A multidimensional approach to working time

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”Time is the fire in which we burn”

Malcolm McDowell as “Dr. Soran” to Patrick Steward as “Jean-Luc Picard” in “Star Trek – Generations”

Abstract

In the last decades, the organization of working time has changed considerably. Forced by an increased competition, organizations have begun to expand operation time and to flexibly use their workforce which resulted in an increase of shift work, part-time employment, and compressed workweeks. In a similar vein, the higher share of the service sector in the total economy has led to a widespread emergence of part-time work and shift work. On the other hand, weekly working time has decreased in many countries since the Second World War as a result of considerations of employees' needs for work-life balance. All of these changes have led to a considerable diversification of working time.

From the scientific point of view, the investigation of effects of working time on health, job performance and work-life balance has emerged largely isolated from each other. Consequently, there was research investigating consequences of the various scheduling forms.

In this dissertation, I propose four dimensions that serve to describe working time and that constitute the various working time schedules. These are the (i) *working time duration* (i.e., how long does the individual work), (ii) the *mean time of day* (i.e., at which time of the day does the individual work, on average), (iii) the *working time variation* (is the working time stable or fluctuating within a certain period), and (iv) the *number of shifts* (i.e., how often does the individual work within the period). In the first place, the multidimensional approach is a descriptive attempt as every individual's working time can be located within the four dimensions. For instance, rotating shift work is primarily characterized by a late mean time of day, high variation, and moderate duration. Consequently, the multidimensional approach serves to integrate the different working time literatures. Second, my argument is that these four dimensions are the relevant causal factors that lead to consequences of working time (e.g., work-home interference, ill-health, or decrements in job performance).

After a brief introduction of prominent working time schedules, I describe an empirical investigation using a sample of 387 employees from the German working population. Accordingly, one study (chapter 6) analyzed the relationship between the four working time dimensions and work-home interference and between work-home interference and further consequences (depression, job satisfaction, turnover motivation, and job performance). As a second aim, this study investigated if the relationship between the working time dimensions and work-home interference were moderated by gender, partner status (i.e., living together with a partner or not), child status (i.e., being parent or non-parent), and schedule autonomy (i.e., having the opportunity to influence working time). The results showed significant relationships between work-home interference and working time duration, mean time of day, and variation. Furthermore, work-home inter-

ference was significantly related to depression, job satisfaction, turnover motivation, and two job performance dimensions (meeting deadlines and quality). Finally, the associations between working time and work-home interference were not moderated by gender, partner and child status and schedule autonomy.

The second study (chapter 7) investigated the relationship between duration, mean time of day, variation, and two job stressors (time pressure and role ambiguity) and ill-health. The results suggested significant relationships for mean time of day, duration, and role ambiguity. Surprisingly, the relationship between duration and ill-health was negative, indicating better health for individuals working long hours.

The third study (chapter 8) longitudinally investigated antecedents (working time duration and job stressors) and outcomes of work-home interference (depression and turnover motivation). The results of this study showed a synchronous (i.e., short-term) effect of duration on work-home interference. Furthermore, this study revealed a cyclical model with a job stressors → depression → work-home interference → job stressors pathway.

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1

Introduction

As any other important aspect of work, the organization of working time has undergone substantial changes in the last decades and will continue changing in the next (Patterson, 2001). In the course of globalization, companies have become the subject of an aggravated competition which has a number of consequences. For instance, there is an increased demand for reduction of costs and, thus, organizations refrain from storing supplies to cope with seasonal fluctuations (Bosch, 1999). In addition, the market and the behavior customer have become less predictable. Consequently, the demand for the workforce depends on „the state of the order book and disruptions to the production and supply chain" (Bosch, 1999, p. 143). This is especially the case in the service sector where staffing of the workforce is often attuned to fluctuations of the number of customers. At the same time, the total opening hours in the retail sector have increased. As a result, the higher need for a flexible use of the workforce and longer operating or opening times had led to a tremendous variety of working time arrangements.

As an additional reason for changes of working time, there has been an increased consideration of employees' needs for work-life balance and autonomous determination of the working conditions and scheduling. For instance, weekly working time has decreased in most of the countries, albeit it has increased in some countries such as the United States, Latin America, Great Britain, and New-Zealand and many developmental countries (Bosch, 1999). In Germany there have been efforts by unions forcing employers to reduce weekly working hours since the Second World War. In the last years, however, there has been an increasing pressure on unions to refrain from collective agreements and to accept organization-based working time arrangements that reflect an optimal adaptation of the organization to demands of the market. Since an increase of weekly working hours is often regarded as an opportunity to cost reduction, it can be expected that working hours will again increase in the next decade.

As a result of these economical changes, an enormous variety of working time schedules have emerged (Bosch, 1999, p. 143). The main forms are shiftwork, part-time work, the compressed workweek, and flexitime. With regard to shift work, Thierry and Meijman (1994) reported attempts to organize distinct shift schedules which resulted in 900 kinds of shift schedules. In order to generate a parsimonious view on working time, the question is whether this variety can be organized and, thus, reduced on a limited number of dimensions. I argue that this is possible with the four dimensions *working time duration* (i.e., how long does the individual work), the *mean time of day* (i.e., at which time of the day does the individual work, on average),

the *working time variation* (is the working time stable or fluctuating within a certain period), and the *number of shifts* (i.e., how often does the individual work within the period). This multidimensional view is based on some disadvantages and criticisms on the concept of *working time schedules* which will be presented later.

To provide a background of the multidimensional approach, chapter 2 will briefly describe the most often discussed working time schedules. This description will focus on those features of working time schedules which are relevant in later chapters. In particular, the description aims at illustrating the within-schedule heterogeneity, the problems to define the various schedules as well as to discriminate the schedules from each other. Chapter 3 will then introduce the idea that working time can be described and the bulk of schedules can be integrated by the four working time dimensions. Chapter 4 will present an approach of measuring the four dimensions based on the actual working time of an individual. Chapters 5 to 8 finally, report empirical results, that is, descriptive aspects of the working time dimensions as well as their relationships with important variables (e.g., work characteristics, work-home interference, and well-being).

2

Working Time Schedules

Most of the issues regarding working time discussed in the literature center on concepts such as *alternative work schedules* (Tepas, 1985), *flexible working time arrangements* (Thierry & Meijman, 1994), or *irregular working hours*. Throughout this dissertation, I will refer to them as "working time schedules". The impetus for addressing schedules scientifically is a result of their deviation from the so-called „normal working time", which is defined by scholars as the traditional working week with a weekly working time of 40 hours and five days of work. In addition, normal working hours are located at an early time of the day – that is, they typically start at 7 – 9 o'clock a.m. and end at 16 – 18 o'clock p.m. On the other hand, it is often stated that the "normal" working time does not exist (and from a historical perspective, probably has never existed; cf. Scherrer, 1981).

The most discussed working time schedules are *shift work* (i.e., working late), *part-time work* (i.e., working with fewer weekly working hours), *compressed workweeks* (compressing the weekly working hours on fewer days), and *flexitime* (i.e., opportunities for free choice of starting and finishing times)[1]. Part-time and shift work are most prevalent in non-manufacturing and service providing industries, such as transportation, utilities, and retail, whereas compressed workweeks and flexitime are most prevalent in public facilities (Tepas, 1985).

2.1 Shift Work

Although shift work and especially work at night has occurred throughout the history of work (Scherrer, 1981), its widespread use has increased since the industrial revolution. Shift work is used to expand operation times of machines and services and can predominantly be found in production, transportation, medical services, and retail. As the service sector has gained a larger share in the last decades regarding size and economical importance, shift work has become more prevalent in this sector and is expected to further increase in the next years. This applies to west societies as well as in developing countries (Folkard & Hill, 2002).

Shift work "refers to working systems involving two or more watches" (Thierry & Jansen, 1984, p. 622) or "groups […] of workers succeed each other at the same work station to perform

[1] Some of the reviews on working time schedules include temporary work. In contrast, temporary work is excluded as it concerns a timely fixed employment and has not necessarily implications for immediate working time of the employee.

the same operations, each crew working a certain schedule or "shift" so that the undertaking can operate longer than the stipulated weekly hours for any worker" (Thierry & Meijman, 1994, p. 354). According to Thierry and Meijman (1994), around 20% of European employees work night shifts.

As Folkard and Hill (2002) noted, shift work schedules can be distinguished according to whether they involve *work at night* and whether they include *fixed or varying shifts* (i.e., rotating shift work). In the case of rotating shift work, shift schedules can further be described with regard to the speed and direction of rotation. The direction aspect concerns whether succeeding shifts change from working early to working at night or in the opposite direction. The speed aspect refers to the extent of variation in a certain period. For instance, slow rotation means that the employee works at a certain time of day for more then one day whereas fast rotation refers to changes from day to day.

Reviews on shift work (e.g., Thierry & Meijman, 1994) have pointed to the multidimensionality of shift work, resulting in a tremendous amount of distinct shift schedules. For instance, the authors reported attempts to classify shift schedules that resulted in 900 different schedules. In his "rota-risk-profile-analysis", Jansen (1987) postulated 13 dimensions that characterize shift schedules and influence health and participation in the nonwork domain. Among these 13 dimensions were, for instance, the *regularity* (i.e., variation) of succeeding shifts, the average *shift length*, the *predictability* of following shifts, and *opportunities of nonwork activities*. Although the approach by Jansen provided the basic impetus for the multidimensional approach postulated in this dissertation, the rota-risk-profile analysis has the disadvantage that each of the dimensions are measured by rating scales and that some of the dimensions are complements of others and, thus, lead to redundancies. For instance, the dimension "opportunities for nonwork activities" is a direct consequence of the shift length dimension. Similarly, the dimension "variability of nonwork opportunities" again is the result of the variability of shift length. The multidimensional approach, in contrast, captures working time in general (and not only shift work), is measured based on actual working time (and not by rating scales) and results in four essential and nonredundant dimensions that integrate the bulk of working time schedules

2.2 Part-Time Employment

As a result of the rise of the retail sector and the increased employment of women, part-time employment has become a growing segment in most of the European countries and the United States. In Germany, 22% of the labor force worked part-time in 2003 (Statistisches Bundesamt, 2003), which is similar to the rate in the U.S. (Feldman, 1990). Most of the part-timers are either individuals in the age of 16-24, married women in the age between 25 and 54 or

older males in the age above 55 (Barling & Gallagher, 1996). Although the rate of male part-timers has increased in Germany in the last decade, 87% of the part-timers are women. In addition, women most often work in low status part-time jobs whereas men work in professional part-time jobs (Thierry & Jansen, 1984).

The most prominent aims of part-time employment are the creation of jobs, emancipation of women, an organizational reaction to peak-times at work, the employment of people with handicaps, and an increase of opportunities for employees to influence their working time (Thierry & Jansen, 1984). In particular, women often choose part-time as a possibility to combine work, household, and family.

According to Thierry and Jansen (1984), part-time jobs can be differentiated by their organizational form. For instance, two exotic forms are the *split* or *twin jobs* where two employees are jointly responsible for one job ("job sharing"). Another form is the *mini-shift* where a group of workers run shifts with a short duration. In this case, there is an overlap between the part-time and the shift work concept.

Although part-time employment is a concept that is often referred to in the literature and public discussions, it is difficult to determine what exactly part-time employment is. For instance, the International Labor Organization defines part-time work as "work voluntarily accepted and regularly performed in a number of working hours considerably smaller than usual" (Thierry & Jansen, 1984, p. 608). With regard to the precise numbers of working hours which can regarded as "considerably smaller", there are substantial differences across industries and countries, which makes it difficult to determine the prevalence of part-time work and to analyze differences in the prevalence between industries or countries (Barling & Gallagher, 1996). Sometimes, part-time work is defined by the *average working hours within an industry*. In this regard, an employee works part-time when his/her working hours are below the average in the respective industry. As a consequence, an employee considered as full-timer in one industry could be regarded as part-timer in a different industry. In other cases, part-time is defined as the number of working hours that is less than those defined in the industry's *collective labor agreement.* Thierry and Jansen noted that the European Community characterizes part-time as working below 25 hours per week whereas the Bureau of labor statistics refers to 35 hours per week as the respective cut-off. These examples show that a distinction between full time and part-time employment is based on rather arbitrary than objective grounds.

A further problem with the part-time concept refers to the within-part-time heterogeneity. Barling and Gallagher (1996) argued against the view on part-time as a unitary concept and noted that "differences exist in the *quality* of part-time jobs" (p. 248; italics added) as well as the different *forms of scheduling*. With regard to the quality aspect, Tilly (1992) argued that there are "re-

tention" vs. "secondary" part-time jobs where secondary part-time jobs imply a lower job status and lower pay, less career opportunities, and higher turnover rates than retention part-timers. Barling and Gallagher noted that employers would treat part-timers in varying degrees as part of the core workforce. It should be stressed, however, that these are characteristics of the jobs and not aspects of working time. Furthermore, part-time jobs differ in their precise scheduling; with the two most occurring forms as either working with an evenly distributed working time across the week (e.g., working half-time) or concentrated on two or three days up to full-time day length ("part-week"; Barling & Gallagher, 1996).

2.3 The Compressed Workweek

Compressed workweeks are schedules which reduce the number of worked days while maintaining a full time workweek. The most frequent form is a workweek of 40 hours compressed into four workdays (the "4/40" workweek), thus, leading to a day length of 10 hours each day (Tepas, 1985). Typically, employees have either Monday or Friday off which extends the weekend to three days. Baltes, Briggs, Hulff, Wright, and Neuman (1999) noted, however, that there are many variations, for instance, 3/36, 3/38, or 3/40 schedules.

The proposed advantages of compressed workweeks (Tepas, 1985; Thierry & Jansen, 1984) are more leisure time for the employees, reduced commuting problems and costs, lower start-up and/or warm-up expenses, and higher production rates by enlarging operation times and employing the personal at peak times. Among the proposed disadvantages are fatigue, increases in tardiness, absenteeism, and turnover, increases in accidents, and decreases in production.

With regard to the organizational form, compressed schedules vary according to several dimensions, including *number of consecutive work days* (e.g., four days), the *work - and nonwork day variability* – that is, whether the number of days is constant or not, the *length of the work day*, the *time of day* and *whether it varies*. Thierry and Jansen noted that compressed workweeks are often used within a two-shift system (i.e., the so-called alternating day and night shift system). In this case, the compressed workweek schedule is a particular form of shift work.

2.4 Flexitime

Like the compressed workweek, flexitime was designed to provide the worker with more freedom. Its origins can be traced back to 1967 in Germany. At this time, Messerschmidt Bölkow-Blohm introduced flexitime to prevent traffic problems of their employees. Flexitime allows employees to choose the starting and finishing times of their work day within a certain corridor. For instance, the employee can decide when starting to work in a corridor between 7:00

and 9:00 a.m. and when finishing to work between 16:00 and 18:00 p.m. The most noted aims of flexitime are to provide personnel with flexibility, to increase well-being and motivation but also to improve productivity and provide the organization with flexible options for staffing.

Goliembiewski and Proehl (1978) described the following dimensions of flexitime: (i) the *bandwidth*, that is the total number of hours between the earliest starting time and the latest finishing time (e.g., from 7:00 a.m. to 6:00 p.m.), (ii) the *core hours*, that is the period of time during which all employees must be present (e.g., from 9:00 a.m. to 4:00 p.m.), (iii) *flexible hours*, that is the total number of hours at a workday the employee can make choices about, (iv) *work-week length*, that is the maximal number of hours per week the employee is allowed to work, (v) *banking*, that is to what degree the worker can carry over surplus or deficit hours from one week to the following week, or from one month to the following month, (vi) *variability freedom*, that is the degree to which the worker needs approval in varying from day to day, and (vii) *supervisory role*, that is to which extent the supervisor can override the choice of the employee when necessary.

There is a plenty of proposed advantages of flexitime (see Tepas, 1985, p. 153, for a complete list), for instance, increased day-to-day flexibility for off-the job activities, increased well-being and satisfaction, increased democracy in the workplace, and reduction of tardiness and absenteeism. Proposed disadvantages are, for instance, difficulties to cover some jobs all the times, poorer communication, increases in maintenance costs (e.g., electricity), and irregularity in working hours produced by short-termed changes.

In the next chapter, I present a multidimensional approach to working time that has emerged as the result of various critical issues on the tradition to conceptualize working time as separate schedules and that provides a fruitful and parsimonious perspective on working time.

3

A Multidimensional Approach to Working Time

As the last chapter showed, research and theory-building on working time has developed within separate fields. For instance, research investigated effects of shift work on health (Folkard & Hill, 2002), consequences of part-time employment on work attitudes, commitment, and turnover (Barling & Gallagher, 1996), the relationship between long working hours and physical and psychological well-being (Sparks, Cooper, Fried, & Shirom, 1997), and effects of compressed workweeks on performance and job satisfaction (Baltes et al., 1999). These studies focused on distinct working time *schedules*. They have added new knowledge in all of these areas. However, it might be practically useful, theoretically meaningful, and methodologically feasible to synthesize these disparate approaches into one. The approach I use is to differentiate four working time dimensions that describe working time and constitute the various working time schedules: (i) the *working time duration* (i.e., how long does the individual work), (ii) the *mean time of day* (i.e., at which time of the day does the individual work, on average), (iii) the *working time variation* (is the working time stable or fluctuating within a certain period), and (iv) the *number of shifts* (i.e., how often does the individual work within the period). By adopting a multidimensional approach, the different literatures on working time can be integrated and the bulk of various schedules can be organized in a four-dimensional space. Furthermore, the artificial contrast of standard and non-standard hours can be overcome as the multidimensional approach treats the transition between both as fluent and, thus, can integrate all kinds of working time schedules.

In the first place, the multidimensional approach is a *descriptive attempt* as it locates the working time of every individual in a four-dimensional space. In addition, I argue that these four dimensions are the *relevant causal factors* that lead to the consequences of working time (e.g., work-home interference or ill-health). From a theoretical point of view, the dimensional approach overcomes three problems of working time schedules:

First, a working time schedule introduces a *common label* for a variety of individuals who differ in other working time aspects, social status, or working conditions. Thus, working time schedules ignore differences between individuals working the "same" schedule. For instance, part-timers differ in the time of day they are working (morning vs. evening), or regularity of work (half-day vs. part-week) but are nevertheless simply labeled as part-timers (Feldman, 1990). Compressed workweeks may imply only work at daytime or include nightshifts but are simply labeled as compressed workweek. In fact, there are multiple possible combinations of the four

dimensions which are possible but the working schedule will always be labeled with respect to the most salient feature.

Second, the proposed distinctness of schedules implies *clear boundaries between the schedules*. These boundaries, however, are artificial. For instance, Thierry and Meijman (1994) points to "a grey area between what is defined as a flexible working time arrangement and what is defined as a shift schedule" (p. 344). Boggild (2000) notes that there is no clear definition of shift work and that it is hard to define where a dayshift ends and a nightshift starts. An associated problem is that some schedules imply an artificial cut of a continuous dimension as it is the case in part-time which implies an arbitrary cut within the duration dimension[2] – where the exact point differs across countries and industries- or the distinction of early, late, and night shifts which implies a cut within the time of day dimension. Finally, compressed workweeks are restricted to schedules that imply a full time working week (e.g., 40 hours). However, it is likely that a plenty of combinations between working hours and number of shifts exist, including part-time working weeks distributed over two or three days (e.g., 3 days and a weekly duration of 18 hours).

Third, working time schedules are not mutually exclusive but simply focus *on different aspects of time* as a definitional feature (e.g., part-time vs. shift work). For instance, Thierry and Jansen (1984) noted that compressed workweek are often used within a two-shift system (i.e., the so-called alternating day and night shift system). In this case, the compressed workweek schedule is simply a particular form of shift work.

According to the multidimensional approach, every schedule can be described by a particular location on the four dimensions. For instance, rotating shifts can be characterized by a late time of day and high variation. Compressed workweeks can be described by a certain duration (e.g., 40 hours) and a reduced number of shifts per week (four days). Part-time can be characterized by a short duration but differentiated by the time of day (e.g., "moonlighting", Feldman, 1990), or the number of shifts (e.g., working three days full-time vs. working every day half-time). Moreover, applying a dimensional perspective highlights the fluent transitions from one schedule to another.

From a methodological point of view, the dimensional approach has advantages for the analysis of working time effects. Since working time dimensions are continuous variables, they are better suited for correlation-based methods such as regression or structural equation modeling.

[2] It could be argued that the distinction between part – and fulltime could be based on qualitative differences in social benefits, pay, social status or working conditions. I do not argue that this is impossible. However, the multidimensional approach concerns only the working time part of part-time employment and from the working time perspective, the differentiation between part- and fulltime requires an artificial cut of a continuous dimension.

In contrast, investigating working time schedules (e.g., shift work vs. nonshift work) relies on comparisons of employees working the schedule with those working “normal” schedules. Since every schedule consists of a particular configuration of the four dimensions, comparing different schedules confounds the effects of the single dimensions. For instance, rotating shift work can be mainly defined by the elevated mean time of day and a high variation. When experiencing differences between rotating shift work and a normal schedule on some relevant outcome, it is difficult to ascertain if the difference is due to the mean time of day or to the variation. Thus, a dimensional approach helps to disentangle the specific effects of the dimensions. In summary, the dimensional approach may help to deliver a more fine-grained and conceptually adequate perspective on working time and can be used to investigate the effects of the causally relevant components of working time (i.e., the dimensions) on important outcomes.

4

Measurement of Working Time

As a technical aspect of the multidimensional approach, I propose a particular measurement and operationalization of the four dimensions. *The empirical input consists of the starting and finishing times of each day within a work week*. One week is sufficient but more weeks enable a more reliable picture of the individual's working time. The starting and finishing times are then used to create scores for the four working time dimensions. This approach delivers objective, reliable, and continuous data. In the following, I explain the measurement and provide an example that illustrates the procedure.

4.1 Working Time Duration

The *duration* (i.e., weekly working time) is calculated in two steps. First, the starting point of each workday is subtracted from its finishing point. This delivers the length for each work day. To create a day length with a positive value, it is necessary that the finishing point is always larger than the starting point. This is established by operationalizing finishing times beyond the 12 hours-cycle as *open values*. For instance, 1 p.m. is treated as 13:00 or 2 a.m. is treated as 26:00. Thus, a part-time employee beginning work hat 8 a.m. and finishing at 13:00 has a day length of five hours (i.e., 8:00 subtracted from 13:00). Software such as SPSS or EXCEL enables computing time format data. In the second step, the 14 day lengths are summed and divided by the number of weeks for which time data is available. This delivers the working time duration.

4.2 Mean Time of Day

To calculate the *mean time of day*, one first has to choose a time of day which represents each day. In the following study, this was the middle of the working shift (the "central time of day"). For instance, if a person worked from 8 a.m. (8:00) until 5 p.m. (17:00), the central time of day was 12 a.m. If a person worked from 10 p.m. (22:00) until 6 a.m. (30:00), the central time of day was 2 a.m. (26:00). Thus, this convention makes it possible to quantify early and late working times along a time of day continuum. Finally, the central times of each day are averaged to get the mean time of day.

4.3 Working Time Variation

I operationalized the *working time variation* as both day length variation and time of day variation across the measured time period. The day length variation is calculated as the *standard deviation of the daily length measures* around the individual's average day length. The time of day variation is calculated as the *standard deviation of the time of day measures* around the subject's mean time of day. Finally, both length and time of day variation are standardized and added together to create an index.

4.4 The Number of Shifts

The *number of shifts* was obtained by counting the days the individual worked within the period.

4.5 An Example

Figure 4.1 presents an example of the working time of two fictitious individuals (A vs. B).

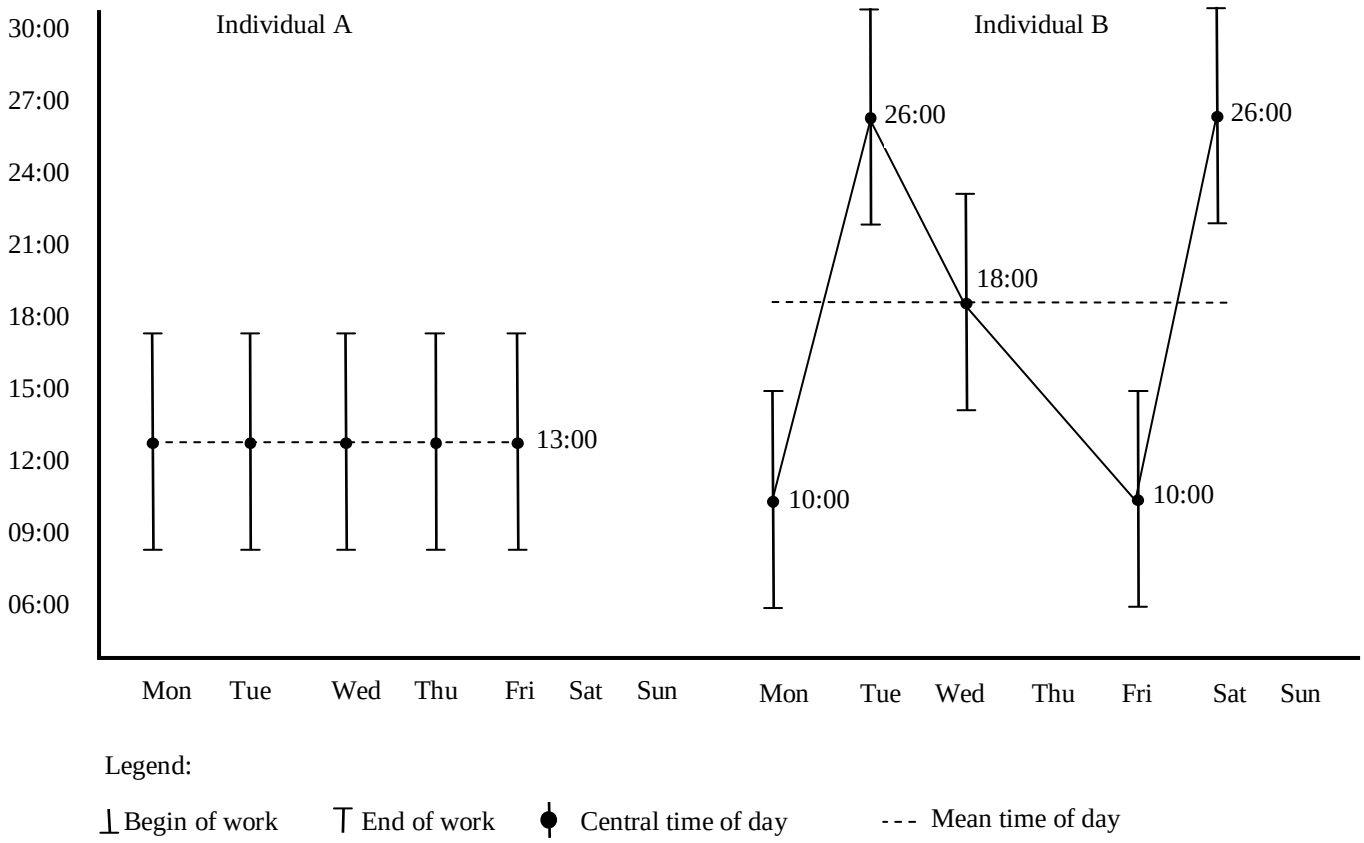


Figure 4.1

Two fictitious working weeks

According to Figure 4.1, individual A works five days in the depicted week (i.e., from Monday to Friday). S/he starts working each day at 8:30 a.m. (8:30) and finishes working at 6:30 (17:30). Consequently, the central time of each day is 1 p.m. (13:00). At this time of day, half of the shift for individual A is over. Because the working time is equal each day, the mean time of day, that is the average of the central times, is also 13:00. The day length of each of the five days is 9 hours (8:30 subtracted from 17:30), thus, leading to a weekly working time of 45 hours. The variation of the day length as well as the variation of the central time of day is zero, as it is indicated by zero standard deviations from the mean day length (i.e., 9 hours) and mean time of day (i.e., 13:00).

Individual B, in contrast, is a shift worker. S/he also works five days in the depicted week. On Monday and Friday s/he works early shifts, on Wednesday, s/he works late, and on Tuesday and Saturday, s/he works night shift - i.e., from 10 p.m. (22:00) until 6 a.m. (30:00). Although, the day length and, thus, the working time duration, is equal to the duration of individual A, the central time of day strongly varies and ranges from an early 10:00 to a late 26:00. The mean day time is 18:00, that is, on average later than the time of day of individual A. The high variation of the day time can directly be seen and is also reflected in a standard deviation of 5 hours and 56 minutes around the 18:00.

This example shows that data reflecting the four dimensions can directly be calculated from the actual working time without relying on subjective and potentially erroneous estimation or rating of the individual. A potential source of error, of course, is the accuracy of obtained working time data. Thus, the preferred way of data collection would be time diaries. In the study, which will be described in the following, I tried to improve accuracy on two ways. First, individuals were informed two weeks before the study started that the study would be about working time. Accordingly, they were asked to pay attention to their working time in the following days or even to write down their working time. Second, a question about the subjective accuracy of remembering the working time was included in the questionnaire. This accuracy measure was then used as a moderator of the relationship between the working time dimensions and outcomes.

5

The Study

5.1 The Sample

The investigated sample consisted of 387 participants. One part of this sample (n = 255) was recruited from a larger population sample of 1,677 individuals who were surveyed in a comprehensive research project[3] about working time. These individuals had been randomly selected out of the German working population. We sent questionnaires to 515 participants from this sample who had indicated their willingness to participate in our study; 255 completed questionnaires were returned. The other part of our sample was recruited at a local hospital and by requesting university employees and students to distribute questionnaires to working acquaintances (n = 132). Multigroup analyses showed no significant differences between both subsamples in regression coefficients. Therefore, both samples were pooled into one. The overall sample (N = 387) was demographically almost identical to the mentioned population sample, which shows that selection effects do not exist. The largest difference between the population sample and the sample used in this study was a slightly higher percentage of females (57% vs. 54%) in our study. The average age was 40 years (SD = 10.5, range = 17 to 61 years). The sample contained a variety of different occupations from various industries (e.g., public service, manufacturing, finance, health care, craft, retail) and included both part- and full time employees.

In addition to self-report data, we obtained 218 reports by others that contained data about job conditions, job stressors, and job performance (see Appendix D). Participants were instructed to forward the others' rating questionnaire to their supervisor or a coworker who is familiar with the self-rater's work behavior. 30 reports were provided by the supervisor, 168 by the coworker, 15 by subordinates. In 5 cases, an identification of the source was not possible. Analysis of variance revealed no significant mean differences in the ratings between supervisors, coworkers and subordinates. The participants and their raters worked together for a duration of between 1 and 46 years (M = 7 years). 142 raters were female, 74 were male, and for two raters gender data was missing. The mean age for the raters was 39 years (range = 16 to 61 years). One year later, I sent questionnaires to the participants of the study again. 130 participants sent back their

[3] The research project „Mobilzeit" was supported by the German Research Foundation (Deutsche Forschungsgemeinschaft; DFG) Grant Nr. SCHM 658/8-3. I want to thank Prof. Peter Schmidt for providing me with the opportunity and financial support to conduct the study. The project analyzed sociodemographic and psychological predictors of the motivation to reduce weekly working hours. Background of the research was a German law that give employees the right to reduce their working time unless organizational factors stand against the reduction.

questionnaires. These data were used in a panel study investigating the relationship between working time duration, job stressors and work-home interference, depression, and turnover motivation (Chapter 8). In the following, I describe descriptive results concerning the four working time dimensions. It should be noted that the analyses were not driven by specific theoretical expectations and are rather exploratory.

5.2 Descriptive results for the Working Time Dimensions

5.2.1 Working Time Duration

The overall mean working time duration was 38:35 (SD = 13:59) and ranged from 3 hours per week to 89 hours. As expected, men (M = 43:56; SD = 11:13) worked substantially more hours than women (M = 35:06; SD = 14:36; $t(327.84^4) = 6.25$, $p < .001$) but the variation was higher in the female group. This result reflects the higher proportion of female part-time employees. Table 5.1 depicts the mean duration with the additional consideration of *child status* (i.e., being parent vs. non-parent). The presence of children had no relationship with the working time duration of men; but it had a relationship with the working time of women: Mothers (M = 32:15; SD = 13:41) worked significantly less hours per week than non-mothers (M = 42:33; SD = 12:34; $t(176) = 5.06$, $p < .001$). This result shows that women handle work and child-care duties by working fewer hours.

Table 5.1

Working time duration for gender and child status

	Non-parent		Parent	
	M	SD	M	SD
Women	42:33	12:34	32:15	13:41
Men	45:47	12:16	44:12	10:11

Note. M = mean, SD = standard deviation

The distribution of working time duration was continuous and smooth and provided no indication of a qualitative break that could legitimate a distinction between full – and part-time employment on empirical grounds (e.g., a bimodal distribution).

[4] In some of the following group comparisons, the variances differed between both groups as indicated by the Levene-test. In this case, the traditional t-test which presupposes variance equality is inappropriate (Diehl & Arbinger, 1992, p. 137), and the Welch-test should be used, which results in a different calculation of the degrees of freedom.

5.2.2 Mean Time of Day

Employees with a high mean time of day work, on average, later at the day. Such schedules, thus, include nightshift. I used two validation criteria to assess the validity of the mean time of day dimension. The first was the question "do you work shift work" that could be answered with a binary response format (*yes* vs. *no*); the second was the question "How often do you have to work at night (between 10 p.m. and 6 a.m.)?". The rating format was a 5-point Likert scale, ranging from 0 (*almost never*) to 5 (*every week*). Mean time of day correlated significantly with the shift work item ($r = .27$, $N = 268$, $p < .001$) and the nightshift item ($r = .65$, $N = 335$, $p < .001$). When considering the first correlation, one should consider that the referring question concerned shift work in general; not nightshifts specifically. The high correlation with the nightshift item, especially, provides evidence that the measurement and conceptualization of mean time of day is valid.

The overall mean time of day was 13:02 (SD = 2:43), ranging from 9:06 a.m. to 4:41 a.m. The mean time of day shows that the typical workday starts in the morning and ends in the afternoon because the typical workday has an average day length of about 8 hours which are distributed around the mean time of day. There were no significant differences between men and women ($t(334) = .51$) but, again, when considering child status, mothers had a significantly earlier mean time of day (M = 12:27, SD = 2:30) than non-mothers (M = 13:40, SD = 2:58, $t(176) = 2.96$, $p < .01$). This difference can be explained by a substantially lower percentage of mothers working night shift.

5.2.3 Working Time Variation

Working time variation was computed as the mean of the *standardized* time of day variation and day length variation. Hence, the mean is zero. To report some results about the variation in time format, I report the statistics for the unstandardized time of day variation. The median[5] of the time of day variation was 0:47, which shows that the time of day varies about fifty minutes around the mean time of day. This result indicates that the time of day varies only to a little extent for the average employee. However, shift workers experienced a high degree of variation, as it is indicated by a correlation between time of day variation and mean time of day ($r = .62$, $N = 339$, $p < .001$) and occurs in form of rotating shift work. Similarly, time of day variation correlated significantly with the mentioned self-reported nightshift item ($r = .65$, $N = 335$, $p < .001$). Men and women did not significantly differ on the time of day variation ($t(334) = -.21$), but on the day

[5] Time of day variation was non-normally distributed and had a skew of 1.7 and a kurtosis of 2.3. Thus, the use of the median is more appropriate.

length variation (t(303.57) = 3.4, p < .001); with men reporting a higher variation. This difference, however, disappeared when working time duration was controlled.

To investigate if the standard deviation of the time of day measure is a valid measure of variation, I assessed two kinds of variations via self-report. The first was the perceived typical variation of the starting times ("To what extent does your starting time vary within a week, typically?"); the response format was a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*strongly).* The second was the perceived typical variation of the finishing times ("To what extent does your finishing time vary within a week, typically?") using the same response format. As Table 5.2 shows, both correlated significantly with time of day variation to r = .34 (starting times variation) and r = .29 (finishing times variation).

Table 5.2

Correlations between time of day variation with self-reports of variation, predictability of working time, and schedule autonomy

	Time of day variation
Variation (self-reported)	
To what extent does your starting time vary within a week, typically?	.34**
To what extent does your finishing time vary within a week, typically?	.29**
Predictability (self-reported)	
How precisely do you know at the beginning of a week when to start working on the following days?	.05
How precisely do you know at the beginning of a week on which days you'll have to work in the following week?	-.15**
How precisely do you know at the beginning of a week when to finish working on the following days?	-.08
Schedule autonomy (self-reported)	
To what extent can you determine the number of hours of your working week?	-.26**
To what extent can you determine the time you begin with your daily work?	-.28**
To what extent can you determine the time you end your daily work?	-.29**

Notes. * p < .05; ** p < .01 ; N = 297 - 335

Two aspects that were expected to be associated with working time variation are *predictability* of working time and *schedule autonomy* (i.e., the opportunity to influence starting and finishing times). With respect to predictability, it was likely that highly varying working times make it difficult to foresee the course of the work week and that the variation indicates a lack of regularity. In this case, variation should negatively be correlated with predictability. With regard to schedule autonomy, it was possible that a high variation reflects an ample use of opportunities to influence working time, which should be lead to a positive correlation between variation and schedule autonomy. To investigate both possibilities, I measured predictability and schedule autonomy with three self-report items, respectively. The question wordings and the correlations with variation are depicted in Table 5.2. From the three predictability items, only the predictability of the days the individual expects to work correlated significantly with variation ($r = -.15$, $N = 300$, $p < .01$). Schedule autonomy correlated negatively with variation ($r = -.28$ for the composite of the three items, $N = 300$, $p < .01$), indicating that variation is externally driven (i.e., the result of the shift schedule) and not a result of need for flexibility and free choice.

5.2.4 Number of Shifts

The respondents had worked 4.91 (SD = .98) shifts per week on average within the period. Thus, the five-day-working week is still the usual form of work. Men worked on average 5.2 shifts per week, women 4.7 ($t(321.16) = 4.8$, $p < .001$). There were no differences in the number of shifts between mothers and non-mothers when working time duration was statistically controlled

5.3 Working Time and Work

There are a number of scholars who argued that working time schedules could be differently be subject of stressful job conditions: For instance, Thierry and Meijman (1994) suggested that night shift workers would experience less stressors and supervisory control. Smulders (1993) argued that part-timers have less autonomy and according to Tilly (1992), part-timers often work in jobs with low status, detrimental job conditions, and low career opportunities. Finally, partial inclusion theory (Katz & Kahn, 1966; Miller & Terborg, 1979) argues that part-timers are less involved in the social system of the organization which should be indicated by smaller social networks. The following section relates the four working time dimensions to a variety of job related constructs (job conditions, job stressors, social networks, career opportunities, working time and overall job satisfaction). Table 5.3 contains the analyzed constructs and one exemplary item,

respectively. A complete description of the scales and respective items can be found in Appendix A.

Table 5.3

Measured job conditions, stressors social networks, career opportunities, and satisfaction

Job condition	Sample item
Job complexity	When working, employee A has to make difficult decisions. Person B, in contrast has to make only easy decisions. Which of both persons is more similar to you?
Autonomy	When you take a look at your tasks: To which extent are you allowed to determine the sequence of subtasks?
Role ambiguity	How often do you get unclear assignments?
Time pressure	How often do you work under time pressure?
Organizational obstacles	Employee A works with excellent material, supplies or tools, whereas employee B works with insufficient material, supplies or tools. Which of both persons is more similar to you?
Disruptions	How often do you get disrupted by other people while working?
Friendship network	To how many colleagues in your company can you talk to when you are in a negative mood?
Strategic network	To how many persons in your company can you talk to when you need advises concerning your career?
Career opportunities	How likely is it that you get a raise within the next two years?
Working time satisfaction	How satisfied are you with your working time?
Overall job satisfaction	How satisfied are you with your job in general?

