DESIGNING & COMPENSATING SHIFT WORK SCHEDULES

The case of the Dutch disability sector

Master of Business Administration

Faculty of Behavioural, Management and Social sciences

Graduation Thesis

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Second supervisor: Dr. J.G. Meijerink

Enschede, 24 October 2017

UNIVERSITEIT TWENTE.

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Enjoy reading this thesis.

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Abstract

Background – Shift work concerns working irregular, flexible, variable and non-standard working hours. It is a complex concept, with many characteristics and is often brought in contact with many negative consequences for satisfaction, health and wellbeing of employees. Much research has been done on various characteristics and their effect on the consequences. For the Dutch disability sector, there is limited knowledge of the current view of the employees in this sector on this topic.

Purpose - This study investigates the current state of shift working in the Dutch disability sector. The comforts and discomforts, the design of the schedule and the compensation for the discomforts are included. The impact of shift work on employee satisfaction, sleep quality and work-life balance (WLB) is investigated. Yearly working hours variation, short-term schedule disturbances, schedule disturbances, and five most distinctive working patterns serve as explaining variables. It is hypothesised that counter-value and counter-weight compensation will have a moderating effect on this relation. The main research question thus reads: to what extent do financial compensation and work-time control influence the relation between shift work schedule characteristics and employee outcomes?

Methodology – Based on gathered information from previously performed case studies, a digital survey was composed and distributed. Respondents (N=6552) were employees working in any institution in the disability sector in the Netherlands. Through multiple regression analyses, the proposed hypotheses were tested.

Findings – Moderating effects of financial compensation and work-time control on the relation between schedule characteristics and satisfaction, sleep quality and/or work-life balance were found. However, their impact is very small. Financial compensation and work-time control showed to have a great direct effect on the employee outcomes. Also, direct effects of some of the schedule characteristics were found. Especially the experienced heaviness of the work schedule/shift played an important role in explaining the dependent variables.

Implications – The main conclusion of this thesis has to be that both financial compensation and work-time control do not substantially weaken the negative effects of shift work on employee outcomes. However, the results of this study provide interesting insights and many opportunities for improvement. Financial compensation and WTC have a great direct effect on the employee outcomes. Come recommendations for the sector were given. Limiting the late-early combination (LEC) shifts, night shifts and late shifts in the weekends would improve the schedule. Yearly working hours variation, short-term disturbances and schedule complexity should be minimised as this has a negative impact of the satisfaction and WLB. A compensation system based on the availability of the employee could be fairer. Moreover, the options of more work-time control should be explored because of the great effect on the outcome variables. Employees working the LEC and active night shifts could be given the opportunity to choose for premium in time or money. Along with this, an additional premium for LEC would be beneficial. In order to account more for experienced heaviness, the current premium could be displaced to the heavier times of the schedule. Lastly, an equal compensation for active night and long sleep shift, or additional compensation for the long sleep shift could lead to improvement.

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1 Introduction

The world, and more specifically the disability sector in the Netherlands, is developing fast. The care taking of mentally disabled people in the Netherlands is on the move (Woittiez, Crone, Jonker, Ooms, & Stevens, 2005). The composition of the range of facilities provided, as well as the extent to which different facilities are used, are adapting. Ambulatory care and accompanied living within a neighbourhood, for example, are getting more important. Changes in the Dutch regulation of health care for disabled people have resulted in a more demand oriented way of working in this sector. It has become more important to treat mentally disabled people as full citizens with personal support for individual needs. This requires individual living facilities or very small group facilities instead of the old group facilities. Many of the living facilities are thus demolished or replaced. Also, more attention is now given to the integration and participation of mentally disabled people, which will only be possible if everything in the fields of living, working, day care, education and sports and recreation is altered. All those developments have caused an increase in the demand for health care in this sector, which has led to growing waiting lists. Moreover, we are living more and more in a 24/7 society. This also applies for the disability sector, as many people are in need of care 24 hours a day. Among others, this increase in the demand for care as well as the need for 24/7 care, have led to an increasing desire for adapted working hours. Which has a fair impact on irregular hours and shifts of the organisations and the people working in this sector. The health care sector stands out in this, as around 80 per cent of all employees in this sector working irregular hours (AOOW, 2013). Looking at the clients in this sector, there are around 200,000 people in need of, more or less intensive, disability care (VGN, Feiten en cijfers, 2014). According to Zorgkaart Nederland, there are plus minus 2,570 institutions that provide this care (ZorgkaartNederland, 2017). More importantly, the sector is for the first time in years growing again (VGN, 2017). All of this indicates that is a large and bustling sector, which influences many employees.

