan, A. M., Fackrell, T., Buswell, L., Jones, B. L., Hill, E. J., & Carroll, S. J. (2010). The work-family interface in the United States and Singapore: Conflict across cultures. *Journal of Family Psychology, 24*(5), 646–656.

Gao, Y., Shi, J., Niu, Q., & Wang, L. (2013). Work-family conflict and job satisfaction: Emotional intelligence as a moderator. *Stress and Health, 29*(3), 222–228.

Geurts, S. A. E., Taris, T. W., Kompier, M. A. J., Dikkers, J. S. E., Van Hooff, M. L. M., & Kinnunen, U. M. (2005). Work-home interaction from a work psychological perspective: Development and validation of a new questionnaire, the SWING. *Work & Stress, 19*(4), 319–339.

Grandey, A. A., & Cropanzano, R. (1999). The conservation of resources model applied to work-family conflict and strain. *Journal of Vocational Behavior, 54*(2), 350–370.

Greenhaus, J. H. (1988). The intersection of work and family roles: Individual, interpersonal, and organizational issues. *Journal of Social Behavior and Personality, 3*(4), 23–44.

Greenhaus, J. H., & Beutell, N. J. (1985). Sources and conflict between work and family roles. *Academy of Management Review, 10*(1), 76–88.

Greenhaus, J. H., Collins, K. M., Singh, R., & Parasuraman, S. (1997). Work and family influences on departure from public accounting. *Journal of Vocational Behavior, 50*(2), 249–270.

Greenhaus, J. H., Parasuraman, S., & Collins, K. M. (2001). Career involvement and family involvement as moderators of relationships between work-family conflict and withdrawal from a profession. *Journal of Occupational Health Psychology, 6*(2), 91–100.

Grice, M. M., McGovern, P. M., & Alexander, B. H. (2008). Flexible work arrangements and work-family conflict after childbirth. *Occupational Medicine, 58*(7), 468–474.

Härmä, M. (2006). Workhours in relation to work stress, recovery and health. *Scandinavian Journal of Work, Environment & Health, 32*(6), 502–514.

Higgins, C., Duxbury, L., & Julien, M. (2014). The relationship between work arrangements and work-family conflict. *Work, 48*(1), 69–81.

Hill, A. B. (1965). The environment and disease: Association or causation? *Proceedings of the Royal Society of Medicine, 58*, 295–300.

Hobfoll, S. E. (1989). Conservation of resources. A new attempt at conceptualizing stress. *American Psychologist, 44*(3), 513–524.

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing Conservation of Resources theory. *Applied Psychology: An International Review, 50*(3), 337–370.

Hobfoll, S. E., & Shirom, A. (2001). Conservation of Resources Theory. Applications to stress and management in the workplace. In: R. T. Golembiewski (Ed.), *Handbook of organizational behavior* (pp. 57–80). New York: Dekker.

International Agency for Research on Cancer Working Group on the evaluation of carcinogenic risks to humans. (2010). Shiftwork. In: Painting, firefighting, and shiftwork. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans 98*, 563–764.

Jansen, N. W. H. (2003). *Working time arrangements, work-family conflict, and fatigue.* Doctoral dissertation, Maastricht, the Netherlands: Maastricht University.

Jansen, N. W. H., Kant, I., Kristensen, T. S., & Nijhuis, F. J. N. (2003a). Antecedents and consequences of work-family conflict: A prospective cohort study. *Journal of Occupational and Environmental Medicine, 45*(5), 479–491.

Jansen, N. W. H., Kant, I., Van Amelsvoort, L. G. P. M., Nijhuis, F. J. N., & Van den Brandt, P. A. (2003b). Need for recovery from work: Evaluating short-term effects of working hours, patterns and schedules. *Ergonomics, 46*(7), 664–680.

Jansen, N. W. H., Van Amelsvoort, L. G. P. M., Kristensen, T. S., Van den Brandt, P. A., & Kant, IJ., (2003c). Work schedules and fatigue: A prospective cohort study. *Occupational and Environmental Medicine, 60*(Suppl 1), i47–i53.