Since I had measured the job conditions and job stressors with self reported data as well with others' ratings, I specified a structural equation model where these job conditions were modeled as latent variables that were reflected by a self-rating item parcel and an others' rating item parcel[6]. This procedure enabled modeling objective job conditions and stressors. The term "ob-

[6] Item parcels are composites consisting of several items. Some authors (Bandalos & Finney, 2001) have emphasized that using item parcels is only reasonable when the parcels themselves are unidimensional. This notion was investigated with a confirmatory factor analysis**,** where the parcels were modeled as latent variables measured by three items each. This model, thus had 12 latent job conditions (6 latent self-rated and 6 latent others'

jective" should, however, not be understood as "true" or "real". Frese and Zapf (1988) defined "objective" as the independence of a measure from the target person's information processing. The latent variables, expressing the common variance of both kinds of ratings, was conceptualized as the underlying causes of the self-raters' and other's perception and did not contain idiosyncratic perception biases. Figure 5.1 depicts a path diagram of the model.

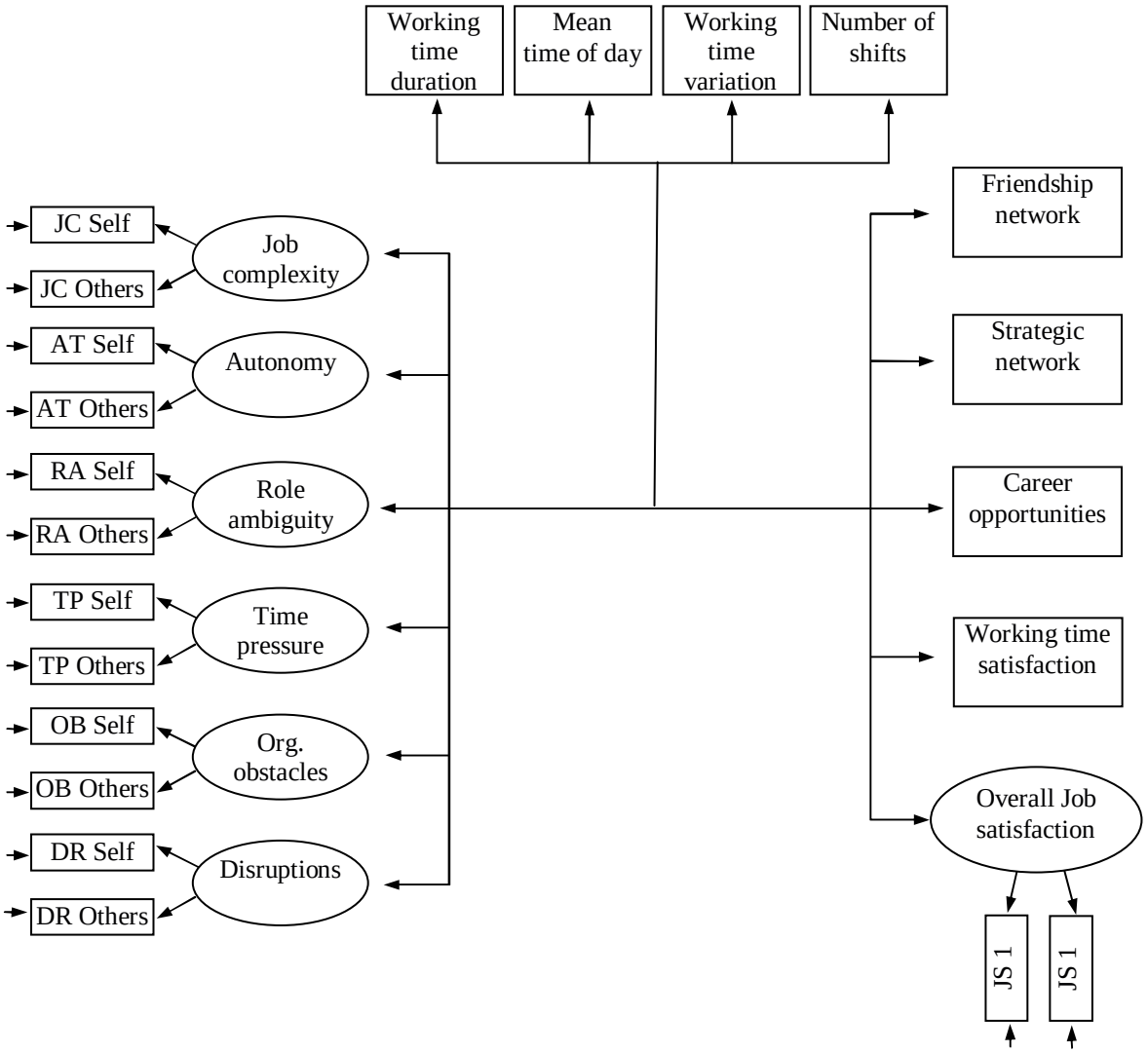


Figure 5.1

Relationships between working time, job conditions, stressors, social networks, career opportunities, working time and overall job satisfaction (Note: all variables intercorrelate)

The figure shows ellipses and boxes. The ellipses indicate latent variables which were reflected by two indicators. Consequently, relationships with these variables are free of measurement error. The boxes indicate indices which are sums of items and denote so-called formative

rated job conditions) in addition to the four working time dimensions, friendship and strategic networks, career opportunities, working time satisfaction, and overall job satisfaction. The fit of this model supported unidimensionality ($\chi^2(769) = 1587.52$; RMSEA = .056; CFI = .94).

constructs which are determined or defined by several facets (Bollen & Lennox, 1991; MacKenzie, Podsakoff, & Jarvis, 2005). For instance, career opportunities are the result of a variety of specific opportunities (e.g., raise, training, leadership). Finally, working time satisfaction was a single item (see Table 5.3). The depicted structure of doubled-headed errors signify estimated covariances, that is, every variable in the model covaried with each of the other variables. Not depicted are method correlations between the error variances of the self – vs. others ratings (i.e., the errors of the self rated parcels covaried with each others as did the errors of the others rated parcels). The fit of this model was good ($\chi^2(82) = 141.09$; RMSEA = .047; CFI = .984; SRMR = .032). Table 5.4 shows the correlations between the four working time dimensions and the job variables. The complete correlation matrix is depicted in Appendix B.

Table 5.4

Correlations between latent objective job characteristics, working time satisfaction, overall job satisfaction, and working time dimensions

	Duration	Mean time of day	Variation	Number of shifts
Job complexity	.30**	-.01	.16**	.24**
Autonomy	.09	-.01	-.19**	.23**
Role ambiguity	.38**	.13*	.38**	.13*
Time pressure	.30**	.19**	.33**	.05
Organizational obstacles	.20**	.00	.09	.12
Disruptions	.21**	.14*	.28**	.00
Career opportunities	.13*	.02	.02	.14*
Size of the friendship network at work	.14*	.10	.14*	.05
Size of strategic network at work	.10	.10	.10	.06
Working time satisfaction	-.39**	-.28**	-.38**	-.17**
Job satisfaction	-.13**	-.09	-.16**	-.01

Note. *p < .05, ** p < .01

Working time duration correlated significantly with job complexity ($\phi = .30$, $p < .01$), but not with autonomy, which shows that part-timers work in simpler jobs compared to full-timers but have an equal amount of opportunities for deciding about work related issues. On the other hand, autonomy correlated with number of shifts ($\phi = .23$, $p < .01$) which suggests, that it is not the duration that is relevant for the job status of the employee but the frequency the employee is present in the organization. Furthermore, duration correlated positively with job stressors; most

notably with role ambiguity ($\phi = .38$, $p < .01$) and time pressure ($\phi = .30$, $p < .01$). From this perspective, full-time jobs and not part-time jobs are stressful. Finally, duration correlated only slightly with friendship networks ($\phi = .14$, $p < .05$) and not significantly with strategic networks. Therefore, partial inclusion theory, which supposes a lower degree of social involvement of part-timers, may be partially supported, but the degree of the reduced inclusion seems to be only small. The same is true with regard to career opportunities where full-timers showed only slightly higher opportunities than part-timers ($\phi = .13$, $p < .05$).

With regard to shift work and its dimensions mean time of day and variation, it is especially the variation aspect that is related to job stressors. The correlation between variation and disruption ($\phi = .28$, $p < .01$) suggests that variation as well as disruption indicate work places which are characterized by a large amount of discontinuity and an inefficient work flow. In contrast, mean time of day had only small correlations with job stressors. However, it was not correlated with autonomy, hence, contradicting suggestions by Thierry and Meijman (1994).

Finally, the correlations with working time satisfaction indicate that especially working long hours and with high variation leads to dissatisfaction. It should be noted that the correlation between working time satisfaction and variation remained after controlling for working time predictability. Hence, it is variation per se that leads to dissatisfaction and not the potentially higher amount of unpredictability that may result from variation. When all of the four dimensions were included in an ordinary least squares multiple regression, only duration and variation remained as significant predictors.

5.4 Reliability, Accuracy, and Representativeness of the Working Time Measures

As noted in Chapter 4, the measurement of the working time dimensions based on the working time of the previous two weeks. Since the participants of the study had to remember their working time of these two weeks, the reliability and accuracy of the time data is of concern. In addition, it is possible that the measured working time of the period was an exception and not representative for the usual working time. All of these factors represent dangers for the predictive validity of the working time dimensions. One attempt to increase data quality was made by informing the participants two weeks before study began that the study would be about working time. Furthermore, they were asked to note their start and finishing times of the following 14 days.

5.4.1 Reliability

Computation of internal consistency measures like Cronbach's alpha was not possible as there were no multiple measures of working time. However, the panel design of the study enabled computation of test-retest-reliability. As Table 5.5 depicts, the test-retest-reliabilities were all substantial. Since it is unlikely that the true working time was completely stable during the one-year interval, it can be assumed that the true reliability is even higher. The reason is that interpreting test-retest-correlations in terms of reliability (or lack of random error) presupposes perfect stability of the true scores (DeVellis, 2006).

Table 5.5

Test-retest reliabilities of the working time dimensions (1-year interval)

	r_{tt}
Working time duration	.86**
Mean time of day	.62**
Working time variation	.79**
Number of shifts	.64**

Note. r_{tt} = test-retest-reliability; ** $p < .001$

5.4.2 Accuracy and representativeness

As the true accuracy and representativeness of the working time measures was not assessable, I measured the *perception* of the accuracy ("How well did you remember your working time during the last two weeks?"; response options ranged from 0 [*very inaccurately*] to 3 [*very accurately*]) and representativeness of the working time ("Does the time you worked during the last two weeks differ from your usual working time?"; response options ranged from 0 [*not at all*] to 3 [*very much*]).

As Table 5.6 shows, the majority of the participants (70.7%) were confident to remember working time of the 14 days "rather accurately" or "very accurately". Regarding the representativeness of the working time (see Table 5.7), 94.2% of the respondents indicated that the start and finishing times of the last 14 days differed "slightly" or "not at all" from their usual working time.

Table 5.6

Responses to the question “How well did you remember your working time during the last two weeks?” (perceived accuracy)

	Frequency	Percent
Very inaccurately	69	20.2
Rather inaccurately	31	9.1
Rather accurately	117	34.2
Very accurately	125	36.5
Total	342	100.0

Table 5.7

Responses to the question “Does the time you worked during the last two weeks differ from your usual working time?” (perceived representativeness of working time)

	Frequency	Percent
Not at all	241	70.3
Slightly	82	23.9
Quite	13	3.8
Very much	7	2.0
Total	343	100.0

Although the number of individuals perceiving high accuracy was promising, around 30% of the respondents indicated problems when remembering their working time of the last 14 days. Hence, the question arises if this amount of inaccuracy can lead to attenuation of relationships between working time dimensions and other variables. This was tested with a multigroup confirmatory factor analysis where the model depicted in Figure 5.1 was specified in a low vs. high accuracy group. If the perceived accuracy is an indication of low data quality then the covariances between working time and the other model variables should be significantly lower in the low accuracy group. Methodologically speaking, it was tested if accuracy moderates the relationships between the working time dimensions and other variables. The low vs. high accuracy groups were created by sorting individuals responding to the lower scale points (“very inaccurately” and “rather inaccurately”) in one group and those responding to the higher scale points (”rather accurately” or “very accurately”) in the other.

Although a multigroup approach has the disadvantages that (i) respondents differing in two or more scale units are combined in the same group, (ii) that the grouping variable contains measurement error and, thus, respondents might sorted in the wrong group and (iii) an estimation of the form and size of the moderator effect is not possible, it is sufficient for detecting a moderator effect when there is one. Furthermore, a large number of relationships can be tested for equality within one analytical step and is recommended as a first step to interaction modeling by some authors (McArdle & Ghisletta, 2000).

In a multigroup analysis, two or more groups are tested for equality of estimated parameters (Steenkamp & Baumgartner, 1998). This is done in a sequence of nested models where one starts with a model allowing all of the parameters to freely vary. In the next step, a complete set of parameters (e.g., factor loadings, latent covariances) are constrained to be estimated as equal. This constrained most often leads to a deterioration of the model fit which can be tested with the chi-square difference test. If the deterioration is significant, then the null hypothesis of equal parameters across the groups has to be rejected.

The primary goal in the present analysis was to test for equality of the covariances between the working time dimensions, job conditions, stressors, social networks, career opportunities and working time and job satisfaction across both accuracy groups (see Figure 5.1). However, comparisons of parameters of the latent structure presupposes the equality of the factor loadings, the so-called “metric invariance” (Steenkamp & Baumgartner, 1998; Vandenberg & Lance, 2000). As a consequence, I tested three nested models: (i) a baseline model where all parameters freely varied across both groups, (ii) a model with equal factor loadings, and (iii) a model with equal variances and covariances of the latent variables.

As it turned out, the model depicted in Figure 5.1 using self-report and others’ report data was not stable and lead to Heywood cases (i.e., negative error variances) in the others report indicators[7]. Therefore, I used just the self-report data, each latent job condition and stressor variable measured with three indicators. As Table 5.8 shows, the analysis showed no significant differences (i.e., the delta-chi-squares) in the factor loadings and variances and covariances of the latent variables. Therefore, the analysis shows that the perceived accuracy did not moderate the relationships between the working time dimensions and the other variables.

Overall, the results reported in this section indicate that (i) working time measurement fairly accurate and that (ii) data provided by respondents who are skeptical about their own response behavior is of similar quality compared with confident respondents.

[7] The reason was that the low accuracy group (N = 100) had 50% missing data in the others’ report data

Table 5.8

Fit indices of the models testing equality of covariances across the low vs. high accuracy groups

Model	χ^2 (df)	$\Delta\chi^2$ Δ(df)	RMSEA	CFI	AIC
Baseline model	699.29 (504)**		.048	.958	1343.29
Equal factor loadings	717.21 (518)**	+ 17.92 (14)	.048	.957	1319.21
Equal variances and covariances	861.21 (638)**	+ 144.00 (120)	.045	.953	1223.21

Note. **p < .01; RMSEA = Root mean square error of approximation; values below .06 indicate good fit; CFI = Comparative fit index; values close to .95 indicate a good fit; AIC = Akaike information criterion; the model with the lowest value is preferred

5.4.3 Outline

The next three chapters report analyses where the four working time dimensions were incorporated in models focusing on a specific theoretical issue: In Chapter 6, a study investigating the relationships between the working time dimensions and work-home interference (i.e., incompatibilities between work and nonwork) is reported and Chapter 7 examines the relationship between working time and subjective health. Chapter 8, finally, reports results from a longitudinal analysis that investigated the relationship between working time duration and job stressors on work-home interference. In this analysis, I incorporated only working time duration as the only working time dimensions, since the statistical power was to low to expect significant results for the other dimensions.

There are three issues to be noted. First, the chapters were written as separate articles to be published in scientific journals. Thus, there is some information that is repeated although it was reported in prior chapters (e.g., description of the multidimensional approach, description of the sample and measures). Second, the main foci of the chapters (articles) were not always working time. Instead working time was one aspect. This is especially the case in chapter 7, where the main focus was the structure of subjective health measures and working time was investigated as a predictor of subjective health (together with job stressors). Third, the “editorial we” was used in the chapters 6, 7, and 8, in contrast to the introduction which was expressed the first prison perspective auf the author.

6

Working Time, Work-Home Interference, Well-being, and Job Performance: The Role of Working Time Dimensions

Based on the notion that working time leads to interferences between work and nonwork, this study differentiates four dimensions of working time (*duration, variation, mean time of day, and number of shifts)* and investigates their relationships with work-home interference (WHI) as well as potential outcomes of WHI (job satisfaction, organizational commitment, turnover motivation, depression, and job performance). Moreover, this study investigated possible interactions of the 4 working time dimensions with 3 demographic variables (gender, child, and partner status) and schedule autonomy. Structural equation modeling was used to analyze the data (N = 387). The results showed that 3 working time dimensions (duration, mean time of day, and variation) had main effects on WHI. Furthermore, WHI was significantly related to depression, turnover motivation, and 2 performance dimensions (quality of work and meeting deadlines). However, neither the 3 demographic variables nor schedule autonomy moderated the majority of the main effects.

6.1 Introduction

Work-home interference (WHI, i.e., incompatibilities between work and private roles)[8] has become an important issue for organizations and individuals. The main reasons are changes in the demographic structure of the industrialized societies (e.g., the increase in double-earner households) which has led to increasing multiple role pressures for individuals. On the other hand, changes of life role values have increased involvement in family and leisure. As a result, WHI is a common experience of today's employees. WHI functions as a role stressor (Kahn, Wolfe, Quinn, & Snoek, 1964) and, therefore, can lead to negative outcomes such as job dissatisfaction, health problems, or turnover intentions (Adams, King, & King, 1996; Allen, Herst, Bruck, & Sutton, 2000; Frone, Russel, & Cooper, 1992).

One of the antecedents of WHI is working time (Greenhaus & Beutell, 1985). However, research has focused almost completely on weekly working hours (e.g., Byron, 2005; Frone, Yardley, & Markel, 1997b; Izraeli, 1993; Smith Major, Klein, & Ehrhart, 2002; Wallace, 1997, 1999). In contrast, other aspects of working time schedules (e.g., shift work) have been investigated less often (Pleck, Staines, & Lang, 1980).

This study takes a comprehensive perspective on the relationship between working time and WHI. We differentiate four dimensions of working time: the *duration* (i.e., how long does the individual work - for instance, per week), the *mean time of day* that the individual works (i.e., does he or she work during the early, middle, or late part of the day, on average), the *variation* (i.e., extent of changes of the daily working time during a certain time period, e.g., as is the case in rotating shift work), and the *number of shifts* worked during a certain time period (two weeks in this study). The first purpose of this study is to investigate potentially negative influences of these four working time dimensions on WHI. As research has mainly focused on working hours as a predictor of WHI, our study contributes to the literature by investigating if other aspects of working time have incremental predictive value.

Second, we address the role of schedule autonomy as a direct influence on WHI and as a moderator of the influence of working time. Schedule autonomy refers to the amount of an individual's influence on his/her working time and is an aspect of overall job related autonomy or self-direction (Ganster & Fusilier, 1989). Third, we incorporate the effects of working time on WHI into a model that integrates both antecedents (e.g., working time) and important individual

[8] Most of the research actually focuses on work-*family* conflict as a facet of overall work-home interference. In present article, however, we conceptualize the latter as a multisource role conflict, where multiple roles (i.e., partner, parent, friend) interfere with work roles.

and organizational outcomes of WHI (*job satisfaction, organizational commitment, depression, turnover motivation,* and *job performance*).

Fourth, we investigate the role of negative affectivity as a predictor of WHI which has rarely been done before (exceptions are Bruck & Allen, 2003; Carlson, 1999). It has been argued that negative affectivity is a disposition to negatively perceive external as well as internal events which can lead to experiencing situations as stressful (Watson & Clark, 1984). The inclusion of negative affectivity further serves to validate relationships between WHI and affect-laden constructs such as depression or job satisfaction against a third variable hypothesis. Stress research has argued that relationships between stressors and strain could be due to the common influence of negative affectivity (Brief, Burke, George, Robinson, & Webster, 1988).

Finally, we investigate the moderator effects of three demographic variables - gender, child status, and partner status - on the relationship between the working time dimensions and WHI. As females, parents, and individuals living together with a partner are supposed to be subject to higher nonwork demands, we expect stronger relationships between working time and WHI for these individuals compared to their counterparts (i.e., men, non-parents, and singles). Figure 6.1 depicts the conceptual model.

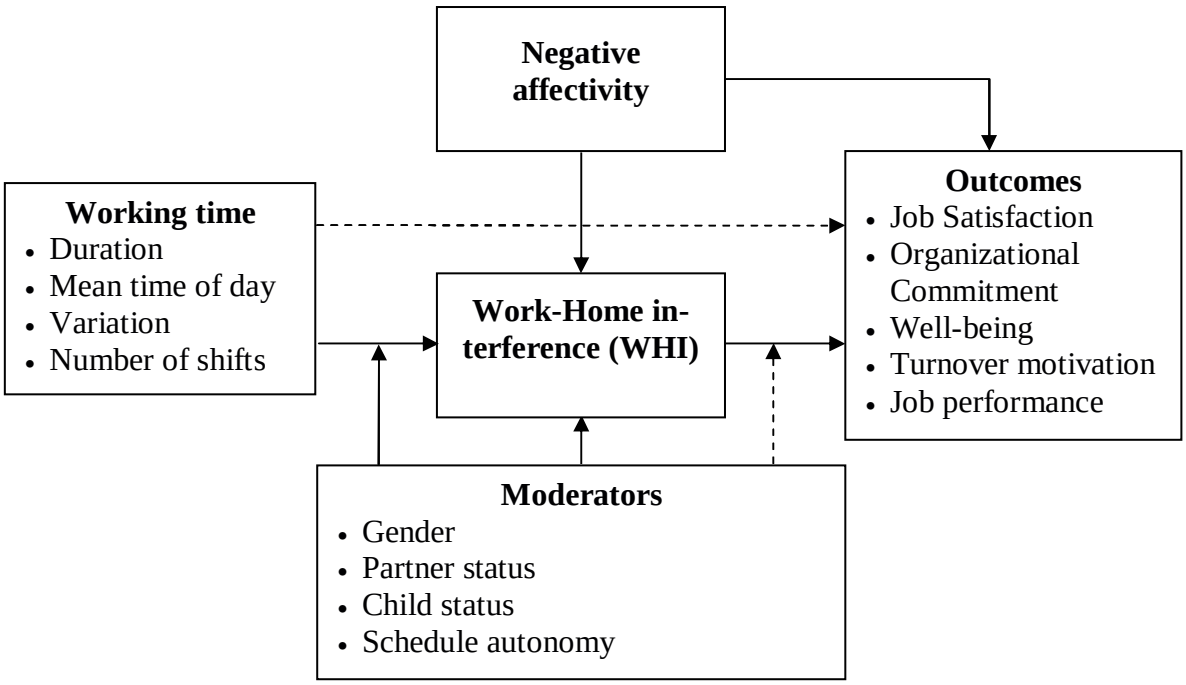


Figure 6.1

Conceptual model (dotted lines = exploratory tested relationships)

6.2 Working Time and WHI

6.2.1 A Dimensional Approach to Working Time

Research and theory-building on working time has developed within separate fields. Most prominent is research on shift work (Folkard & Hill, 2002), part-time employment (Barling & Gallagher, 1996), long working hours (Sparks et al., 1997), and compressed workweeks (Tepas, 1985). These approaches are concerned with distinct working time *schedules* such as part-time or shift work. They have added new knowledge in all of these areas. However, it might be practically useful, theoretically meaningful, and methodologically feasible to synthesize these disparate approaches into one. The approach we use is to differentiate four working time dimensions that describe working time and constitute the various working time schedules: the *duration*, *mean time of day*, *variation*, and *number of shifts*. By adopting a multidimensional approach, the different literatures on working time can be integrated and the bulk of various schedules can be organized in a four-dimensional space. First and foremost, our approach is a descriptive attempt. In addition, we hope to show that these four dimensions are relevant causal factors that lead to the consequences of working time (e.g., WHI or ill-health).

From a theoretical point of view, the dimensional approach overcomes three problems of working time schedules: First, a working time schedule introduces a common label for a variety of individuals who differ in other working time aspects, social status, or working conditions. For instance, part-timers may differ in the time of day they are working (morning vs. evening) but are nevertheless simply labeled as part-timers (Feldman, 1990). Thus, working time schedules ignore differences between individuals working the "same" schedule. Second, the distinctness of schedules implies clear boundaries which define the schedule. These boundaries, however, are artificial. For instance, Thierry and Meijman (1994) noted that there is often "a grey area between what is defined as a flexible working time arrangement and what is defined as a shift schedule" (p. 344). Another example refers to the differences in defining part-time work - cross-nationally and across industries (Thierry & Jansen, 1984). Third, it is often the case that different working time schedules are not mutually exclusive but simply focus on different aspects of time as a definitional feature (e.g., part-time vs. shift work).

According to the dimensional approach, every schedule can be described by four essential dimensions. For instance, rotating shifts can be described by a late time of day and high variation. Compressed workweeks can be characterized by a certain duration (e.g., 40 hours) and a reduced number of shifts per week (four days). Part-time can be characterized by a short duration but differentiated by the time of day (e.g., "moonlighting", Feldman, 1990), or the number of shifts

(e.g., working three days full-time vs. working every day half-time). Moreover, applying a dimensional perspective highlights the fluent transitions from one schedule to another.

From a methodological point of view, the dimensional approach has advantages for the analysis of working time effects. Since working time dimensions are continuous variables, they are better suited for correlation-based methods such as regression or structural equation modeling. In contrast, investigating working time schedules (e.g., shift work vs. nonshift work) relies on comparisons of employees working the "shift" schedule with those working "normal" schedules. Since every schedule consists of a particular configuration of the four dimensions, comparing different schedules confound the effects of the single dimensions. For instance, rotating shift work can be mainly defined by the elevated mean time of day and a high variation. When experiencing differences between rotating shift work and a normal schedule on some relevant outcome, it is difficult to ascertain if the difference is due to the mean time of day or to the variation. Thus, a dimensional approach helps to disentangle the specific effects of the dimensions. To summarize, the dimensional approach may help to deliver a more fine-grained and conceptually adequate perspective on working time and can be used to investigate the effects of the causally relevant components of working time (i.e., the dimensions) on important outcomes. In this study, we expect each of the four dimensions to have a positive effect on WHI. However, we argue that the dimensions operate via different processes. Therefore, integrating the dimensions in a comprehensive model enables it to analyze their unique effects and, thus, to examine the contribution of each process to WHI.

6.2.2 Relationships between Working Time and WHI

The central working time dimension for the investigation of WHI is *duration* (i.e., daily or weekly working time). Most scholars proposing an effect of duration on WHI rely on scarcity theory (Marks, 1977) which emphasizes the limited amount of resources like time or energy. Consequently, the engagement in one role (e.g., work) should be related to decreased opportunities to engage in other roles (i.e., parenthood). A high duration of working time should increase WHI by either limiting the opportunities to perform private behavior at all or by creating difficulties in performing the behavior. This mechanism was also termed the "rational view" of WHI (Gutek, Searle, & Klepa, 1991). Research investigating the association between working time duration and WHI (e.g., Frone et al., 1997b; Greenhaus & Beutell, 1985; Gutek et al., 1991; Izraeli, 1993; Smith Major et al., 2002; Wallace, 1997, 1999) consistently found support for this relationship.

Hypothesis 1a: Working time duration is positively related to WHI.

Furthermore, we predict that the *mean time of day* is related to WHI in such a way that working late should lead to higher WHI. Many nonwork related activities are bound to a certain time of the day. This may be due to culturally developed patterns of behavior (e.g., mealtime with the family, going to practice for some sporting activity, etc.) but also to opening hours of facilities like shopping malls, public authorities, pubs, and restaurants, etc. Although working at a later time of the day can be expected to facilitate some of these activities (e.g., when a night-shift worker can go shopping during the early daytime), it should interfere especially with those that are associated with private and family related activities (Spurgeon & Cooper, 2000). The conflict between work and nonwork can especially be expected with regard to social activities since these have to be coordinated with interaction partners (e.g., spouse and friends) whose work-nonwork rhythms are different from the rhythms of the individual. Empirically, shift workers complain about their reduced opportunities to attend cultural events as well as to participate in social organizations and social and leisure-related activities (Thierry & Meijman, 1994).

Hypothesis 1b: Mean time of day is positively related to WHI.

To our knowledge, no study has investigated a relationship between *working time variation* and WHI. Variation should have a negative effect on private activities. Private activities are often carried out in some regular patterns. Consequently, variation in working time should lead to disturbances of these patterns. Furthermore, private activities are often of a social nature and imply interpersonally coordinated plans or shared habits. We suppose that working time variation should be especially detrimental for private activities because it should exacerbate the coordination between the diverse social agents (e.g., partner, friends, children).

Hypothesis 1c: Working time variation is positively related to WHI.

Finally, we predict a relationship between the *number of shifts* and WHI. For some working time schedules - mainly shift-work and compressed workweeks - Tepas (1985) as well as Thierry and Meijman (1994) argued that complete days off provide an amount of nonwork time that could be used more effectively than a small amount of nonwork time each day. On working days, individuals have to coordinate work-related activities with private activities, which can lead to interferences between work and nonwork life. Furthermore, work restricts the amount of time available for private activities to a few hours (e.g., in the evening). In contrast, free days can be used in their entirety for private activities without any work related constraints. In this respect, Daus, Sanders, and Campbell (1998) reviewed research on compressed workweeks and noted an increase in social participation due to a longer weekend of the workers.

Hypothesis 1d: The number of shifts is positively related to WHI.

6.2.3 Schedule Autonomy and WHI

The opportunity to influence working time according to private matters has been discussed as one of the job characteristics that can provide a resource in the prevention of WHI (Baltes et al., 1999; Christensen & Staines, 1990). We investigate both main and interaction effects of schedule autonomy on WHI. According to theorizing on overall autonomy at the workplace (Ganster & Fusilier, 1989), subjects high on schedule autonomy should be able to influence their working time and, thus, prevent the occurrence of WHI (Thomas & Ganster, 1995). Thus, we expect a direct effect of schedule autonomy on WHI. Moreover, schedule autonomy should alleviate the negative effects of the working time dimensions. Individuals who are high on a respective dimension as well as on schedule autonomy should be able to adapt working time to private and family demands when deemed necessary. Therefore, we expect schedule autonomy to moderate the effect of the mean time of day, variation, duration, and number of shifts on WHI.

Research has mostly focused on the direct relationship between *flexitime* and WHI (e.g., Byron, 2005; Christensen & Staines, 1990; Greenhaus, Parasuraman, Granrose, Rabinowitz, & Beutell, 1989; Shinn, Wong, Simko, & Ortiz-Torres, 1989; Thomas & Ganster, 1995). Our study deviates from this tradition by a) its attempt to investigate interaction effects and b) focusing on schedule autonomy instead of flexitime. Compared to autonomy, flexitime is a formal schedule that does not have to imply an actual influence over working time. For instance, expectations of the supervisor or high workload can diminish actual autonomy (Christensen & Staines, 1990). Thus, focusing on autonomy should better match the concept of control over working time.

Hypothesis 2a: Schedule autonomy is negatively related to WHI.

Hypothesis 2b: Schedule autonomy decreases the positive relationship between working time duration, variation, mean time of day, and number of shifts and WHI.

6.2.4 Demographic Variables and WHI

Several scholars have emphasized the importance of nonwork related demands or responsibilities for WHI. In this respect, some research focused on demographic variables such as gender, marital status, or parenthood because these variables are associated with nonwork-related responsibilities (e.g., Duxbury & Higgins, 1991; Duxbury, Higgins, & Lee, 1994; Eagle, Icenogle, Maes, & Miles, 1998; Gutek et al., 1991). The main argument is that especially women, parents, and individuals with a partner should be prone to WHI because of their greater amount of nonwork-related role demands and responsibilities (for the household, child care, etc.). As in the case of schedule autonomy, some studies compared different demographic groups (e.g., males vs. females, Duxbury et al., 1994; Eagle et al., 1998) in their average WHI. In contrast, we argue that a

higher degree of nonwork-related role demands should not inevitably lead to higher WHI. For instance, women tend to work part-time or reduce their working time to cope with current or anticipated WHI (Barling & Gallagher, 1996). Consequently, women may experience an equal or even lower amount of WHI (Eagle et al., 1998). Instead of mean differences between the different groups, we expect an interaction between the working time dimensions and gender, partner status (i.e., living together with a partner/spouse vs. living without one) and child status (i.e., having children vs. being childless), respectively (Duxbury & Higgins, 1991; Wallace, 1999). Based on the definition of WHI as incompatible role demands, the effect of a long working time duration, a late time of day, a high variation, and large number of shifts should be larger with increasing nonwork-related role demands. As a result, women, parents, and those with a partner/spouse should experience stronger relationship between the working time dimensions and WHI.

Hypothesis 3a: Women show a stronger positive relationship between working time and WHI than men.

Hypothesis 3b: Parents show a stronger positive relationship between working time and WHI than non-parents.

Hypothesis 3c: Individuals with a partner/spouse show a stronger positive relationship between working time and WHI than individuals without a partner/spouse.

6.3 The Consequences of WHI

As WHI is usually conceptualized as a *role stressor* (Kahn et al., 1964), we expect several strain variables to be influenced by WHI. We focus on *job satisfaction, affective organizational commitment, turnover motivation,* and *job performance* as important organizational outcomes, and *depression* as an indicator of well-being.

WHI is the perceived consequence of characteristics of the job. These characteristics concern, for instance, working time in a narrower sense or organizational practices in a wider sense. Therefore, as a reaction to WHI, people should develop negative attitudes toward the job and the organization. This argument is in line with assumptions stated in attitude theory (Ajzen & Fishbein, 1980) that people develop negative attitudes toward issues that imply negative consequences. Thus, WHI should decrease overall *job satisfaction* as a global attitude toward the job and *affective organizational commitment* as an attitude toward the organization. Furthermore, because of its aversive quality, WHI should cause individuals to avoid the causing conditions and, thus, to leave the organization. Therefore, we expect a relationship between WHI and *turnover motivation*.

Hypothesis 4a: WHI is negatively related to job satisfaction.

Hypothesis 4b: WHI is negatively related to affective organizational commitment.

Hypothesis 4c: WHI is positively related to turnover motivation.

We also expect an association between WHI and *job performance*. Individuals experiencing a strong WHI may often be concerned and preoccupied with private or family related issues or experience a high absence motivation. Hence, attention, that is necessary for the execution of work tasks, is directed to non-task related areas (Kanfer & Ackerman, 1989). This should result in more errors and a reduced quality of work. Furthermore, individuals may reduce their effort and motivation as a reaction to their WHI, thus, leading to reduced performance of job related activities that are voluntary but important for the organization, for instance, cooperation or engagement (Borman & Motowidlo, 1997). The relationship between performance and WHI has not often been investigated - exceptions are the studies by Aryee (1992), Greenhaus, Bedeian, and Mossholder (1987), and Netemeyer, Maxham, and Pullig (2005) which have produced inconsistent evidence.

Hypothesis 4d: WHI is negatively related to job performance

Since WHI can be regarded as an overall negative evaluation of the integration of work life and private life, we propose that this negative evaluation will have implications for the individuals' general level of *well-being* (Allen et al., 2000; Kossek & Ozeki, 1998). Furthermore, we assume that WHI has negative implications for the individuals' self-evaluation or sense of mastery. According to identity theory (Burke, 1991), individuals strive for positive identities by meeting the internally represented standards of role performance. Since WHI implies that the standards in important nonwork related roles cannot be achieved, the effects should be feelings of insufficiency and increased strain. This study focused on depression as an operationalization of well-being since negative self-evaluations are a main characteristic of this construct. Thus, depression should be the central dependent variable according to the hypothesized process.

Hypothesis 4e: WHI is positively related to depression

Finally, we expect negative affectivity to be a predictor of WHI. Negatively affective individuals tend to experience their environment in a negative way (Watson & Clark, 1984). Consequently, they should demonstrate a higher tendency to perceive role stressors like WHI (Carlson, 1999). Moreover, since negative affectivity is associated with strain symptoms, negatively affective individuals should tend to strain-based WHI (Greenhaus & Beutell, 1985). Strain-based WHI occurs when consequences of stress, such as preoccupation with work events or a higher need for recovery, lead to difficulties in performing nonwork role behavior.

Hypothesis 5: Negative affectivity is positively related to WHI

6.4 Method

6.4.1 Sample

The sample consisted of 387 participants. One part of this sample (n = 255) was recruited from a larger population sample of 1,677 individuals who were surveyed in a comprehensive research project about working time. These individuals had been randomly selected out of the German working population. We sent questionnaires to 515 participants from this sample who had indicated their willingness to participate in our study; 255 completed questionnaires were returned. The other part of our sample was recruited at a local hospital and by requesting university employees and students to distribute questionnaires to working acquaintances (n = 132). Multigroup analyses showed no significant differences between both subsamples in the regression coefficients of the model variables. Therefore, we pooled both samples into one. The overall sample (N = 387) was demographically almost identical to the larger German population sample, which shows that selection effects do not exist. The largest difference between the population sample and the sample used in this study was a slightly higher percentage of females (57% vs. 54%) in our study. The average age was 40 years (SD = 10.5, range = 17 to 61 years). Participants worked in a variety of different occupations from various industries (e.g., public service, manufacturing, finance, health care, craft, retail) and included both part- and full-time employees.

In addition to the self-report data, we obtained 218 reports by others that contained data about job performance (see Appendix D). Participants were instructed to forward the others' rating questionnaire to their supervisor or a coworker who is familiar with the self-rater's work behavior. 30 reports were provided by the supervisor, 168 by the coworker, and 15 by subordinates. In 5 cases, an identification of the source was not possible. Analysis of variance revealed no significant mean differences in the ratings between supervisors, coworkers, and subordinates. The participants and their raters worked together for a duration of 1 to 46 years (M = 7 years). 142 raters were female, 74 were male, and for two raters, gender data was missing. The mean age of raters was 39 years (range = 16 to 61 years).

6.4.3 Measures

Working time. Participants were asked at what time they had started and ended each working day during the last two weeks. All of the working time dimension indices were then calculated from this data. This approach delivers continuous variables which are superior to categorical, Likert-type items. Moreover, the variables are not influenced by systematic biases (e.g., overrating).

The *duration* (i.e., weekly working time) was calculated in two steps. First, we subtracted the starting point of each workday from its end point. This procedure delivered the length for each of the 14 days. The end points were treated as open-ended values (e.g., 13:00 instead of 1 p.m. or 26:00 instead of 2 a.m.) to assure that they were always numerically larger than the starting point. Second, we summed the 14 day lengths and divided them by two to obtain the weekly working duration.

To calculate the *mean time of day* for the two weeks, we had to choose one central time of day for each day. This was the middle of the working shift. For instance, if a person worked from 8 a.m. until 5 p.m. (i.e., 17:00), the central time of day was 12 p.m. If a person worked from 10 p.m. (i.e., 22:00) until 6 a.m. (i.e., 30:00), the central time of day was 2 a.m. (i.e., 26:00). Thus, this convention made it possible to quantify early and late working schedules along a daytime continuum. Finally, we averaged the central time of day values of the 14 days to get the mean time of day.