Often, shift working is associated with many discomforts for the employee, leading to negative employee outcomes, such as satisfaction, health and wellbeing (Eekelen, Limborgh, & Groen, 2011). Looking at those consequences in the Dutch disability sector, the absenteeism has been relatively high since 2014 (Beurden, 2017). In 2016, the absenteeism increased even further to 5.66 percent, which is around 1.3 percentage points higher than the national average (FBZ, 2017; CSB, 2016). Moreover, the absenteeism is relatively long term and frequent. Therefore, it is ever so important that the collective agreement (CAO) parties, in 2016, agreed to have a fundamental discussion about the topic of shift working in the sector. However, the real profit from this can not only be found in ways to reduce the discomforts from shift working to a minimum, but also finding the best ways to compensate the employees for their work schedules. Because of the 24/7 need, in this sector, there is no going around working irregular hours and shifts so in that field, it is only possible to reduce the discomforts to a minimum by finding the least bothersome work schedule for the employees. The possibilities there are limited, because the employers are already dealing with shortage on the labour market (VGN, 2017), and thus there are little opportunities to increase the labour force within the institutions, which would make the schedule less heavy. As mentioned, the greater value can be found in compensating for the shift schedules. Generally, this can be done in two ways: through money (financial compensation) or through work-time control. The financial compensation, in the Netherlands, usually regards a premium for pre-determined types of shifts (VGN, 2016). The form of non-financial compensation, work-time control,

is currently also not used to its full potential in the Dutch disability sector. The direct effects of either financial compensation or work-time control on employee outcomes are widely known (Eekelen, Limborgh, & Groen, 2011). However, the effect of those two on the relation between the shift work schedule and the employee outcomes is less studied. This relationship is a very interesting one, as this could indicate for the employers, whether or not heavier work schedules are acceptable when there is a suitable compensation for it. Since the schedules are unavoidable, this could bring many opportunities for the employers with regard to the design of the shift schedules.

This thesis attempts firstly to get insights in what the opinions of organisations and employees are and what they find important with regard to shift work. And secondly, get a view of the current situation of compensation in the sector. Furthermore, it tries to find out the least bothersome shift work schedule, in other words what would be the best way to design a shift schedule. Lastly, the current study searches for the relevance of suitable financial compensation and work-time control and its effect on the relation between schedule characteristics and employee outcomes. In that way, this study will conclude by giving recommendations on how to design and compensate shift work in the disability sector in the Netherlands. This research thus contributes to the debate about whether different forms of design of the schedule and the compensation for the irregular working have an effect on the employees in the sector. In order to reach the goal of the paper, based on the previous, the following research question is formulated:

To what extent do financial compensation and work-time control influence the relation between shift work schedule characteristics and employee outcomes in the Dutch disability sector?

This study contributes to the scientific literature on the subject of shift work by adding empirical evidence to the body of knowledge. Also, it investigates the moderating effect of financial compensation and work-time control on the relation between shift work schedules and employee outcomes. Most importantly, this study should provide many practical insight, especially for the Dutch disability sector, but also for broader use on how to design and compensate the inevitable shift work schedules in today's society.

This report is put together as follows. The next chapter firstly provides the necessary theoretical background, explaining the concepts of interest. Documents from the field, as well as scientific literature, mostly in the form of empirical articles, form the basis for this. This is followed by the methodology chapter, in which the research method of this study is elaborated. Next, in chapter four, the many results of the study are presented. In chapter five, these results and the study by itself are discussed. Finally, the research question is answered and based on this, recommendations for shift working in the Dutch disability sector are given in the last chapter.

2 Theoretical background

2.1 SHIFT WORK

Shift work is a broad term, which often is "synonymous of irregular, odd, flexible, variable, unusual, non-standard working hours" (WHO, 2010, p. 563). The international Labour Organization (1990) defines shift work as "a method of organization of working time in which workers succeed one another at the workplace so that the establishment can operate longer than the hours of work of individual workers". They make a distinction between a fixed shift system and a rotating shift system (ILO, 2004). In the fixed shift system, working times are organised in pre-defined shifts. This can be done in two, three or five shifts (Dalen & Leede, 2016). The traditional shift schedule would have two or three shifts of eight hours per day. A two-shift schedule, in practice, could mean that one group of employees works in the morning (06:00h – 14:00h e.g.) and another group of employees works in the evening (14:00h – 22:00h e.g.). The first group will work in the morning for the first week and shift to the evening in the second week. The second group does the opposite. The other shift system, the rotating (non-repetitive) one, is more common in organisations and sectors with many part-time employees and many women, such as the heath care (and thus disability) sector (Dalen & Leede, 2016). In those kind of systems, there is no regularity and predictability at all. The working times of employees will rotate around the clock (ILO, 2004). Related to the fixed and rotating shift system are also the following concepts (Limborgh, 1995): (a) dis-continuous, (b) semi-continuous, (c) full-continuous. The dis-continuous work schedule would regard schedules that are not continuous at all and have shift rotation (Vangelova, 2008). In this schedule, only a part of the days and nights is worked (for example a two-shift schedule without night shifts) (Dalen & Leede, 2016). In a semi-continuous schedule, the entire day is worked, but not all days of the week. It does, for example, not include the weekends, whereas a full-continuous schedule would include the weekends (Ven, et al., 2016).

Shift work has many characteristics, that identify the work schedule. Van Limborgh (1995) defined a fairly complete list: the number of different shift types in the schedule, the proportion of various shifts (e.g. early shift, morning, day, late, evening, night), the proportion of shifts with different length (e.g. 4 hours, 8 hours, extended 9 hours), the type of shift system (dis-continuous, semi-continuous, continuous), the major shift cycle length, the operating time per week covered by the schedule (168 hours at most in the complete continuous schedule), the operating time per day, the average working time per week, the average sequence length until a day off, the speed of rotation (average sequence length of identical shifts), the average number of shift changes within sequences, the direction of rotation, the proportion of weekends worked, and the proportion of weekends with a single day off. An important notice Van Limborgh makes with those characteristics is that they are independent from each other, unless correlations are inevitable. For example, the number of different shift types in a schedule has an inevitable influence of the operating time per week covered by the schedule. Costa (2010) also indicates that "the amount of night work, timing and duration of shifts, length of shift cycle, speed and rotation of shifts, and position and length of rest days" (p. 120) are crucial characteristics of a shift schedule. The shift system design might have a fair impact on the heaviness of the work and the consequences. FNV Bondgenoten (2011) additionally gives some numbers for the characteristics. They state that the following should be taken into account: forward rotation, a maximum of six shifts in a row, a