Jansen, N. W. H., Kant, I., Nijhuis, F. J. N., Swaen, G. M. H., & Kristensen, T. S. (2004). Impact of worktime arrangements on work-home interference among Dutch employees. *Scandinavian Journal of Work, Environment & Health, 30*(2), 139–148.

Jansen, N. W., Kant, IJ., Van Amelsvoort, L. G., Kristensen, T. S., Swaen, G. M., & Nijhuis, F. J. (2006). Work-family conflict as a risk factor for sickness absence. *Occupational and Environmental Medicine, 63*(7), 488–494.

Jansen, N. W., Mohren, D. C., Van Amelsvoort, L. G., Janssen, N., & Kant, I. (2010). Changes in working time arrangements over time as a consequence of work-family conflict. *Chronobiology International, 27*(5), 1045–1061.

Kant, I., Jansen, N. W., Van Amelsvoort, L. G., Van Leusden, R., & Berkouwer, A. (2008). Structured early consultation with the occupational physician reduces sickness absence among office workers at high risk for long-term sickness absence: a randomized controlled trial. *Journal of Occupational Rehabilitation, 18*(1), 79–86.

Kant, IJ., Bültmann, U., Schröer, C. A. P., Beurskens, A. J. H. M., Van Amelsvoort, L. G. P. M., & Swaen, G. M. H. (2003). An epidemiological approach to study fatigue in the working population: The Maastricht cohort study. *Occupational and Environmental Medicine, 60*(Suppl 1), i32–i39.

Kinnunen, U., & Mauno, S. (1998). Antecedents and outcomes of work-family conflict among employed women and men in Finland. *Human Relations, 51*(2), 157–177.

Kristensen, T. S. (2000). Workplace intervention studies. *Occupational Medicine, 15*(1), 293–305.

Leufkens, K. (2009). Full-time job plus part-time job most satisfactory combination. http://www.cbs.nl/en-GB/menu/themas/dossiers/vrouwen-en-mannen/publicaties/artikelen/archief/2009/2009-2644-wm.htm?Languageswitch=on. Accessed 01 June 2015.

Lexis, M. A., Jansen, N. W., Huibers, M. J., Van Amelsvoort, L. G., Berkouwer, A., Tjin A Ton, G., et al. (2011). Prevention of long-term sickness absence and major depression in high-risk employees: a randomised controlled trial. *Occupational and Environmental Medicine, 68*(6), 400–407.

Lidwall, U., Marklund, S., & Voss, M. (2010). Work-family interference and long-term sickness absence: a longitudinal cohort study. *European Journal of Public Health, 20*(6), 676–681.

Loudoun, R. J., & Bohle, P. L. (1997). Work/Non-work conflict and health in shiftwork: Relationships with family status and social support. *International Journal of Occupational and Environmental Health, 3*(Suppl 2), S71–S77.

Meijman, T. & Schaufeli, W. (1996). Psychische vermoeidheid en arbeid; Ontwikkelingen in de A&O-psychologie [Mental fatigue and work. Developments in Work and Organizational Psychology]. *Psycholoog 31*(6), 236–241.

Michel, J. S., Kotrba, L. M., Mitchelson, J. K., Clark, M. A., & Baltes, B. B. (2011). Antecedents of work-family conflict: A meta-analytic review. *Journal of Organizational Behavior, 32*(5), 689–725.

Mohren, D. C. L., Jansen, N. W. H., van Amelsvoort, L. G. P. M., & Kant, IJ. (2007). *An epidemiological approach of fatigue and work*. Maastricht: Programma Epidemiologie van Arbeid en Gezondheid, Maastricht University.

Mounstephen, A., & Sharpe, M. (1997). Chronic fatigue syndrome and occupational health. *Occupational Medicine, 47*(4), 217–227.

Nijp, H. H., Beckers, D. G., Geurts, S. A., Tucker, P., & Kompier, M. A. (2012). Systematic review on the association between employee worktime control and work-non-work balance, health and well-being, and job-related outcomes. *Scandinavian Journal of Work, Environment & Health, 38*(4), 299–313.

Nohe, C., Meier, L. L., Sonntag, K., & Michel, A. (2015). The chicken or the egg? A meta-analysis of panel studies of the relationship between work-family conflict and strain. *Journal of Applied Psychology, 100*(2), 522–536.