The *working time variation* was operationalized as both day length variation and time of day variation across the 14 days. The length variation was calculated as the standard deviation of the daily lengths measures around the subject's mean day length. The time of day variation was calculated as the standard deviation of the time of day measures around the subject's mean time of day. Finally, both length and time of day variation were standardized and added together to create an index. The *number of shifts* ranged from 1 to 14. To determine this, we counted each day the respondent had worked.

Work-home interference. Netemeyer, Boles, and McMurrian's (1996) 5-item scale was translated into German and back-translated by an English native speaker. A sample item is "Things I want to do at home do not get done because of the demands my job puts on me". The response options ranged from 0 (*totally disagree)* to 4 (*totally agree)*. Cronbach's alpha for the five items was .92.

Job satisfaction. We measured job satisfaction with two items. One of them was a popular single-item measure ("overall, how satisfied are you with your job?", cf. Scarpello & Campbell, 1983; Wanous, Reichers, & Hudy, 1997) and the other one was self-constructed ("how does your job corresponds with your idea of how your job should be"). The use of two items was necessary to enable the specification of a latent variable and to take measurement error into account. Both items were measured on a bipolar 5-point scale (from "–2" to "+2") with numeric scale anchors. Cronbach's alpha for the two items was .89.

Depression. We used four items from a depression scale developed by Zung (1965) adapted by Mohr (1986). A sample item is "I am looking into the future without any hope". Responses

were given on 7-point Likert scales with response options ranging from 0 (*never)* to 6 (*almost always)*. Cronbach's alpha for this measure was .79.

Organizational commitment. Organizational commitment was measured with three 5-point Likert items from a German version of the Allen and Meyer (1990) scale by Schmidt, Hollmann, and Sodenkamp (1998). A sample item is "this organization has a high personal meaning for me". The response options ranged from 0 (*totally disagree)* to 4 (*totally agree)*. Cronbach's alpha was .76.

Turnover motivation. Turnover motivation was measured with three 5-point Likert items focusing on important aspects of the turnover process (Hom, Caranikas-Walker, Prussia, & Griffeth, 1992; Mobley, 1977; Mobley, Horner, & Hollingsworth, 1978). This was "turnover cognitions" ("how often do you think of quitting your job?" – response options ranging from 0 (*almost never*) to 4 (*almost everyday*)), "search behavior" ("how often have you recently looked for another job [e.g., by reading the newspaper or asking acquaintances]?" – response options ranging from 0 (*not at all*) to 4 (*almost everyday*)), and "intention to quit" ("how probable is it that you will quit your job during the next year?" – response options ranging from 0 (*very unlikely*) to 4 (*very likely*)). The cognition and the intention item were developed by Schaubroeck, Cotton, and Jennings (1989). The behavior item was self-developed and added to the scale. Cronbach's alpha of the 3-item scale was .78.

Negative affectivity. We measured negative affectivity with five items of the "stress reaction" scale which is part of the Multidimensional Personality Questionnaire (MPQ, Patrick, Curtin, & Tellegen, 2002)[9]. The items of this scale emphasize the dispositional aspect of negative affectivity with regard to perception of events (e.g., the tendency to react sensitively to criticism). The response format was provided on a 5-point Likert scale with response options ranging from 0 (*totally disagree)* to 4 (*totally agree)*. Cronbach's alpha for the five items was .81.

Job performance. We used self- and others' ratings to measure seven performance dimensions that represent the entire job performance domain. The dimensions were *quality* of work, *efficiency* during task execution, meeting task-related *deadlines*, *effort* that exceeds expectations, *altruism* concerning co-workers, *initiative*, and *engagement* in extra-role tasks. These dimensions can be related to concepts of task and contextual performance (Motowidlo & Van Scotter, 1994). With regard to task performance, we considered a fine-grained and multidimensional measure more appropriate than using well-known and unidimensional measures (e.g., Williams & Anderson, 1991). Because we suggested specific mechanisms how WHI should affect job performance (e.g., by making more errors), our goal was to measure job performance at this level of specifity

[9] Multidimensional Personality Questionnaire-Brief Form (MPQ-BF). Copyright © 1995, 2002 by Auke Tellegen. Unpublished test. Used by permission of the University of Minnesota Press. All rights reserved.

(e.g., quality of performance). The three items that can be related to task performance are *quality*, *deadlines*, and *efficiency*. Especially quality and deadlines can be related to ”speed” and “accuracy” suggested by Campbell, McCloy, Oppler, and Sager (1993) as “critical parameters” of task performance. The other four measures of performance (*effort, altruism, engagement,* and *initiative)* can be related to the concept of contextual performance (Motowidlo & Van Scotter, 1994). Analogous to task performance, we measured those dimensions that matched potential specific consequences of WHI. Finally, we measured performance with behavioral descriptions that match the concept of performance as behavior (Campbell et al., 1993). Due to space restrictions in our questionnaire, we measured each dimension with one self- and one others' report item on a 7-point bipolar scale. Each pole contained a short behavioral description of an extreme form of the relevant behavior. The items were “do you often make mistakes / produce insufficient results (low quality) or do you always produce excellent results?” (high quality); “do you always work in a structured way (high efficiency) or is your way of doing things rather cumbersome” (low efficiency); “do you often miss deadlines / take longer than scheduled (low deadlines) or do you mange to finish work in due time?” (high deadlines), “do you waste time when working (by attending to private things, taking long breaks, chats, etc. (low effort) or do you always work in an ambitious and focused way exceeding the expectations?” (high effort); “are you always willing to help your colleagues / do you pass on important information without being asked to (high altruism) or do you often act according to the motto that everybody should mind his own business” (low altruism); “do you usually wait until somebody tells you what to do (low initiative) or do you immediately take the initiative” (high initiative), and “are you often ready to do more than requested (high engagement) or do you stick to the tasks you are requested to do?” (low engagement). Correlations between self- and others' ratings were .21 (quality), .24 (deadlines), .16 (efficiency), .28 (effort), .30 (altruism), .26 (initiative), and .29 (engagement).

We modeled job performance as a set of specific dimensions instead of an overall job performance composite. Edwards (2001) as well as Murphy and Shiarella (1997) emphasized that job performance is a multidimensional construct. Although they noted that the different facets could be grouped in broader constructs like task and contextual performance, they recommended using specific facets when analyzing predictors of job performance. Along a similar vein, Edwards and others (Paunonen, Rothstein, & Jackson, 1999; Schneider, Hough, & Dunnette, 1996; Smith, Fischer, & Fister, 2003) argued for the use of “multivariate sets” of broad constructs – that is, utilizing specific facets of a construct as predictors or outcomes. This “would allow researchers to investigate specific questions for each dimension individually along with general questions for the dimensions collectively” (Edwards, 2001, p. 149). Especially where one can expect vary-

ing or even opposing relationships between the components and predictors or outcomes, this approach reduces the risk of biasing relationships regarding the overall construct.

Schedule autonomy. We constructed three items that refer to the degree of influence on working time. Responses were given on 4-point Likert scales with options ranging from 0 (*not at all*) to 3 (*completely*). The items were "To what extent can you determine the time you begin with your daily work?", "To what extent can you determine the time you end your daily work?" and "To what extent can you determine the number of hours of your working week?". Cronbach's alpha for this scale was .89.

Demographic variables. We measured *child status* with the dichotomous question "Do you have children?" (1 = yes; 2 = no), and *partner status* with the question "Do you live together with a partner?" (1 = yes; 2 = no). Gender was coded as 1 = male, 2 = female.

Further measures. We measured two issues concerning the measured working time on a 4-point Likert scale. The first was the subjects' confidence in remembering the working time accurately ("How well did you remember your working time during the last two weeks?"). The response options ranged from 0 (*very inaccurately*) to 3 (*very accurately*). The other question asked how representative the working time they reported for the previous two weeks was for their working time in general ("Does the time you worked during the last two weeks differ from your usual working time?"). The response options ranged from 0 (*not at all*) to 3 (*very much*). These measures were used to test if the predictive validities of the working time measures depend on the subjective accuracy of the time measurement or representativeness of the measure. Therefore, we tested a moderator effect of the accuracy and representativeness on the effects of the working time dimensions.

6.4.4 Treatment of Missing Data and Non-Normality

The percentage of missing data in the self-report part of present study ranged from 4.7% (gender) to 19.4% (child and partner status). Although the response rate of the others' reports was acceptable (52.5%), the nonresponse caused a substantial amount of missingness. We decided to use the multiple imputation method (Rubin, 1987; Schafer & Graham, 2002) to reduce bias in the estimation of the performance part of our model. Multiple imputation has been shown to lead to better estimates and standard errors and, thus, is superior to traditional methods such as pairwise or listwise deletion (Abraham & Russell, 2004; Newman, 2003). The multiple imputation procedure was carried out with PRELIS 2 (Jöreskog & Sörbom, 1996). In the first phase of the process, we identified "auxiliary variables" - that is, variables that are correlated with the variables that contain missing data. Auxiliary variables have been shown to support the multiple imputation process (Collins, Schafer, & Kam, 2001). We used 34 auxiliary variables and the 41 model vari-

ables and imputed 15 data sets that served as input for our models. The respective outputs of these multiple models (parameter estimates, standard errors, t-values, standardized coefficients, and goodness-of-fit indices) were finally aggregated with PRELIS to obtain overall parameters and fit indices.

Furthermore, most of the variables were non-normally distributed. Although non-normality usually provides unbiased parameter estimates (Boomsma & Hoogland, 2001; Chou & Bentler, 1995), the chi-square statistic is upwardly biased and the standard errors of the parameters are underestimated (Boomsma & Hoogland, 2001; West, Finch, & Curran, 1995). Therefore, we used the Satorra-Bentler scaled chi-square (hereafter SB-chi-square) and robust standard errors that correct for these biases as recommended by several scholars (e.g., Chou & Bentler, 1995; Curran, West, & Finch, 1996; Hu, Bentler, & Kano, 1992). Since the difference of two SB-chi-square values itself is not chi-square distributed, multigroup analyses cannot be conducted with the simple difference. Thus, we applied the program SBDIFF, which corrects the chi-square differences.

6.4.5 Procedures

We conducted three kinds of analyses. The main effects depicted in Figure 6.1 were analyzed within the *main effects model* containing the working time dimensions, WHI, and all outcomes. The interaction effects were considered in smaller submodels, which excluded the performance dimensions but included schedule autonomy and the demographic variables. Since schedule autonomy is a continuous variable, its interaction with working time was tested in *latent interaction models.* Finally, the interaction between working time and the demographic variables were analyzed in *multigroup models* where we compared the different groups (e.g., women vs. men) in their model parameters.

Main effect model. The conceptual model is depicted in Figure 6.1. Unfortunately, a complete translation of this model into a structural equation model with all of the variables contained would have resulted in too many parameters. Thus, we decided to exclude the demographic variables *in the first step* and estimated the main model only with the working time dimensions, WHI, and the outcomes (job satisfaction, commitment, turnover motivation, depression, and job performance). The demographic variables were considered in smaller submodels in the second (interaction analyses) and third part (multigroup analyses) of our study. Following this strategy allowed us to analyze the effects of the working time dimensions while controlling for the demographic variables.

We modeled the working time dimensions as single-indicator variables with loadings fixed to one and their errors fixed to zero. All other variables were modeled as multi-item latent variables. This approach allows the estimation of regression coefficients that are free of random

measurement error (Bollen, 1989). The performance dimensions were modeled as latent variables - each reflected by one self and one other's item. That is, the performance dimensions were not the aggregate of both measures but their covariance. This procedure treated the residual variance of each rating as person-specific bias and enabled analyzing relationships with performance dimensions free of rating error. We modeled the self- and others' data as a "correlated uniqueness" structure (Kenny & Kashy, 1992). That means we allowed the within-others' report errors and within-self-report errors to correlate across the performance dimensions. This reflected the method covariance due to the rating source (self- vs. others' rating) as well as the bipolar rating format of the measurement instrument. The identification of the performance structure was obtained by fixing the first loading to one and equating the within-construct measurement errors.

The modeling procedures started with the measurement model allowing all latent variables to correlate. Model A was the target model. This model implied a full mediation of WHI without any direct effects of working time on the dependent variables. The residuals between the dependent variables were all uncorrelated. Negative affectivity was hypothesized to influence WHI as well as the psychological constructs (job satisfaction, commitment, depression, and turnover motivation). The effects of negative affectivity on job performance were fixed to zero.

Because we had not explicitly hypothesized a full mediation or uncorrelated residuals, we investigated potential direct effects and correlated residuals within a series of nested models: In Model B, we examined correlated residuals. This addressed our expectation that the covariation between the dependent variables is not only caused by WHI but also by other omitted variables. This was conducted in two steps. In the first step, we estimated all residual correlations; in the second step, we fixed all nonsignificant residuals to zero. As a result, Model B contained only substantial residual correlations. In Model C, we added direct effects of the working time dimensions. Again, this was accomplished in two steps: First, we allowed all direct effects of working time and negative affectivity to be freely estimated. Second, we again fixed all of the nonsignificant direct effects to zero. In the course of the imputation procedure all of the models were replicated 15 times. One replication did not converge during the estimation of the measurement model and was excluded. The parameter estimates and fit indices were averaged from the remaining 14 replications.

Interactions with schedule autonomy. The interactions between working time and schedule autonomy were tested with latent interaction models by using an approach developed recently by Marsh, Wen, and Hau (2004) that is a simplified alternative to the traditional approaches (Jöreskog & Yang, 1996; Kenny & Judd, 1984). We used centered indicators of the predictors, fixed the latent means of both predictors to zero, and constrained the mean of the product term to the covariance of both predictors (i.e., $\kappa_3 = \phi_{21}$). To test our hypotheses, we included the three

demographic variables as well as all of the four working time dimensions as control variables in the model. For each working time dimension we specified a separate interaction model including one product variable, thus, resulting in four tested models. The significance of the product variable was the criterion for an interaction effect.

Interaction with the demographic variables. The moderator effects of the demographic variables (gender, child, and partner status) were tested with multigroup analyses (Jaccard & Wan, 1996). The multigroup analyses were conducted in smaller submodels that contained the demographic variables, schedule autonomy, the working time dimensions, WHI, a limited set of outcomes (job satisfaction, turnover motivation, and depression), and negative affectivity as an influence of WHI, job satisfaction, depression, and turnover motivation. Multigroup analyses estimate models across two or more groups. This allows testing for measurement and structural invariance (Byrne, Shavelson, & Muthén, 1989; Steenkamp & Baumgartner, 1998)[10]. Hence, we tested whether the properties of the measurement instruments (e.g., factor loadings) are comparable in the investigated groups.

The sequence of tests began with a test of structural comparability (i.e., configural invariance) where all of the parameters were allowed to freely vary across the groups. In the following, certain types of parameter matrices were successively constrained to be equal across both groups in order to test for the various types of invariance (i.e., metric invariance, invariance of variances and covariances, error invariance, structural invariance). Each specific test of invariance started with the complete parameter matrix set equal across both groups (i.e., full measurement invariance). This step was evaluated by testing the significance of the SB-chi-square difference: A significant difference points to one or more significantly different parameters. Consequently, the equality constraints for parameters with the highest modification indices were relaxed until the difference between this partially invariant model and the unrestricted model was no longer significant. The partially invariant model then functioned as the comparison standard for the following test of full measurement invariance. It is the tests of invariance of the structural effects that are of interest for the moderator hypotheses.

[10] Tests of measurement invariance address the question of whether the measurement instrument measures the constructs of interest with comparable reliability and validity. It consists of three parts: *Configural invariance* tests if the overall model structure (i.e., number of factors and referring indicators) is the same in both groups. This is the most fundamental test. Next, *metric invariance* concerns the equality of the factor loadings across both groups. Metric invariance tests if the subjects of both groups use the same scale in answering the items. Since factor loadings are the correlations between the measured and latent variables, metric invariance also implies that the latent variable is the same in both groups. Finally, the invariance of the measurement errors tests whether the latent variables are measured with equal precision in both groups. In the case of equal latent variances, error invariance can be interpreted as equal reliability (Marsh & Hocevar, 1985). Tests of structural invariance refer to the equality of structural coefficients (factor variances and covariances and regression coefficients). These tests also can be conducted within a predictive validity framework or can test particular hypotheses about group differences in causal effects, as was the case in our study.

Fit indices. We used the Satorra-Bentler corrected chi-square (SB-chi-square), RMSEA (root mean square error of approximation), SRMR (standardized root mean squared residual), the CFI (comparative fit index), and the AIC (Akaike information criterion) to evaluate the fit of our models. According to Hu and Bentler (1999), we considered CFI values close to or above .95, RMSEA values below .06, and SRMR values below .08 as indicators of a good fit. Furthermore, we regarded the model with the lowest AIC as the preferred one.

6.5 Results

6.5.1 Descriptive Results

Table 6.1 shows the means, standard deviations, and intercorrelations of the manifest (composite) study variables. The working time dimensions were significantly correlated. The strongest correlation appeared for duration and number of shifts (r = .67). This was expected since subjects with a high weekly working time tend to work on more days than part-time workers. Furthermore, mean time of day and variation correlated at r = .60, a finding which is due to rotating shift work (i.e., shift workers have higher mean time of day and increased variation). WHI correlated significantly with the working time dimensions.

6.5.2 Main Effect Models

The fit indices of the main effect models are depicted in Table 6.2. The measurement model (M1) showed acceptable approximation to the data ($SB\chi^2(573) = 898.83$; $p < .001$; RMSEA = .038; SRMR = .051, CFI = .959). However, the modification indices indicated high values for three double loadings[11]. Despite the initial fit, we estimated these three loadings. All three double loadings could be meaningfully interpreted. The modified measurement model (M2) had a good fit ($SB\chi^2(570) = 851.88$, $p < .001$; RMSEA = .036; SRMR = .049, CFI = .964) and was significantly better than the initial model ($\Delta SB\chi^2(3) = 34.10$, $p < .001$).

[11] One turnover item ("How often do you think of leaving the organization?") loaded on job satisfaction; one depression item ("It is hard for me to make decisions") loaded on negative affectivity; and one commitment item ("I would be glad to stay in this organization the rest of my career") loaded on turnover motivation.

Table 6.1

Descriptive Statistics of Manifest Variables

	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Working time duration	38:35	13:59																				
2. Mean time of day	13:02	2:34	.28**																			
3. Working time variation	.00	1.59	.53**	.60**																		
4. Number of shifts	9.82	1.96	.67**	.01	.04																	
5. Schedule autonomy	1.03	.91	-.03	-.17**	-.28**	.02																
6. WHI	1.42	.91	.40**	.33**	.41**	.19**	-.15**															
7. Negative affectivity	1.85	.56	-.03	.02	.06	-.05	-.02	.15**														
8. Job satisfaction	.43	.66	-.10	-.02	-.17**	.02	.28**	-.25**	-.08													
9. Commitment	2.43	.97	.05	-.06	-.05	.09	.14*	-.12*	-.06	.54**												
10. Turnover motivation	.69	.83	.11*	.14*	.21**	.02	-.14*	.24**	.12*	-.36**	-.50**											
11. Depression	1.57	1.02	.00	.08	.07	-.06	-.10	.21**	.46**	-.34**	-.20**	.19**										
12. Quality	5.57	.96	-.03	-.07	-.04	-.02	.05	-.12*	-.12*	.12*	.09	-.15**	-.11*									
13. Efficiency	5.21	1.23	.02	-.01	.07	-.04	.02	.09	-.02	.02	.08	-.11*	-.06	.42**								
14. Deadlines	5.07	1.48	.00	.07	.11	-.10	-.09	-.08	-.10	.00	.02	-.04	-.08	.26**	.15**							
15. Effort	5.41	1.28	-.05	-.07	.02	-.06	.00	-.14*	-.01	.00	-.02	-.01	-.07	.29**	.19**	.16**						
16. Altruism	5.87	1.24	.00	.06	.11**	-.12*	-.01	.04	.07	.12*	.11*	-.04	-.02	.22**	.14**	.26**	.04					
17. Initiative	5.67	1.11	.05	-.05	.00	.02	-.01	.01	-.10	.09	.11*	-.10	-.16**	.41**	.43**	.16**	.22**	.21**				
18. Engagement	5.18	1.39	.17*	.04	.14**	.04	.12*	.08	.08	.13*	.30**	-.16**	-.10	.16**	.27**	.09	.08	.34**	.39**			
19. Gender	1.57	.50	-.31**	-.03	-.11*	-.23**	-.17**	.02	.22**	-.06	-.01	-.04	.12*	.01	.10	.01	.09	.16**	.06	-.01		
20. Partner status	1.32	.47	.06	.05	-.02	.07	-.03	-.05	.08	-.08	.00	-.03	.07	-.13*	-.04	-.01	-.10	.04	-.02	.07	-.04	
21. Child status	1.41	.49	.24**	.13*	.18**	.17**	-.09	.08	.18**	-.04	-.10	.13*	.07	-.10	-.07	.02	-.11	.09	-.04	.03	-.17**	.41**

Note. $^{**}p < .01$; $^{*}p < .05$; N = 299-350, all variables are the composites of their respecting items, performance variables were computed as the mean of the self- and others' ratings; means and standard deviation of working time duration and mean time of day are depicted in their raw time format

Table 6.2

Fit Indices of the Main Effect Model

	Model	SBχ^2 (df)	χ^2	Compared model	ΔSBχ^2 (Δdf)$^{\$}$	RMSEA	SRMR	CFI	AIC
M1	Measurement model	898.83 (573)**	972.08**	-	-	0.038	0.051	0.959	1392.81
M2	Modified measurement model	851.88 (570)**	919.20**	M1	- 34.10 (3)**	0.036	0.049	0.964	1351.87
A	Fully mediated, uncorrelated residuals	1357.49 (676)**	1458.47**	M2	+ 513.85 (106)**	0.051	0.084	0.930	1645.49
B	Partially correlated residuals	993.96 (651)**	1066.59**	A	- 353.45 (35)**	0.037	0.058	0.958	1331.96
C	Partially mediated, partially correlated residuals	949.57 (644)**	1018.93**	B	- 44.21 (7)**	0.035	0.055	0.962	1301.57

Note. SBχ^2 = Satorra-Bentler scaled chi-square; **$p < .01$; RMSEA = Root mean square error of approximation; SRMR = Standardized root mean square residual; CFI = Comparative fit index; AIC = Akaike information criterion; all indices are averaged from 14 replications, $^{\$}$difference of the Satorra-Bentler scaled χ^2

Table 6.3

Correlations between Latent Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14	15	16
1. Mean time of day																
2. Duration	.29**															
3. Number of shifts	.01	0.67**														
4. Variation	.60**	.53**	.05													
5. WHI	.33**	.41**	.20**	.41**												
6. Negative Affectivity	.08	-.03	-.07	.09	.19**											
7. Depression	.12*	.01	-.06	.10	.25**	.62**										
8. Job Satisfaction	-.09	-.13*	-.02	-.16*	-.32**	-.12	-.41**									
9. Commitment	-.06	.09	.13*	-.02	-.11	-.08	-.24**	.57**								
10. Turnover Motivation	.14**	.12*	.01	.22**	.27**	.17*	.23**	-.44**	-.49**							
11. Quality	-.09	.00	-.02	-.03	-.23*	-.27*	-.26*	.22*	.15	-.20						
12. Effort	.04	.07	-.02	.16*	.17	-.05	-.17	.02	.18	-.15	.32					
13. Efficiency	.16	.01	-.16*	.20*	-.11	-.26**	-.14	.00	-.05	-.02	.42	.03				
14. Deadlines	-.10	-.10	-.07	.00	-.23**	-.05	-.11	.07	-.05	.02	.70**	.15	.05			
15. Altruism	.11	-.02	-.23**	.17	.05	.09	-.03	.27*	.18	-.02	.15	.01	.24	-.16		
16. Initiative	-.07	.02	-.01	-.01	-.02	-.24*	-.35**	.31**	.20*	-.11	.61**	.67**	.41*	.47*	.43*	
17. Engagement	.05	.26**	.02	.22**	.14	.05	-.15	.32**	.49**	-.17*	.36*	.59**	.04	-.05	.49*	.71**

Note. Each correlation was averaged from the 14 completely standardized solutions; *$p < .05$; **$p < .01$, two-tailed

The correlations between the latent variables are depicted in Table 6.3. Most obvious are several substantial correlations between the psychological constructs and the job performance dimensions. Overall, the significant correlations fit with results found in the literature and provide evidence for the construct validity of the performance dimensions.

The next three steps focused on the structural model. The most restrictive model (Model A) presumes no direct effects of working time and no residual covariances. This model showed a poor fit ($SB\chi^2(676) = 1357.49$, RMSEA = .051, SRMR = .084, CFI = .930; AIC = 1645.49). Models B and C, thus, released some of these constraints. Model B contained 25 residual covariances and fitted the data significantly better than Model A ($SB\chi^2(651) = 993.96$, RMSEA = .037, SRMR = .058, CFI = .958; AIC = 1331.96). Model C, finally, contained the residual correlations of the former model and 4 additional estimated direct effects. This was an effect of duration (weekly working hours) and number of shifts on engagement ($\beta = .39$, $p < .01$ and $\beta = -.26$, $p < .01$; two-tailed) and an effect of working time variation on deadlines ($\beta = .08$, $p > .05$) and one effect of number of shifts on altruism ($\beta = -.20$, $p < .05$). As expected this final model was the best with regard to fit ($SB\chi^2(644) = 949.57$, RMSEA = .035, SRMR = .055, CFI = .962; AIC = 1301.57) and parsimony.

The relationships are depicted in Figure 6.2, which contains the standardized coefficients (tested one-tailed). We omitted the residual correlations and the correlations between the exogenous variables from the figure. Three of the four working time dimensions (mean time of day, working hours, and working time variation) were significantly associated with WHI (βs = .14, .28, and .16, respectively). Therefore, Hypotheses 1a, 1b, and 1c, that postulated relationships of WHI with working time duration, mean time of day, and variation, were supported. In addition, negative affectivity was also significantly related to WHI ($\beta = .17$; hypothesis 5). The explained variance in WHI was 27%. Furthermore, WHI was significantly related to job satisfaction, turnover motivation, and depression (βs = -.31, .24, and .14, respectively), hence, supporting hypotheses 4a, 4c, and 4e. The relationship with organizational commitment was not significant. Therefore, hypothesis 4b was rejected. From all tested associations with job performance, only those with quality and deadlines were significant (βs = -.26 and -.27, respectively).

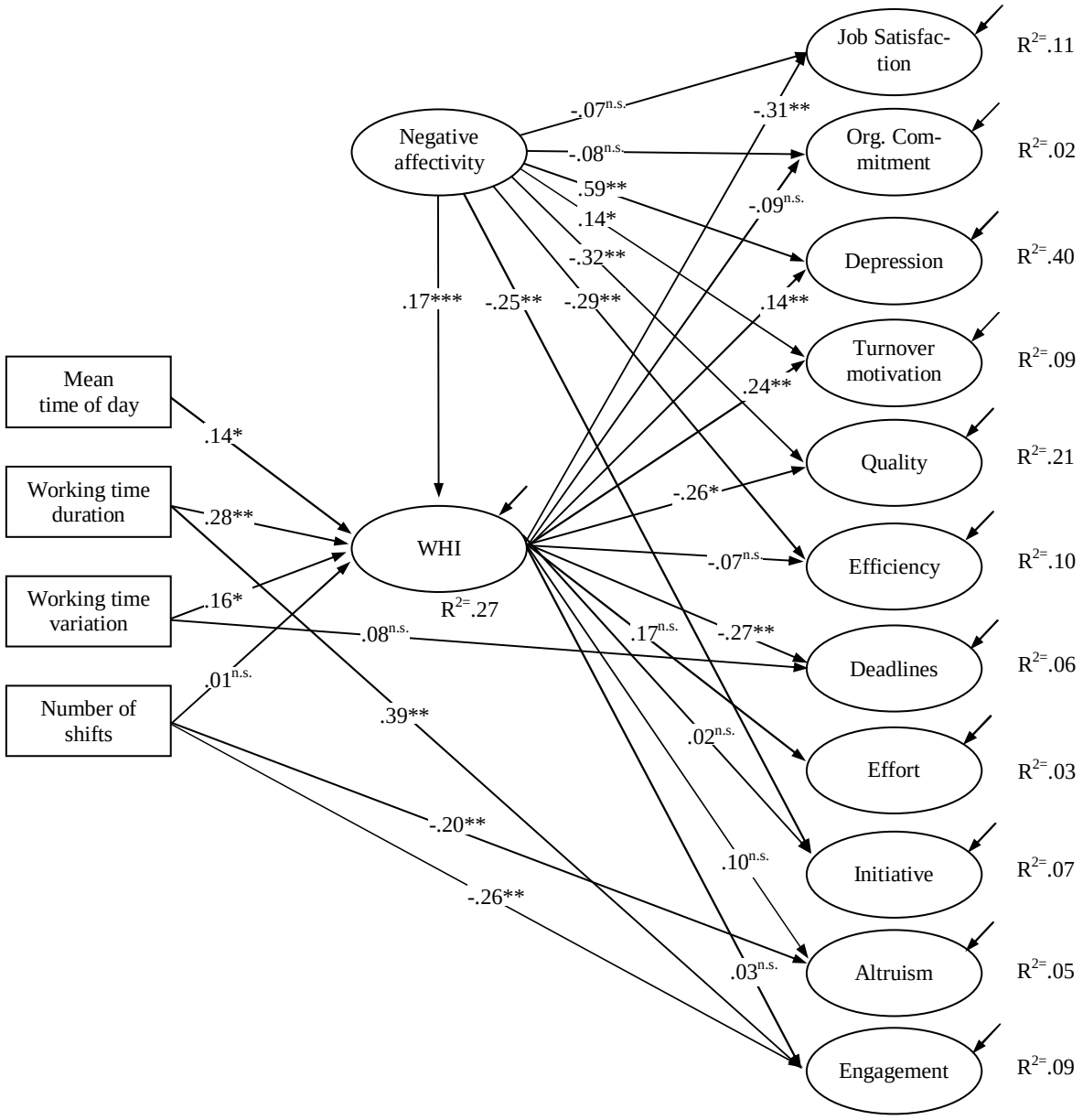


Figure 6.2

Standardized parameters of the main effect model C (residual correlations and correlations among exogenous variables omitted; tested one-tailed)

6.5.3 Interactions with schedule autonomy

The results of the four interaction models are depicted in Table 6.4. None of the main and interaction effects of schedule autonomy were significant. Thus, Hypotheses 2a and 2b, postulating main and interaction effects for schedule autonomy, were not supported.

Table 6.4

Results of the Interaction Models

Predictor	Stand. estimate	χ^2 (df)	RMSEA	SRMR	CFI
Duration and schedule autonomy		230.17 (110)**	.054	.035	.958
Gender	.14**				
Partner status	-.07				
Child status	-.03				
Mean time of day	.15*				
Working time variation	.16*				
Number of shifts	-.01				
Working time duration	.36**				
Schedule autonomy	-.06				
Duration x schedule autonomy	.03				
Mean time of day and schedule autonomy		172.34 (110)**	.039	.040	.970
Gender	.13**				
Partner status	-.07				
Child status	-.04				
Working time duration	.36**				
Working time variation	.13				
Number of shifts	.01				
Mean time of day	.13				
Schedule autonomy	-.08				
Mean time of day x schedule autonomy	-.05				

Table 6.4. continued

Predictor	Stand. estimate	χ^2 (df)	RMSEA	SRMR	CFI
Working time variation and schedule autonomy		162.77 (110)**	.036	.031	.982
Gender	.14**				
Partner status	-.07				
Child status	-.03				
Working time duration	.37**				
Mean time of day	.15*				
Number of shifts	-.01				
Working time variation	.19*				
Schedule autonomy	-.04				
Variation x schedule autonomy	.07				
Number of shifts and schedule autonomy		253.39 (110)**	.059	.040	.947
Gender	.14**				
Partner status	-.07				
Child status	-.03				
Mean time of day	.14*				
Number of shifts	.01				
Working time duration	.33**				
Working time variation	.16*				
schedule autonomy	-.06				
Number of shifts x schedule autonomy	.09				

Note. **p<.01; *p<.05 (one-tailed); RMSEA = Root mean square error of approximation; SRMR = Standardized root mean squared residual; CFI = Comparative fit index

Furthermore, we specified interaction models that tested whether the effects of the four working time dimensions on WHI were moderated by the individual's *subjective accuracy of remembering the working time of the last two weeks* and the *representativeness of the last two week's working time for the overall working time* (results omitted). None of the product terms were significant.

6.5.4 Interactions with the demographic variables

We conducted multigroup analyses to test for moderator effects of gender, child status, and partner status. These analyses were based on the reduced submodel without the performance dimensions. In all of the three comparisons, we experienced the occurrence of nonpositive definite fitted covariance matrices that were a result of an inadequate equality constraint of the variance of working time duration. The reason was that the variance of working time duration strongly differed between all of the analyzed groups. As a solution, we relaxed this constraint, even in the full invariance tests. The second problem arose in the partner status comparison, where a negative SB-chi-square difference appeared during the test for full measurement invariance. As Satorra and Bentler (2001) noted, negative difference values point to a misspecified model and/or a small sample size. Both were true in our case. Hence, we interpreted the negative difference in combination with a) a large decrease in fit of the other indices (RMSEA, CFI, and AIC) and b) substantial modification indices as a failure of the test of full invariance. Therefore, in these cases we proceeded with tests of partial invariance. This strategy produced reasonable results in each case. The results of the group comparisons are depicted in Table 6.5 and Figure 6.3.

Overall, the comparisons showed partial invariance of all parameters for all of the investigated groups. The results indicate that the loadings were fully invariant in the gender analysis and partially invariant in the child status and partner status analyses. However, whereas both partner status groups differed in just one loading (i.e., subjects with a partner had a higher loading), the child status groups differed on three of the five items (with higher loadings for parents).

Figure 6.3 shows the structural effects for all of the three comparisons. There are three coefficients depicted regarding each path. The first coefficient refers to the gender comparison, the second refers to the child status groups' comparison, and the third refers to the partner status groups' comparison. One single coefficient indicates a nonsignificant difference between both groups (and, thus, the same coefficient is estimated in both groups); two different coefficients indicate significantly different structural effects for the groups in question.

Table 6.5

Results of the Multigroup Analyses

	Model	SBχ^2 (df)	χ^2	Compared model	ΔSBχ^2 (Δdf)$^{\$}$	RMSEA	CFI	AIC
Gender								
A	Baseline model	891.01 (618)**	953.73			.049	.950	1279.01
B	Full metric invariance	907.18 (636)**	969.60	A	+ 15.65 (18)$^{n.s.}$	.048	.951	1259.19
C	Full invariance of latent variances	940.06 (647)**	998.56	B	+ 42.42 (11)**	.049	.944	1270.07
D	Partial invariance of latent variances	911.53 (646)**	982.13	B	+ 7.70 (10)$^{n.s.}$	.047	.951	1243.51
E	Full invariance of latent covariances	998.81 (677)**	1050.11	D	+ 133.91 (31)**	.051	.944	1268.81
F	Partial invariance of latent covariances	949.06 (675)**	1010.48	D	+ 36.30 (29)$^{n.s.}$	.047	.948	1223.05
G	Full invariance of error variances	1023.86 (697)**	1076.52	F	+ 102.85 (22)**	.051	.946	1253.85
H	Partial invariance of error variances	972.82 (694)**	1026.87	F	+ 22.44 (19)$^{n.s.}$	.046	.948	1208.81
I	Full invariance of structural effects	1005.61 (708)**	1057.15	H	+ 36.15 (14)**	.048	.948	1213.61
J	Partial invariance of structural effects	985.33 (707)**	1039.21	H	+ 12.23 (13)$^{n.s.}$	.046	.948	1195.33
Child status								
A	Baseline model	761.34 (618)**	775.95			.039	.962	1149.34
B	Full metric invariance	817.83 (636)**	810.41	A	+ 1674.72 (18)**	.043	.959	1169.83
C	Partial metric invariance	775.14 (629)**	784.20	A	+ 13.98 (11)$^{n.s.}$	.039	.962	1141.15

Table 6.5 continued

	Model	SBχ^2 (df)	χ^2	Compared model	ΔSBχ^2 (Δdf)$^{\$}$	RMSEA	CFI	AIC
D	Full invariance of latent variances	829.38 (641)**	836.94	C	+ 60.33 (12)**	.044	.955	1171.39
E	Partial invariance of latent variances	792.87 (639)**	803.26	C	+ 17.29 (10)$^{n.s.}$	.039	.960	1138.86
F	Full invariance of latent covariances	928.67 (670)**	896.62	E	NA	.050	.949	1212.67
G	Partial invariance of latent covariances	815.19 (657)**	819.26	E	+ 22.31 (18)$^{n.s.}$	.040	.960	1125.18
H	Full invariance of error variances	946.85 (679)**	955.19	G	+ 121.07 (22)**	.051	.945	1212.85
I	Partial invariance of error variances	829.79 (673)**	839.19	G	+ 15.68 (16)$^{n.s.}$	.039	.960	1107.81
J	Full invariance of structural effects	878.00 (687)**	872.89	I	+ 198.42 (14)**	.042	.957	1128.01
K	Partial invariance of structural effects	843.10 (682)**	850.82	I	+ 13.73 (9)$^{n.s.}$	.039	.960	1103.10
Partner status								
A	Baseline model	677.36 (618)$^{n.s.}$	844.20			.025	.951	1065.35
B	Full metric invariance	726.03 (636)*	861.54	A	NA	.030	.948	1078.03
C	Partial metric invariance	688.42 (632)$^{n.s.}$	850.55	A	+ 8.37 (14)$^{n.s.}$	.024	.952	1048.43
D	Full invariance of variances	724.82 (643)*	871.28	C	NA	.029	.948	1062.83
E	Partial invariance of variances	695.57 (639)$^{n.s.}$	851.24	C	+ 4.14 (7)$^{n.s.}$	.024	.953	1041.56
F	Full invariance of covariances	796.66 (670)**	909.73	E	NA	.035	.946	1080.65
G	Partial invariance of covariances	726.11 (663)$^{n.s.}$	872.61	E	+ 4.75 (24)$^{n.s.}$	.025	.953	1024.12
H	Full invariance of error variances	804.68 (685)**	936.95	G	+ 1704.23 (22)**	.034	.947	1058.68

Table 6.5 continued

	Model	SBχ^2 (df)	χ^2	Compared model	ΔSBχ^2 (Δdf)[$]	RMSEA	CFI	AIC
I	Partial invariance of error variances	741.36 (678)[n.s.]	878.13	G	+ 13.11 (15)[n.s.]	.025	.954	1009.35
J	Full invariance of structural effects	758.17 (692)[n.s.]	891.86	I	+ 17.57 (14)[n.s.]	.025	.954	998.17

Note. ***p* < .01; **p* < .05; men: *n* = 142, women: *n* = 227; parents: *n* = 195; non-parents: *n* = 117; individuals with partner: *n* = 234; individuals without partner: *n* = 78; NA = In this case, the SBχ^2 difference value was negative and not applicable; [$]the difference between both SBχ^2 is a corrected difference and not just the ordinary difference

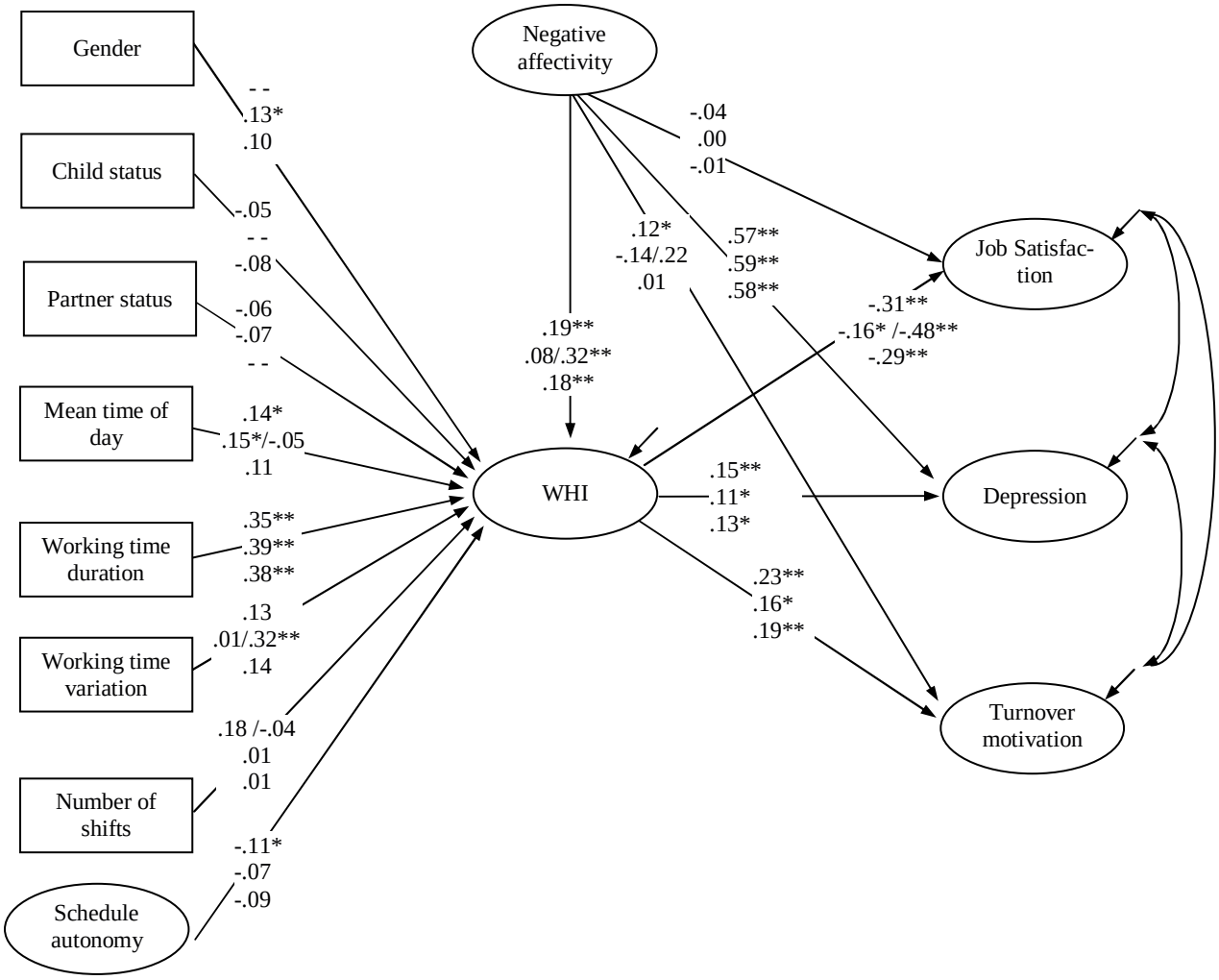


Figure 6.3

Summarized results of the group comparisons (first coefficient = effect for both gender groups (men / women), second coefficient = effect for both child status groups (parents / non-parents), and third coefficient = effect for both partner status groups (subjects with a partner / subjects without a partner). Two different coefficients in a line imply significantly different coefficients for both referring groups. All coefficients are standardized, exogenous covariances are omitted; * $p <$ .05, ** $p <$ .01 (one-tailed).