minimum of two shifts in a row, a maximum of working four of the same shifts, a weekly working time of maximum 34 to 38 hours (depending on the heaviness of the schedule, maximum of 36 hours if the schedule contains night shifts), minimal 48 continuous hours off after a series of night shifts, half an hours break in the middle of the shift, a maximum shift length of 9 hours, starting and end times around 07:00/15:00/23:00 o'clock, predictable schedule pattern and at least 40 per cent of the evenings/nights and weekends off, with good spreading. Van Dalen & De Leede (2016) also mention many of those guidelines and add the following to this: a maximum of three morning shifts and a maximum of three night shifts. Dall'Ora, Ball, Recio-Saucedo and Griffiths (2016) studied and reviewed 35 recent papers on characteristics of shift work. They were interested in the association between those characteristics (which they call 'factors') and job performance and wellbeing and found six characteristics that had an impact on this: "shift length, weekly work hours, the compressed work week, overtime, night work/rotating or fixed shifts, and rest opportunities" (Dall'Ora, Ball, Recio-Saucedo, & Griffiths, 2016, p. 24).

However, for the Dutch disability sector, based on a previous research by De Leede & Van Hilst (2017), three characteristics within the shift work schedule are of interest: (1) yearly working hours variation, (2) short-term disturbances, and (3) the schedule complexity (Leede & Hilst, 2017). This first one regards the changing of working patterns during a year, which is also implicated through the change of types of shifts worked throughout the year. In practice, an employee could have to work many night shifts in the one period and in the next period be working mainly during the day. The second characteristic of interest is about the short-term changes of working hours. These are referred to as disturbances and have to do with covering unplanned gaps in the schedule on short notice. Usually those situations will occur because of absence of a colleague. Covering for those short-term disturbances, requires a decent amount of flexibility and adaptability of an employee. In their research on work ergonomics, Knauth and Hornberger (2003) state that short-term deviations in the schedule should be avoided, because these affect the possibilities to plan leisure activities and disturb the compatibility between work and private life. Lastly, schedule complexity refers to the number of different types of shifts an employee works within a schedule. Schedule complexity does not actually say anything about the job complexity. The content of the job or the required skills for a type of shift do not vary between an early shift and an evening shift, because an employee is trained for specific work activities. The relation between schedule complexity (the number of different kinds of shifts an employee works) and job complexity (the requirement of more skills, more challenge in the job for an employee) is thus limited. Mainly schedule complexity influences the working times of an employee, instead of its skills. Comparing this to schedule variation, which regards the yearly changes in working times, schedule complexity focusses more on the variation in a published schedule at one moment. Yearly variation does not imply a complex or varied schedule in one published schedule.

In line with the findings from Dall'Ora et al. (2016), in literature shift working is extensively negatively related to an substantial list of consequences for the employee and organisation. The consequences can be grouped into categories. Three main employee outcomes on the topic of shift work are: (1) disturbed biological rhythms and disturbed sleep, causing employee health problems, (2) employee satisfaction, and (3) employee work-life balance.

The first category, health, entails all possible health risks involved with working in shift schedules. Literature presents many risks, such as the Shift Work Sleep Disorder (SWSD), hearth and vascular disease, cancer and gastrointestinal complaints (Knutsson, 2003). SWSD is the next stage after fatigue, as it is defined as a first

complaint of insomnia or excessive sleepiness resulting from working at a usual sleeping period (Basner, 2005). Research found that shift workers experience more fatigue, especially in a three-shift schedule, compared to employees working regular day schedules (Jansen, Amelsvoort, Kristensen, Brandt, & Kant, 2003). The tiredness and fatigue originates from the fact that shift workers in general sleep shorter, induced by the conflict between displaced work hours and the output of the biological clock. Which results in working at subjective alertness or behavioural efficiency (Åkerstedt, 2003). Åkerstedt (2003) writes that a night worker theoretically could adjust its circadian rhythm, but that this adjustment is often intervened by a light exposure during the early morning. And that because of that, adjustment to night work is mostly not accomplished and partial day orientation maintains. Jansen et al. (2003) made a distinction between the type of shift and the prevalence of fatigue and found the following figures: 18.1% of day workers experience fatigue, 28.6% of the employees working three-shift schedules do, 23.7% of those working in five-shift schedules experience fatigue and 19.1% of the irregular shift workers experience it. Showing that there are substantial differences between fatigue in day and night shift workers. Gastrointestinal disorders are the second most reported health issue, after sleep problems (Wedderburn, 2000). According to Wedderburn (2000), those disorders are mostly caused by the fact that the working times of shift workers interfere with meal times. This leads the employees to either eat at non-biological hours and/or to eat pre-packaged, less healthy food. Also, night workers tend to drink more stimulating (with high caffeine levels) and alcoholic drinks and smoke more. Even though one might expect shift workers to be more absent, because of having more health risks, literature differs on this. A recent study did actually find that either continuous exposure to a two- or three-shift schedule, nor cumulative night shift exposure let to a higher risk of sickness absence (Drongelen, Boot, Hlobil, Beek, & Smid, 2017). On the other hand, the European Survey of Working conditions reported higher absence of shift workers than day workers (Paoli, 1997). In the continuation of this research, the focus will be on the sleep quality of the employees. Many health aspects are hard to measure, for example due to the healthy worker effect, but also due to privacy and subjectivity reasons. Since literature shows that (disturbed) sleep is the major cause of many health problems, the sleep quality will be of interest.