Pärnänen, A., Sutela, H., & Mahler, S. (2007). *Combining family and full-time work*. Dublin: European Foundation for the Improvement of Living and Working Conditions.

Peeters, M. C. W., Montgomery, A. J., Bakker, A. B., & Schaufeli, W. B. (2005). Balancing work and home: how job and home demands are related to burnout. *International Journal of Stress Management, 12*(1), 43–61.

Perrewé, P. L., Hochwarter, W. A., & Kiewitz, C. (1999). Value attainment: An explanation for the negative effects of work-family conflict on job and life satisfaction. *Journal of Occupational Health Psychology, 4*(4), 318–326.

Pisarski, A., Brook, C., Bohle, P., Gallois, C., Watson, B., & Winch, S. (2006). Extending a model of shift-work tolerance. *Chronobiology International, 23*(6), 1363–1377.

Putnik, K., Houkes, I., Jansen, N., Nijhuis, F., & Kant, IJ. (2016). Work-home interface in a cross-cultural context: A framework for future research and practice. *Manuscript submitted for publication*

Rindfleisch, A., Malter, A. J., Ganesan, S., & Moorman, C. (2008). Cross-sectional versus longitudinal survey research: Concepts, findings, and guidelines. *Journal of Marketing Research, 45*(3), 261–279.

Rothman, K. J., & Greenland, S. (2005). Causation and causal inference in epidemiology. *American Journal of Public Health, 95*(Suppl 1), S144–S150.

Siermann, C. (2009). The Netherlands has highest rate of part-timers in Europe. http://www.cbs.nl/en-GB/menu/themas/arbeid-sociale-zekerheid/publicaties/artikelen/archief/2009/2009-2821-wm.htm?Languageswitch=on. Accessed 01 June 2015.

Smith Major, V., Klein, K. J., & Ehrhart, M. G. (2002). Work time, work interference with family, and psychological distress. *Journal of Applied Psychology, 87*(3), 427–436.

Tang, K. (2014). A reciprocal interplay between psychosocial job stressors and worker well-being? A systematic review of the "reversed" effect. *Scandinavian Journal of Work, Environment & Health, 40*(5), 441–456.

Valcour, M. (2007). Work-based resources as moderators of the relationship between work hours and satisfaction with work-family balance. *Journal of Applied Psychology, 92*(6), 1512–1523.

Van Amelsvoort, L. G., Jansen, N. W., & Kant, I. (2006). Smoking among shift workers: More than a confounding factor. *Chronobiology International, 23*(6), 1105–1113.

Van Amelsvoort, L. G. P. M., Jansen, N. W. H., Swaen, G. M. H., Van den Brandt, P. A., & Kant, I. (2004). Direction of shift rotation in three-shift workers in relation to psychological health and work-family conflict. *Scandinavian Journal of Work, Environment & Health, 30*(2), 149–156.

Van der Hulst, M., & Geurts, S. (2001). Associations between overtime and psychological health in high and low reward jobs. *Work & Stress, 15*(3), 227–240.

Voydanoff, P. (2005). Social integration, work-family conflict and facilitation, and job and marital quality. *Journal of Marriage and Family, 67*(3), 666–679.

Wagena, E., & Geurts, S. (2000). SWING: Ontwikkeling en validering van de 'Survey Werk-thuis Interferentie-Nijmegen' [SWING: development and validation of the 'Survey Work-home Interaction Nijmegen']. *Gedrag en Gezondheid, 28*(3), 138–157.

Walker, J. (1985). Social problems of shiftwork. In: S. Folkard & T. H. Monk (Eds.) *Hours of work. Temporal factors in work-scheduling* (pp. 211–225). New York: John Wiley & Sons.

Wang, J. L., Patten, S. B., Currie, S., Sareen, J., & Schmitz, N. (2012). Predictors of 1-year outcomes of major depressive disorder among individuals with a lifetime diagnosis: a population-based study. *Psychological Medicine, 42*(2), 327–334.

Zapf, D., Dormann, C., & Frese, M. (1996). Longitudinal studies in organizational stress research: A review of the literature with reference to methodological issues. *Journal of Occupational Health Psychology, 1*(2), 145–169.