The gender comparison revealed a significantly different relationship between the number of shifts on WHI (with men having a higher coefficient than women). However, both relationships were nonsignificant ($\beta = .18$, $p > .05$ vs. $\beta = -.04$, $p > .05$). Thus, Hypothesis 3a, which postulates higher effects of working time for women, was not supported. The comparison of parents and non-parents showed two statistically different effects. First, parents showed a higher relationship between mean time of day and WHI than non-parents ($\beta = .15$, $p < .05$ vs. $\beta = -.05$, $p > .05$). Additionally, the relationship was only significant for the first group. Second, non-parents showed a stronger association between working time variation and WHI ($\beta = .32$, $p < .01$ vs. $\beta = .01$, $p > .05$). In this case, variation had no significant effect for parents. Overall, the results did not support stronger working time effects for parents (Hypothesis 3b). Furthermore, a stronger relationship between WHI and job satisfaction was found for non-parents compared to parents ($\beta = -.48$, $p < .001$ vs. $\beta = -.16$, $p < .05$). Finally, we found no significant differences for both partner status groups. Hence, the results also did not support higher effects of working time for individuals with a partner (Hypothesis 3c).

6.6 Discussion

In this study, we tested the effects of the four working time dimensions *duration*, *mean time of day*, *variation*, and *number of shifts* on WHI. Furthermore, the effects of WHI on job satisfaction, organizational commitment, turnover motivation, depression, and job performance were analyzed. Negative affectivity was included as a hypothesized predictor of both WHI and affect-laden dependent variables (job satisfaction, commitment, depression, and turnover motivation).

6.6.1 Working time and WHI

Overall, the results showed the fruitfulness of the multidimensional approach to working time. The results showed significant effects of three working time dimensions (duration, variation, and mean time of day). The relationship between working time duration and WHI was substantial and varied across the different analyses from $\beta = .28$ to $\beta = .36$. In addition, working time variation and mean time of day had unique effects ($\beta = .16$ and $\beta = .14$, respectively) beyond the effects of duration. From the sizes of the relationships it can be concluded that duration has the largest effect on WHI. As proposed by scarcity theory, it is the restriction of time that leads to problems to perform nonwork behavior. This result is in line with overall research on the relationship between working time and WHI that focused on weekly working hours as independent variable (Byron, 2005). However, the restriction of time seems not to be the only pathway through which working time disturbs the nonwork domain. The effects of mean time of day and variation showed

that individuals who work at night or with a highly variable working time experience more WHI. Because time of day and variation are the constituting dimensions of rotating shift work, these results imply a substantial influence of rotating shifts on nonwork life. This again is in accordance with traditional research on shift work that has found that shift work leads to a lower participation in social activities. We argue that a late time of day and high variation leads to a *desynchronization* of the individual's work-life rhythm from those of her/his social environment. Especially a varying working time should make anticipation of opportunities for nonwork activities and the coordination with social interaction partners more difficult.

The nonsignificant effect of the number of shifts shows that complete days off are not to be considered practical means to decrease WHI. Whereas scholars investigating compressed workweeks argued that one additional day off from work facilitates family life and leisure, the results of our study suggests that it is the total amount of nonwork time that is relevant for a fulfilling work-life balance. Since we did not find interactions with the respondents' subjective accuracy in remembering working time as well as the subjective representativeness of working time, we feel confident that measurement of working time points and calculation of the dimension values are valuable approaches to the assessment of working time.

6.6.2 The consequences of WHI

WHI was significantly related to job satisfaction, depression, and turnover motivation. In contrast, the relationship with commitment was not significant. The latter indicates that, in our sample, negative evaluations that result from WHI were not generalized to the organizational level. This result is in direct contrast to those from a meta-analysis that has shown a relationship between WHI and commitment (Allen et al., 2000). Since this meta-analysis focused on U.S. American samples, these results may indicate a culture-specific effect. Perhaps American employees expect their organizations to enable work-life balance as an exchange for the investigation of invested resources (e.g., effort, engagement). Thus, the contrasting results could be to due to a lower extent of such expectations in Germany. Future research should investigate the existence of such expectations and their functions as possible important moderators in the WHI – outcomes relationships.

We found only a moderate association between WHI and turnover motivation ($\beta = .24$). Since turnover motivation mediates the effect of WHI on *actual* turnover, the indirect effect of work-family conflict on actual turnover, consequentially, is smaller. However, we suppose that we would have found a stronger effect under different economic circumstances. The current situation in Germany is characterized by an economic recession and the threat of unemployment. Because the expectation to find a new job has an influence on the turnover process (Hom et al., 1992;

Mobley, 1977), the effect of antecedents (such as WHI) on turnover motivation may be diminished by the current economic situation. Hence, it is reasonable to expect WHI to be a predictor of turnover only in economically better circumstances.

With regard to job performance, we found only two significant effects out of the seven that were tested. WHI was specifically related to low quality of work and failure to meet deadlines. These specific results show the advantages of investigating specific dimensions of broad constructs (Edwards, 2001; Murphy & Shiarella, 1997; Paunonen et al., 1999). These specific effects would have been undetected if we had used an index of overall performance. The interpretation of these two relationships, however, is difficult. Although we hypothesized that WHI impedes self-regulation of work behavior and, thus, impacts quality and deadlines, there are other possible interpretations. Given the cross-sectional nature of the present study, the reverse causal direction could be possible. From this perspective, a low quality and failure to meet deadlines could function as antecedents that lead to WHI. This explanation could also hold for the positive relationship between working time duration and engagement that emerged during the modeling procedure. Instead of duration increasing the amount of engagement, we regard it as more likely that a high working time duration reflects high engagement. These interpretations offer an alternative perspective on performance as an independent variable in contrast to the traditional view as a dependent variable.

In addition to the effects of working time and WHI, we found effects of negative affectivity on WHI and some of the dependent variables. The results showed that high negatively affective individuals reported more WHI regardless of their working time. This is in accordance with suggestions from general stress research that negative affectivity increase perception the of stressors (Brief et al., 1988; Spector, Zapf, Chen, & Frese, 2000). With regard to WHI, these results show that a certain, albeit small, amount of variance of that construct could be of a perceptual nature. However, this interpretation should be regarded with caution. Spector et al. (2000) suggested that negative affectivity could be an outcome of stressors (WHI in our case). Although we tried to increase the reasonableness of a perceptual interpretation by selecting a measure of negative affectivity with items having both an implicit dispositional content as well as a substantial amount of heritability (Tellegen et al., 1988), longitudinal studies are needed to clarify the direction of this relationship. Although most items of the MPQ scale refer to an increased sensitivity to negatively evaluated events (like criticism or stress) instead of overall well-being, it is possible that this increased sensitivity could be an effect of WHI. Therefore, we recommend a closer examination of the causal direction between WHI and negative affectivity in future research.

6.6.3 Demographic Variables and WHI

In addition to main effects of working time, we tested the hypotheses that the effects of working time on WHI are moderated by gender, child status (i.e., parents vs. non-parents) and partner status (i.e., individuals with vs. without a partner). However, these hypotheses were not supported. These results are surprising because they imply that the different demographic groups react with the same sensitivity to working time. Two explanations for these findings can be offered: First, the lack of an interaction could be due to a selection effect. Women, parents and individuals with a partner could have reduced their working time or changed their schedule to part-time in order to cope with or avoid WHI. This would flatten the slope that describes the relationship between working time and WHI. Therefore, future research should longitudinally investigate possible effects of WHI on changes in working time. Second, we suppose that individuals without responsibilities for the household, children, or a partner are also involved in important nonwork related roles which can interfere with working time. This may even be the case for single employees because it is very possible for them to be highly committed to leisure activities and social interaction with friends. Whereas traditional research has almost entirely focused on couples and parents, future research should broaden the composition of their samples by including individuals for which problems of integrating work and private life is traditionally not expected. Therefore, researchers and practitioners should enlarge their perspective on the work – nonwork interface and acknowledge that every individual can experience and suffer from WHI. A fruitful area of research could be the determination of the particular domains and activities which are the subject of WHI of individuals with different sociodemographic backgrounds. For instance, it is likely that singles report WHI stemming from difficulties combining work and social activities with friends, whereas parents report WHI resulting from difficulties combining work and child care and activities with the partner.

6.6.4 Limitations of the Study

One of the uncertainties in our study involves the performance part of our model. Since we had a serious amount of missing data due to the low response rate of the other raters, we applied multiple imputation. Although the efficacy and trustworthiness of this method has been shown in Monte Carlo studies (Abraham & Russell, 2004; Newman, 2003), we cannot be sure that this is true given such an amount of missing data. In addition, self- and others' ratings did not correlate high enough (average $r = .25$) to establish substantial factor loadings. Although measurement error and reliability are not a problem in structural equation modeling as they are in traditional approaches, low loadings can lead to bias in factor correlations (Jackson, 2003).

One may criticize that our approach of finding a partially mediated structure was exploratory and may not be replicable in other samples. However, the confirmatory part of our model was just concerned with the effects of working time on WHI and with outcomes of WHI. These effects were not affected by the nested modeling procedure and remained the same in the first as in the final model. Furthermore, the working time effects were found in the main effect model, multi-group model, and interaction model. With exception of the multigroup model, where the effects of working time variation and mean time of day varied, the effects were highly stable. The difference in the multigroup model can be explained by the lower sample size due to missing data in the group variables.

7

Subjective health and its relationship with working time and job stressors: Sequence or general factor model?

Two theoretical models are compared that make different assumptions about the structure of subjective health constructs and about the effects of job stressors and working time on health. The first model, the sequence model, is based on sequential models of the development of ill-health (e.g., Leiter & Maslach, 1988; Mohr, 1991) and posits that job stressors and working time affect depression and somatic complaints over chronic fatigue and sleep problems. The second model, the general factor model, is a higher-order factor model and posits that specific health constructs (e.g., fatigue, depression, and somatic complaints) are reflections of a common general strain factor. The analyses were carried out in a sample of 365 subjects using self- and others ratings of job stressors and reveal a slight superiority of the general factor model. Furthermore, the effects of job stressors and working time on the specific health construct were mediated by the general strain factor. Finally, a negative relationship emerged between working time duration (i.e., weekly working time) and general strain.

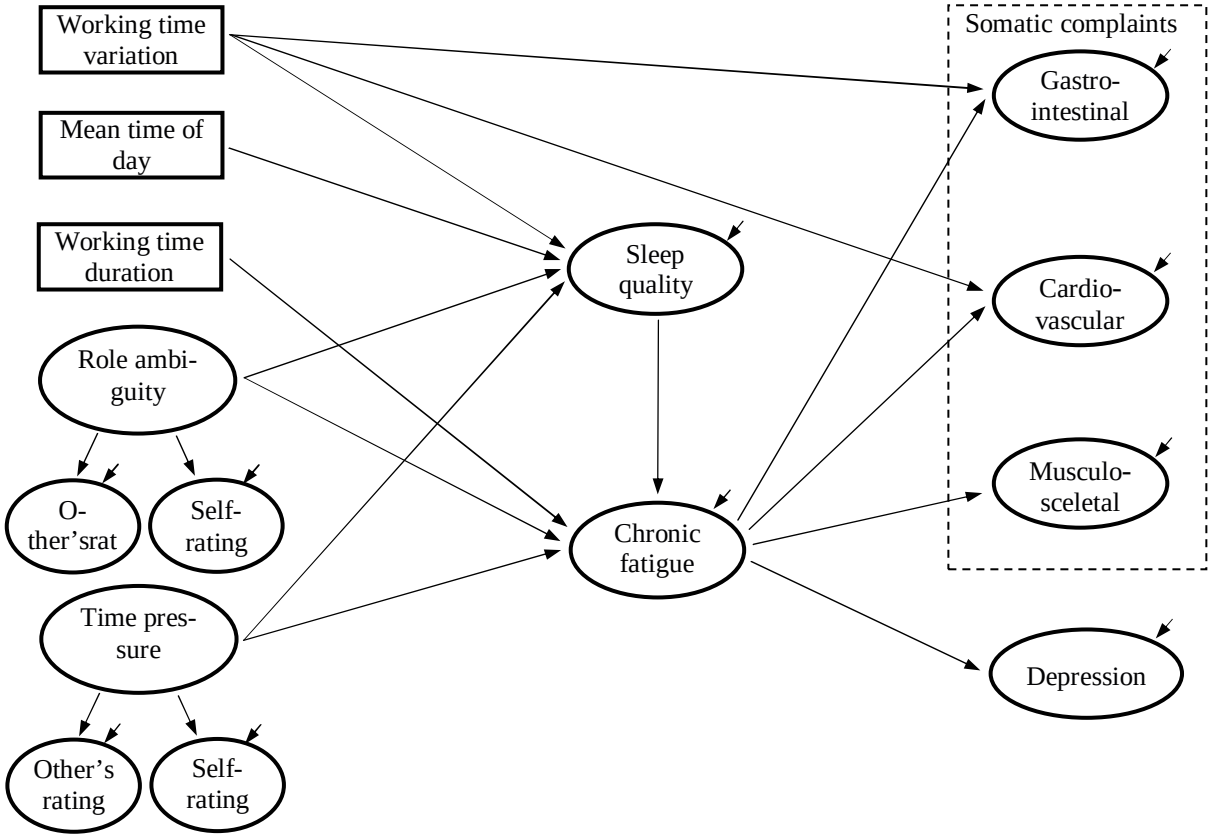
Occupational health psychology usually focuses on facets of subjective health and well-being which are perceived as equally representative for overall health. As a consequence, the criteria of preferring a particular facet over another are often arbitrary. Popular health constructs in health research are, for instance, somatic complaints, depression, fatigue, and sleep problems. In contrast, some theoretical approaches (Leiter & Maslach, 1988; Mohr, 1991), assigned certain health constructs a *distinct role* in a sequentially developing process of ill-health. Specifically, these approaches argue that stressors initially lead to an exhaustion of psychological resources which, in turn, causes a development of further ill-health.

In this article, we compared two alternative models (see Figure 7.1) that express different assumptions about the effects of job stressors and working time on subjective health. The first model (the "*sequence model*") proposes that stressors and working time unfold their effects over chronic fatigue and impairment of sleep quality on depression and three subtypes of somatic complaints, namely musculoskeletal, gastrointestinal, and cardiovascular complaints. This model is based on the sequential models provided, for instance, by Mohr (1991) and Leiter and Maslach (1988) that will be explained later. We expanded these models by including effects of working time. Furthermore, we added sleep quality as a second mediator in order to acknowledge direct effects of working time on sleep that are proposed especially in shift work research (Thierry & Jansen, 1984; Thierry & Meijman, 1994). We then compared the sequence model to an alternative model that describes the relationships between the diverse health constructs as a higher-order factor structure. This model claims that every health construct (including chronic fatigue and sleep quality) is a reflection of a common *general strain* factor (the "*general factor model*").

7.1 The Sequence Model

In her research on stress at work, Mohr (1991) argued that stressors affect somatic complaints, depression, anxiety, and low self-esteem in a certain sequence. Moreover, the effects of stressors are mediated by irritation. She described irritation as a state of psychological exhaustion that has reached an extent which cannot be relieved during breaks. According to Mohr, exhaustion implies a lack of important psychological resources individuals need for the regulation of tasks performance or interpersonal behavior in everyday situations. The consequence is a reduction of engagement, initiative, and activity in various situations.

A similar developmental process was postulated in burnout research. Leiter and Maslach (1988) argued that the three components of burnout, namely *exhaustion, depersonalization,* and *perceived lack of personal accomplishment,* develop in a special sequence. Analogous to Mohr (1991), the sequence starts with exhaustion as a primary stress response to exceeding work demands.



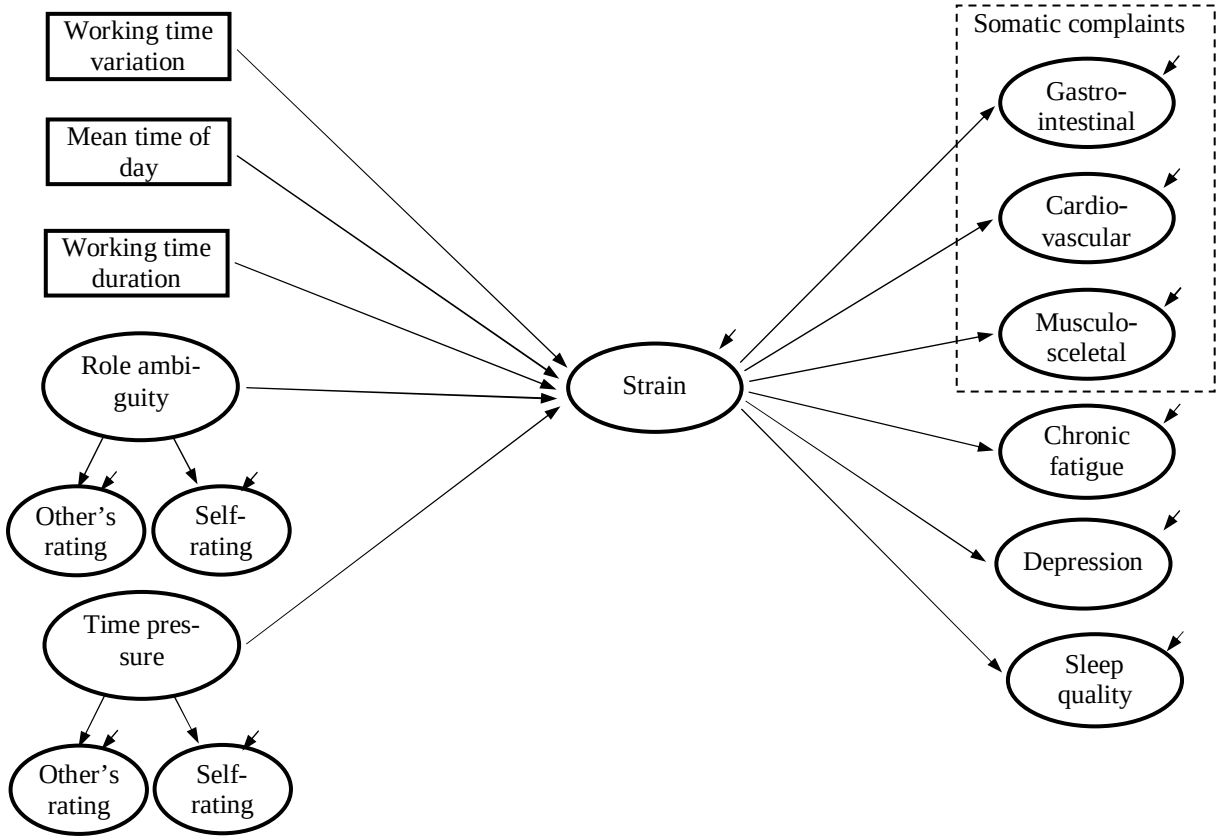


Figure 7.1: Path diagrams of analyzed models: Sequence model and general strain model (Note: Correlations between exogenous variables are not displayed)

As a consequence, individuals respond with disengagement, reduced involvement, and depersonalization which finally lead to low feelings of accomplishment. Cherniss (1980), as a further example, postulated a developmental process in which perceived stress first leads to physical fatigue, emotional exhaustion, and anxiety, followed by a decrease in job attitudes and interests.

Finally, there were some studies that analyzed effects of burnout on psychological health variables like self-esteem, depression, anxiety, and somatic health variables like gastrointestinal complaints or headaches (see Cordes & Dougherty, 1993, for a review). These studies reflect the belief that burnout mediates the effects of stressors on the previously mentioned health variables.

The common theme of all these approaches is that they conceive exhaustion as the central mediating concept. The hypothesis of an effect of job demands on exhaustion can be integrated in theoretical models of work load (Gaillard, 2001; Meijman & Mulder, 1988). For instance, Meijman and Mulder argue that work load and stress lead to psychological and physiological adaptation processes that cause exhaustion, which can cumulate and persist. From a practical point of view, scholars have argued that a mediating function of exhaustion enables practitioners to detect individuals who are at risk for developing more severe forms of health problems (Mohr, 1991; Taris, Le Blanc, Schaufeli, & Schreurs, 2005). It should be noted, however, that there are burnout theorists who argue for a different sequence of the burnout components (e.g., Golembiewski, Munzenrider, & Stevenson, 1986; van Dierendonck, Schaufeli, & Buunk, 2001).

In line with the theoretical models outlined above, the core part of our theoretical model (see the upper part of Figure 7.1) posits effects of job demands on depression and somatic complaints via exhaustion of resources. We operationalized exhaustion of resources with *chronic fatigue*. As several scholars and empirical results indicate, chronic fatigue is analogous to the exhaustion construct in burnout. This highlights the relevance of the sequential model by Leiter and Maslach (1988) for our study as well as the results of our study for burnout research. Although Kristensen, Borritz, Villadsen, and Christensen (2005) argued that exhaustion conceptually differs from fatigue by its implied attribution of the exhaustion state to aspects of work, there are other burnout theorists who acknowledged the identity of both constructs (e.g., Schaufeli & Taris, 2005). Furthermore, some empirical studies showed that items measuring both exhaustion and fatigue loaded on the same factor (De Vries, Michielsen, & van Heck, 2005; Michielsen, De Vries, van Heck, van de Viijver, & Sijtsma, 2004a) and were comparably predicted by work and personality variables (Michielsen, Willemsen, Croon, De Vries, & van Heck, 2004b).

In addition to the proposed mediator effect of chronic fatigue, we expanded the model by incorporating indirect and direct effects of working time and sleep problems on depression and somatic complaints. Because the working time variables tested in this study differ from traditional

approaches to working time effects, the next section will briefly describe our conceptualization of working time.

7.2 The Effects of Working Time on Health

Our conceptualization of working time is based on a multidimensional approach to working time (Steinmetz, Frese, & Schmidt, 2007). This approach states that the various forms of working time schedules (e.g., shift work, part-time work) can be described by four essential dimensions. These four dimensions are the *working time duration* (i.e., how long does the individual work on average), the *mean time of day* (i.e., at which time of the day does the individual work on average), *working time variation* (i.e., the extent of stability or fluctuation of time over a period of days) and the *number of shifts* the individual works in a certain period. Whereas there is some research on the effects of working time duration (see Sparks et al., 1997, for a meta-analysis), the conceptualization and methodological consideration of time of day and variation as dimensions is new. Mean time of day and variation are the essential dimensions that characterize rotating shift work. The time of day dimension reflects differences between the different schedules regarding time of day (i.e., does the schedule contain night shifts or only day shifts). Most important, mean time of day is considered as a continuous dimension ranging from early (e.g., 6 a.m.) to late (e.g., 10 p.m.). Traditionally, consequences of night shift are investigated by comparing different groups of employees working different shift schedules. The variation dimension concerns the rotation aspect of shift work. Again, we conceptualize variation as a dimension ranging continuously from "no variation" to "high variation".

The multidimensional approach has two major advantages. First, it adequately conceptualizes working time as (multi)-dimensional and not categorical (i.e., as it is implied by comparing, e.g., day with night shifts). Categorizing dimensional data implies the loss of information and can lead to a number of statistical problems that can distort results (MacCallum, Zhang, Preacher, & Rucker, 2002). Second, the multidimensional approach enables the analysis the unique effects of working time dimensions in a multiple regression framework. This is especially important in the case of mean time of day and variation, which are often confounded when groups of shift workers are investigated. Since it can be expected that the different working time dimensions affect health via different processes, the investigation of their unique effects can lead to information about the relative contribution to ill-health.

We analyzed the relationship between three of the dimensions – that is, working time duration, mean time of day and variation – and health because we considered these dimensions as relevant in the health context. Based on the sequence model, we expected that *working time duration* should exert a specific effect on chronic fatigue (Sparks et al., 1997) because individuals who

work long hours show increased physical and psychological load reactions which lead to fatigue. Furthermore, due to less time for recreation, individuals working with a high duration should be prone to the accumulation of daily fatigue states (Meijman & Mulder, 1988). Spurgeon, Harrington, and Cooper (1997) argued that high working time duration acts as a stressor because it increases the demands of maintaining performance levels against fatigue (see Gaillard, 2001, for the conceptual difference between fatigue and stress). Finally, in their meta-analysis on effects of weekly working time, Sparks et al. (1997) speculated particularly about a mediation of fatigue in the relationship of working time and health. With regard to *mean time of day*, we expected a relationship with sleep quality. Because individuals who work at night have to sleep at a time that is nonsynchronous with the usual social rhythms, they are subject to more external disturbances such as traffic noise (Thierry & Meijman, 1994). Furthermore, body temperature is increased during daytime sleep which leads to a fragmentation of sleep (Folkard & Hill, 2002; Spurgeon & Cooper, 2000). Finally, we expected specific effects of *working time variation* on sleep quality, gastrointestinal complaints, and cardiovascular complaints. The underlying physiological systems are subject to physiological regulation cycles that should be disturbed by highly varying shifts. Poissonnet and Véron (2000) theorized that it is difficult for individuals working rotating shifts to adjust their internal clocks and the related physiological rhythms (such as the sleep-wake cycle) to changing shifts. With regard to gastrointestinal complaints, Spurgeon and Cooper (2000) argued that rotating shifts lead to irregular and inappropriate eating habits which in turn cause appetite disturbances and gastrointestinal disorders.

7.3 The General Factor Model

The general factor model (see the lower part of Figure 7.1) differs from the sequence model in two respects. First, whereas the sequence model specifies covariances among the various health constructs in terms of causal interrelationships, the general factor model specifies them as an expression of a common underlying factor. Second, whereas the sequence model proposes effects of job stressors and working time on chronic fatigue and sleep quality, the general factor model proposes an influence of job stressors and working time on the general factor but not on the specific health constructs. Therefore, the general factor mediates the influence of the job stressors and working time dimensions on the specific health constructs. Specifying a general factor, however, raises the question of which construct or process can be hypothesized as a central and common cause of the variety of specific health constructs.

One possible answer to this question is delivered by sensitization theory (Eriksen & Ursin, 2002; Ursin, 1997). Sensitization theory states that subjective health complaints are the result of an increased reactivity of neurobiological processes. Whereas habituation refers to the *decreased*

reaction intensity toward stimuli, sensitization refers to an *increased* reactivity. According to Eriksen and Ursin, sensitization processes can be conceptualized on the specific level of single neurons where a synapse increases its efficacy. However, sensitization can also concern the level of complex neuronal networks. An example is the kindling phenomenon which involves an increased reaction strength of the limbic system after extended activation. Sensitization is the result of diverse changes in the bio-physiological system, such as an increased synaptic efficacy, increased sensitivity of the hormone system, and exertion of "algogens", that is, substances that increase the reactivity of nociceptors and cause widening of receptive fields. Sensitization processes lead to increased vulnerability toward somatic complaints. In addition, individuals develop a hypervigilance with regard to symptoms which further increase sensitivity to bodily sensations. This process is similar to Pennebaker's (1982) *competition of cues* framework that states that stress and high arousal increases processing of internal stimuli.

Recently, Brosschot (2002) expanded sensitization theory to the cognitive and emotional level. He argued that activation of semantic associative networks resulting from worries or concerns can lead to cognitive and emotional sensitization. The consequences are cognitive and attentional biases in the form of giving an inordinate priority to the processing of concern-related information and development of dysfunctional cognitive schemes (e.g., beliefs) that guide information processing. According to Brosschot, cognitive-emotional sensitization leads to an increased cognitive and emotional reactivity with regard to individual concerns and is involved in the development of somatic complaints as well as affective disorders. Brosschot concluded that sensitization is a multi-level process that concerns "all systems that possess a neural or similar type of plastic hardware that is able to accommodate a feed-forward process" (Brosschot, 2002, p. 115).

Apart from theoretical approaches as the two aforementioned, we found differences in the way scholars conceptualize relationships between specific health constructs. As previously discussed, theorists like Leiter and Maslach (1988) and Mohr (1991) conceptualize the relationships in terms of cause and effect, thus strengthening the importance of especially exhaustion (or fatigue) by assigning it a causal role. In contrast, scholars in psychosomatic research view relationships between health constructs in terms of factor or principal component analysis. Likewise, interrelationships between health constructs are often viewed as *syndromes* involving co-occurring complaints. An example is the chronic fatigue syndrome (Lewis & Wessley, 1992) that is characterized by extreme fatigue and multiple somatic complaints. In this regard, some research has been carried out that analyzed the factor structure of health indicators contained in symptom checklists (Attanasio, Andrasik, Blanchard, & Arena, 1984; Haugland, Wold, Stevenson, Aaroe, & Woynarowska, 2001; Ursin, 1997).

The general factor model overcomes some disadvantages of these approaches. First, these authors used exploratory analytical methods. These methods are adequate in detecting relationships but are data driven and, as such, prone to find artificial relationships due to sampling error. Second, the existing studies conducted principal component analyses instead of factor analyses. Because principal components do not underlie the common factor model (i.e., the hypothesis that a common factor is the cause of the indicators) but are weighted sums of their indicators (Fabrigar, Wegener, MacCallum, & Strahan, 1999), the meaning and theoretical status of such components is ambiguous. Third, the analyses were often carried out using the varimax rotation method. The application of this method probably impeded finding intercorrelated factors and, hence, prevented investigations of higher-order factors. Finally, since principal components are defined as being error free they do not allow controlling for measurement error.

The general factor model contrasts to these approaches by a) specifying a theory based factor structure instead of using data-driven exploratory methods, b) investigating a common factor approach as it should be understood (i.e., as a common cause of the indicators) instead of principal components analysis, and c) conceptualizing the general factor on a higher-order level and, thus, allowing the acknowledgement of distinct primary factors that concern symptom perceptions that are related to distinct psychological or physiological subsystems.

Ursin and colleagues did not specifically argue for one central sensitization process and, hence, for one factor. However, referring to the often found comorbidity of complaints, they considered the possibility that “the iceberg of subjective health complaints may have many tips, but [may be] still one iceberg” (Eriksen & Ursin, 2002, p. 191). Although Eriksen and Ursin (2002) proposed that complaints could be explained by a three-component structure (i.e., *musculoskeletal*, *gastrointestinal*, and *pseudoneurological complaints* such as fatigue, depression, and sleep problems), we can again suppose that their use of varimax rotation may have impeded finding correlated components and, thus, a higher-order factor. In contrast, a higher-order factor model acknowledges the discriminant validity of specific health complaints and investigates the hypothesis that a common factor underlies the complaints. It should be noted, however, that the general factor model should not be understood as a *test* of sensitization theory. Rather, the theory provides a reasonable theoretical framework for understanding a possible central strain process.

7.4 Method

7.4.1 Sample

The sample consisted of 365 participants. One part of the sample (n = 249) was from a larger German random population sample of 1,677 individuals that was surveyed in a research project

investigating working time. The other part of our sample was recruited at a local hospital and by requesting university employees and students to distribute questionnaires to working acquaintances (n = 132). Regarding demographic variables such as age, education, and gender, the overall sample was almost identical to the population sample which shows that there were no selection effects. The largest difference was a 5% higher percentage of females in our study. Multigroup analyses showed no significant differences in the regression coefficients of the model variables across the subsamples. The sample consisted of 62% women and 38% men. The average age was 39.9 years and ranged from 17 to 65 years.

In addition to self-report data, we obtained 218 reports by others that contained data about job stressors (see Appendix D). We instructed self-raters to forward an attached questionnaire to their supervisor or a coworker. Thirty reports were provided by the supervisor, 168 by the coworker, and 15 by subordinates. In 5 cases, an identification of the source was not possible. Analysis of variance revealed no significant mean differences in the ratings between the three rating sources (i.e., supervisors, coworkers, and subordinates).

In addition to self-report data, we obtained 218 reports by others that contained data about job stressors. We instructed self-raters to forward an attached questionnaire to their supervisor or a coworker. Thirty reports were provided by the supervisor, 168 by the coworker, and 15 by subordinates. In 5 cases, an identification of the source was not possible. Analysis of variance revealed no significant mean differences in the ratings between the three rating sources (i.e., supervisors, coworkers, and subordinates).

7.4.2 Measures

Job stressors. Both role ambiguity and time pressure were measured with three items from a scale by Semmer, Zapf, and Dunckel (1998). An example for role ambiguity is “how often do you get unclear assignments?”; an example for time pressure is “how often do you work under time pressure?”. The rating format was a 5-point Likert scale from 1 (*very rarely/never*) to 5 (*often - one or two times per day*) (role ambiguity) and 1 (*rarely/never)* to 5 (*often - almost continuously*) (time pressure). Cronbach’s alpha for role ambiguity was .76 and for time pressure .81. In addition to self-reports of job stressors, we assessed other’s reports (supervisor, coworker, or subordinate) of the job incumbent’s role ambiguity and time pressure using the same items as in the self-reports. Cronbach’s alpha for the other’s reports of role ambiguity was .79 and time pressure .84. The correlation between the self-report and the respective other’s report was .57 (role ambiguity) and .61 (time pressure).

Working time dimensions. We calculated scores for the three working time dimensions on the basis of actual working time data provided by the respondents for the previous two weeks. In contrast to the traditional approach of comparing groups of different workers (e.g., shift workers), our approach enables the joint inclusion of working time and stressor variables in a regression framework. Instead of using Likert scales, the use of real time data made it possible to create continuous measures of the working time dimensions, which has statistical advantages compared to using categorical Likert-scales (Finney & DiStefano, 2006; West et al., 1995). We calculated the scores of *working time duration* by summing up the daily working hours over the 14 days. *Mean time of day* was assessed (1) by calculating the central time of day of each work day (i.e., the point in time where half of the shift is over) and, (2) by calculating the average over the central time of day scores of the 14 days. Finally, *working time variation* was operationalized as an index of the standard deviations of the central time of day and the daily working duration.

Chronic fatigue. Chronic fatigue was measured with five items of the Checklist Individual Strength (Vercoulen et al., 1994), which were translated into German and back-translated. An example item is "I feel tired". The rating format was a 5-point Likert scale ranging from 0 (*totally disagree)* to 4 (*totally agree)*. Cronbach's alpha was .88.

Sleep quality. We measured sleep quality with five items of the Groningen Sleep Quality Scale (Meijman, Vries-Griever, de Vries, & de Kampman, 1985; German version by Richter & Hacker, 1998). One example is "I think I am sleeping well". The rating format was a 5-point Likert scale ranging from 0 (*totally disagree)* to 4 *(totally agree)*. Cronbach's alpha was .86.

Somatic complaints. We used a selection of complaints listed in a symptom checklist developed by Fahrenberg (1975). The items were selected such that they matched the three hypothesized factors musculoskeletal complaints (4 items), cardiovascular complaints (4 items), and gastrointestinal complaints (3 items). The rating format was a 5-point Likert scale ranging from 0 (*almost never*) to 4 (*almost everyday*). Cronbach's alphas for the three scales were .83, .71, and .63, respectively.

Depression. We measured depression with four items from a scale developed by Zung (1965) adapted by Mohr (1986). A sample item is "I am looking into the future without any hope". The response format was a 7-point Likert scale with response options ranging from 0 (*never)* to 6 (*almost always)*. Cronbach's alpha was .79.

7.4.3 Modeling procedure

The development of the structural equation models consisted of two steps. In the first step, we specified a measurement model to test the factorial structure and, hence, the convergent and

discriminant validity of the health measures. In the second step, we specified different structural models to test the theoretical models.

The measurement model. Our first aim was to test the factorial structure of our measures. Consequently, we specified a measurement model (i.e., confirmatory factor analysis) in which all of the latent variables were allowed to covary freely. With exception of the working time dimensions, all of the latent variables were measured with multiple items. Each latent variable was scaled by fixing its first loading to one. The loading of the working time variables were fixed to one and their errors were fixed to zero. This equated the latent variables to their respective indicators. With regard to somatic complaints, we hypothesized a three-factor structure with each factor referring to a specific functional physiological subsystem. These factors were *musculoskeletal complaints*, *cardiovascular complaints*, and *gastrointestinal complaints*. With regard to both stressors (role ambiguity and time pressure), we included one latent self-rating and one others' rating stressor variable in the model. Since the self-rater and his or her other had responded to the same items, we allowed error covariances between the respective items. The model was based on the covariance matrix of the items, and the estimation method was maximum likelihood. The sample size specified in the LISREL input syntax was the median of the various cells of the covariance matrix (N = 346).