The second category, employee satisfaction, is associated with many causes. Firstly, often employees suffer from tiredness or fatigue, which is caused by insufficient sleep due to the shift schedule. Next to the fact that tiredness and fatigue at work often lead to a risk for safety and thus injuries or accidents and less performance (Tucker & Folkard, 2012), it also has an effect on employee satisfaction. Because it is a day-to-day problem, it is even often a reason for leaving a shift work job (Åkerstedt, 2003; Jansen, Amelsvoort, Kristensen, Brand, & Kant, 2003), indicating they are unsatisfied. Zedeck, Jackson and Summers (1983) found that adaptation is the most important issue in this. Their results showed that if an employee is unable to adapt psychologically within shift working, he/she is more unsatisfied with the schedule and even intend to quit the organisation. On the other hand, the length of the shift has shown to have a negative effect on the satisfaction of the employee, as longer shifts will cause higher job dissatisfaction (Ball, et al.). Moreover, also the type of shift seems to affect the satisfaction, especially employees working the late and early shifts seem to be more unsatisfied (Josten, Ng-A-Tham, & Thierry, 2003).

The employees' work-life balance as a consequence of shift work is associated with the wellbeing of employees and social discomforts (such as no time for family, friends and sports and clubs) caused by shift working. This consequence also originates from the fact that the daily rhythms of most shift workers are not aligned with their social lives and family (Agosti, Andersson, Ejlersson, & Janlöv, 2015). Besides, shift workers often do not have enough

energy to perform family roles sufficiently (Jansen, Kant, Nijhuis, Swaen, & Kristensen, 2004). Costa, Gadbois, Jansen, Knauth and Léonard (2000) also argue this and state that a healthy social and domestic life is a great foundation for good physical and mental well-being, but that shift work often puts a strain on this.

Next to those consequences, there are also some individual characteristics that are said to moderate the effects of shift working. Some of those are age, gender, being a morning or evening type, already suffering from diseases (such as Diabetes Mellitus, Epilepsy or Inflammatory bowel disease) and way of life (Eekelen, Limborgh, & Groen, 2011).

2.2 DESIGN AND COMPENSATION

The end goal of personnel scheduling is having the right (amount of) people, at the right place, at the right time (Dalen & Leede, 2016). Van Dalen & De Leede (2016) distinguish three levels of scheduling: (1) strategic, (2) tactical and (3) operational. On the strategic level alignment with the organisational strategy has to take place. The tactical entails the arrangement of the work processes and the formation of the personnel. On the operational level, the actual resource planning is performed and realised. When designing the schedule, many researches show that it is of great importance to do this on the basis of the characteristics of a shift work schedule as mentioned before.

Within the operational designing of the shift work systems, working time arrangements (WTAs) come into play. These refer to the length and scheduling of a job's working time over a certain period and can be divided in "standard" and "non-standard" (Hoffmann & Greenwood, 2001). Shift work belongs to the latter category, since this category regards those jobs in which working at night or on weekends and early or late starting and exit times are common. Within those working arrangements, we can differentiate between at-the-job availability and on-call availability. There are many types of arrangements, or types of shifts, which require at-the-job availability. The most common types of shift in the Dutch disability sector are: the short-day shift, long-day shift, early shift, evening shift, night shift, short-sleep shift, long-sleep shift, one-hour shift, late-early combination shift, broken shift and the stand-by shift (CAO Gehandicaptenzorg 2016; Leede & Hilst, 2017). In Appendix 1, those eleven types of shift are explained. The first ten of those are at-the-job availability working time arrangement. Only the last one regards on-call availability. Having an on-call job requires that workers are available to work when called with a specific notice (Hoffmann & Greenwood, 2001). Another form of working time arrangement related to shift working, is the concept called self-rostering. This is a rostering method that gives employees more work-time control by planning their own work schedules often through IT software (Garde, et al., 2012). In that way, the working environment meets the needs of individuals better, as it provides more flexibility. However, self-rostering is a relatively new method (especially in the Dutch disability sector) and oftentimes employees view it as advantageous, hence it is important to have strong leadership (Wortley & Grierson-Hill, 2003).

Moreover, several contextual factors influence the design of the shift work schedule. In general, there are the following factors that might influence the schedule. Firstly, the disability sector is a sector with 24/7 need for employees, since the disabled people are in need of 24/7 care. Secondly, the Dutch Working Hours Law (Arbeidstijdenwet) includes regulations on the number of hours someone is allowed to work (continuously). For example, the following rules are in this law (Arbeidstijdenwet, 2017):

- Every 24 hours, an employee gets a daily minimum rest time of 11 hours (continuously). Once a week (seven days) this can be reduced to 8 hours.

- Every five-day work week, an employee gets minimally 36 hours continuous weekly rest. If this is not achieved, there has to be 72 hours continuous rest within fourteen days. More concrete: it is allowed to work 11 days maximum continuously.
- Every night shift, ending after 2:00 AM, an employee gets a continuous rest of 14 hours after the shift ended. Once a week (seven days) this can be reduced to 8 hours.
- After a series of night shifts (3 or more) an employee gets a continuous rest of minimally 46 hours.
- An employee can work a maximum of 7 successive shifts in a series, of which one night shift (can be extended to 8, if agreed upon by collective parties).
- Per 16 weeks, an employee can work a maximum of 36 night shifts ending after 2:00 AM (if agreed upon by collective parties, this can be altered).

Those rules will protect the employee from having to work too much, however they also have an impact on the schedule. Thirdly, also the employee availability influences the schedule, since not everybody is willing to work at night, for example. Lastly, the organisation capacity might have an impact on the work schedule. For example, not being able to hire more employees will lead to more working hours for the existing employees.

Focusing on the compensation for the employees working shift and irregular, of course there is the financial compensation, also called the counter-weight compensation. This is mostly done in the form of a shift allowance, also called an irregularity premium. The current premiums are as follows:

Table 1: Current irregularity premiums (CAO Gehandicaptenzorg 2016)

Day	Time frame	Premium percentage
Monday-Friday	Between 06:00h and 07:00h and between 20:00h and 22:00h	22%
Saturday	Between 06:00h and 08:00h and between 12:00h and 22:00h	38%
Monday-Friday	Between 00:00h and 06:00h and between 22:00h and 24:00h	44%
Saturday	Between 00:00h and 06:00h and between 22:00h and 24:00	49%
Sunday + Holidays	Between 00:00h and 24:00h	60%

These percentages are based upon the hourly wage of the employee. Next to the basis premium, also other allowances are included in the collective agreement. A remarkable statement about this financial compensation was made by Wedderburn (2000), who states that some people will accept the fact that they have to work at night, because they make "real money". This could indicate the moderating effect on the relation between a shift schedule and employee outcomes. In the Dutch disability sector active night work, however, is not compensated with money, but in additional free time (CAO Gehandicaptenzorg 2016). This falls into the second category: counter-value compensation. This form of compensation is about reducing or eliminating the inconveniences of irregular hours or shifts. Within counter-value compensation three levels are identified (Thierry, 1980): (1) reduce or eliminate inconveniences, (2) reducing the consequences of inconveniences, and (3) dealing with the psychological meaning of inconveniences. This first level can be done by having a solid and well thought out shift system design, as explained in the previous paragraph. The second level can be filled in by preventive measures such as (Knauth & Hornberger, 2003): artificial lighting, worker participation (e.g. when introducing a new shift system), good working conditions, alertness and wellness management (measures to enhance alertness during night shifts are for example: contact with colleagues, on-duty naps, exercises, adequate light levels, a cool workplace, music and breaks), education to create awareness of managers and shift workers, health care management and commuting arrangements. For the counter-value compensation, a widely researched method falls into this second level and is called work-time control (WTC). Following earlier work, work-time control is defined as "an employee's

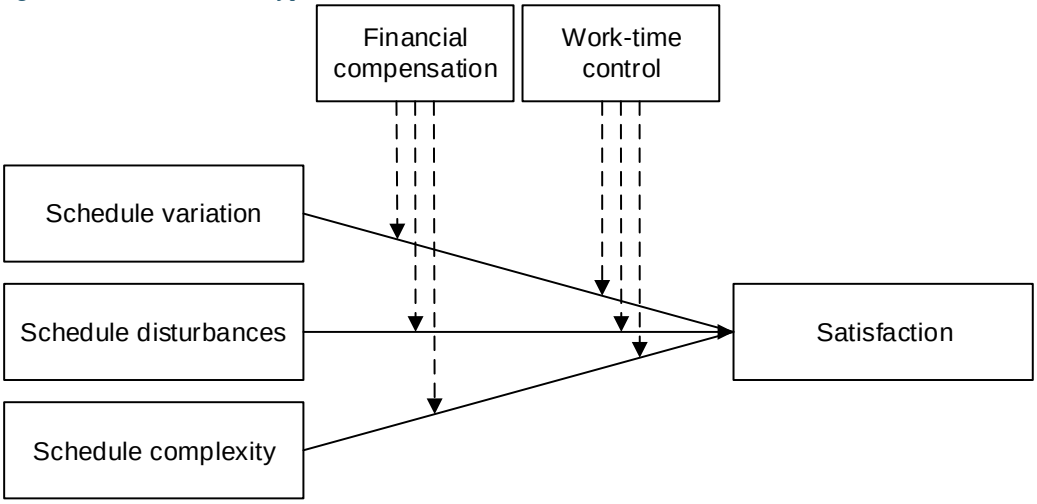
possibilities to control the duration, position, and distribution of his or her work time, that is, autonomy with regard to worktime" (Ingre, Åkerstedt, Ekstedt, & Kecklund, 2012, p. 328). Work-time control can apply to many subdimensions such as, working time, starting and ending time of shifts, distribution of working hours over the week, breaks and vacation and overtime (Nijp, 2016). Work-time control also comes in different quantities, ranging from minimal requested deviations in fixed schedules to full, far-reaching work-time autonomy. The Dutch FNV Bondgenoten (2011) is in favour of more work-time control, as that would possibly have a positive effect on the schedule satisfaction. If, with regard to the third level of counter-value compensation, a shift working employee experiences loss of status, a status-enhancing intervention from the management could be a form of counter-value compensation (Limborgh, 1995). Next to the responsibilities of the organisation with employees that work irregular hours and/or shifts, Knauth and Hornberger (2003) presented some actions an employee himself could take. For example, making sure to sleep well at home by looking into the many recommendations that are available (cutting out noise, making the bed room as dark as possible, sleeping in an adequate bed, having regular bed time habits, etcetera) (Knauth & Hornberger, 2003). Also, a shift worker should pay additional attention to his or her personal health-related behaviour and resources (eating healthy, active living and coping with stress). Lastly, they indicate that family and social support could be important for a shift worker, which could be achieved by planning well with family members and setting times to spend together beforehand. For the management, it is essential to know what the consequences of certain work schedules could be, as this might change productivity, absenteeism, and company costs (Costa, 2010).