Structural equation models. In the structural models, the latent self- and others' rating stressor variables were specified to load on respective higher-order factors. The higher-order factors expressed the common variance of the self and the other and, therefore, an objective conceptualization of both job stressors. As on the primary level, one of the loadings was fixed to one to establish a metric of the higher-order factor. Both the sequence model and the general factor model were based on this factor structure. The disturbances of the dependent health variables were uncorrelated. The theoretical models (see Figure 7.1) varied with regard to the structural coefficients: In the sequence model, the higher-order stressor variables and the working time variables had differential effects on chronic fatigue and sleep quality. Chronic fatigue, in turn, had effects on somatic complaints and depression. To consider the possibility that sleep problems are affected by depression (Espie, 2002), we tested a nested submodel of the sequence model where an effect of depression on sleep quality was estimated. In contrast to the sequence model, the general factor model imposed a higher order factor on which all the health variables loaded. The loading of fatigue was fixed to one to identify the general factor. The three working time variables and the two second order stressor variables had effects of this general strain factor. No further direct effects on the specific health variables were estimated.

7.4.4 Fit Indices

To evaluate the fit of the analyzed models, we referred to the chi-square, root mean square error of approximation (RMSEA), standardized root mean squared residual (SRMR), the comparative fit index (CFI), and the Akaike information criterion (AIC). Following Hu and Bentler's (1999) suggestions, we considered CFI values close to or above .95, RMSEA values below .06, and SRMR values below .08 as indicators of a good fit. The AIC was especially important since the sequence model and the general factor models are not nested and, thus, cannot be statistically compared. We regarded the model with the lowest AIC as the preferable one.

7.5 Results

7.5.1 Descriptive Statistics

Table 7.1 shows the correlations between the manifest study variables as well as their means and standard deviations. The working time dimensions were substantially correlated with each other. Especially the correlation of .60 between mean time of day and variation shows that night shift work is usually rotating shift work. The correlations between the working time variables and the job stressors were slightly but significantly positive, thus, indicating that individuals working long hours and at night experience more role ambiguity and time pressure. Finally, there were no relationships between working time and health. Exceptions were fatigue and sleep quality which correlated significantly with mean time of day and working time variation in the expected direction. With regard to somatic complaints, only gastrointestinal complaints correlated positively with mean time of day.

7.5.2 The Measurement Model

The fit indexes of the measurement and structural models are depicted in Table 7.2. The initial measurement model (Model A) contained freely covarying latent variables (the stressors and health constructs) and three single indicator working time variables. The fit of the initial model was good ($\chi^2(659) = 1194.80$; RMSEA = .046; CFI=.969; SRMR=.052; AIC = 1467.10). However, we decided to exclude two of the sleep quality items because the loadings were only moderate (.55 and .60), and the modification indices pointed to a substantial error covariance between them and to a second loading of both on the chronic fatigue factor. The error covariance indicated a second substantial factor that could be interpreted as a "sleep *effect*" factor instead of sleep quality, because it concerned items that described the *consequences* of sleep problems instead of the problems themselves (e.g., "Feeling not well rested"). In addition, the double loadings indicated

that the items reflect tiredness and, hence, also measure fatigue. Furthermore, the modification pointed to a double loading of the complaint "headache" on the gastrointestinal complaints factor. We freed this double loading because we did not want to eliminate a substantial complaint from our analyses and regarded this double loading as a reasonable description of the influential factors of headaches. The revised measurement model (Model B) had a good fit ($\chi^2(583) = 871.44$; RMSEA = .038; CFI = .977; SRMR = .042; AIC = 1187.44) and served as the baseline for the structural models.

7.5.3 Structural Models

Table 7.2 shows that the sequential model (Model C) had a good fit ($\chi^2(632) = 1045.61$; RMSEA = .044; CFI = .967; SRMR = .058; AIC = 1263.61). Surprisingly, the relationship between working time duration and fatigue was negative. Since we regarded this finding to more likely indicate that fatigue leads to shorter working time instead of working time duration decreases fatigue (or increases health), we estimated a structural effect of fatigue on working time and eliminated the effect of duration on fatigue. The fit of this revised model (Model D) was similar to the prior one ($\chi^2(632) = 1039.11$; RMSEA = .044; CFI = .968; TLI = .964; SRMR = .057; AIC = 1257.11). At the next step, we tested a potential effect of depression on sleep quality. However, the nonsignificant increase in chi-square ($\Delta\chi^2(1) = .07$, $p > .05$) and the nonsignificant path from depression to sleep quality indicated that sleep quality is not an indicator of depression. Therefore, we regarded the revised sequential model (Model D) as the reference model for the comparison with the general factor model.

The fit of the general factor model (Model F) was better fit than that of the sequential model ($\chi^2(636) = 1020.18$; RMSEA = .042; SRMR = .055, CFI = .969; AIC = 1230.18) in all fit indexes. Furthermore, the AIC pointed to a higher parsimony of the general factor model compared with the sequence model. Figure 7.2 depicts the path diagram of the general factor and the standardized factor loadings and regression coefficients. As can be seen, all of the higher-order factor loadings were significant and substantial in magnitude. Role ambiguity ($\beta = .38$, $p < .01$) and mean time of day ($\beta = .19$, $p < .05$) showed significant effects on the general factor. In contrast, the effects of time pressure ($\beta = .06$, $p > .05$) and working time variation ($\beta = -.11$, $p > .05$) were not significant. Finally, the general factor had a negative effect on working time duration ($\beta = -.25$, $p < .01$).

Table 7.1

Correlations, Means, and Standard Deviations of the Manifest Study Variables

	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Mean time of day	13:02	2:43												
(2) Working time duration	38:35	13:59	.28**											
(3) Working time variation	.00	1.59	.60**	.53**										
(4) Role ambiguity (self)	2.42	.89	.10	.30**	.30**									
(5) Time pressure (self)	3.25	.95	.09	.26**	.23**	.50**								
(6) Role ambiguity (others)	2.42	.87	.09	.32**	.30**	.57**	.33**							
(7) Time pressure (others)	3.19	.95	.19**	.22**	.30**	.33**	.61**	.44**						
(8) Chronic fatigue	1.33	.79	.19**	-.03	.18**	.22**	.20**	.17*	.17*					
(9) Sleep quality	2.53	.92	-.17**	-.02	-.20**	-.23**	-.21**	-.25**	-.21**	-.58**				
(10) Musculoskeletal complaints	1.59	1.10	.06	-.03	.10	.23**	.22**	.05	.17*	.53**	-.47**			
(11) Cardiovascular complaints	.50	.70	.02	-.07	.00	.18**	.14**	.08	.09	.47**	-.38**	.42**		
(12) Gastrointestinal complaints	.38	.61	.12*	-.01	.08	.22**	.17**	.13	.14*	.41**	-.30**	.34**	.54**	
(13) Depression	1.57	1.02	.08	.00	.07	.27**	.15**	.27**	.11	.58**	-.45**	.30**	.40**	.35**

Notes. *$p < .05$, **$p < .01$; N's = 201 (correlations with others' ratings) to 336 (correlations among self-ratings); variables are composite scores; means and standard deviations for mean time of day and working time duration are in time format

Table 7.2

Fit Indexes of the Models

Model		χ^2 (df)	RMSEA	SRMR	CFI	AIC
A	Measurement model	1194.80 (659)**	.046	.052	.969	1467.10
B	Revised measurement model (two sleep quality items deleted and one double loading estimated)	871.44 (583)**	.038	.042	.977	1187.44
C	Sequence model	1045.61 (632)**	.044	.058	.967	1263.61
D	Revised sequence model (fatigue has an effect on working time duration)	1039.11 (632)**	.044	.057	.968	1257.11
E	Revised sequence model (with depression affecting sleep quality)	1039.18 (631)**	.044	.057	.968	1259.18
F	General factor model	1020.18 (636)**	.042	.055	.969	1230.18

Note. ** $p < .01$; RMSEA = Roots mean square error of approximation; SRMR = Square root mean residual; CFI = Comparative fit index; AIC = Akaike information criterion

7.6 Discussion

7.6.1 The General Strain Factor

This study compared two models that express assumptions about the interrelationships between health variables (chronic fatigue, sleep quality, depression, and three forms of somatic complaints) and their association with job stressors and working time. The *sequence model* postulates that job stressors and working time first cause increases in chronic fatigue and a decrease in sleep quality, which in turn lead to depression and somatic complaints. In contrast, the *general factor model* postulates that the covariances among the health constructs are an expression of a single underlying common factor. The results showed that the general factor model fitted the data slightly better.

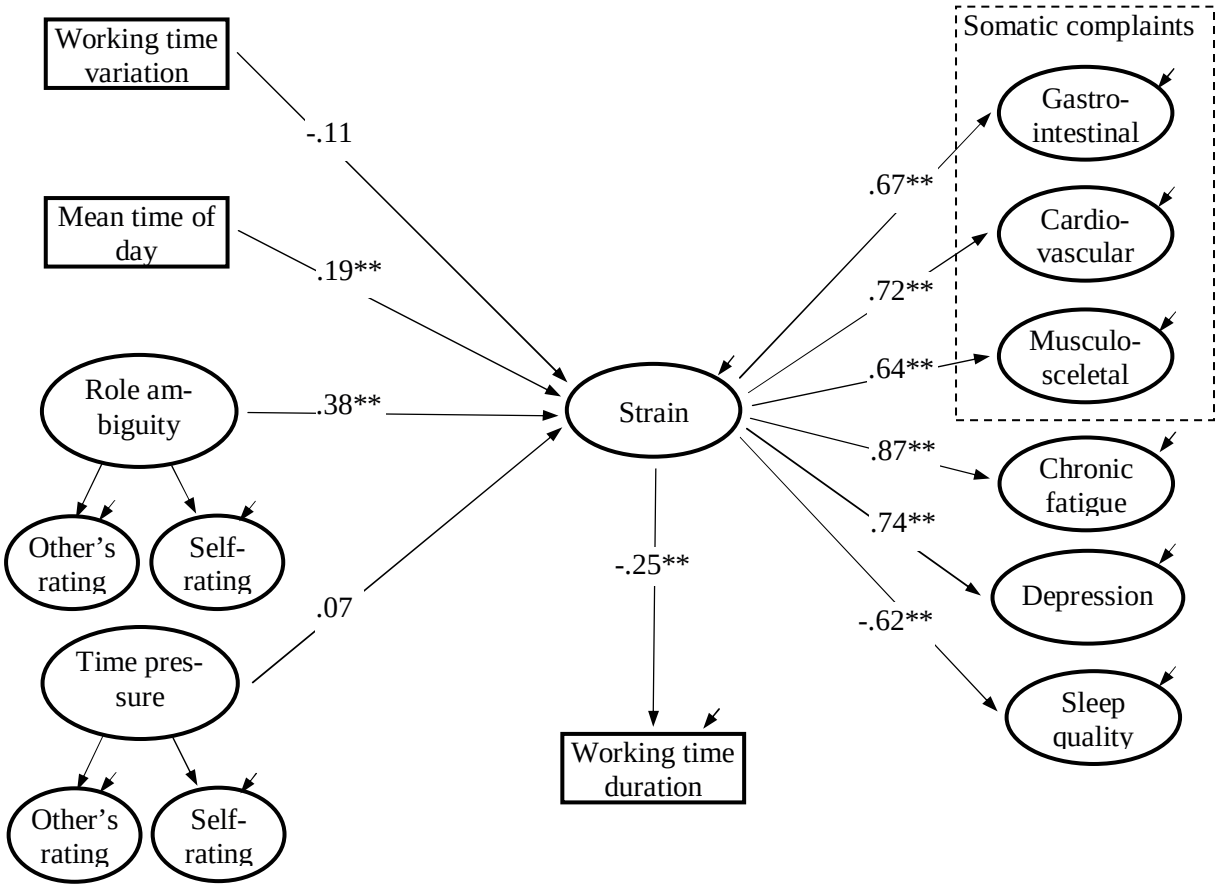


Figure 7.2

Standardized effects of the general factor model

Given the significantly higher restrictiveness and parsimony of higher-order models, we interpret our results as a support of the general strain model. Although the modification indices indicated a significant covariance between the disturbances of the gastrointestinal and cardiovascular factor, estimating this covariance would not have changed the result that a substantial amount of covariance among the specific health variables was due to one factor. Furthermore, the factor loadings of the health constructs on the general factor were all substantial and of approximately equal size. A further result that supports the general factor model is that there were no modification indices that pointed to eventually omitted direct effects of the job stressors or working time variables to the specific health constructs. In contrast, the effects of mean time of day and role ambiguity in the general factor model were larger than those in the sequence model which strengthens the validity of the general factor model.

These results should not be interpreted such that distinct health constructs (like fatigue or somatic complaints) are identical and, thus, exchangeable. First, the good fit of the primary factor models supported the distinctive nature of the specific health constructs. Instead, we interpret the general factor as a general strain factor that channels the effects of different work factors (job stressors and working time) on the specific health constructs. In this manner, we adopted the framework of sensitization theory (Eriksen & Ursin, 2002; Ursin, 1997) as a rationale for the possible process that underlies these effects. Based on sensitization theory, we interpret the general strain factor as a common pathway that leads to increased sensitization toward physiological, cognitive, and affective sensations. A second objection against the view that all of the health variables are “the same” is that the health constructs could be differentially related to consequences of ill-health such as absenteeism, turnover, drug abuse, medical consultations, etc. Different relationships with outcomes would imply a discriminant validity of the specific health constructs.

The models in this study focused on subjective health. Hence, our results parallel the concept of *subjective health complaints* proposed by Ursin (1997) as an umbrella term for such complaints. When focusing on more objective measures of health (e.g., blood pressure, hormones, diseases), we regard it as unlikely that a general factor model provides an adequate description of the covariance structure of these measures.

7.6.2 The Role of Chronic Fatigue

The results indicate that chronic fatigue probably does not function as a mediator between aversive job conditions and somatic complaints but is by itself an indicator of the general strain factor. This result corresponds to the view of many scholars in psychosomatic research who regard chronic fatigue as a further somatic complaint (e.g., Ursin, 1997). Although we did not investigate

emotional exhaustion and burnout, our results have implications for burnout research because emotional exhaustion and chronic fatigue are similar, if not identical, constructs (De Vries et al., 2005; Michielsen et al., 2004a; Michielsen et al., 2004b; Schaufeli & Taris, 2005). Consequently, instead of investigating different versions of the burnout sequence model (e.g., Golembiewski et al., 1986; Leiter & Maslach, 1988) research should recognize the possibility of a higher-order burnout factor. Indeed, Cordes, Dougherty, and Blum (1997) analyzed a higher order factor as well as two sequence models. However, they did not perceive both models as competing with each other and presented the results as equitable. It should be emphasized that sequence models and common factor models imply competing assumptions about the causes that underlie the covariance of the respective constructs. Sequence models propose that the covariance is due to a sequential process of the involved constructs – whereas common factor models propose that the covariance is due to one underlying factor. In their strictest sense, they cannot both be true.

At first glance, the lack of support for fatigue as a mediator could disappoint those who had argued that screening for fatigue or other precursors could offer possibilities to prevent individuals at risk from developing more severe problems (e.g., Mohr, 1991; Taris et al., 2005). We think, however, that there is no evidence for such pessimism. Even if fatigue, depression, and somatic complaints are due to a common factor, their effect latencies may differ. As a consequence, individuals may experience fatigue prior to somatic complaints or depression, which offers the possibility for interventions. Furthermore, even if fatigue is not a mediator, there may be other constructs that mediate the effect of aversive job conditions. According to the cognitive activation theory of stress (CATS; Ursin & Eriksen, 2004), worries and rumination about work-related events lead to sustained activation which in turn leads to sensitization. Therefore, the worries construct can be presumed to function as a mediator between stressors and strain. In this context, Brosschot, Pieper, and Thayer (2005) argued that it is the *anticipated* stressors (and not the current ones) that have the most severe effects on well-being.

7.6.3 The Effects of Working Time on Health

In addition to the effects of job stressors, we investigated the effect of three dimensions of working time (mean time of day, working time duration, and variation) on subjective health. Conceptualizing and measuring working time as distinct dimensions enabled us to analyze working time in a complex structural model. This can be considered an advancement to traditional working time research that relies on comparisons of groups (e.g., shift workers vs. non-shift workers). As Table 7.1 shows, the three working time dimensions were substantially correlated with each other and with the job stressors. Especially the correlation between mean time of day and working time variation indicates that jobs including night shifts are usually jobs with highly varying working

time (i.e., rotating shifts). Analyzing the working time dimensions and job stressors in one regression model allowed us to control for their confounding effects and to analyze the specific effects of each dimension. Especially with regard to potential confounding effects of working time and stressors, Thierry and Meijman (1984) reported that night shift usually implies lower stressors than day shifts. In contrast, we found small positive effects – indicating that night shifters have more stressors (i.e., time pressure and role ambiguity) than individuals who work only during the daytime.

Regarding the effects of working time on health or strain, our results showed a significant effect of mean time of day but no effect of working time variation. These results indicate that it is the time of day, and not the rotation, that is critical for health. Furthermore, we found a negative relationship between working time duration and strain. As we regarded it as unlikely that high working time duration decreases strain (Sparks et al., 1997; Spurgeon et al., 1997), we respecified both models such that strain had an effect on working time duration. To our knowledge, this is the first time that such an effect has been found. This effect could indicate that individuals cope with work stress and aversive working time by reducing working time duration or by searching for a new job with less working time (i.e., part-time).

Whereas scholars argue that shift work has specific effects on sleep quality and somatic complaints, the effects found in our study were mediated over global strain. One explanation for this result could be that shift work research often investigates state-like effects (Akerstedt, 1990), for instance, sleep problems as an immediate or middle-term response to night shift. We, in contrast, focused on health on a trait-like or long-term level. Thus, in the long run, the specific short term processes could be masked by an overall sensitization process. For instance, sleep problems as a reaction to night shift would rather express a long-term increased vulnerability with regard to a wide range of health outcomes.

7.6.4 Limitations of the Study

The main limitation of our study is that it relies on cross-sectional data. Especially the sequence model makes assumptions about the unfolding of specific health constructs over time. Although some longitudinal studies exist that have investigated the sequence model in the case of burnout (e.g., Taris et al., 2005; van Dierendonck et al., 2001), they did not test the possibility of a higher-order strain factor model. A notable exception is the study by Dormann (2002) who tested a mediator model in a three-wave longitudinal study where stressors were hypothesized to affect depression mediated by irritation. Although he also specified models where the variables were affected by third variables in the form of common factors, the third variables were all specified as affecting *all* of the variables in the model – including the stressor variables. However, he did not

test a model where irritation and depression were specified as indicators of a higher-order strain factor. Finally, there are some studies (see Shirom, 1989, p. 38) that longitudinally tested an effect of burnout on somatic complaints. However, these also did not include a test of a common factor of both constructs. Thus, a goal for future research is a longitudinal contrast of the sequence models with common factor strain models.

One further drawback of our study refers to the distribution of the working time variables in the sample. The sample had distributions of demographic and study variables that were comparable to the German population. Thus, the percentage of individuals working shifts was in the range of 20%. This number might have been too low to find stronger effects of shift work or a significant effect for working time variation. Therefore, our approach to conceptualize and measure working time as multiple dimensions might be more fruitful in a sample that contains a larger number of shift workers.

Finally, we emphasize that the possibility of a higher-order structure of health would have remained undetected if we had focused solely on the sequence model. Our results demonstrate the importance of specifying different theoretically based models and comparing them in terms of data fit and predictive value.

8

A longitudinal panel study on antecedents and outcomes of work-home interference

Theoretical models of the antecedents and outcomes of work-home interference (WHI) suggest that work characteristics (e.g., job stressors, working hours) increase the probability that an individual experiences work-home interference. Since work-home interference is considered as a role stressor, these experiences should be detrimental for long-term well-being. In this 2-wave panel study, the authors compared this suggested pathway with competing models that propose reverse causation and reciprocal effects in a broad sample of 365 employees (N at T2 = 130) from the German work population using structural equation modeling. In particular, a model with two proposed antecedents (job stressors, working hours) of WHI and two proposed consequences (depression, turnover motivation) was analyzed in alternative configurations. The results support a cyclical model with a job stressors → depression → WHI → job stressors pathway. Furthermore, working hours affected WHI, and turnover motivation emerged as an outcome of WHI.

In the last decades, it has been repeatedly shown that the work and nonwork domain interact in various ways (Edwards & Rothbard, 2000). The most prominent form of these interactions is work-home interference (WHI) that is the experience of incompatibilities between work and non-work roles. Most often based on role theory (Kahn et al., 1964), it has been assumed that WHI is detrimental for well-being or organizational behavior (e.g., turnover, performance). As demographic and cultural changes have led to increases of multiple role pressures for employees in recent years (e.g., working fathers are expected to take care of children), WHI has become an important topic for practitioners and researchers.

In order to understand antecedents and consequences of WHI, scholars have developed and tested a number of theoretical models (Carlson & Perrewé, 1999; Frone et al., 1992; Frone et al., 1997b; Kopelman, Greenhaus, & Connolly, 1983). Although these models focus on different details (e.g., predictive value of work stress, job involvement, or social support), they agree in their assumption that certain work characteristics lead to difficulties or restrict the opportunities to enact in certain private or family activities (Burke & Greenglass, 1987; Edwards & Rothbard, 2000; Kahn et al., 1964). Greenhaus and Beutell (1985) differentiated between three forms of WHI: Whereas *behavior-based conflict* refers to inadequately applied work behavior at home, the other two forms, *time-* and *strain-based conflict*, point to working hours and work stress as antecedents of WHI.

Fortunately, there have been around a dozen longitudinal analyses particularly in the last years (Britt & Dawson, 2005; Demerouti, Bakker, & Bulters, 2004; Frone, Russel, & Cooper, 1997a; Grandey, Cordeiro, & Crouter, 2005; Grant-Vallone & Donaldson, 2001; Hammer, Cullen, Neal, Sinclair, & Shafiro, 2005a; Hammer, Neal, Newsom, Brockwood, & Colton, 2005b; Kelloway, Gottlieb, & Barham, 1999; Kinnunen, Geurts, & Mauno, 2004; Leiter & Durup, 1996; van Hooff et al., 2005). These studies have increased the knowledge about proposed causal dynamics inherent in the WHI process. However, the studies had some limitations which the present study attempts to overcome. First, most of these studies focused on the relationship between WHI and well-being and did not analyze effects of antecedents of WHI. Second, the vast majority of the studies focused on work-family conflict as a specific component of overall WHI and, thus, focused on individuals living with a partner and/or having children. Third, the majority of the studies did not make full use of the longitudinal design for analyses of reverse causation or reciprocal effects (Zapf, Dormann, & Frese, 1996) and only tested the proposed effect of WHI on well-being. Finally, the majority of the studies relied on traditional regression analyses or path analysis. However, the use of structural equation modeling with latent variables is superior due to the possibility to specify measurement errors and over time correlated error covariances.

The present study contributes to the literature by testing a model of antecedents (*working hours* and *job stressors*) and outcomes (*depression* and *turnover motivation*) of WHI longitudinally and compares this model with four alternative models which propose different causal directions among the study variables (see Figure 8.1). The study especially extends prior longitudinal research by specifying a more complex model whereas former studies focused on single relationships such as the relationship between WHI and well-being or job stressors and WHI). Second, the study tests for lagged and synchronous effects whereas the former studies only analyzed lagged effects. In the next sections, we first present a brief review of prior longitudinal research and then describe the theoretical models tested in this study. Table 8.1 presents the characteristics and results of prior longitudinal WHI studies relevant for our study.

8.1 Longitudinal research on WHI

8.1.1 Research focus

Of the 11 studies, only three studies analyzed a complete set of antecedents (e.g., work overload) and outcomes (e.g., well-being) of WHI (Demerouti et al., 2004; Leiter & Durup, 1996; Peeters, de Jonge, Janssen, & van der Linden, 2004). Of the remaining eight studies, the majority (N = 6) only focused on the effects of WHI on well-being (Frone et al., 1997a; Grant-Vallone & Donaldson, 2001; Hammer et al., 2005a; Kelloway et al., 1999; Kinnunen et al., 2004; van Hooff et al., 2005). With regard to possible antecedents, four studies investigated job stressors as antecedents (Britt & Dawson, 2005; Demerouti et al., 2004; Leiter & Durup, 1996; Peeters et al., 2004) but only two analyzed working hours (Britt & Dawson, 2005; Hammer et al., 2005b). As time constraints are seen as an important source of WHI (Greenhaus & Beutell, 1985), the neglect of working time in longitudinal research is astonishing.

8.1.2 Time lag

Half of the longitudinal studies investigated effects within a time lag of one year. The remaining studies applied time lags of six months (Grant-Vallone & Donaldson, 2001; Kelloway et al., 1999), four months (Britt & Dawson, 2005), three months (Leiter & Durup, 1996) and six weeks (Demerouti et al., 2004). The longest time lag of four years was used in the study of Frone et al.(1997a). Furthermore, except two studies (Hammer et al., 2005a; Peeters et al., 2004), the studies investigated only lagged effects. In analyses of lagged effects, the respective outcome measured at time 2 is regressed on the predictors measured at time 1 controlling for the outcome at time 1.

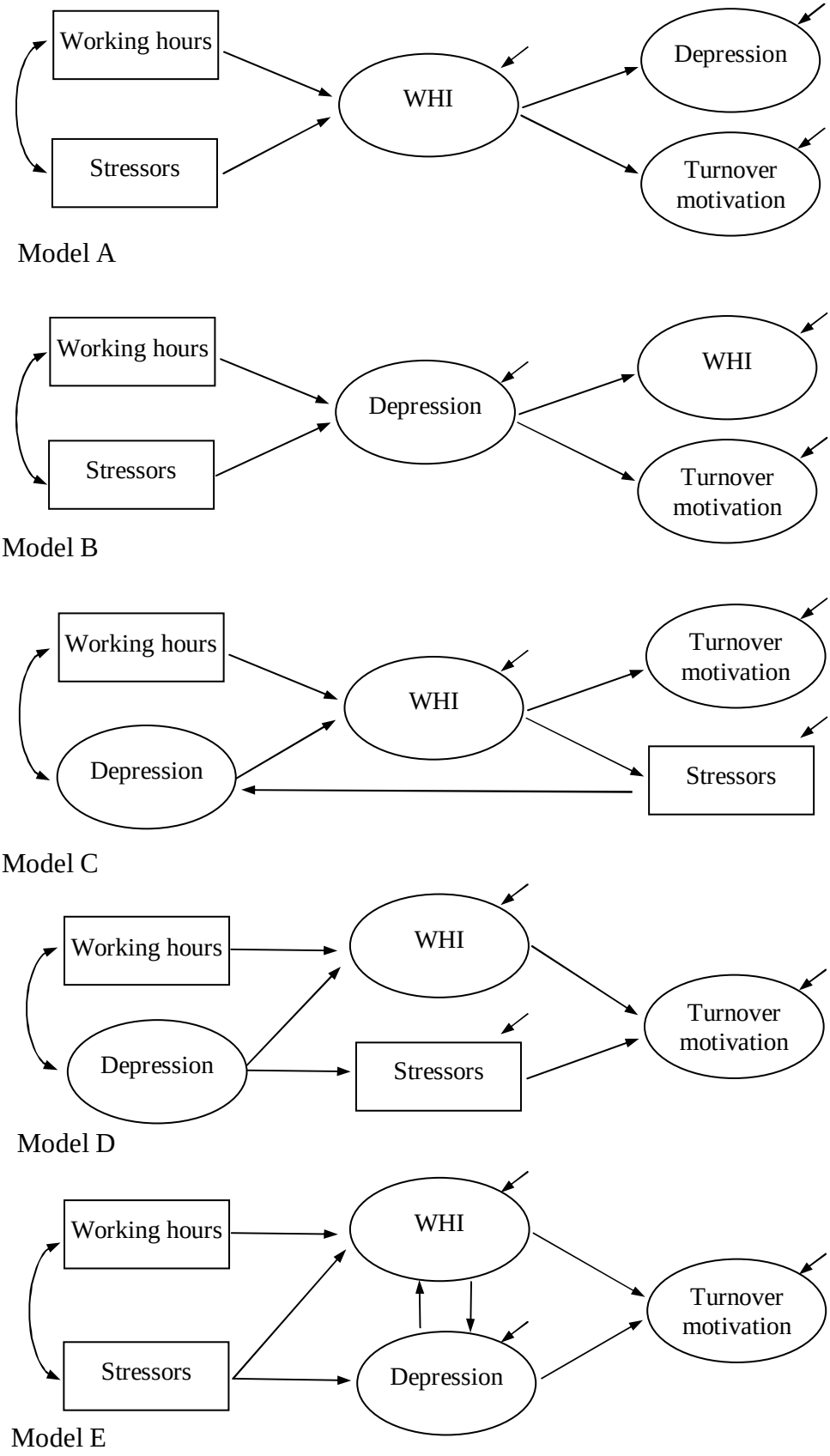


Figure 8.1

Path diagrams of analyzed models; WHI = work-home interference

Table 8.1

Characteristics of longitudinal studies on WHI

Study	N	Method	Antecedents of WHI	Consequences of WHI	Time lag	Causal analyses[a]	Results
Leiter & Durup (1996)	151	Path analysis	Work overload	Dysphoric mood Burnout (Emotional exhaustion, depersonalization, lack of accomplishment	3 months	a), b), c)	Reciprocal effects between WHI and emotional exhaustion; effect of WHI on dysphoric mood No effects of work overload
Frone, et al. (1997a)	1933	OLS regression	not analyzed	Depression, physical wellbeing, hypertension, heavy alcohol use	4 years	a)	WHI was only related to alcohol use
Kelloway et al. (1999)	236	Path analysis	not analyzed	Perceived stress, turnover intention	6 months	a), b)	Reverse effects of perceived stress on WHI
Grant-Vallone & Donaldson (2001)	342	OLS regression	not analyzed	Well-being (life satisfaction)	6 months	a)	Effect of WHI on well-being
Demerouti et al. (2004)	335	SEM	Work pressure	Exhaustion	6 weeks	a), b), c)	Reciprocal effects of WHI, exhaustion, and work pressure

Table 8.1 continued

Study	N	Method	Antecedents of WHI	Consequences of WHI	Time lag	Causal analyses[a]	Results
Kinnunen et al. (2004)	429	OLS regression	not analyzed	Work and family satisfaction, psychological and physical well-being	1 year	a), b)	Effect of WHI on all dependent variables for women; effect of satisfaction and well-being on WHI for men
Peeters et al. (2004)	383	OLS regression	Job stressors	Exhaustion Psychosomatic complaints	1 year	a), b)	Effect of job stressors on WHI and exhaustion Effect of WHI on exhaustion No effect on psychosomatic complaints
Van Hooff et al. (2005)	730	Path analysis	not analyzed[b]	Depression and fatigue	1 year	a), b), c)	Effect of strain-based WHI on depression and fatigue; no effect of time-based WHI
Hammer, Neal et al. (2005b)	418	SEM	Work hours Organizational support Number of children Parent care hours	not analyzed	1 year	a)	No effects on WHI

Table 8.1 continued

Study	N	Method	Antecedents of WHI	Consequences of WHI	Time lag	Causal analyses[a]	Results
Britt & Dawson (2005)	493	OLS regression	Work overload Work hours Days of training Hours of sleep De-pression Physical symptoms Morale Job attitudes	not analyzed	4 months	a)	Overall sample: Effects of physical symptoms and cohesion Subsample (married soldiers with children): Effects of physi-cal symptoms, cohesion, and two job attitudes (job satisfaction and job significance)
Hammer, Cullen et al. (2005a)	468	OLS regression	not analyzed	Depression	1 year	a)	No effect

Note. Some of the studies focused of work-family conflict as a specific form of WHI but will here be subsumed under the term WHI; considered vari-ables were only those relevant for the present study

The consequence of controlling the outcome is that the predictors explain the change of the outcome from time 1 to time 2. In contrast, the analysis of synchronous effects might be adequate if the time which the predictor needs to cause a change in the outcome is significantly shorter than the investigated time lag (Finkel, 1995). In an analysis of synchronous effects, the outcome at time 2 is regressed on the predictors at time 2 (instead of time 1) controlling for the outcome at time 1. Because the studies investigating lagged effects in a short time lag (six weeks to six months) (Demerouti et al., 2004; Grant-Vallone & Donaldson, 2001; Kelloway et al., 1999; Leiter & Durup, 1996) found effects for antecedents and/or outcomes of WHI, analyses of synchronous effects could be fruitful in addition to lagged effects when applying longer time lags.

8.1.3 Comprehensiveness of the causal analyses

Zapf et al. (1996) criticized that many longitudinal studies on work stress do not make full use of the longitudinal design and only investigate one causal direction, that is the traditionally hypothesized stressor - strain direction. The authors recommended that reverse causation and reciprocal effects should be investigated in longitudinal studies. Of the 10 longitudinal studies, five studies investigated either the effects of antecedents (e.g., work hours, work overload) of WHI (Britt & Dawson, 2005; Hammer et al., 2005b) or the effects of WHI on outcomes (Frone et al., 1997a; Grant-Vallone & Donaldson, 2001; Hammer et al., 2005b). Six longitudinal studies also examined reverse causation (Demerouti et al., 2004; Kelloway et al., 1999; Kinnunen et al., 2004; Leiter & Durup, 1996; Peeters et al., 2004; van Hooff et al., 2005).

8.1.4 Method of analysis

Finally, 10 out of the 11 studies used either multiple regression or path analysis. Both methods use composite scores that imply attenuation of the relationships between variables (Bollen, 1989). Additionally, it is not possible to consider over-time-correlated measurement errors which are typical in longitudinal analyses. If correlated errors are not taken into account, the autoregressions or stabilities of the constructs are overestimated as the overall covariance between time 1 and 2 is not separated into error covariance and covariance between the latent variables (Finkel, 1995). There were only two studies (Demerouti et al., 2004; Hammer et al., 2005b) that used structural equation modeling and, hence, could address measurement error and correlated errors.

A further methodological topic which has not been addressed is invariance of the constructs over time. Golembiewski, Billingsley, and Yeager (1976) as well as Schaubroeck & Green (1989) argued that the comparison of constructs over time requires a consistency of measurement.

Changes of measurement parameters are an indication of a change of meaning and validity of the used measures. Therefore, panel analyses should examine measurement invariance over time.

The present study attempts to contribute to the field by applying a research design that addresses the discussed topics (research focus, time lag, comprehensiveness, and method of analysis): First, we compare five theoretically plausible models that contain both antecedents (working hours and job stressors) and outcomes (depression, and turnover motivation) of WHI and address reverse causation and reciprocal effects (see Figure 8.1). Second, we analyze lagged and synchronous effects using a time lag of one year. Third, by using structural equation modeling with latent variables, we address the issue of correlated measurement errors and measurement invariance.

8.2 Theoretical models

The present study compares five models which propose a different causal sequence of working hours, job stressors, WHI, depression, and turnover motivation[12]. The path diagrams of the models are depicted in Figure 8.1.

Model A represents traditional theorizing about causes and consequences of WHI which is most often based on role theory (Kahn et al., 1964). Kahn et al. describe interrole conflict as the result of incompatible role demands in two or more domains. In the case of WHI, long working hours and job stressors reduce either opportunities to fulfill private role demands or impair psychological resources (e.g., attention, motivation, self-discipline) that make it difficult to fulfill the demands. Greenhaus and Beutell (1985) referred to the first form as time-based WHI and to the second as strain-based. Strain-based WHI is the result of a spillover of negative affect or worries which has traditionally been discussed as a process linking work and nonwork (Edwards & Rothbard, 2000). As a further mechanism of strain-based WHI, an increased need for recovery that is the result of demanding work should interfere with the capability or motivation to engage in private activities. Since WHI is itself considered as a stressor, consequences of WHI are mostly hypothesized within the classical stressor-strain framework (Cooper & Payne, 1988; Kahn & Byosiere, 1992). In this regard, research on WHI has focused on well-being or behavioral outcomes of strain like turnover intentions or absenteeism (Allen et al., 2000). The literature provides

[12] It should be noted, that the models often differ by some details (e.g., does WHI affects depression or vice versa) whereas other parts remain constant. For instance, we regard working hours as a predictor and turnover as a consequence of the respective mediator (WHI, depression, or stressors). Although it is possible that WHI, depression, or stressors influence working hours, we did not especially test the role of working hours as a dependent variable. The same is true for turnover motivation which we only analyzed as a dependent variable. The reason was to keep the number of tested model at a reasonable limit. To avoid overlooking potential relationships not addressed in the theoretical models, we inspected information provided by the software about neglected paths. In order to avoid redundancy, we limit the following reasoning on the elements that differ across the models.

a number of theoretical models (e.g., Carlson & Perrewé, 1999; Frone et al., 1992; Frone et al., 1997b; Kopelman et al., 1983) which – although focusing on different specific antecedents and outcomes of WHI – can be traced back to the traditional stressor-strain framework. Model B differs from Model A as it proposes a reverse causal direction underlying the relationship between WHI and depression (see Figure 8.1). Whereas Model A proposes that WHI influences depression and, thus, mediates the effects of working hours and job stressors, Model B states that WHI is a consequence of depression (cf. Kelloway et al., 1999). There are several mechanisms for such a reverse causation. First, depression may function as an affective disposition that influences the perception or report of role stressors such as WHI (Kelloway et al., 1999). Specifically, depression could negatively influence the evaluation of an individual's amount of WHI. For example, given a comparable objective WHI for two individuals, the depressive individual could experience a higher WHI. This mechanism is similar to the role of negative affectivity in the assessment of job stressors (Brief et al., 1988; Burke, Brief, & George, 1993; Chen & Spector, 1991; Judge, Erez, & Thoresen, 2000; Payne, 2000; Spector et al., 2000). Recently, Kelloway et al. (1999) noted that "affective states (e.g., depressive mood) can increase the availability of thoughts and information that are consistent with the mood state" (p. 338). In this regard, depressive mood could heighten the salience of events where work interferes with nonwork and increase the availability of memories of such events. Second, the underlying mechanism between an effect of depression on WHI may consist of a combination of reduced effectiveness at home and attribution of this reduced effectiveness on work and, thus, WHI (Kelloway et al., 1999). Depressive individuals experience a lack of motivation (Layne, Lefton, Walters, & Merry, 1983) and tend to rumination and worries (Muris, Roelofs, Rassin, Franken, & Mayer, 2005; Wupperman & Neumann, 2006) which implies the allocation of resources to non-action oriented foci (Kuhl, 1992). As a consequence, the lack of these resources should lead to difficulties to perform private activities. In search for an explanation of this reduced effectiveness, it is likely that depressive individuals regard work as a probable cause. Because Model B suggests job stressors as an antecedent of depression, this attribution may actually be correct. Given the correctness of this model, the status of depression should be interpreted within the aforementioned concept of strain-based WHI (Greenhaus & Beutell, 1985) instead as a long term outcome of WHI. A further difference of this model to Model A is that it proposes depression as the immediate outcome of job stressors and working hours and turnover motivation as an outcome of depression.