2.3 HYPOTHESES

With the foregoing literature as the foundation, the hypotheses for this research are composed. In the literature section, among others, the characteristics of a shift work schedule design are elaborated. In general, these can be split into two parts: characteristics of the schedule (which are schedule variation, schedule disturbances and schedule complexity for this study), and characteristics of the working times, which will be referred to as the working pattern. The characteristics of the schedule and the working patterns, are the independent variables in the research. The dependent variables are the three described employee outcomes: employee satisfaction, employee sleep quality and employee work-life balance. Lastly, the compensation strategies for shift working were elaborated, which come in two forms and have a positive effect on the outcome variables. This research is interested in whether financial compensation and work-time control moderate the relation between the shift schedule system and the employee outcomes mentioned. The research is split into two sets of hypotheses. Within each of those sets, there are three (sub-)hypotheses, one for each of the outcome variables: satisfaction, sleep quality and work-life balance.

The first set of hypotheses focusses on the first group of consequences: the characteristics of the schedule. Hypothesis 1a is formulated: the more satisfied employees are about their (financial) compensation and work-time control in the shift schedule, the weaker the negative effect of schedule variation, disturbances and complexity on the employee satisfaction. This hypothesised relation is pictured in the research model below.

Figure 1: Research model hypothesis 1a



The negative effect of variation and disturbances are based upon the findings of Ingre et al. (2012), who found that employees longing for more regularity and predictability are less satisfied with shift working. Looking at the schedule complexity, the argumentation is as follows. Schedule complexity does not certainly say anything about the job complexity, schedule complexity actually influences the working times. A high complexity means that an employee works many different shifts and thus, has very varying working hours. As this influences, for one, the circadian clock, schedule complexity is expected to have a direct, negative effect on the employee outcomes. Moreover, the expectation is that this effect is linear, implying the higher the complexity (the more varying working hours), the stronger the effect on employee outcomes. Along the same line of reasoning, hypothesis 1b and 1c are written. Less variation, disturbances and complexity in the schedule leave more room for planning of the private life of the employee. In that way, an employee can sleep more regularly and also reserve time for social activities. Because of employees worrying less about, for example making ends meet, due to the good financial compensation, it is expected that the negative effects of variation, disturbances and complexity are reduced and thus employees sleep better. Of course, when an employee has more opportunities to influence his/her own schedule (more work-time control), they are able to minimise the variation, disturbances and complexity, leading to the second moderating effect. This leads to hypothesis 1b: the more satisfied employees are about their (financial) compensation and work-time control in the shift schedule, the weaker the negative effect of schedule variation, disturbances and complexity on the employee sleep quality. The moderating effect of work-time control in hypothesis 1c is expected for the same reasons as in hypothesis 1b. However, the moderating effect of financial compensation on the relation between the schedule characteristics and work-life balance is hard to argue. But for continuity reasons of the study and possible explorative results the effect will be tested anyway. Therefore, hypothesis 1c reads: the more satisfied employees are about their (financial) compensation and work-time control in the shift schedule, the weaker the negative effect of schedule variation, disturbances and complexity on the employee work-life balance. The visualisation of those relations is, subsequently, shown in Figure 2 and Figure 3 on the next page.

Figure 2: Research model hypothesis 1b

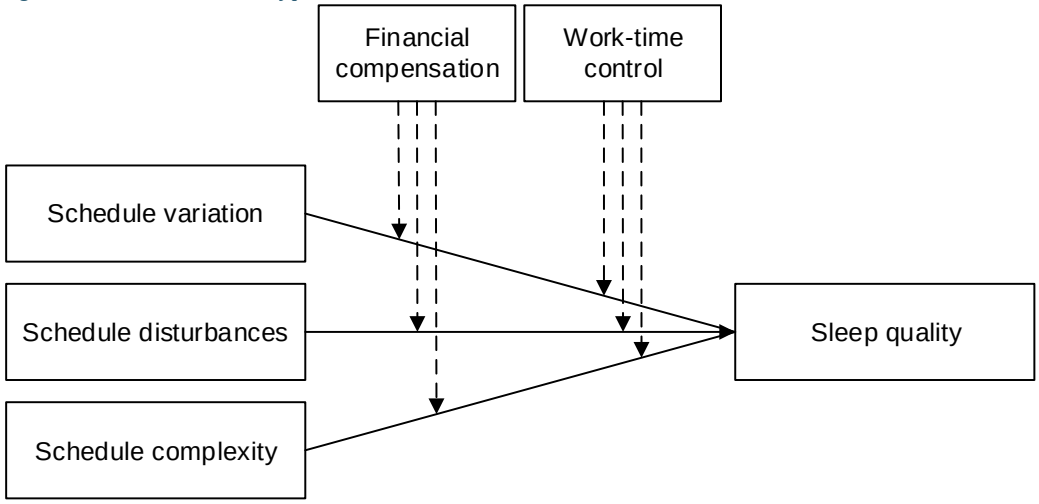
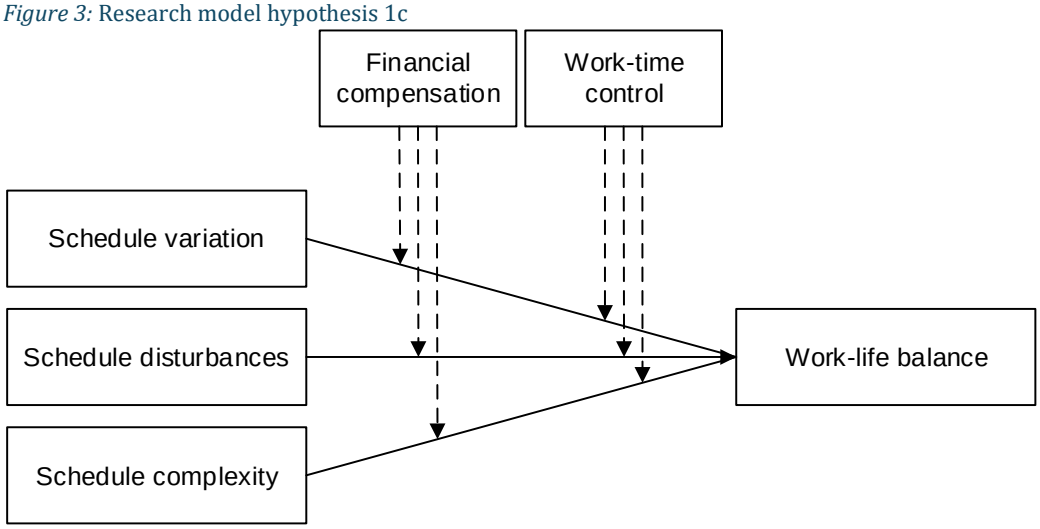


Figure 3: Research model hypothesis 1c



The second set of hypotheses is, as indicated, about the effect of characteristics of the working times, certain working patterns, on the outcome variables. Although this might be related to the schedule complexity characteristic, looking into working patterns intentionally will bring more insights into which working patterns, and thus which working times, have the greatest effect on the employee outcomes. The working patterns are reduced to the five most typical working patterns for the Dutch disability sector, which are the following (Leede & Hilst, 2017):

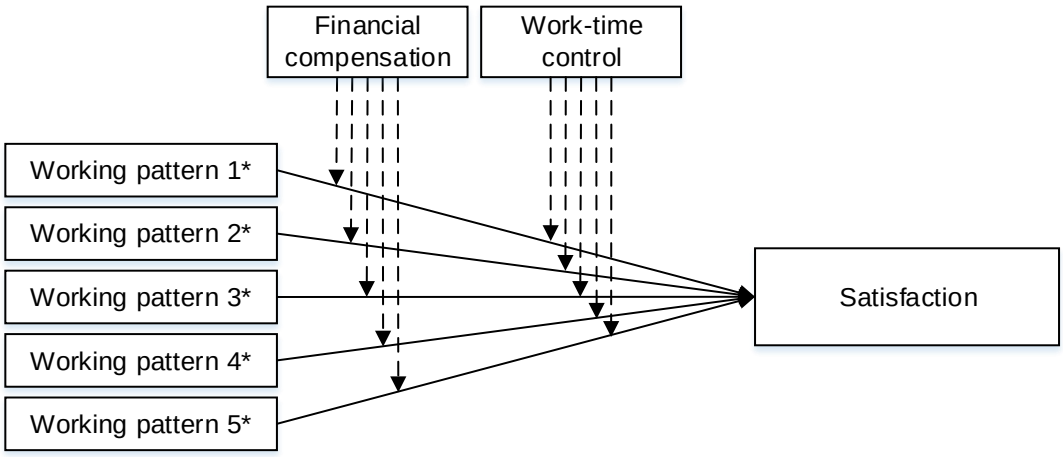
Table 2: Explanation five working patterns

Types of shifts per working pattern	
Working pattern 1	Exclusively on weekdays, during daytime
Working pattern 2	Exclusively on weekdays, during daytime and evenings
Working pattern 3	Exclusively on weekdays and weekends, during daytime and evenings
Working pattern 4	Exclusively on weekdays and weekends, during daytime, evenings and sleep shifts
Working pattern 5	Exclusively on night shifts (active wait)

The working patterns can also be referred to as the shift mix of an employee. In the table above, it can be seen that working pattern 1 to 4 the shift mix gets broader, as there are more types of shifts in this working pattern. Working

pattern 5 is again a small shift mix. The literature section already argued that there is a relation between the shift work schedule and the three employee outcomes. The argumentation for the moderating effects are the same as in hypothesis 1a, b and c. Hypothesis 2a therefore is: the financial compensation and work-time control in the shift schedule, have a positive effect on the relation between each of the five working patterns and the employee satisfaction. The research model for this hypothesis can be found below.