Model C adds a second reverse causation hypothesis as it suggests an effect of WHI on stressors. Hence, Model C implies a complete reversal of the traditionally proposed stressor → WHI → depression sequence. Again, there are several possible mechanisms for such an effect. First, WHI could cause work behavior that increases stressors (e.g., absenteeism, low perform-

ance, social conflicts) or leads to the selection into jobs which are characterized by more stressors. Demerouti et al. referred to the latter possibility as an example of the "drift hypothesis" in stress research that states that people with health problems get worse jobs (Zapf et al., 1996). This process concerns a change in the objective work environment. Second, WHI implies a negative evaluation of the work-nonwork balance that is related to job dissatisfaction (Kossek & Ozeki, 1998). As in the case of depression and WHI, dissatisfaction could negatively bias reporting job stressors. In contrast to the first mechanism, this second process would rely on the subjective perception and report of objectively unchanged stressors. As final aspect, Model C states an effect of stressors on depression as it is proposed in models of stress at work.

According to Model D, depression affects WHI and job stressors which in turn affect turnover motivation. Whereas WHI is partly determined by the individual's working hours and, thus, is based on actual work features, the model views job stressors (and partly WHI) as a result of depression. The rationale for this reverse causation can be either seen in a bias of perceiving or reporting stressors (cf. Model B) or as a results of the aforementioned downward drift (Zapf et al., 1996), that is the deterioration of the working conditions.

Finally, Model E proposes the most complex structure of relationships among the study variables. It relies on the traditional perspective on WHI as it proposes a job stressors → WHI → depression sequence. In addition, however, Model E incorporates reciprocal effects between WHI and depression and, thus, considers not only an effect of WHI on depression but also the reverse. Finally, the model allows direct effects of job stressors on both WHI and depression in contrast to Models A and B where job stressors are allowed to either influence WHI or depression. Recently, Demerouti et al.(2004) found support for a reciprocal relationship between WHI and exhaustion in a three-wave longitudinal study.

8.3 Method

8.3.1 Sample

At time 1, the sample consisted of N = 365 participants who represented the German working population[13]. 62% of the participants were women. The mean age was 39.8 years (SD = 10.5) and ranged from 17 to 61 years. At time 2, 130 participants took again part of the study. The sam-

[13] This sample came from two sources. The larger part (n = 248) stemmed from a research project using a survey (N = 1,677) from the German working population. The 248 individuals were the result of 515 participants of the survey who had expressed their willingness to participate in a further study. The other part of our sample was recruited at a local hospital and by requesting university employees and students to distribute questionnaires to working acquaintances (n = 117). We pooled both data sets as multigroup confirmatory factor analyses had shown invariance of the complete set of factor loadings and latent covariances (with the exception that the covariance of working hours and job stressors was larger in the second sub sample)

ple contained a variety of different occupations from various industries (e.g., public service, manufacturing, finance, health care, craft, retail). The sample at time 2 consisted of 60% women; the mean age was 41.6. When comparing individuals who participated in both waves with individuals dropped out after the first wave, we found a significant lower mean age and a higher mean turnover motivation for drop-outs cases. The effect size of both differences was r = .13 (age) and r = .12 (turnover motivation). The rest of the model variables - working hours, stressors, WHI, and depression – showed non-significant differences.

8.3.2 Measures

Job stressors. We measured role ambiguity, time pressure, and organizational obstacles as facets of an overall job stressors index. Each stressor was measured with three items respectively using a scale by Zapf (1991) which is well validated and was used in many studies in the stress context (e.g., Garst, Frese, & Molenaar, 1999). An example for role ambiguity is "how often do you get unclear assignments?"; an example for time pressure is "how often do you work under time pressure?". Both stressors were measured on a 5-point Likert scale – the rating format for role ambiguity reached from 1 (*very rarely/never*) to 5 (*often - one or two times per day*) and for time pressure from 1 (*rarely/never)* to 5 (*often - almost continuously*). Organizational obstacles refer to working with insufficient tools, supplies, or material and were measured on a bi-directional 5-point Likert scale that represents the participant's similarity to two opposing virtual employees indicating the low pole (e.g., "employee A works with excellent material, supplies or tools") vs. high pole (e.g., "employee B works with insufficient material, supplies or tools") of organizational obstacles. The response options reached from 1 (*exactly like employee A*) to 5 (*exactly like employee B*). Cronbach's alpha for role ambiguity was .76 for time 1 and .77 for time 2. For time pressure, Cronbach's alpha was .81 for time 1 and .85 for time 2. We did not calculate Cronbach's alpha for organizational obstacles, as we conceptualized organizational obstacles as a multidimensional formative construct (Cohen, Cohen, Teresi, Marchi, & Velez, 1990) determined by some facets (e.g., insufficient tools). The stability of the overall stressor index was .73.

Working hours. We measured working hours by asking respondents when they had started and ended working during the last two weeks. The average weekly working time was calculated based on these data. This assessment form was used within a larger project on differential aspects of working time.

Work-home interference. Three items from Netemeyer, Boles, and McMurrian's (1996) scale were used to measure WHI. A sample item is "Things I want to do at home do not get done be-

cause of the demands my job puts on me". The response options ranged from 0 (*totally disagree)* to 4 (*totally agree)*. Cronbach's alpha for the five items was .88 (time 1) and .89 (time 2).

Depression. We measured depression using three items from a depression scale developed by Zung (1965) adapted by Mohr (1986). A sample item is "I am looking into the future without any hope". Responses were possible on 7-point Likert scales with response options ranging from 0 (*never)* to 6 (*almost always)*. Cronbach's alpha for this measure was .71 (time 1) and .72 (time 2).

Turnover motivation. Turnover motivation was measured with three 5-point Likert items which address turnover cognitions, search behavior and turnover intention. The cognition and the intention item were developed by Schaubroeck, Cotton, and Jennings (1989); the search behavior item was self-developed. The turnover cognitions item was "how often do you think of quitting your job?" – response options ranged from 0 (*almost never*) to 4 (*almost everyday*), the search behavior item was "how often have you recently looked for another job (e.g., by reading the newspaper or asking acquaintances)?" – response options ranged from 0 (*not at all*) to 4 (*almost everyday*), and the intention item was "how probable is it that you will quit your job during the next year?" – response options ranged from 0 (*very unlikely*) to 4 (*very likely*). Cronbach's alpha for the three items was .78 (time 1) and .81 (time 2).

8.3.3 Modeling procedure

The various models were analyzed with structural equation modeling using LISREL 8.54. The input matrix was the covariance matrix of the indicators. The chosen sample size used in the program was the median of the cells of the covariance matrix (N = 188). The estimation method was maximum likelihood. The analyses were carried out in two steps. In the first step, we specified a measurement model to investigate the convergent and discriminant validity of the measures and if the measures provide longitudinal measurement invariance (Golembiewski et al., 1976; Vandenberg & Self, 1993). In the second step, we tested the five structural models.

Measurement model. We specified a longitudinal measurement model that contained the latent variables from both waves. WHI, depression, and turnover motivation were modeled as latent variables which were reflected by three manifest items, respectively. The loading of the first indicator of each latent variable was fixed to one to provide a scale for the latent variable. We specified covariances between the error of each measured indicator at time 1 and its respective part at time 2 (Kenny & Campbell, 1989). Working hours and job stressors were modeled as single indicator variables which are equal to the measured variable (i.e., had a factor loading fixed to one and zero measurement error). Job stressors were represented as an aggregate that was the mean of the time pressure, role ambiguity, and organizational problems measures. Although aggregating dif-

ferent facets of a construct in a single index has the disadvantage that specific relationships between the facets and the outcomes of interest cannot be investigated, this procedure was necessary to reduce the number of variables and parameters in the model. Furthermore, the conceptualization of overall job stressors as a aggregate or formative construct (MacKenzie et al., 2005) consisting of several specific stressors was more adequate than specifying a higher order common factor that is the assumed cause of the specific stressors.

We tested the longitudinal invariance of the measurement model in a sequence of nested models (Golembiewski et al., 1976; Millsap & Hartog, 1988; Pentz & Chou, 1994; Vandenberg & Self, 1993). Specifically, the factor loadings, variances of the latent variables, and their covariances were restricted to be equal across both waves. Non-invariant loadings and variances have been called *beta change* (e.g., Schaubroeck & Green, 1989) and indicate recalibrations of the response scales. Consequently, a response to the same category has a different meaning at each wave. Non-invariant covariances have been referred as *gamma change* (e.g., Schaubroeck & Green, 1989) and indicate a "redefinition or reconceptualization of some domain" (Golembiewski et al., 1976, p. 135) and, thus, a change in the meaning of the latent variable. Tests of invariance are conducted by restricting the respective parameter matrix to be equal across both waves. Consequently, a significant increase of the chi-square-value indicates lack of invariance.

Structural models. The five models (see Figure 8.1) were analyzed in longitudinal autoregressive structural models (Finkel, 1995), where the dependent variable at time 2 (e.g., WHI) is regressed on the same variable at time 1 in addition to a assumed antecedent (e.g., job stressors). This autoregression enables predicting the change in the dependent variable from time 1 to time 2. Figure 8.2 presents an example of a lagged effect model (upper part) and a synchronous effect model (lower part). The analysis of five models and two sorts of effects (lagged vs. synchronous) resulted in 10 analyzed models.

Fit indexes. We evaluated the fit of our models with the chi-square-statistic, the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993), the squared root mean residual (SRMR; Jöreskog & Sörbom, 1981), the comparative fit index (CFI; Bentler, 1990), and the Akaike information criterion (AIC; Akaike, 1987). Values indicating adequate fit (Hu & Bentler, 1999) are < .06 for the RMSEA, < .08 for the SRMR, and > .95 for the CFI. The AIC evaluates both the fit as well as the parsimony of the model and has no recommended criterion value. Instead, the model with the lowest AIC is preferred. As Hu and Bentler (1999) noted, the RMSEA tends to over-reject adequate models in samples with small size. Therefore, we attached more importance on the SRMR, CFI, and AIC.

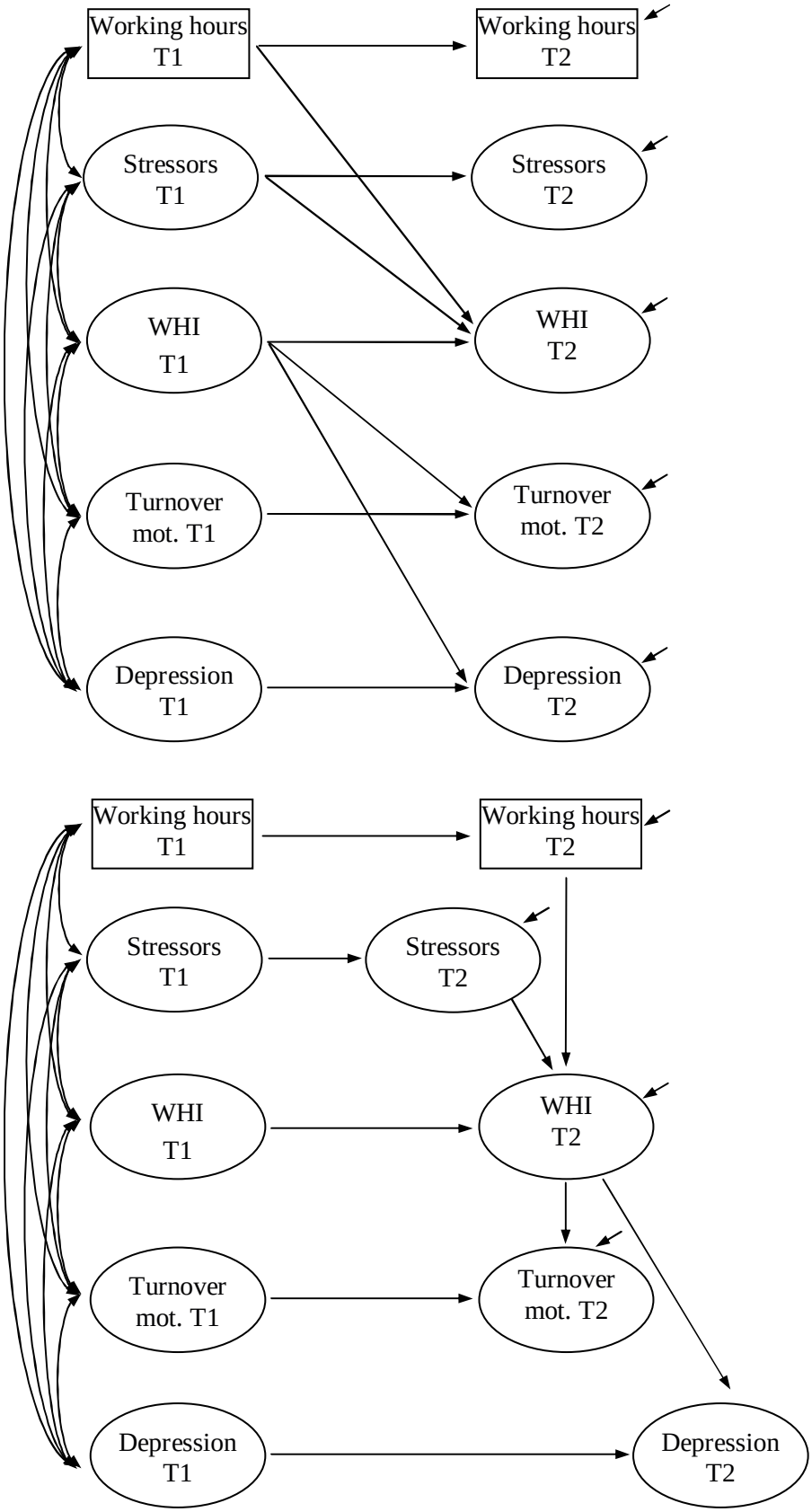


Figure 8.2: Example of a structural model testing for lagged effects (upper part of the diagram) and synchronous effects (lower part of diagram); WHI = work-home interference

8.4 Results

8.4.1 Descriptive results

Table 8.2 depicts the means, standard deviations, and latent correlations among the study variables. Job stressors, working hours, depression, and turnover motivation substantially correlated with WHI; within and across both waves. Especially, working hours and job stressors showed large correlations with WHI (r =. 42 and r = .46). The mean of WHI was 1.42 and remained stable during the year. The means of the other variables were similar as they all laid in the lower part of the scale. Finally, the stabilities of working hours (r = .85), job stressors (r = .73), and WHI (r = .82) were quite large compared with depression (r = .62) and turnover motivation (r = .61).

8.4.2 Measurement models

The fit of the measurement model was moderate ($\chi^2(158) = 288.63$; RMSEA = .066; CFI = .963; SRMR = .056; AIC = 476.63). Whereas the CFI and the SRMR were adequate, the RMSEA was slightly above the recommended cut-off value of .06. Therefore, we tried to improve the model. The modification indexes pointed to a residual covariance between one turnover intention item ("how often did you lately perform behavior oriented towards a new job (e.g., reading the newspaper, asking acquaintances)?") with the intention to quit the job one year later. We specified this covariance because this relationship suggests a long-term effect of job search behavior on the turnover intention.

The resulting model had adequate fit ($\chi^2(159) = 257.64$; RMSEA = .058; CFI = .968; SRMR = .055; AIC = 447.64) and was significantly better than the former model ($\Delta\chi^2(1) = 30.99$, $p < .001$). The model had substantial standardized factor loadings in the range between .55 and .92 with a mean of .76. Table 8.3 shows the factor loadings, standard errors and test statistics. In addition, the table shows the composite reliability of the measures (Fornell & Larcker, 1981) which is a function of the sum of the standardized factor loadings and the error variances[14]

[14] The composite reliability gives a more adequate measure of the true reliability than Cronbach's alpha in cases where measures are not essentially tau-equivalent (i.e., show unequal factor loadings), which is a prerequisite for the correctness of alpha (Graham, 2006). In our case, the composite reliability especially for depression was substantially higher than its Cronbach's alpha, which can be attributed to the differences of the factor loadings.

Table 8.2

Descriptive statistics of model variables

	M	SD	Range	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Working hours T1	38:35	13:59	3 – 90									
2. Job stressors T1	2.74	.67	1 – 5	.30**								
3. WHI T1	1.42	.91	0 – 4	.42**	.46**							
4. Depression T1	1.57	1.02	0 – 6	.02	.29**	.25**						
5. Turnover motivation T1	.69	.83	0 – 4	.13	.29**	.31**	.29**					
6. Working hours T2	38:41	12:50	7 – 73	.85**	.25**	.39**	.12	.20**				
7. Job stressors T2	2.71	.67	1 – 5	.34**	.73**	.48**	.25**	.33**	.32**			
8. WHI T2	1.48	.96	0 – 4	.36**	.33**	.82**	.34**	.29**	.42**	.41**		
9. Depression T2	1.66	.91	0 – 6	.07	.26**	.25**	.62**	.20*	.15*	.31**	.39**	
10. Turnover motivation T2	.59	.78	0 – 4	.24**	.28**	.36**	.21**	.61**	.29**	.40**	.39**	.33**

Note. M = manifest mean, SD = standard deviation; * $p < .05$, ** $p < .01$ (one-sided)

Table 8.3

Factor loadings and composite reliabilities of the measurement model

Latent variable	Unstandardized loading	SE	z-value	Standardized loading	Composite reliability
WHI T1					
whi01	1.00	-	-	.84	.89
whi02	1.00	.07	14.51	.87	
whi03	1.00	.07	13.91	.84	
Depression T1					
dep01	1.00	-	-	.65	.78
dep02	1.24	.15	8.31	.81	
dep03	1.13	.14	8.26	.75	
Turnover motivation T1					
tmot01	1.00	-	-	.79	.78
tmot02	1.02	.11	9.30	.79	
tmot03	.74	.10	7.81	.63	
WHI T2					
whi01	1.00	-	-	.86	.92
whi02	1.07	.06	17.23	.92	
whi03	1.01	.06	15.86	.87	
Depression T2					
dep01	1.00	-	-	.79	.81
dep02	1.09	.10	10.70	.92	
dep03	.74	.10	7.75	.55	
Turnover motivation T2					
tmot01	1.00	-	-	.86	.82
tmot02	1.02	.09	11.70	.86	
tmot03	.66	.08	8.50	.60	

Note. T1 = wave 1, T2 = wave 2; SE = standard error, loadings without standard error and *t* value were fixed and not estimated; composite reliability calculated with $(\Sigma\lambda_i)^2 / [(\Sigma\lambda_i)^2 + \Sigma\theta_i]$, where λ_i is the standardized loading of indicator *i* and θ_i is the standardized measurement error of indicator *i*

The results of the tests of measurement invariance are depicted in Table 8.4. The test of equal factor loadings resulted in a non-significant increase of the chi-square ($\Delta\chi^2(6) = 9.34$, $p > .05$), thus, indicating non-significant differences between the loadings at both waves. When testing for equal variances, the analyses showed that the variances had not changed significantly within the interval ($\Delta\chi^2(5) = 6.93$, $p > .05$). Finally, tests of equal covariances showed no significant difference between both waves ($\Delta\chi^2(10) = 8.98$, $p > .05$). In summary, the analyses of longitudinal measurement invariance revealed a complete stability of factor loadings and latent variances and covariances across both waves.

8.4.3 Structural Models

The results of the structural models are depicted in Table 8.5. From all tested models, the models with lagged effects were throughout inferior to the models with synchronous effects. Of the synchronous effects models, Model C, that postulates a feedback loop linking depression, WHI, and stressors, showed the best fit of the tested models ($\chi^2(183) = 303.67$; RMSEA = .059; CFI = .964; SRMR = .065; AIC = 443.63). Furthermore, the AIC indicated that Model C showed the best ratio of fit and parsimony. Finally, the effects within the traditionally postulated stressors – WHI – depression chain were non-significant in all of the tested models. Figure 8.3 depicts the final model. It should be noted that the coefficients refer to predictions of change. Working time ($\beta = .12$, $p < .05$) and depression ($\beta = .19$, $p < .05$) had effects on WHI which again led to an increase of stressors ($\beta = .19$, $p < .01$) and turnover motivation ($\beta = .24$, $p < .01$). Furthermore, job stressors were related to depression ($\beta = .14$, $p < .05$). To avoid overlooking effects not explicitly postulated, we checked the modification indices for potential effects of WHI, depression or stressors on working hours. However, there was no evidence for such effects.

Table 8.4

Results of the Tests of Measurement Invariance

	Model	χ^2 (df)	$\Delta\chi^2$ (Δdf)	Compared model	RMSEA	SRMR	CFI	AIC
A	Baseline model	257.64 (158)**		-	.058	.055	.968	447.64.
B	All loadings equal	266.96 (164)**	+ 9.43 (6)	A	.058	.056	.967	444.96
C	All factor variances equal	273.89 (169)**	+ 6.93 (5) n.s.	B	.058	.059	.966	441.89
E	All factor covariances equal	282.87 (179)**	+ 8.98 (10)	C	.056	.063	.966	430.87

Note. **p < .01, RMSEA = root mean square of approximation, SRMR = square root mean error of approximation; CFI = comparative fit index; AIC = Akaike information criterion

Table 8.5

Fit Indexes of the Structural Models

Latent variable	χ^2 (df)	RMSEA	SRMR	CFI	AIC
Stability model[a]	367.77 (188)**	.072	.093	.955	497.77
Models with lagged effects					
A (stressors → WHI → depression)	346.94 (184)**	.069	.077	.958	484.94
B (stressors → depression → WHI)	354.86 (184)**	.071	.082	.956	492.86
C (feedback loop with depression, WHI, and stressors)	332.67 (183)**	.061	.070	.961	472.67
D (depression → stressors, WHI)	344.24 (183)**	.067	.075	.958	484.24
E (stressors → WHI, depression; reciprocal effect of WHI and depression)	335.23 (181)**	.068	.071	.959	479.23
Models with synchronous effects					
A (stressors → WHI → depression)	327.81 (184)**	.065	.073	.960	465.81
B (stressors → depression → WHI)	324.50 (184)**	.064	.075	.961	462.50
C (feedback loop with depression, WHI, and stressors)	303.63 (183)**	.059	.065	.964	443.63
D (depression → stressors, WHI)	310.59 (183)**	.061	.070	.963	450.59
E (stressors → WHI, depression; reciprocal effects of WHI and depression)	310.52 (181)**	.062	.069	.962	454.52

*Note.*** $p < .01$; [a]The stability model only contains the stabilities of the latent variables but no lagged or synchronous effects; RMSEA = root mean square of approximation, SRMR = square root mean error of approximation; CFI = comparative fit index; AIC = Akaike information criterion

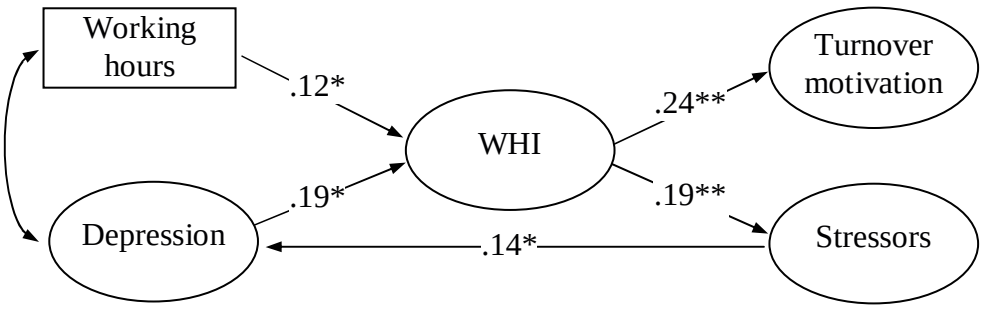


Figure 8.3

Final model with synchronous effects (controlling for stabilities of the dependent variables); WHI = Work-home interference

8.5 Discussion

This study investigated longitudinally five models proposing different directions of causal effects among working hours, job stressors, WHI, depression, and turnover motivation. One of these models was based on the traditional stressor-strain conception (Kahn, 1978) and postulated a mediation of WHI in the relationship between working hours and job stressors as independent variables and depression and turnover motivation as dependent variables. The other models differed from the traditional model by analyzing reverse causation and reciprocal effects. The five models were tested with lagged as well as synchronous effects. The results supported a model with synchronous effects where WHI is predicted by depression and itself predicts the perception of job stressors. Furthermore, the results indicated a mediation of WHI in the relationship between working hours and turnover motivation. The effect sizes were substantial given the longitudinal design of the study. Especially, the prediction of the highly stable WHI by working hours and depression is notable. In contrast to common thinking (Allen et al., 2000), depression which was chosen as an operationalization for overall well-being, did not emerge as an outcome of WHI but its antecedent. The mediating position of depression linking job stressors and WHI suggests a function of depression in the development of strain-based WHI (Greenhaus & Beutell, 1985). According to Greenhaus and Beutell, strain-based WHI occurs when job stressors lead to strain which spills over in the nonwork domain and makes it difficult to perform nonwork related activities. The most notable result was the emergence of a vicious circle of job stressors, depression and WHI. Because WHI increased the perception of job stressors, it introduced a positive feedback loop by again increasing strain-based WHI over stressors and depression. To our knowledge, only one of the

longitudinal studies (Demerouti et al., 2004) found a reverse effect of WHI on stressors. Unfortunately, given the use of subjective measures, such an effect is difficult to interpret. As suggested, it is likely that WHI leads to an increase in actual stressors or only perception of actually unchanged stressors. In any way, these results imply that WHI influences perception of the workplace. It is likely that this effect of WHI is not limited to job stressors and can also concern the psychological climate, evaluation of the behavior of coworkers or supervisors, trust and experienced fairness et cetera. It is conceivable that individuals hold expectations about how much the organization should enable a smooth integration of work and nonwork, which when being violated lead to negative evaluation of the workplace.

With regard to the relationship between WHI and well-being, it is useful to address the time lag and the produced result. As in our study, which found a synchronous effect of well-being on WHI, those studies that applied rather short time lags (six weeks to three months) also found an effect in that direction (Demerouti et al., 2004; Kelloway et al., 1999; Leiter & Durup, 1996). Those studies, however, that applied a one-year time lag and investigated lagged effects found an effect of WHI on well-being (Kinnunen et al., 2004; Peeters et al., 2004; van Hooff et al., 2005). Taken together, the overall evidence seems to point to both a short term effect on well-being on WHI as well as a long term effect of WHI on well-being. The short term effect corresponds to the concept of strain-based conflict and reflects work-related strain that leads to problems to perform nonwork behavior. The long term effect, however, reflects a change in well-being as a reaction to durable problems to perform nonwork behavior. An apparent contradiction to this interpretation is the study of Grant-Vallone and Donaldson (2001) which revealed a short-term effect of WHI on life satisfaction. We think, however, that life satisfaction can be contrasted from other concepts of well-being as it is an evaluation of the past and current personal circumstances and, thus, should reflect recent WHI within a short time lag.

The strong effect of WHI on the increase of turnover motivation highlights the practical importance of considering the work-life balance of employees. As the mean of turnover motivation decreased significantly between both waves, it is possible that a substantial amount of individuals actually left their firms. In this case, the true effect is perhaps even larger. It is likely that formal or informal organizational support practices will be an important issue for individuals for selecting a place for work in the future (Glass & Estes, 1997). In Germany, working part-time is a strategy of expectant mothers to cope with anticipated WHI which implies, in particular for highly educated women, the loss of educational resources. It is likely that individuals who are less concerned with rigid role duties than parents will rather tend to lower their standards or desires for nonwork activities (Hall, 1972) than to leave the organization. In the case, however, that the number of job offers will increase during the next decades, organizational support policies could become an im-

portance competition factor in the search for talents. One practically important point in this regard is that support or policies do not necessarily have to aim at an actual decrease of working time or stressors to reduce WHI. For instance, Smith-Major, Klein, and Ehrhart (2002) showed that expectations of supervisors and coworkers about time spent at work had both an indirect effect on WHI over actual working time as well as a strong direct effect. The direct effect could be interpreted such that expectations lead to an experienced threat to desired levels of nonwork time which is reflected in the current experienced WHI. Such a process implies that WHI probably not only depends on an actual interference of two roles but on an anticipated interference or a perceived contradiction of different role expectations. Given the correctness of this interpretation, high expectations could turn into a doubled edged sword by increasing employee's engagement while at the same time threatening nonwork related desires and goals.

8.6 Limitations

Scholars has emphasized that there are two forms of WHI, namely time - and strain-based WHI. This study, however, only addressed an overall evaluation of WHI that comprised both forms. However, we used a well-known scale of WHI that contains items of both forms and this scale has been shown to be unidimensional (Netemeyer et al., 1996). The three items used as indicators in this study also referred to both forms of conflict and as our results showed, we also found one factor with equal factor loadings. Although a two-factor solution can be found when using subsets of items referring to both forms (e.g., Carlson, Kacmar, & Williams, 2000), it is perhaps more reasonable to expect consequences of WHI conceptualized as a overall representation of several forms of conflicts. On the other hand, it is possible that experience of time vs. strain-based conflict differ and, thus, show different effects on well-being. For instance, it is imaginable that individuals experience time-based conflict in a stronger sense as an external restriction that is beyond ones control. Finally, the focus of specific vs. global forms of WHI may depend on the research question – in our study investigating WHI, work characteristics, turnover motivation and well-being, we found overall WHI a useful concept.

9

Summary and Conclusion

9.1 Summary and Discussion

In this dissertation, I proposed that working time can be described by four dimensions - *working time duration*, *mean time of day*, *working time variation*, and *number of shifts*. I argued that the multidimensional approach is fruitful for two reasons. First, it is a descriptive attempt as every individual's working time can be located within the four dimensions. Therefore, the multidimensional approach is able to integrate research on working time that emerged almost completely isolated from each other. In this regard, I criticized the concept of working time schedules. Second, I argued that the four dimensions are the relevant causal factors when addressing negative consequences of working time. This argument was evaluated in three studies. Especially, the focus was to investigate the relationship between working time and work-home interference and well-being (or subjective health).

The results of study 1 (chapter 6) showed that working duration, variation, and mean daytime were significantly related to work-home interference. Of these relationships, especially duration had the strongest effect. To investigate if such a causal interpretation holds, study 3 (chapter 8) tested the effect of duration (together with job stressors) on work-home interference in a longitudinal panel study with a one-year interval. The results supported a short-term effect of working time duration. Unfortunately, the sample size was too small to test effects of mean time of day and variation. Given the small effect sizes of mean time of day and variation found in study 1 and the high stability of work-home interference, the power of the analysis was much to low.

Furthermore, some important demographic variables (gender, partner and child status) and schedule autonomy were tested as moderators of the working time – work-home interference relationship. Surprisingly, non of the tested interactions was significant. With the regard to the demographic variables, this result shows that working time is detrimental for every individual, regardless of its demographic background. In summary, these results imply fruitful implications for future research, for instance, about the specific processes whereby each working time dimension has an impact nonwork, or which nonwork domains (e.g., childcare, leisure) are affected. For instance, a (pretest) study I conducted revealed that individuals reporting work-home interference most often experience the lack of opportunities to engage in social activities with friends or other leisure time activities (e.g., sports).

A further aspect of the working-time – work-home interference relationship concerns the objective vs. subjective side of work-home interference that has not been addressed in the literature

yet. As any other stressor, work-home interference has an objective side. Edwards and Rothbard (2000), for instance, argued that work-family conflict (i.e., a domain-specific form of work-home interference) occurs when work diminishes the time or mental resources to perform family role behavior. The *perception* of this objective interference denotes the subjective side of work-home interference. It can be hypothesized that working time should mainly impact the objective side - that is, working time should interfere with actual nonwork behavior. There is some evidence, however (e.g., Smith Major et al., 2002), suggesting that work leads to the perception of work-home interference beyond actual impairment of nonwork behavior. Moreover, the effect of negative affectivity on work-home interference (controlling for working time), found in study 1, could reflect a disposition to view work and home as incompatible. Thus, future research should disentangle the objective and subjective sides of work-home interference and analyze their relationships with work features as well as psychological attributes.

The failure to find an interaction between working time and schedule autonomy limits the practical relevance of schedule autonomy as a resource. Although the literature (e.g., Christensen & Staines, 1990) points to the usefulness of autonomy as a way to cope with working time, the results of study 1 showed that especially working time duration leads to work-home interference no matter if employees are able influence their working time. Whereas scholars argued that schedule autonomy or flexitime could enable individuals to make minor adaptations to extraordinary nonwork-related events (e.g., illness of a child), I assume that it is the total amount of insufficient nonwork time which is the core of work-home interference. Although freedom to influence starting or finishing times surely has beneficial effects (Baltes et al., 1999), it can not outweigh lost time. On the other hand, schedule autonomy was directly related with mean time of day and working time variation. Thus, employees, when given opportunities to influence working time, tend to avoid working late and with high variation. Especially the negative evaluation of variation – as it is implied by the negative correlation with time satisfaction (see Table 5.4), casts doubt on the benefits of increased flexibility at the work place. It may be argued that there are a “good” side of flexibility (i.e., self-determined flexibility) and a “bad” side (i.e., flexibility determined by the work system) – but it should be noted (again) that schedule autonomy did not moderate the negative effect of variation.

Regarding the relationship between the working time dimensions and well-being, the results of study 2 (chapter 7) showed that mean time of day had a significant effect on well-being - in addition to role ambiguity. This result implies that particularly working at night is the most detrimental working time aspect. The non-significant effect of variation (or rotation), however, should not be interpreted that high variation implies no risk for health. Mean time of day and variation were very highly correlated ($r = .60$, $p < .01$) which potentially overcontrolled their unique contri-

bution to ill-health. Further, it can be suggested that the effect of variation may depend on the direction of variation. For instance, research has shown that a clockwise rotation (i.e., rotating from night shifts to early shifts, and then to late shifts) is preferable compared to a counter-clockwise rotation scheme. Indeed, the multidimensional approach does not allow a differentiation of different directions of rotation or variation. However, this is because the multidimensional approach has a general focus, as it aims to provide a reference system for all working time schedules beyond shift work. Therefore, the abstraction of the approach has the disadvantage that schedule-related specifics can not be adequately addressed.

An advantage of the present design was that job stressors were included in the model. Because night shift workers experienced more stressors than day shift workers (cf. Table 5.4), the effect of stressors could be controlled when examining the effects of the mean time of day. One limitation of the analysis, however, could be that the hypothesis of a linear relationship between mean time of day and ill-health may be too simple: A detrimental effect of mean time of day was hypothesized based on the circadian rhythms of various physiological processes. Studies which assessed physiological parameters have shown that these rhythms have a complex course (Folkard & Hill, 2002) with several ups and downs during the day and night. Although the hypothesis of a detrimental effect of a late working time – in comparison to an early working time - on ill-health still holds, the linear regression coefficient probably has underestimated the true effect.

As it was repeatedly stated in this dissertation, one goal of the analyses was to investigate the unique effects of the four working time dimensions. This goal was successfully achieved. As a next step of research on the working time dimensions, a goal could be to investigate clusters or configurations of these dimensions. It can be assumed that the combined effect of the dimensions is at least additive, if not multiplicative. For instance, study 1 (Chapter 6) found unique effects of duration, variation, and mean time of day on work-home interference. Therefore, working time schedules consisting of rotating shift work with long shifts should be most detrimental for the work-home interference. In the last years, new methodological approaches such as latent mixture modeling (Lubke & Muthén, 2005; Muthén, 2001; Stein, 2006) have emerged that are a combination of latent class analysis and structural equation modeling. Applied to the working time context, these methods allow revealing latent classes of people working with specific configurations of the working time dimensions and simultaneously analyze differences in *means* of outcomes (e.g., well-being, work-home interference, or turnover), *change trajectories* or *cause-effect relationships* between these configurations. From a different perspective, it is possible to estimate relationships between the dimensions and outcomes and to search for unobserved classes that differ on these relationships.

9.2 Conclusion

In this dissertation, I proposed four working time dimensions and investigated their unique consequences. In the near future, working time will change along these four dimensions. Usually, working time duration and mean time of day are used to expand operation time in organizations and to make the most effective use of the work force. Increased variation is a direct consequence of employers' increasing demands for flexibility and an on-demand workforce. Employers will use changes of working time along these dimensions to react to global competition. For instance, there is a current public discussion in Germany with regard to increases of working time duration and flexibility. Study 1 showed that working time has negative implications for individuals from all demographic backgrounds. I assume that the negative consequences for organizations will increase with the employees' increasing desires and expectations toward a successful integration of work and private life. Hence, organizations will have to find practical solutions to solve the dilemma between increasing time demands of organizations and a necessary consideration of the needs of individuals for a satisfying work-nonwork balance.

10

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11

Appendix A: Used Scales

In the following, the scales that were used in the dissertation are listed. I kept the items in the German language. In addition to the question wording, I depict scale means, standard deviations, Cronbach's alpha, and the item-total correlation (r_{it}). In cases where items were used as indicators in CFA, the standardized factor loading (λi) is presented. Whenever Cronbach's alpha is not shown, the referring scale was conceptualized as a measure of a formative construct for which calculation of alpha, loadings or item-total correlations is not meaningful. It should be noted that the questionnaire included in Appendix C contains additional items which were not analyzed. A complete codebook listing all assessed measures can be obtained on request.

Table of contents

Job complexity

Reference: Semmer, N., Zapf, D., & Dunckel, H. (1998). ISTA – Instrument zur stressbezogenen Arbeitsanalyse; Version 6.0. Bern, Frankfurt, Flensburg.

Format: The respondent is instructed to rate her/his similarity to two poles. The rating format is a 5-point Likert scale with the categories „*exactly like A*“ (genau wie A), „*similar to A*“ (ähnlich A), „*between A and B*“ (zwischen A und B), „*similar B*“ (ähnlich B), and „*exactly like B*“ (genau wie B).

	T1	T2
Alpha	.72	.73
Mean	3.68	3.73
Standard deviation	.89	.86
N	347	127

Code	Welcher der beiden Arbeitsplätze ist Ihrem Arbeitsplatz am ähnlichsten?	r_{it} T1	r_{it} T2
ak02R	Kollege/in A muss bei seiner/ihrer Arbeit sehr komplizierte Entscheidungen treffen. Kollege/in B muss bei seiner/ihrer Arbeit nur sehr einfache Entscheidungen treffen.	.53	.50
ak07R	Kollege/in A bearbeitet Aufgaben, bei der er oder sie genau überlegen muss, was im einzelnen zu tun ist. Kollege/in B bearbeitet Aufgaben, bei denen sofort klar ist, was zu tun ist.	.60	.60
ak08R	A bearbeitet Aufgaben, bei der er oder sie zuerst genau planen muss, um die Aufgaben ausführen zu können. B bearbeitet Aufgaben, bei denen keine Planung erforderlich ist.	.49	.58

Codes T2: t2ak02r, t2ak07r, t2ak08r

Autonomy

Reference: Semmer, N., Zapf, D., & Dunckel, H. (1998). ISTA – Instrument zur stressbezogenen Arbeitsanalyse; Version 6.0. Bern, Frankfurt, Flensburg

Format: 5-point Likert scale ranging from 1 („*very little*“ [„sehr wenig“]) to 5 („*very much*“ [„sehr viel“]).

	T1	T2
Alpha	.83	.79
Mean	3.73	3.78
Standard deviation	.85	.74
N	349	128

Code		r_{it} T1	r_{it} T2
hs01	Wenn Sie Ihre Tätigkeit insgesamt betrachten, inwieweit können Sie die Reihenfolge der Arbeitsschritte selbst festlegen?	.67	.63
hs03	Wenn man Ihre Arbeit insgesamt betrachtet, wie viel Möglichkeiten zu eigenen Entscheidungen bietet ihnen Ihre Arbeit?	.70	.70
hs04	Können Sie selbst bestimmen, auf welche Art und Weise Sie Ihre Arbeit erledigen?	.70	.54

Codes T2: t2hs01, t2hs03, t2hs04

Job Stressors

Reference: Semmer, N., Zapf, D., & Dunckel, H. (1998). ISTA – Instrument zur stressbezogenen Arbeitsanalyse; Version 6.0. Bern, Frankfurt, Flensburg

Organizational obstacles

Format: 5-point Likert scale ranging from 1 (*exactly like A* [genau wie A]) to 5 (*exactly like B* [genau wie B]) (For details see „job complexity“).

	T1	T2
Alpha	--	--
Mean	2.56	2.52
Standard deviation	.80	.78
N	350	127

Code	Welcher der beiden Arbeitsplätze ist Ihrem am ähnlichsten?
aop03	A hat Unterlagen und Informationen, die immer genau stimmen und aktuell sind. B hat Unterlagen, bei denen Informationen oft unvollständig und veraltet sind.
aop08R	A muss mit Material, Arbeitsmitteln oder Werkzeugen arbeiten, das nicht viel taugt. B arbeitet mit einwandfreiem Material, Arbeitsmitteln oder Werkzeugen.
aop04R	A muss viel Zeit damit vertun, um sich Informationen, Material oder Werkzeuge zum Weiterarbeiten zu beschaffen. B stehen die nötigen Informationen, Material oder Werkzeuge immer zur Verfügung.

Codes T2: t2aop03, t2aop08r, t2aop04r

Role ambiguity

Format: 5-point Likert scale ranging from 1 (*very rarely/never* [sehr selten/nie]) to 5 (*often - one or two times per day* [oft – ein– bis zweimal täglich])

	T1	T2
Alpha	.76	.77
Mittelwert	2.42	2.39
Standardabweichung	.89	.88
N	351	127

Code		λ_i T1	r_{it} T2
un05	Wie oft erhalten Sie unklare Anweisungen?	.81	.70
un06	Wie oft erhalten Sie von verschiedenen Vorgesetzten widersprüchliche Anweisungen?	.71	.61
un07	Wie oft kommt es vor, dass Sie bei Ihrer Arbeit Entscheidungen fällen müssen, ohne dass ausreichende Information zur Verfügung steht?	.63	.52

λ_I = Standardized loading in a CFA; Codes T2: t2un05, t2un06, t2un07

Disruptions

Format: 5-point Likert scale ranging from 1 (*very seldom/never* [sehr selten/nie]) to 5 (*very often (several times per hour*) [sehr oft (mehrmals pro Stunde)]).

	T1
Alpha	.80
Mittelwert	3.52
Standardabweichung	.93
N	349

Code		r_{it} T1
aub01	Wie häufig werden Sie durchschnittlich bei Ihrer Arbeit von anderen Personen unterbrochen (z.B. wegen einer Auskunft)?	.62
aub04	Kommt es vor, dass Sie aktuelle Arbeiten unterbrechen müssen, weil etwas wichtiges dazwischen kommt?	.69
aub07	Wie häufig kommt es vor, dass Sie an mehreren Aufgaben gleichzeitig arbeiten müssen und zwischen den Arbeitsaufgaben hin und her springen?	.62

Time pressure

Format: 5-point Likert ranging from 1 (*very seldom/never* [sehr selten/nie]) to 5 (*very often (almost continously* [sehr oft/fast ununterbrochen]) – ZD06 ranges to *very often (several times per hour)* [sehr oft (mehrmals pro Stunde].

	T1	T2
Alpha	.81	.85
Mittelwert	3.25	3.22
Standardabweichung	.95	1.00
N	349	128

		λ_i T1	r_{it} T2
zd01	Wie häufig stehen Sie unter Zeitdruck?	.81	.72
zd02	Wie häufig passiert es, dass Sie schneller arbeiten, als sie es normalerweise tun, um die Arbeit zu schaffen?	.70	.70
zd06	Wie oft wird bei Ihrer Arbeit ein hohes Arbeitstempo verlangt?	.81	.74

Codes T2: t2zd01, t2zd02, t2zd06

Social networks

(Self-developed)

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Lang, F.R., Staudinger, & Carstensen, L.L. (1998). Perspectives on socioemotional selectivity in late life: How personality and social context do (and do not) make a difference. *Journal of Gerontology: Psychological Sciences*, 53B (1), P21-P30.

Podolny, J.M. & Baron, J.N. (1997). Resources and relationships: Social networks and mobility in the workplace. *American Sociological Review*, 62, 673-693.

Format: The number of persons is assessed in a open format

Friendship network

	T1	T2
Alpha	--	--
Mean	5.99	4.93
Standard deviation	4.41	4.28
N	344	128

Code	
s01	Mit wie vielen Personen in Ihrer Firma unterhalten Sie sich öfters über nicht-berufliche Themen (z.B. private Themen, Politik, Wirtschaft, Sport usw.)?
s02	Bei wie vielen Personen in Ihrer Firma können Sie sich aussprechen, wenn es Ihnen schlecht geht?
s03	Mit wie vielen Personen unternehmen sie gelegentlich außerberufliche soziale Aktivitäten (z.B. nach der Arbeit „ein Bier trinken“, Sport usw.)
s04	Auf wie viele Personen in Ihrer Firma können Sie sich verlassen?
s05	Wie viele Personen in Ihrer Firma bedeuten Ihnen persönlich etwas?

Codes T2: t2sn02, t2sn04, t2sn05

Strategic network

	T1	T2
Alpha	--	--
Mean	2.75	2.09
Standard deviation	2.54	3.22
N	344	128

Code	
s06	Von wie vielen Personen erfahren Sie gelegentlich Neuigkeiten über wichtige firmeninterne Ereignisse (z.B. neue Produkte, geplante Entlassungen, firmenpolitische Veränderungen usw.)?
s07	Wie viele Personen in Ihrer Firma könnten Sie fragen, wenn Sie Tipps und Ratschläge zur Verbesserung Ihrer beruflichen Leistung bräuchten?
s08	Wie viele Personen in Ihrer Firma kennen Sie, die Ihnen sinnvolle Ratschläge oder Informationen für Ihre berufliche Zukunft geben können?
s09	Wie viele Personen aus höheren Unternehmensebenen Ihrer Firma kennen Sie persönlich sehr gut?
s10	Was denken Sie, wie vielen Personen aus höheren Unternehmensebenen Ihre berufliche Weiterentwicklung am Herzen liegt?
s11	Angenommen, Sie wollten sich um eine andere Stelle in Ihrer Firma bewerben. Wie viele Personen könnten Ihnen dabei wohl behilflich sein (z.B. durch „Beziehungen spielen lassen“, nützliche Informationen usw.)?

Codes T2: t2sn08, t2sn10, t2sn11

Career opportunities

(Self-developed)

Format: 5-point Likert scale ranging from 0 (*very unlikely* [sehr unwahrscheinlich]) to 4 (*very likely* [sehr wahrscheinlich]).

	T1	T2
Alpha	--	--
Mean	2.03	2.01
Standard deviation	.72	.67
N	351	128

Code	Für wie wahrscheinlich halten Sie es, dass Sie in den nächsten 2 Jahren...
k01	...eine Gehaltserhöhung bekommen?
k02	...an Maßnahmen zu Ihrer beruflichen Weiterentwicklung (Trainings, Seminare, etc.) teilnehmen können?
k03	... Möglichkeiten erhalten, Ihre Entscheidungsbefugnisse zu erweitern?
k04	...Möglichkeiten erhalten, Führungsaufgaben auszuüben (oder zu erweitern)?
k05	...Arbeitstätigkeiten ausführen können, die in höherem Maße Ihren Interessen entsprechen?
k06R	...oder, dass Sie Arbeitstätigkeiten ausführen müssen, die weniger interessant sind als im Moment?
k07R	...dass Sie arbeitslos werden?

Codes T2: t2k01, t2k02, t2k03, t2k04, t2k05, t2k06, t2k07

Working Time Variation (Self-rating)

(self-developed)

Format: 4-point Likert scale ranging from 0 (*not at all* [überhaupt nicht]) to 3 (*strongly* [stark]).

	T1
Alpha	--
Mean	1.06
Standard deviation	.72
N	304

Code	
Azvar01	Wie stark schwankt Ihr Arbeitsbeginn innerhalb einer Woche normalerweise?
Azvar02	Wie stark schwankt Ihr Arbeitsende innerhalb einer Woche?
Azvar03	Wie stark schwankt die Anzahl der tatsächlich gearbeiteten Stunden von Woche zu Woche?

Schedule autonomy

(self-developed)

Format: 4-point Likert scale ranging from 0 (*not at all* [überhaupt nicht]) to 3 (*completely* [stark]).

	T1	T2
Alpha	--	--
Mean	1.03	1.16
Standard deviation	.91	.93
N	305	127

Code	
az_sb01	Wie sehr können Sie selbst bestimmen, wie viele Stunden Sie pro Woche arbeiten?
az_sb02	Wie sehr können Sie selbst bestimmen, wann Sie mit Ihrer Arbeit beginnen?
az_sb03	Wie sehr können Sie selbst bestimmen, wann Sie Ihre Arbeit beenden?

Codes T2: t2azsb01, t2azsb02, t2azsb03

Predictability of Working Time

(self-developed)

Format: 4-point Likert scale ranging from 0 (*not at all* [überhaupt nicht]) to 3 (*always* [immer]).

	T1
Alpha	--
Mean	2.29
Standard deviation	.61
N	305

Code	
az_vh01	Wie genau wissen Sie am Anfang einer Woche, wann Sie an den folgenden Arbeitstagen mit der Arbeit beginnen werden?
az_vh02	Wie genau wissen Sie am Anfang einer Woche, wann Sie an den folgenden Arbeitstagen die Arbeit beenden werden?
az_vh03	Wie genau wissen Sie am Anfang einer Woche, an welchen Tagen Sie arbeiten werden?

Job Attitudes

Job Satisfaction

References:

Warr, P.B., Cook, J.D. & Wall,T.D. (1979). Scales for the measurement of some work attitudes and aspects of psychological well-being. *Journal of Occupational Psychology*, 52, 129-148.

Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall Job Satisfaction: How good are single-item measures? *Journal of Applied Psychology*, 82 (2), 247-252.

Format: 5-point Likert scale ranging form –2 to +2 (without verbal anchors)

Job satisfaction was assessed as the satisfaction with job facets as well as overall job satisfaction.

	T1	T2
Alpha	--	--
Mean	.39	.44
Standard deviation	.66	.64
N	350	127

Code	Wie zufrieden sind Sie mit ...
azf01	Umweltbedingungen am Arbeitsplatz (Lärm, Licht, Temperatur usw.)
azf02	Bezahlung
azf03	Arbeitszeiten
azf04	Vorgesetzten
azf05	Möglichkeiten, befördert zu werden.
azf06	Arbeitstätigkeit
azf07	Informationsfluss in der Firma
azf08	Arbeitsmittel (Werkzeuge, Computer, Möbel etc.)
azf09	Möglichkeiten der Mitbestimmung
azf10	Zusammenarbeit mit Kollegen
azf11	Möglichkeiten, neue fachliche Kenntnisse und Fähigkeiten zu erwerben.

Overall job satisfaction:

		λi T1
azf_g01	Wie sehr entspricht Ihre Arbeit insgesamt Ihrer Vorstellung, wie sie sein sollte?	.87
azf_g02	Alles in Allem: Wie zufrieden sind Sie mit Ihrer Arbeit?	.91

Codes T2: t2azf01, t2azf02, t2azf03, t2azf04, t2azf05, t2azf06, t2azf07, t2azf08, t2azf09, t2azf10, t2azf11, t2azfg01, t2azfg02

Organizational Commitment

Reference: Schmidt, K.H., Hollmann, S. & Sodenkamp, D. (1998). Psychometrische Eigenschaften und Validität einer deutschen Fassung des „Commitment"-Fragebogens von Allen & Meyer (1990). *Zeitschrift für Differentielle und Diagnostische Psychologie*, 19 (2), 93-106.
Format: 5-point Likert scale ranging from 0 (*does not apply at all* [trifft überhaupt nicht zu]) to (*does apply completely* [trifft völlig zu]).

	T1	T2
Alpha	.76	.71
Mean	2.43	2.52
Standard deviation	.97	.89
N	349	127

		r_{it} T1	r_{it} T2
cm01r	Ich empfinde kein starkes Gefühl der Zugehörigkeit zu meinem Betrieb (R)	.48	.37
cm02	Ich wäre sehr froh, mein weiteres Berufsleben in diesem Betrieb verbringen zu können	.60	.61
cm03	Dieser Betrieb hat eine große persönliche Bedeutung für mich	.71	.61

Codes T2: t2cm01r, t2cm02, t2cm03

Well-being

Chronic fatigue

References:

Bueltman, U. (2002). *Fatigue and Psychological Distress in the Working Population: The Role of Work and Lifestyle*. Universitaire Pers Maastricht

Vercoulen, J. H. M. M., Swanink, C. M. A., Fennis, J. F. M., Galema, J. M. D., Van der Meer, J. W. M., & Bleijenberg, G. (1994). Dimensional assessment of chronic fatigue syndrome. *Journal of Psychosomatic Research*, 38, 383-392.

Format: 5-point Likert scale ranging from 0 (*does not apply at all* [trifft überhaupt nicht zu]) to 4 (*does completely apply* [trifft völlig zu])

	T1	T2
Alpha	.88	.88
Mittelwert	1.30	1.40
Standardabweichung	.79	.87
N	360	129

Code		λ_i T1	r_{it} T2
es01R	Ich fühle mich fit (R).	.70	--
es02	Ich fühle mich müde.	.78	.75
es03	Ich fühle mich schwach.	.78	.73
es04	Ich ermüde sehr schnell.	.74	.73
es05	Ich fühle mich körperlich erschöpft.	.85	.73

Codes T2: t2es02, t2es03, t2es04, t2es05

Sleep quality

References:

Richter, P. & Hacker, W. (1998). *Belastung und Beanspruchung: Stress, Ermüdung und Burnout im Arbeitsleben*. Heidelberg: Asanger.

Meijman, T.F., Vries-Griever, A. de, Vries, G.M. de, Kampman, R. (1985). *The construction and evaluation of a onedimensional scale measuring subjective sleep quality*. Rijksuniversiteit Groningen.

Mulder-Hajonides van der Meulen, W.R.E.H., Wijnberg, J.R., Hollanders, J.J., DeDiana, I., Hoofdakker, R. (1980). Measurement of subjective sleep quality. Fifth European Congress on Sleep Research (Sleep 1980), Amsterdam.

Format: 5-point Likert scale ranging from 0 (*does not apply at all* [trifft überhaupt nicht zu]) to 4 (*does completely apply* [trifft völlig zu])

	T1	T2
Alpha	.86	.88
Mittelwert	2.53	2.53
Standardabweichung	.92	.95
N	360	130

		r_{it} T1	r_{it} T2
es06R	Ich finde, dass ich meist sehr schlecht schlafe (R).	.81	.83
es07	Ich finde, dass ich nachts meistens gut schlafe.	.80	.83
es08	Meistens fühle ich mich morgens nach dem Aufstehen gut ausgeruht.	.55	
es09R	Ich wache nachts oft mehrere Male auf (R).	.63	.66
es10R	Ich habe oft das Gefühl, nur ein paar Stunden geschlafen zu haben.	.63	

Codes T2: t2es06, t2es07, t2es08, t2es09

Somatic Complaints

References:

Fahrenberg, J. (1975). Die Freiburger Beschwerdeliste FBL. *Zeitschrift für klinische Psychologie*, 4, 79-100.

Format: 5-point Likert scale ranging from 0 (*almost never* [fast nie]) to 4 (*almost every day* [fast täglich]).

Musculo-sceletal Complaints

	T1	T2
Alpha	.83	.84
Mittelwert	1.59	1.65
Standardabweichung	1.10	.17
N	360	127

Code		λi T1
pb01	Haben Sie Nackenschmerzen?	.78
pb05	Spüren Sie, dass Ihr ganzer Körper verspannt ist?	.83
pb06	Haben Sie Kopfschmerzen?	.54
pb07	Haben Sie Rückenschmerzen?	.72

Codes T2: t2pb01, t2pb05, t2pb07

Cardio-vascular Complaints

	T1	T2
Alpha	.71	.77
Mittelwert	.50	.55
Standardabweichung	.70	.76
N	360	130

Code		λi T1
pb02	Spüren Sie bei geringer Anstrengung Herzklopfen?	.72
pb03	Verspüren Sie Schwindelgefühle?	.67
pb04	Haben Sie Schmerzen in der Herzgegend?	.63
pb10	Haben Sie plötzlich Schweißausbrüche?	.47

Codes T2: t2pb02, t2pb03, t2pb04, t2pb10

Gastro-intestinal Complaints

	T1	T2
Alpha	.63	.44
Mittelwert	.38	.41
Standardabweichung	.61	.55
N	360	130

Code		λi T1
pb08	Haben Sie Bauchschmerzen?	.66
pb09	Spüren Sie Übelkeit?	.75
pb11	Haben Sie Appetitmangel?	.45

Codes T2: t2pb08, t2pb09, t2pb11

Depression

References:

Mohr, G. (1986). *Die Erfassung psychischer Befindensbeeinträchtigungen bei Industriearbeitern*. Frankfurt/Main: Peter Lang.

Zung, W. W. K. (1965). A self-rating depression scale. *Archives of General Psychiatry*, 12, 63-70.

Format: 7-point Likert scale ranging from 0 (*never* [nie]) to 6 (*almost always* [fast immer])

	T1	T2
Alpha	.84	.75
Mittelwert	1.57	1.66
Standardabweichung	1.02	.91
N	360	129

Code		λi T1	λi T2
d01	Vieles erscheint mir so sinnlos.	.65	.79
d02	Ich habe traurige Stimmungen.	.81	.92
d04	Ich fühle mich einsam, selbst wenn ich mit anderen Menschen zusammen bin.	.75	.55

Codes: t2d01, t2d02, t2d04

Work-Home Interference

Reference: Netemeyer, R.G., Boles, J.S., & McMurrian, R. (1996). Development and validation of work-family conflict and family-work-conflict scales. *Journal of Applied Psychology*, 81 (4), 400-410.

Format: 5-point Likert scale ranging from 0 (*does not apply at all* [trifft gar nicht zu]) to 4 (*does apply completely* [trifft völlig zu]).

	T1	T2
Alpha	.92	.92
Mittelwert	1.42	1.48
Standardabweichung	.91	.96
N	360	126

Code		λi T1	λi T2
wfc01	Meine beruflichen Anforderungen behindern mein Privat und Familienleben	.84	.86
wfc02	Die Zeit, die meine Arbeit in Anspruch nimmt, macht es schwer, meine familiären Verpflichtungen zu erfüllen	.87	.92
wfc04	Meine Arbeit verursacht Belastungen, die mir die Erfüllung familiärer Verpflichtungen erschweren	.84	.87

Codes T2: t2wfc01, t2wfc02, t2wfc04

Personality

References:

Patrick, C.J., Curtin, J.J., & Tellegen, A. (2002). Development and validation of a brief form of the multidimensional personality questionnaire. *Psychological Assessment,* 14 (2), 150-163.

Tellegen, A., & Waller, N. G. *Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire*. Minneapolis: University of Minnesota Press.

Format: 5-point Likert scale ranging from 0 [*does not apply at all* [trifft gar nicht zu]) to 4 (*does apply completely* [trifft völlig zu]).

Wellbeing (positive Emotionality)

	T1	T2
Alpha	.82	.82
Mittelwert	2.54	2.74
Standardabweichung	.57	.60
N	353	129

Code		r_{it} T1	r_{it} T2
p01	Ich bin von Natur aus ein fröhlicher Mensch	.53	.65
p03	Ich genieße fast alles was ich tue	.60	.56
p04	Im Grunde bin ich ein glücklicher Mensch	.65	.72
p06	Mir passieren jeden Tag interessante und aufregende Sachen	.41	--
p09	In der Regel bin ich guter Dinge	.66	.62
p12	Es fällt mir sehr leicht, die guten Seiten des Lebens zu erkennen	.50	--
p10	Ich finde mein Leben sehr interessant	.63	--

Codes T2: t2p01 t2p03 t2p04 t2p09

Stress Reaction (negative Emotionality)

	T1	T2
Alpha	.85	.79
Mittelwert	1.85	1.94
Standardabweichung	.57	.55
N	353	128

Code		r_{it} T1	λi T1	r_{it} T2
p02	Ich bin viel sensibler, als für mich gut ist	.56	.67	.53
p05	Ich leide unter Nervosität	.52	.55	.50
p07	In meinen Stimmungen gibt es häufig ein Auf und Ab	.54	--	
p08	Manchmal lasse ich mich zu sehr von kleinen Rückschlägen irritieren	.65	.73	.62
p11	Meine Gefühle sind leicht zu verletzen	.65	.70	.56
p13	Ich gerate leicht aus der Fassung, wenn es kritisch wird.	.62	--	
p14	Oftmals irritieren mich bereits kleine Ärgernisse	.72	.70	.58
p15	Durch Dinge, die unerwartet geschehen, bin ich leicht zu erschrecken	.53	--	

Note. The scale is copyright protected by the University of Minnesota Press. Use for publication has to be authorized. The presentation of items (even one example) is prohibited; codes T2: t2p02, t2p05, t2p08, t2p11, t2p14

Job performance

(Self-developed)

References:

Borman, W.C. & Motowidlo, S.J. (1997). Expanding the criterion domain to include elements of contextual performance. In N. Schmitt, W.C. Borman, & Associates (Eds) *Personnel selection in organizations* (p. 71-98. San Francisco, CA: Jossey-Bass.

Motowidlo, S.J. & Van Scotter, J.R. 1994). Evidence that task performance should be distinguished from contextual performance. *Journal of Applied Psychology*, 79 (4), 475-580.

Format: Bipolar 7-point scale. The respondents were instructed to rate to what degree their work behavior varies between to opposite poles indicating low vs. high performance. Each behavioural description was provided by a heading

Task Performance

	T1	T2
Alpha	--	--
Mean	5.28	5.28
Standard deviation	.92	.92
N	346	127

Code	
l01	*Qualität der Arbeit* Machen Sie häufig Fehler bzw. produzieren Sie oft unzureichende Ergebnisse ... oder liefern Sie ausschließlich tadellose Ergebnisse ab?
l03R	*Systematik* Arbeiten Sie immer klar strukturiert und erledigen Sie die wichtigsten Dinge immer zuerst ... oder ist Ihre Vorgehensweise oft eher etwas umständlich?
l04	*Einhaltung von Terminen* Überziehen Sie Termine häufig und brauchen etwas länger, als vereinbart ... oder schaffen Sie es, Arbeiten immer zum vereinbarten Zeitpunkt zu erledigen?

Code T2: t2l01, t2l03R, t2l04

Contextual Performance

	T1	T2
Alpha	--	--
Mean	5.43	5.43
Standard deviation	.91	.96
N	346	127

Code	
l02	*Motivation* Vertun Sie beim Arbeiten viel Zeit - z.B. durch private Dinge, längere Pausen, Gespräche, etc. ... oder arbeiten Sie immer über das geforderte Maß hinaus angestrengt und konzentriert?
l05R	*Verhalten zu Kollegen* Helfen Sie immer bereitwillig Kollegen, geben Sie wichtige Informationen auch ohne Nachfrage weiter etc. ... oder handeln Sie oft nach dem Motto „jeder sollte sich um seine eigenen Sachen kümmern“?
l06	*Initiative* Warten Sie gewöhnlich, bis Ihnen jemand Anweisungen gibt, bzw. Sie um Ihre Mitarbeitbittet ... oder ergreifen Sie sofort von sich aus die Initiative?
l07R	*Einsatzbereitschaft* Engagieren Sie sich häufig freiwillig über die geforderten Aufgaben hinaus ... oder beschränken Sie sich in der Regel auf die Aufgaben, die von Ihnen gefordert werden?

Code T2: t2l02, t2l05R, t2l06, t2l07R

Turnover motivation

References:

Mobley, W.H., Horner, S.O. & Hollingsworth, A.T. (1978). An evaluation of precursors of hospital employee turnover. *Journal of Applied Psychology*, 63 (4), 408-414

Schaubroeck, J., Cotton, J.L. & Jennings, K.R. (1989). Antecendents and consequences of role stress: A covariance structure analysis. *Journal of Organizational Behavior*, 10, 35-58

Format: Item 1 and 2 are measured with a 5-point Likert scale ranging from 0 (*almost never* [fast nie]) to 4 (*almost every day* [fast täglich]); Item 3 is measured with a 5-point Likert scale ranging from 0 (*very unlikely* [sehr unwahrscheinlich]) to 4 (*very likely* [sehr wahrscheinlich]).

	T1	T2
Alpha*	.78	.81
Mittelwert	.69	.59
Standardabweichung	.83	.78
N	348	127

*only FT01, FT02 und FT04

Code		λi T1	λi T2
ft01	Wie häufig kommt Ihnen der Gedanke, zu kündigen?	.79	.86
ft02	Wie häufig haben Sie sich in letzter Zeit nach einem anderen Arbeitsplatz erkundigt (z.B. Stellenanzeigen gelesen, Bekannte gefragt etc.)	.79	.86
ft03	Wenn Sie Ihre derzeitige Arbeitsstelle kündigen würden: Wie leicht würden Sie wohl eine neue Stelle finden?	-	-
ft04	Wie wahrscheinlich ist es, dass Sie tatsächlich innerhalb des nächsten Jahres kündigen werden?	.63	.60

Note. ft03 is no motivation item; codes T2: t2ft01, t2ft02, t2ft03, t2ft04

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Appendix B: Correlations between working time, objective job conditions, social networks, career opportunities, and satisfaction

Table B1

Correlations between working time, objective job conditions, social networks, career opportunities, and satisfaction

		M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1.	Duration	38:35	13:59														
2.	Mean time of day	13:02	2:43	.28**													
3.	Variation	0.00	1.59	.53**	.60**												
4.	Number of shifts	4.91	.98	.67**	.01	.04											
5.	Job complexity	3.64	.73	.30**	-.01	.16**	.24**										
6.	Autonomy	3.72	.64	.09	-.01	-.19**	.23**	.31**									
7.	Role ambiguity	2.42	.67	.38**	.13*	.38**	.13*	.38**	-.10								
8.	Time pressure	3.22	.74	.30**	.19**	.33**	.05	.19*	-.15*	.55**							
9.	Org. obstacles	2.54	.53	.20**	.00	.09	.12	.28**	.02	.39**	.15						
10.	Disruptions	3.54	.77	.21**	.14*	.28**	.00	.30**	.01	.56**	.60**	.21*					
11.	Career opportunities	2.03	.72	.13*	.02	.02	.14*	.28**	.30**	.05	.05	-.16*	.18**				
12.	Friendship network	5.60	4.41	.14*	.10	.14*	.05	.09	.08	.14*	.14*	.05	.19**	.18**			
13.	Strategic network	2.75	2.54	.10	.10	.10	.06	.02	.06	.09	.12	-.07	.30**	.25**	.52**		
14.	Working time satisfaction	.50	1.26	-.39**	-.28**	-.38**	-.17**	-.01	.25**	-.22**	-.40**	-.08	-.15*	.22**	.01	.04	
15.	Job satisfaction	.66	.85	-.13**	-.09	-.16**	-.01	.14*	.39**	-.32**	-.18**	-.11	-.09	.44**	.10	.19**	.44**

Note. *p < .05, **p < .01; M = mean, SD = standard deviation; SD's were computed from the root of the latent variables' variances

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Appendix C: Questionnaire (Self-rating)

JUSTUS-LIEBIG-
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ARBEIT & ARBEITSZEIT

im 21. Jahrhundert

Forschungsprojekt „Mobilzeit“ an der Universität Giessen

www.Mobilzeit.com

Kontakt: Holger Steinmetz (Tel. 0641 99-23054 – Email: Holger.Steinmetz@sowi.uni-giessen.de)

ARBEITSTÄTIGKEIT

In den folgenden Kästchen werden jeweils **zwei beispielhafte Arbeitsplätze** einander gegenübergestellt. Bitte kreuzen Sie an, welcher von beiden **Ihrem** Arbeitsplatz am **ähnlichsten** ist

Kollege/in A muss bei seiner/ihrer Arbeit sehr **komplizierte** Entscheidungen treffen.

Kollege/in **B** muss bei seiner/ihrer Arbeit nur sehr **einfache** Entscheidungen treffen.

Welcher der beiden Arbeitsplätze ist Ihrem Arbeitsplatz am ähnlichsten? AK2

genau wie der von A	( ) 1
ähnlich wie der von A	( ) 2
zwischen A und B	( ) 3
ähnlich wie der von B	( ) 4
genau wie der von B	( ) 5

A hat Unterlagen und Informationen, die immer **genau stimmen und aktuell** sind.

B hat Unterlagen, bei denen Informationen **oft unvollständig und veraltet** sind.

Welcher der beiden Arbeitsplätze ist Ihrem am ähnlichsten? AOP3

genau wie der von A	( ) 1
ähnlich wie der von A	( ) 2
zwischen A und B	( ) 3
ähnlich wie der von B	( ) 4
genau wie der von B	( ) 5

Kollege/in **A** bearbeitet Aufgaben, bei der er oder sie **genau überlegen** muss, was im einzelnen zu tun ist.

Kollege/in **B** bearbeitet Aufgaben, bei denen **sofort klar** ist, was zu tun ist.

Welcher der zwei Arbeitsplätze ist Ihrem Arbeitsplatz am ähnlichsten? AK7

genau wie der von A	( ) 1
ähnlich wie der von A	( ) 2
zwischen A und B	( ) 3
ähnlich wie der von B	( ) 4
genau wie der von B	( ) 5

A muss mit Material, Arbeitsmitteln oder Werkzeugen arbeiten, die **nicht viel taugen**.

B arbeitet mit **einwandfreiem** Material, Arbeitsmitteln oder Werkzeugen.

Welcher der beiden Arbeitsplätze ist Ihrem Arbeitsplatz am ähnlichsten? AOP8

genau wie der von A	( ) 1
ähnlich wie der von A	( ) 2
zwischen A und B	( ) 3
ähnlich wie der von B	( ) 4
genau wie der von B	( ) 5

A bearbeitet Aufgaben, bei der er oder sie zuerst genau **planen** muss, um die Aufgaben ausführen zu können.

B bearbeitet Aufgaben, bei denen **keine Planung erforderlich** ist.

Welcher der zwei Arbeitsplätze ist Ihrem Arbeitsplatz am ähnlichsten? AK8

genau wie der von A	( ) 1
ähnlich wie der von A	( ) 2
zwischen A und B	( ) 3
ähnlich wie der von B	( ) 4
genau wie der von B	( ) 5

A muss **viel Zeit damit vertun**, um sich Informationen, Material oder Werkzeuge zum Weiterarbeiten zu beschaffen.

B stehen die nötigen Informationen, Material oder Werkzeuge **immer zur Verfügung.**

Welcher der beiden Arbeitsplätze ist Ihrem am ähnlichsten? AOP4

genau wie der von A	( ) 1
ähnlich wie der von A	( ) 2
zwischen A und B	( ) 3
ähnlich wie der von B	( ) 4
genau wie der von B	( ) 5

Wenn Sie Ihre Tätigkeit insgesamt betrachten, inwieweit können Sie die **Reihenfolge der Arbeitsschritte** selbst festlegen? HS1

sehr wenig	( ) 1
ziemlich wenig	( ) 2
etwas	( ) 3
ziemlich viel	( ) 4
sehr viel	( ) 5

Wenn man Ihre Arbeit insgesamt betrachtet, wie viel **Möglichkeiten zu eigenen Entscheidungen** bietet ihnen Ihre Arbeit? HS3

sehr wenig	( ) 1
ziemlich wenig	( ) 2
etwas	( ) 3
ziemlich viel	( ) 4
sehr viel	( ) 5

Können Sie selbst bestimmen, **auf welche Art und Weise** Sie Ihre Arbeit erledigen? HS4

sehr wenig	( ) 1
ziemlich wenig	( ) 2
etwas	( ) 3
ziemlich viel	( ) 4
sehr viel	( ) 5

Wie oft erhalten Sie **unklare Anweisungen**? UN5

sehr selten/nie	( ) 1
selten (etwa 1 x pro Monat)	( ) 2
gelegentlich (etwa 1 x pro Woche)	( ) 3
oft (mehrmals pro Woche)	( ) 4
sehr oft (ein bis mehrmals täglich)	( ) 5

Wie oft erhalten Sie von verschiedenen Vorgesetzten **widersprüchliche Anweisungen**? UN6

sehr selten/nie	( ) 1
selten (etwa 1 x pro Monat)	( ) 2
gelegentlich (etwa 1 x pro Woche)	( ) 3
oft (mehrmals pro Woche)	( ) 4
sehr oft (ein bis mehrmals täglich)	( ) 5

Wie oft kommt es vor, dass Sie bei Ihrer Arbeit **Entscheidungen fällen** müssen, **ohne** dass **ausreichende Information** zur Verfügung steht? UN7

sehr selten/nie	( ) 1
selten (etwa 1 x pro Monat)	( ) 2
gelegentlich (etwa 1 x pro Woche)	( ) 3
oft (mehrmals pro Woche)	( ) 4
sehr oft (ein bis mehrmals täglich)	( ) 5

Wie häufig werden Sie durchschnittlich bei Ihrer Arbeit von anderen Personen **unterbrochen** (z.B. wegen einer Auskunft)? AUB1

sehr selten/nie	( ) 1
selten (etwa 1 x pro Woche)	( ) 2
gelegentlich (etwa 1 x pro Tag)	( ) 3
oft (mehrmals pro Tag)	( ) 4
sehr oft (mehrmals pro Stunde)	( ) 5

Kommt es vor, dass Sie **aktuelle Arbeiten** unterbrechen müssen, weil etwas wichtiges dazwischen kommt? AUB4

sehr selten/nie	( ) 1
selten (etwa 1 x pro Woche)	( ) 2
gelegentlich (etwa 1 x pro Tag)	( ) 3
oft (mehrmals pro Tag)	( ) 4
sehr oft (mehrmals pro Stunde)	( ) 5

Wie häufig kommt es vor, dass Sie an **mehreren Aufgaben gleichzeitig** arbeiten müssen und zwischen den Arbeitsaufgaben hin und her springen? AUB7

sehr selten/nie	( ) 1
selten (etwa 1 x pro Woche)	( ) 2
gelegentlich (etwa 1 x pro Tag)	( ) 3
oft (mehrmals pro Tag)	( ) 4
sehr oft (mehrmals pro Stunde)	( ) 5

Wie häufig stehen Sie unter **Zeitdruck**? ZD1

sehr selten/nie	( ) 1
selten (etwa 1 x pro Woche)	( ) 2
gelegentlich (etwa 1 x pro Tag)	( ) 3
oft (mehrmals pro Tag)	( ) 4
sehr oft (fast ununterbrochen)	( ) 5

Wie häufig passiert es, dass Sie **schneller arbeiten**, als sie es normalerweise tun, um die Arbeit zu schaffen? ZD2

sehr selten/nie	( ) 1
selten (etwa 1 x pro Woche)	( ) 2
gelegentlich (etwa 1 x pro Tag)	( ) 3
oft (mehrmals pro Tag)	( ) 4
sehr oft (fast ununterbrochen)	( ) 5

Wie oft wird bei Ihrer Arbeit ein **hohes Arbeitstempo** verlangt? ZD6

sehr selten/nie	( ) 1
selten (etwa 1 x pro Woche)	( ) 2
gelegentlich (etwa 1 x pro Tag)	( ) 3
oft (mehrmals pro Tag)	( ) 4
sehr oft (mehrmals pro Stunde)	( ) 5

Bei den folgenden Fragen geht es um Ihre **Zufriedenheit** oder **Unzufriedenheit** mit einigen Punkten Ihrer Arbeit.

Kreuzen Sie bitte die entsprechende Zahl durch

Wie zufrieden sind Sie mit ...					
1. Umweltbedingungen am Arbeitsplatz (Lärm, Licht, Temperatur usw.)	-2	-1	0	1	2
1. Bezahlung	-2	-1	0	1	2
2. Arbeitszeiten	-2	-1	0	1	2
3. Vorgesetzten	-2	-1	0	1	2
4. Möglichkeiten, befördert zu werden.	-2	-1	0	1	2
5. Arbeitstätigkeit	-2	-1	0	1	2
6. Informationsfluss in der Firma	-2	-1	0	1	2
7. Arbeitsmittel (Werkzeuge, Computer, Möbel etc.)	-2	-1	0	1	2
8. Möglichkeiten der Mitbestimmung	-2	-1	0	1	2
9. Zusammenarbeit mit Kollegen	-2	-1	0	1	2
10. Möglichkeiten, neue fachliche Kenntnisse und Fähigkeiten zu erwerben.	-2	-1	0	1	2
11. Wie sehr entspricht Ihre Arbeit insgesamt Ihrer Vorstellung, wie sie sein sollte?	-2	-1	0	1	2
12. Alles in Allem: Wie zufrieden sind Sie mit Ihrer Arbeit?	-2	-1	0	1	2

In wie weit stimmen Sie den folgenden **Aussagen** zu?

		Trifft gar nicht zu	Trifft wenig zu	Trifft teils teils zu	Trifft ziemlich zu	Trifft völlig zu
Die meiste Befriedigung in meinem Leben erlange ich durch meine Arbeit.	JI1	0	1	2	3	4
Ich lebe für meine Arbeit.	JI2	0	1	2	3	4
Die für mich wichtigsten Dinge ereignen sich in meiner Arbeit.	JI3	0	1	2	3	4
Ich empfinde kein starkes Gefühl der Zugehörigkeit zu meinem Betrieb.	CM1	0	1	2	3	4
Ich wäre sehr froh, mein weiteres Berufsleben in diesem Betrieb verbringen zu können	CM2	0	1	2	3	4
Dieser Betrieb hat eine große persönliche Bedeutung für mich	CM3	0	1	2	3	4

Für wie wahrscheinlich halten Sie es, dass Sie in den nächsten 2 Jahren...	sehr **un**wahr-schein-lich	eher **un**wahr-scheinlich	vielleicht	eher wahr-scheinlich	sehr wahr-scheinlich
...eine Gehaltserhöhung bekommen? K1	0	1	2	3	4
...an Maßnahmen zu Ihrer beruflichen Weiterentwicklung (Trainings, Seminare, etc.) teilnehmen können? K2	0	1	2	3	4
... Möglichkeiten erhalten, Ihre Entscheidungsbefugnisse zu erweitern? K3	0	1	2	3	4
...Möglichkeiten erhalten, Führungsaufgaben auszuüben (oder zu erweitern)? K4	0	1	2	3	4
...Arbeitstätigkeiten ausführen können, die in höherem Maße Ihren Interessen entsprechen? K5	0	1	2	3	4
...oder, dass Sie Arbeitstätigkeiten ausführen müssen, die weniger interessant sind als im Moment? K6	0	1	2	3	4
...dass Sie arbeitslos werden? K7	0	1	2	3	4

☞ **SEHR WICHTIG:** Bitte geben Sie uns nun einen Einblick in Ihre **Arbeitszeiten während der letzten 2 WOCHEN.**

Mit „Arbeit" ist hier nur Ihre Erwerbstätigkeit gemeint (nicht Haushalt, Studium etc.)

Uhrzeiten letzte Woche: Bitte versuchen Sie, sich zu erinnern!

	Montag	**Dienstag**	**Mittwoch**	**Donnerstag**	**Freitag**	**Samstag**	**Sonntag**
Arbeitsbeginn							
Arbeitsende							
Summe Arbeits-pausen (in Minu-ten)							

Uhrzeiten vorletzte Woche: Bitte versuchen Sie, sich zu erinnern!

	Montag	**Dienstag**	**Mittwoch**	**Donnerstag**	**Freitag**	**Samstag**	**Sonntag**
Arbeitsbeginn							
Arbeitsende							
Summe Arbeits-pausen (in Minu-ten)							

1. Unterscheiden sich die Arbeitszeiten der letzten beiden Wochen von Ihren üblichen Arbeitszeiten? AZ1

Nein (die letzten beiden Wochen waren typisch)..... [ ]0

Etwas..... [ ]1

Ziemlich..... [ ]2

Stark (die beiden letzten Wochen waren Ausnahmen)..... [ ]3

2. Was glauben Sie, wie genau Sie sich an die einzelnen Arbeitszeiten der letzten beiden Wochen erinnert haben? AZ2

Sehr ungenau.....[ ]0

Eher ungenau.....[ ]1

Eher genau.....[ ]2

Sehr genau.....[ ]3

3. Wie sehr unterscheiden sich in der Regel mehrere aufeinander folgende Wochen in den Arbeitszeiten? AZ3

Überhaupt nicht (jede Woche ist wie die andere)..... [ ]0

Kaum ..... [ ]1

Ziemlich..... [ ]2

Sehr stark (mehrere Wochen unterscheiden sich sehr)..... [ ]3

4. Wie häufig müssen Sie samstags oder sonntags arbeiten? AZ4

So gut wie nie..... [ ]0

Seltener als einmal pro Monat..... [ ]1

Etwa einmal pro Monat..... [ ]2

Etwa zweimal pro Monat..... [ ]3

Jede Woche..... [ ]4

5. Wie häufig müssen Sie nachts arbeiten (d.h. zwischen 22 und 6 Uhr)? AZ5

So gut wie nie..... [ ]0

Seltener als einmal pro Monat..... [ ]1

Etwa einmal pro Monat..... [ ]2

Etwa zweimal pro Monat..... [ ]3

Jede Woche..... [ ]4

7. Seit wann arbeiten Sie mit Ihren derzeitigen Arbeitszeiten? AZE
(Wenn Sie die gleichen Zeiten ohne Unterbrechung schon bei früheren Arbeitgebern hatten, zählen Sie diese bitte mit)

Seit | | | | | (Bitte Jahreszahl eintragen)

	Überhaupt nicht	Etwas	Ziemlich	Stark
Wie stark schwankt Ihr Arbeitsbeginn innerhalb einer Woche normalerweise?	0	1	2	3
Wie stark schwankt Ihr Arbeitsende innerhalb einer Woche?	0	1	2	3
Wie stark schwankt die Anzahl der tatsächlich gearbeiteten Stunden von Woche zu Woche?	0	1	2	3
Wie stark wechseln die Wochentage, an denen Sie arbeiten von Woche zu Woche?	0	1	2	3

	Überhaupt nicht	Etwas	Ziemlich	Vollständig
Wie sehr können Sie selbst bestimmen, **wie viele Stunden** Sie pro Woche arbeiten?	0	1	2	3
Wie sehr können Sie selbst bestimmen, wann Sie mit Ihrer Arbeit **beginnen**?	0	1	2	3
Wie sehr können Sie selbst bestimmen, wann Sie Ihre Arbeit **beenden**?	0	1	2	3

	Überhaupt nicht	Manchmal	Oft	Immer
Wie genau wissen Sie am Anfang einer Woche, wann Sie an den folgenden Arbeitstagen mit der Arbeit **beginnen** werden?	0	1	2	3
Wie genau wissen Sie am Anfang einer Woche, wann Sie an den folgenden Arbeitstagen die Arbeit **beenden** werden?	0	1	2	3
Wie genau wissen Sie am Anfang einer Woche, **an welchen Tagen** Sie arbeiten werden?	0	1	2	3

Wie sieht gegenwärtig Ihr normaler Alltag aus?

Wie viele Stunden pro Tag entfallen bei Ihnen an einem durchschnittlichen Werktag auf die folgenden Tätigkeiten?

	Stunden
Berufstätigkeit (inkl. Lehre, nebenberufliche Tätigkeit und Arbeitsweg)	⌊__⌋⌊__⌋
Haushaltsverpflichtungen (Einkaufen, Waschen, Kochen, Reparaturen im Haus etc.)	⌊__⌋⌊__⌋
Soziale Verpflichtungen (Kindererziehung, Altenpflege etc.)	⌊__⌋⌊__⌋
Hobbies und sonstige Freizeit – Aktivitäten	⌊__⌋⌊__⌋
Ausruhen, Entspannen, Schlafen	⌊__⌋⌊__⌋

WOHLBEFINDEN

Am Arbeitsplatz passieren oft Ereignisse, die Gefühle in uns auslösen (z.B. Schuldgefühle oder Verlegenheit wegen eines Fehlers, Ärger über eine Kritik des Vorgesetzten, Stolz über eine tolle Leistung etc.)

Kreuzen Sie nun bitte an, wie häufig Sie die unten aufgezählten Gefühle am Arbeitsplatz erleben

	fast nie	etwa 1x pro Monat	mehrmals pro Monat	etwa 1x pro Woche	mehrmals pro Woche	etwa 1x täglich	mehrmals täglich
1. Ärger	0	1	2	3	4	5	6
2. Abneigung	0	1	2	3	4	5	6
3. Langeweile	0	1	2	3	4	5	6
4. Angst	0	1	2	3	4	5	6
5. Unruhe	0	1	2	3	4	5	6
6. Traurigkeit	0	1	2	3	4	5	6
7. Verbitterung	0	1	2	3	4	5	6
8. Schuldgefühle	0	1	2	3	4	5	6
9. Enttäuschung	0	1	2	3	4	5	6
10. Besorgnis	0	1	2	3	4	5	6
11. Verlegenheit	0	1	2	3	4	5	6
12. Optimismus	0	1	2	3	4	5	6
13. Stolz	0	1	2	3	4	5	6
14. Begeisterung	0	1	2	3	4	5	6
15. Erleichterung	0	1	2	3	4	5	6
16. Freude	0	1	2	3	4	5	6
17. Interesse	0	1	2	3	4	5	6

Wie fühlen Sie sich <u>im Allgemeinen</u>?		fast nie	alle paar Monate	alle paar Wochen	alle paar Tage	fast täglich
Haben Sie Nackenschmerzen?	PB01	0	1	2	3	4
Spüren Sie bei geringer Anstrengung Herzklopfen?	PB02	0	1	2	3	4
Verspüren Sie Schwindelgefühle?	PB03	0	1	2	3	4
Haben Sie Schmerzen in der Herzgegend?	PB04	0	1	2	3	4
Spüren Sie, dass Ihr ganzer Körper verspannt ist?	PB05	0	1	2	3	4
Haben Sie Kopfschmerzen?	PB06	0	1	2	3	4
Haben Sie Rückenschmerzen?	PB07	0	1	2	3	4
Haben Sie Bauchschmerzen?	PB08	0	1	2	3	4
Spüren Sie Übelkeit?	PB09	0	1	2	3	4
Haben Sie plötzlich Schweißausbrüche?	PB10	0	1	2	3	4
Haben Sie Appetitmangel?	PB11	0	1	2	3	4
Haben Sie Probleme mit einer Allergie?	PB12	0	1	2	3	4

Wie fühlen Sie sich im Allgemeinen?		**Trifft gar nicht zu**	**Trifft wenig zu**	**Trifft teils teils zu**	**Trifft ziemlich zu**	**Trifft völlig zu**
Ich fühle mich fit.	ES01	0	1	2	3	4
Ich fühle mich müde.	ES02	0	1	2	3	4
Ich fühle mich schwach.	ES03	0	1	2	3	4
Ich ermüde sehr schnell.	ES04	0	1	2	3	4
Ich fühle mich körperlich erschöpft.	ES05	0	1	2	3	4
Ich finde, dass ich meist sehr schlecht schlafe.	ES06	0	1	2	3	4
Ich finde, dass ich nachts meistens gut schlafe.	ES07	0	1	2	3	4
Meistens fühle ich mich morgens nach dem Aufstehen gut ausgeruht.	ES08	0	1	2	3	4
Ich wache nachts oft mehrere Male auf.	ES09	0	1	2	3	4
Ich habe oft das Gefühl, nur ein paar Stunden geschlafen zu haben.	ES10	0	1	2	3	4

	nie	**sehr selten**	**selten**	**gelegentlich**	**häufig**	**sehr häufig**	**fast immer**
Vieles erscheint mir so sinnlos. D1	0	1	2	3	4	5	6
Ich habe traurige Stimmungen. D2	0	1	2	3	4	5	6
Ich finde es schwer, Entscheidungen zu treffen. D3	0	1	2	3	4	5	6
Ich fühle mich einsam, selbst wenn ich mit anderen Menschen zusammen bin. D4	0	1	2	3	4	5	6
Ich schaue ohne Hoffnung in die Zukunft. D5	0	1	2	3	4	5	6

In der unteren Tabelle sind in der linken und rechten Spalte zwei gegenteilige Verhaltensweisen am Arbeitsplatz dargestellt.

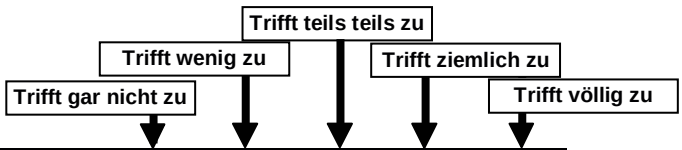
Bitte kreuzen Sie in der mittleren Spalte an, zu welcher Seite Ihr eigenes typisches Arbeitsverhalten tendiert.

- **Je ähnlicher Ihr eigenes Verhalten einem der beiden Seiten ist, desto weiter außen sollte Ihr Kreuz liegen.**
- **Ein Kreuz in der Mitte der Skala bedeutet, dass beide Verhaltensweisen gleich häufig vorkommen.**

Versuchen Sie bitte, sich nicht nur an die positiven Dinge zu erinnern!

← Zu welcher Seite tendieren Sie? →

1. Qualität der Arbeit Machen Sie häufig Fehler bzw. produzieren Sie oft unzureichende Ergebnisse ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder liefern Sie ausschließlich tadellose Ergebnisse ab? L1
2. Motivation Vertun Sie beim Arbeiten viel Zeit - z.B. durch private Dinge, längere Pausen, Gespräche, etc. ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder arbeiten Sie immer über das geforderte Maß hinaus angestrengt und konzentriert? L2
3. Systematik Arbeiten Sie immer klar strukturiert und erledigen Sie die wichtigsten Dinge immer zuerst ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder ist Ihre Vorgehensweise gelegentlich etwas umständlich? L3
4. Einhaltung von Terminen Überziehen Sie Termine häufig und brauchen etwas länger, als vereinbart ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder schaffen Sie es, Arbeiten immer zum vereinbarten Zeitpunkt zu erledigen? L4
5. Verhalten zu Kollegen Helfen Sie immer bereitwillig Kollegen, geben Sie wichtige Informationen auch ohne Nachfrage weiter etc. ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder handeln Sie oft nach dem Motto „jeder sollte sich um seine eigenen Sachen kümmern“? L5
6. Initiative Warten Sie gewöhnlich, bis Ihnen jemand Anweisungen gibt, bzw. Sie um Ihre Mitarbeit bittet ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder ergreifen Sie sofort von sich aus die Initiative? L6
7. Einsatzbereitschaft Engagieren Sie sich häufig freiwillig über die geforderten Aufgaben hinaus ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder beschränken Sie sich in der Regel auf die Aufgaben, die von Ihnen gefordert werden? L7
8. Allgemeine Verpflichtungen Was glauben Sie: Ist Ihr/e Vorgesetzte/r mit Ihrer Arbeitsleistung sehr unzufrieden ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder sehr zufrieden? L8



Meine beruflichen Anforderungen behindern mein Privat und Familienleben WFC1	0 – 1 – 2 – 3 – 4
Die Zeit, die meine Arbeit in Anspruch nimmt, macht es schwer, meine familiären Verpflichtungen zu erfüllen WFC2	0 – 1 – 2 – 3 – 4
Wegen meiner beruflichen Anforderungen kann ich Dinge, die ich zu Hause erledigen möchte, nicht tun. WFC3	0 – 1 – 2 – 3 – 4
Meine Arbeit verursacht Belastungen, die mir die Erfüllung familiärer Verpflichtungen erschweren WFC4	0 – 1 – 2 – 3 – 4
Aufgrund meines Berufs muss ich oft familiäre Pläne ändern. WFC5	0 – 1 – 2 – 3 – 4

Wie oft üben Sie die unten aufgezählten **Freizeitaktivitäten** aus?

	fast nie	etwa 1x pro Monat	mehrmals pro Monat	etwa 1x pro Woche	mehrmals pro Woche	fast täglich
Besuch von Freizeitveranstaltungen (Konzerte, Kino, Disco etc.) FZ01	0	1	2	3	4	5
Aktiver Sport FZ02	0	1	2	3	4	5
Geselligkeit mit Freunden. Verwandten oder Nachbarn FZ03	0	1	2	3	4	5
Mithelfen, wenn bei Freunden, Verwandten oder Nachbarn etwas zu tun ist FZ04	0	1	2	3	4	5
Ehrenamtliche Tätigkeiten in Vereinen, Verbänden oder sozialen Diensten FZ05	0	1	2	3	4	5
Aktive Beteiligung in Bürgerinitiativen, in Parteien, in der Kommunalpolitik FZ06	0	1	2	3	4	5

Im Folgenden bitten wir Sie, in der unteren Tabelle die **Anzahl der Tage** zu notieren, die Sie an Ihrem Arbeitsplatz **seit Anfang diesen Jahres gefehlt** haben.

Bitte versuchen Sie, möglichst die genaue Anzahl zu erinnern.

	Anzahl der Tage
Urlaub (bezahlt und unbezahlt)	⌊_⌊_⌋ A1
Krankheit (vom Arzt attestiert)	⌊_⌊_⌋ A2
Krankheit (nicht vom Arzt attestiert)	⌊_⌊_⌋ A3
Familiäre Verpflichtungen (z.B. Krankheit eines Kindes, Hochzeiten, Beerdigungen etc.)	⌊_⌊_⌋ A4
Persönliche Gründe (z.B. Unlust etc.)	⌊_⌊_⌋ A5

Wie häufig kommt Ihnen der Gedanke, zu kündigen? FT01	0 fast nie	1 selten	2 gelegentlich	3 häufig	4 fast täglich
Wie häufig haben Sie sich in letzter Zeit nach einem anderen Arbeitsplatz erkundigt (z.B. Stellenanzeigen gelesen, Bekannte gefragt etc.) FT02	0 gar nicht	1 selten	2 gelegentlich	3 häufig	4 fast täglich
Wenn Sie Ihre derzeitige Arbeitsstelle kündigen würden: Wie leicht würden Sie wohl eine neue Stelle finden? FT03	0 sehr schwer	1 eher schwer	2 mittel	3 eher leicht	4 sehr leicht
Wie wahrscheinlich ist es, dass Sie tatsächlich innerhalb des nächsten Jahres kündigen werden? FT04	0 sehr **un**wahr-scheinlich	1 eher **un**wahr-scheinlich	2 vielleicht	3 eher wahr-scheinlich	4 sehr wahr-scheinlich

Bei den folgenden Fragen geht es um Ihre **sozialen Kontakte innerhalb Ihrer Firma**. Bitte geben Sie an,

- **wie viele Personen** Sie kennen („Anzahl“) und
- in welchem Maße sich diese Personen Ihrer Meinung nach **gegenseitig gut kennen**

Bitte denken Sie an alle Personen in Ihrer Firma – auch außerhalb Ihrer Abteilung!

	Anzahl	**Wie viele dieser Personen kennen sich Ihrer Meinung nach gegenseitig gut?**			
		Die Personen kennen sich nicht	Ein paar davon kennen sich gut	Die meisten kennen sich gut	(Fast) alle kennen sich gut
B E I S P I E L *Mit wie vielen Personen in Ihrer Firma unterhalten Sie sich öfters über **nicht-berufliche Themen** (z.B. Hobbies, Politik, Wirtschaft, Sport usw.)?*	*1 2*	☐ 0	☐ 1	☐ 2	☐ 3
Mit wie vielen Personen in Ihrer Firma unterhalten Sie sich öfters über **nicht-berufliche Themen** (z.B. Hobbies, Politik, Wirtschaft, Sport usw.)? 01	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Bei wie vielen Personen in Ihrer Firma können Sie sich **aussprechen**, wenn es Ihnen schlecht geht? 02	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Mit wie vielen Personen unternehmen sie gelegentlich außerberufliche soziale **Aktivitäten** (z.B. nach der Arbeit „ein Bier trinken“, Sport usw.) 03	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Auf wie viele Personen in Ihrer Firma können Sie sich **verlassen**? 04	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Wie viele Personen in Ihrer Firma **bedeuten** Ihnen persönlich etwas? 05	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Von wie vielen Personen erfahren Sie gelegentlich Neuigkeiten über **wichtige firmen-interne Ereignisse** (z.B. neue Produkte, geplante Entlassungen, firmenpolitische Veränderungen usw.)? 06	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Wie viele Personen in Ihrer Firma könnten Sie fragen, wenn Sie Tipps und Ratschläge zur **Verbesserung Ihrer beruflichen Leistung** bräuchten**?** 07	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Wie viele Personen in Ihrer Firma kennen Sie, die Ihnen sinnvolle Ratschläge oder Informationen für Ihre **berufliche Zukunft** geben können? 08	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Wie viele Personen aus höheren Unternehmensebenen Ihrer Firma **kennen Sie persönlich sehr gut**? 09	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Was denken Sie, wie vielen Personen aus höheren Unternehmensebenen Ihre berufliche **Weiterentwicklung am Herzen liegt?** 10	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3
Angenommen, Sie wollten sich um eine andere Stelle in Ihrer Firma bewerben. Wie viele Personen könnten Ihnen dabei wohl **behilflich** sein (z.B. durch „Beziehungen spielen lassen“, nützliche Informationen usw.)? 11	⌊__⌋	☐ 0	☐ 1	☐ 2	☐ 3

1. In welchem Jahr sind Sie geboren?

1 9 ☐☐

2. Wie viele Jahre Berufserfahrung haben Sie (in Ihrem jetzigen Beruf) ? BE

_____ Jahre

3. Wie viele Jahre arbeiten Sie bereits allgemein (auch in früheren Berufen, Lehre etc.) ? AE

_____ Jahre

4. Seit wann arbeiten Sie in Ihrer jetzigen Firma? (Bitte Jahreszahl eintragen) DA

Seit ☐☐☐☐

5. Wieviel Mitarbeiter hat die Firma, in der Sie jetzt arbeiten? (Schätzen Sie ruhig) MA

an Ihrem Standort / Filliale:..... _____

insgesamt (d.h. deutschland- oder weltweit):..... _____

in Ihrer Abteilung:..... _____

6. Wieviel Stunden pro Woche arbeiten Sie in der Regel an den unten stehenden Orten (nur Erwerbstätigkeit) AZLOK

in Ihrem Firmengebäude:..... _____h

von zu Hause aus:..... _____h

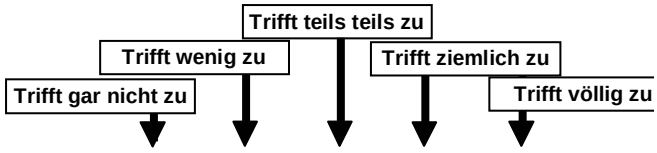
im Außendienst:..... _____h

sonstiges:..... _____h

7. Wie hoch ist Ihr monatliches berufliches Netto-Einkommen? (D.h. das Einkommen, nach Abzug der Steuern und Abgaben) PAY

weniger als € 500..... [ ]
€ 501 - € 1000..... [ ]
€ 1001 - € 1500..... [ ]
€ 1501 - € 2000..... [ ]
€ 2001 - € 2500..... [ ]
€ 2501 - € 3000..... [ ]
€ 3001 - € 3500..... [ ]
€ 3501 - € 4000..... [ ]
€ 4001 - € 4500..... [ ]
über € 4501..... [ ]

Zum Schluss möchten wir Sie bitten, sich mit den unten aufgeführten Begriffen **selbst als Person zu beschreiben**.



Ich bin von Natur aus ein fröhlicher Mensch	P01	0 – 1 – 2 – 3 – 4
Ich bin viel sensibler, als für mich gut ist	P02	0 – 1 – 2 – 3 – 4
Ich geniesse fast alles was ich tue	P01	0 – 1 – 2 – 3 – 4
Im Grunde bin ich ein glücklicher Mensch	P01	0 – 1 – 2 – 3 – 4
Ich leide unter Nervosität	P05	0 – 1 – 2 – 3 – 4
Mir passieren jeden Tag interessante und aufregende Sachen	P06	0 – 1 – 2 – 3 – 4
In meinen Stimmungen gibt es häufig ein Auf und Ab	P07	0 – 1 – 2 – 3 – 4
Manchmal lasse ich mich zu sehr von kleinen Rückschlägen irritieren	P08	0 – 1 – 2 – 3 – 4
In der Regel bin ich guter Dinge	P09	0 – 1 – 2 – 3 – 4
Ich finde mein Leben sehr interessant	P10	0 – 1 – 2 – 3 – 4
Meine Gefühle sind leicht zu verletzen	P11	0 – 1 – 2 – 3 – 4
Es fällt mir sehr leicht, die guten Seiten des Lebens zu erkennen.	P12	0 – 1 – 2 – 3 – 4
Ich gerate leicht aus der Fassung, wenn es kritisch wird.	P13	0 – 1 – 2 – 3 – 4
Oftmals irritieren mich bereits kleine Ärgernisse	P14	0 – 1 – 2 – 3 – 4
Durch Dinge, die unerwartet geschehen, bin ich leicht zu erschrecken	P15	0 – 1 – 2 – 3 – 4

Vielen Dank für das Ausfüllen des Fragebogens!

Es wäre sehr wichtig, wenn Sie noch mal überprüfen würden, ob auch jede Frage beantwortet wurde.

Möchten Sie einen Kurzbericht über die Ergebnisse erhalten?

( ) ja

( ) nein

Ihre persönliche Studienteilnehmer-Nr. ist /

Falls Sie uns aufgrund einer Anfrage oder Kritik kontaktieren möchten, nennen Sie diese bitte.

Falls Sie noch **Anmerkungen zu unserer Umfrage** haben oder falls Sie uns gerne sonst irgendetwas mitteilen möchten, können Sie das hier tun. Nehmen Sie kein Blatt vor den Mund!

Appendix D: Questionnaire (Other’s rating)

JUSTUS-LIEBIG-
UNIVERSITÄT
GIESSEN

ARBEIT & ARBEITSZEIT

im 21. Jahrhundert

Forschungsprojekt „Mobilzeit“ an der Universität Giessen

www.Mobilzeit.com

Kontakt: Holger Steinmetz (Tel. 0641 99-23054 – Email: Holger.Steinmetz@sowi.uni-giessen.de)

In den folgenden Fragen geht es um die Arbeitsbedingungen Ihres Kollegen / Ihrer Kollegin.

Dabei werden in jedem der folgenden Kästchen **zwei beispielhafte Arbeitsplätze** einander gegenübergestellt. Bitte kreuzen Sie an, welcher von beiden dem Arbeitsplatz **Ihres Kollegen/ Ihrer Kollegin** am **ähnlichsten** ist

Wenn Sie sich nicht sicher sind, **spekulieren Sie ruhig.**

Person **A** muss bei seiner/ihrer Arbeit sehr **komplizierte** Entscheidungen treffen.

Person **B** muss bei seiner/ihrer Arbeit nur sehr **einfache** Entscheidungen treffen.

Welcher der beiden Arbeitsplätze ist dem Arbeitsplatz **Ihres Kollegen / Ihrer Kollegin** am ähnlichsten? AK2

genau wie der von A ( ) 1
ähnlich wie der von A ( ) 2
zwischen A und B ( ) 3
ähnlich wie der von B ( ) 4
genau wie der von B ( ) 5

A hat Unterlagen und Informationen, die immer **genau stimmen und aktuell** sind.

B hat Unterlagen, bei denen Informationen **oft unvollständig und veraltet** sind.

Welcher der beiden Arbeitsplätze ist seinem / ihrem Arbeitsplatz am ähnlichsten? AOP3

genau wie der von A ( ) 1
ähnlich wie der von A ( ) 2
zwischen A und B ( ) 3
ähnlich wie der von B ( ) 4
genau wie der von B ( ) 5

Person **A** bearbeitet Aufgaben, bei der er oder sie **genau überlegen** muss, was im einzelnen zu tun ist.

Person **B** bearbeitet Aufgaben, bei denen **sofort klar** ist, was zu tun ist.

Welcher der zwei Arbeitsplätze ist seinem / ihrem Arbeitsplatz am ähnlichsten? AK7

genau wie der von A ( ) 1
ähnlich wie der von A ( ) 2
zwischen A und B ( ) 3
ähnlich wie der von B ( ) 4
genau wie der von B ( ) 5

A muss mit Material, Arbeitsmitteln oder Werkzeugen arbeiten, die **nicht viel taugen**.

B arbeitet mit **einwandfreiem** Material, Arbeitsmitteln oder Werkzeugen.

Welcher der beiden Arbeitsplätze ist seinem / ihrem Arbeitsplatz am ähnlichsten? AOP8

genau wie der von A ( ) 1
ähnlich wie der von A ( ) 2
zwischen A und B ( ) 3
ähnlich wie der von B ( ) 4
genau wie der von B ( ) 5

A bearbeitet Aufgaben, bei der er oder sie zuerst genau **planen** muss, um die Aufgaben ausführen zu können.

B bearbeitet Aufgaben, bei denen **keine Planung erforderlich** ist.

Welcher der zwei Arbeitsplätze ist seinem / ihrem Arbeitsplatz am ähnlichsten? AK8

genau wie der von A ( ) 1
ähnlich wie der von A ( ) 2
zwischen A und B ( ) 3
ähnlich wie der von B ( ) 4
genau wie der von B ( ) 5

A muss **viel Zeit damit vertun**, um sich Informationen, Material oder Werkzeuge zum Weiterarbeiten zu beschaffen.

B stehen die nötigen Informationen, Material oder Werkzeuge **immer zur Verfügung.**

Welcher der beiden Arbeitsplätze ist seinem / ihrem am ähnlichsten? AOP4

genau wie der von A ( ) 1
ähnlich wie der von A ( ) 2
zwischen A und B ( ) 3
ähnlich wie der von B ( ) 4
genau wie der von B ( ) 5

Wenn Sie seine/ihre Tätigkeit insgesamt betrachten, inwieweit kann Ihr(e) Kollege(in) die **Reihenfolge der Arbeitsschritte** selbst festlegen? HS1

sehr wenig ( ) 1
ziemlich wenig ( ) 2
etwas ( ) 3
ziemlich viel ( ) 4
sehr viel ( ) 5

Wenn man seine / ihre Arbeit insgesamt betrachtet, wie viel **Möglichkeiten zu eigenen Entscheidungen** bietet sie ihm / ihr? HS3

sehr wenig ( ) 1
ziemlich wenig ( ) 2
etwas ( ) 3
ziemlich viel ( ) 4
sehr viel ( ) 5

Kann er / sie selbst bestimmen, **auf welche Art und Weise** er / sie die Arbeit erledigt? HS4

sehr wenig ( ) 1
ziemlich wenig ( ) 2
etwas ( ) 3
ziemlich viel ( ) 4
sehr viel ( ) 5

Wie oft erhält er / sie **unklare Anweisungen**? UN5

sehr selten/nie ( ) 1
selten (etwa 1 x pro Monat) ( ) 2
gelegentlich (etwa 1 x pro Woche) ( ) 3
oft (mehrmals pro Woche) ( ) 4
sehr oft (ein bis mehrmals täglich) ( ) 5

Wie oft erhält er / sie von verschiedenen Vorgesetzten **widersprüchliche Anweisungen**? UN6

sehr selten/nie ( ) 1
selten (etwa 1 x pro Monat) ( ) 2
gelegentlich (etwa 1 x pro Woche) ( ) 3
oft (mehrmals pro Woche) ( ) 4
sehr oft (ein bis mehrmals täglich) ( ) 5

Wie oft kommt es vor, dass er / sie bei Ihrer Arbeit **Entscheidungen fällen** muss, **ohne** dass **ausreichende Information** zur Verfügung steht? UN7

sehr selten/nie ( ) 1
selten (etwa 1 x pro Monat) ( ) 2
gelegentlich (etwa 1 x pro Woche) ( ) 3
oft (mehrmals pro Woche) ( ) 4
sehr oft (ein bis mehrmals täglich) ( ) 5

Wie häufig wird er / sie durchschnittlich bei der Arbeit von anderen Personen **unterbrochen** (z.B. wegen einer Auskunft)? AUB1

sehr selten/nie ( ) 1
selten (etwa 1 x pro Woche) ( ) 2
gelegentlich (etwa 1 x pro Tag) ( ) 3
oft (mehrmals pro Tag) ( ) 4
sehr oft (mehrmals pro Stunde) ( ) 5

Kommt es vor, dass er / sie **aktuelle Arbeiten** unterbrechen muss, weil etwas wichtiges dazwischen kommt? AUB4

sehr selten/nie ( ) 1
selten (etwa 1 x pro Woche) ( ) 2
gelegentlich (etwa 1 x pro Tag) ( ) 3
oft (mehrmals pro Tag) ( ) 4
sehr oft (mehrmals pro Stunde) ( ) 5

Wie häufig kommt es vor, dass er / sie an **mehreren Aufgaben gleichzeitig** arbeiten und zwischen den Arbeitsaufgaben hin und her springen muss? AUB7

sehr selten/nie ( ) 1
selten (etwa 1 x pro Woche) ( ) 2
gelegentlich (etwa 1 x pro Tag) ( ) 3
oft (mehrmals pro Tag) ( ) 4
sehr oft (mehrmals pro Stunde) ( ) 5

Wie häufig steht er / sie unter **Zeitdruck**? ZD1

sehr selten/nie ( ) 1
selten (etwa 1 x pro Woche) ( ) 2
gelegentlich (etwa 1 x pro Tag) ( ) 3
oft (mehrmals pro Tag) ( ) 4
sehr oft (fast ununterbrochen) ( ) 5

Wie häufig passiert es, dass er / sie **schneller arbeitet**, als er / sie es normalerweise tut, um die Arbeit zu schaffen? ZD2

sehr selten/nie ( ) 1
selten (etwa 1 x pro Woche) ( ) 2
gelegentlich (etwa 1 x pro Tag) ( ) 3
oft (mehrmals pro Tag) ( ) 4
sehr oft (fast ununterbrochen) ( ) 5

Wie oft wird von ihm / ihr bei Ihrer Arbeit ein **hohes Arbeitstempo** verlangt? ZD6

sehr selten/nie ( ) 1
selten (etwa 1 x pro Woche) ( ) 2
gelegentlich (etwa 1 x pro Tag) ( ) 3
oft (mehrmals pro Tag) ( ) 4
sehr oft (mehrmals pro Stunde) ( ) 5

Für wie wahrscheinlich halten Sie es, dass Ihr Kollege / Ihre Kollegin in den nächsten 2 Jahren...	sehr unwahr-scheinlich	eher unwahr-scheinlich	vielleicht	eher wahr-scheinlich	sehr wahr-scheinlich
...eine Gehaltserhöhung bekommen? K1	0	1	2	3	4
...an Maßnahmen zu seiner / ihrer beruflichen Weiterentwicklung (Trainings, Seminare, etc.) teilnehmen kann? K2	0	1	2	3	4
... Möglichkeiten erhält, seine / ihre Entscheidungsbefugnisse zu erweitern? K3	0	1	2	3	4
...Möglichkeiten erhält, Führungsaufgaben auszuüben (oder zu erweitern)? K4	0	1	2	3	4
...Arbeitstätigkeiten ausführen kann, die in höherem Maße seinen / ihren Interessen entsprechen? K5	0	1	2	3	4
...oder, dass er / sie Arbeitstätigkeiten ausführen muss, die weniger interessant sind als im Moment? K6	0	1	2	3	4
...dass er / sie arbeitslos wird? K7	0	1	2	3	4

☞ In den folgenden Fragen geht es um das Wissen Ihres Kollegen / Ihrer Kollegin über verschiedene arbeitsbezogene Gebiete.

Wenn Sie sich nicht sicher sind, **spekulieren Sie ruhig.**

Mein Kollege / meine Kollegin...	sehr unwahr-scheinlich	eher unwahr-scheinlich	vielleicht	eher wahr-scheinlich	sehr wahr-scheinlich
...weiß, im welchem Jahr die Firma gegründet wurde	0	1	2	3	4
...ist mit der Geschichte der Firma vertraut	0	1	2	3	4
...weiß, wie die Firma aufgebaut und organisiert ist	0	1	2	3	4
...kennt die Namen der einflussreichsten Personen in der Firma	0	1	2	3	4
...kennt die Ziele und Visionen der Firma	0	1	2	3	4
...weiß, wie in der Firma „der Hase läuft“	0	1	2	3	4
...weiß, welche Hobbies seine / ihre Kollegen/innen haben	0	1	2	3	4
...kennt private Dinge seiner / ihrer Kollegen/innen	0	1	2	3	4
...weiß, welche beruflichen Sorgen seine / ihre Kollegen/innen haben	0	1	2	3	4
...hat ein besonders umfangreiches Wissen über die Arbeit, die er / sie tut	0	1	2	3	4
...weiß, was die meisten Begriffe bedeuten, die es in seiner / ihrer beruflichen Fachsprache gibt	0	1	2	3	4
...weiß eine Menge über die technischen Geräte (Maschinen, Computer, etc.), mit denen er / sie arbeitet	0	1	2	3	4
...hat auch bei schwierigen Aufgaben sofort Ideen, wie man vorgehen kann	0	1	2	3	4
Wenn es zu arbeitsbezogenen Problemen kommt, kennt mein Kollege / meine Kollegin meist deren Ursachen	0	1	2	3	4

In der unteren Tabelle sind in der linken und rechten Spalte zwei gegenteilige Pole von Verhaltensweisen am Arbeitsplatz dargestellt.

Bitte kreuzen Sie in der mittleren Spalte an, zu welcher Seite das typische Arbeitsverhalten Ihres Kollegen / Ihrer Kollegin tendiert.

Je deutlicher sein / ihr Verhalten einem der Pole ist, desto weiter außen sollte Ihr Kreuz liegen.

Ein Kreuz in der Mitte der Skala bedeutet, dass beide Verhaltensweisen gleich häufig vorkommen.

Versuchen Sie bitte, sich nicht nur an die positiven Dinge zu erinnern! Denken Sie daran, dass diese Befragung keinerlei Konsequenzen für Sie oder Ihre(n) Kollegen/Kollegin hat

← Zu welcher Seite tendiert Ihr/e Kollege/in? →			
1. Qualität der Arbeit Macht er / sie häufig Fehler bzw. produziert er / sie oft unzureichende Ergebnisse ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder liefert er / sie ausschließlich tadellose Ergebnisse ab?	L1
2. Motivation Vertut er / sie beim Arbeiten viel Zeit - z.B. durch private Dinge, längere Pausen, Gespräche, etc. ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder arbeitet er / sie immer über das geforderte Maß hinaus angestrengt und konzentriert?	L2
3. Systematik Arbeitet er / sie immer klar strukturiert und erledigt er / sie die wichtigsten Dinge immer zuerst ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder ist seine / Ihre Vorgehensweise oft eher etwas umständlich?	L3
4. Einhaltung von Terminen Überzieht er / sie Termine häufig und braucht etwas länger, als vereinbart	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder schafft er / sie es, Arbeiten immer zum vereinbarten Zeitpunkt zu erledigen?	L4
5. Verhalten zu Kollegen Hilft er / sie immer bereitwillig Kollegen, gibt er / sie wichtige Informationen auch ohne Nachfrage weiter etc ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder handelt er / sie oft nach dem Motto „jeder sollte sich um seine eigenen Sachen kümmern“?	L5
6. Initiative Wartet er / sie gewöhnlich, bis ihm / ihr jemand Anweisungen gibt, bzw. ihn / sie um Mitarbeit bittet	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder ergreift er / sie sofort von sich aus die Initiative?	L6
7. Einsatzbereitschaft Engagiert er / sie sich häufig freiwillig über die geforderten Aufgaben hinaus?.....	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder beschränkt er / sie sich in der Regel auf die Aufgaben, die von ihm / ihr gefordert werden?	L7
8. Allgemeine Verpflichtungen Was glauben Sie: Ist sein / Ihr Vorgesetzte/r mit seiner / Ihrer Arbeitsleistung sehr unzufrieden ...	☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ 3 2 1 0 1 2 3	... oder sehr zufrieden?	L8

Wie genau kennen Sie den Arbeitsplatz / die Arbeitssituation Ihres Kollegen / Ihrer Kollegin? konf01

Sehr ungenau..... ( )0
Eher ungenau..... ( )1
Mittelmäßig..... ( )2
Eher genau..... ( )3
Sehr genau..... ( )4

Bei wie vielen der bisherigen Fragen waren Sie in Ihrer Einschätzung sehr unsicher ? konf02

Bei fast keiner..... ( )0
Bei ein paar..... ( )1
Bei etwa der Hälfte..... ( )2
Bei mehr als der Hälfte..... ( )3
Bei fast allen..... ( )4

Welches Geschlecht hat Ihr/e Kollege/in ? gesch02

männlich ( ) 0 weiblich ( ) 1

Wissen Sie, wie alt Ihr/e Kollege/in ist ? alter02

Nein..... ( ) 0
Ja, und zwar:.... _____

1. In welchem Verhältnis stehen Sie zu der Person, von der Sie diesen Fragebogen bekommen haben? Sind Sie sein / ihr... koll1/2

Kollege/Kollegin.....( )1
Vorgesetzte(r).....( )2
Unterstellte(r) Mitarbeiter(in).....( )3
Sonstiges:.....( )4, und zwar _____

2. Seit wann arbeiten Sie mit Ihrem / Ihrer Kollege/in zusammen ? (Bitte Jahreszahl eintragen) koop

Seit |_|_|_|_|

3. Welches Geschlecht haben Sie? geschk

männlich ( )0 weiblich ( )1

4. Wie alt sind Sie? alterk

_____ Jahre

Zum Schluss bitten wir Sie noch, anzugeben, in wie weit die folgenden beiden Aussagen zutreffen: sym

1. Ich halte meine/n Kollegen/in für einen außerordentlich sympathischen Menschen

Trifft überhaupt nicht zu.....( ) 0
Trifft größtenteils nicht zu..... ( ) 1
Trifft teils teils zu.....( ) 2
Trifft größtenteils zu.....( ) 3
Trifft voll und ganz zu..... ( ) 4

2. Ich genieße es sehr, mit ihm/ihr Zeit zu verbringen

Trifft überhaupt nicht zu.....( ) 0

Trifft größtenteils nicht zu..... ( ) 1

Trifft teils teils zu.....( ) 2

Trifft größtenteils zu.....( ) 3

Trifft voll und ganz zu..... ( ) 4

Vielen Dank für das Ausfüllen des Fragebogens!

Es wäre sehr wichtig, wenn Sie noch mal überprüfen würden, ob auch jede Frage beantwortet wurde.

Ihre persönliche Studienteilnehmer-Nr. ist /

Falls Sie uns aufgrund einer Anfrage oder Kritik kontaktieren möchten, nennen Sie diese bitte.

Falls Sie noch **Anmerkungen zu unserer Umfrage** haben oder falls Sie uns gerne sonst irgendetwas mitteilen möchten, können Sie das hier tun. Nehmen Sie kein Blatt vor den Mund!

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Erklärung

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