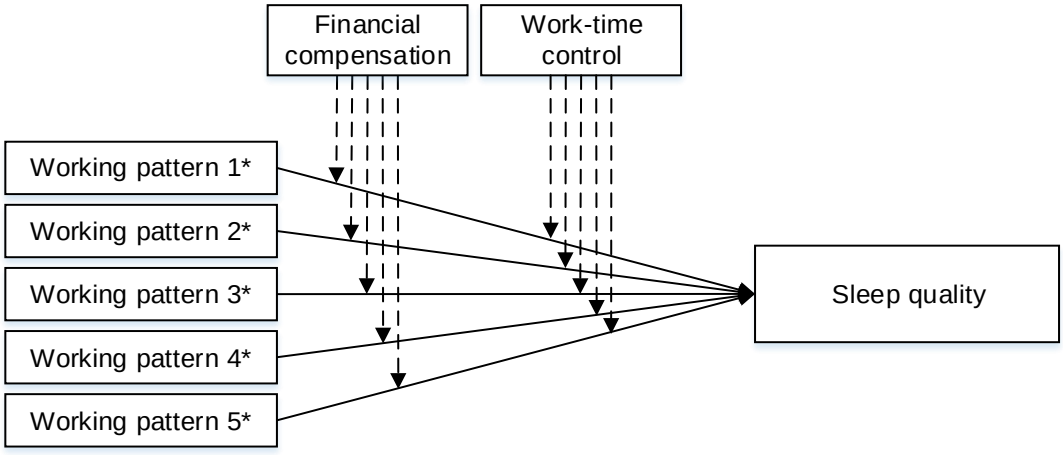
Figure 4: Research model hypothesis 2a



** Explanation of working patterns, see Table 2: Explanation five working patterns*

Just like in the first set of hypotheses, the following two hypotheses focus on the other two dependent variables. Thus, hypothesis 2b reads: the financial compensation and work-time control in the shift schedule, have a positive effect on the relation between each of the five working patterns and the employee sleep quality. The research model belonging to this hypothesis is pictured below.

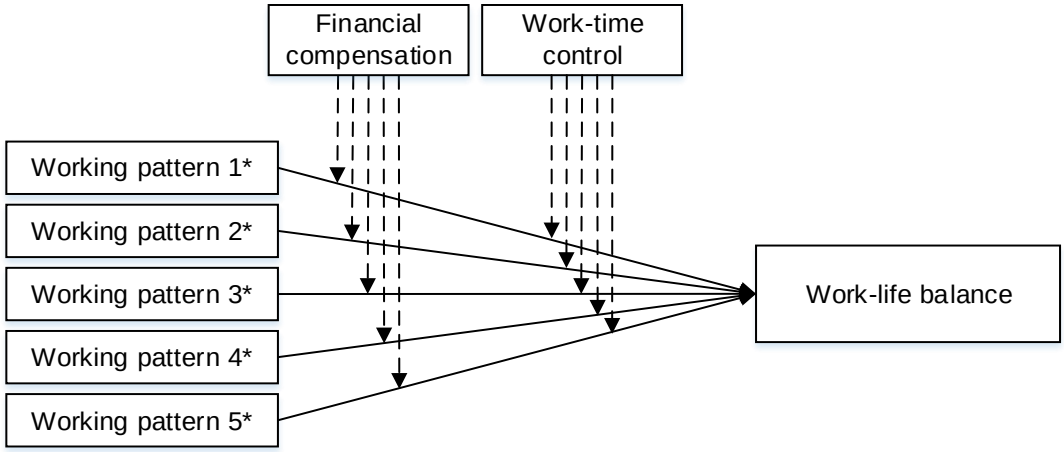
Figure 5: Research model hypothesis 2b



** Explanation of working patterns, see Table 2: Explanation five working patterns*

Lastly, Hypothesis 2c reads: the financial compensation and work-time control in the shift schedule, have a positive effect on the relation between each of the five working patterns and the employee work-life balance. Also, this research model can be found hereafter.

Figure 6: Research model hypothesis 2c



** Explanation of working patterns, see Table 2: Explanation five working patterns*

3 Methodology

3.1 Research design & procedure

For the goal of this study, data had to be collected from a large number of respondents. Therefore, the research was designed as a survey, as the data was gathered through observations, instead of interventions. To be more specific, a cross-sectional survey was performed, due to the fact that there was only one moment of observation and several different relevant actors in the sector were researched (for example, different positions and number of years work experience). Since the study was interested in the current situation and opinions on shift work of the various actors, this was the adequate design.

Prior to this graduation research, case studies within the Dutch disability sector were performed within the project "Onregelmatig werken in de gehandicaptenzorg" by ModernWorkx and BvHilst BV. Results from this in-depth and detailed investigation of several institutions, formed the basis for the current study, as these highlighted the most relevant topics with regard to shift working from the perspective of the employees. Together with topics from literature, the questionnaire was composed. Since questionnaires are an obtrusive, non-verbal method, it was very important to compose the questions in a clear, non-suggestive and non-controversial way. The questionnaire was composed (solely) in Dutch and distributed through the professional digital survey system LimeSurvey. All employees working in the disability sector in the Netherlands could enter the questionnaire. Due to privacy reasons, it was not personally send to the employees, but solely distributed through a link in for example newsletters. The questionnaire was open from 26 June 2017 up and including 19 Augustus 2017. In Appendix 2 the complete questionnaire can be found (in Dutch). The questionnaire started with an introduction text, which informed the respondents about the purpose of the study and the confidentiality and anonymity of the data collection, also an indication of the time needed to fill in the questionnaire was given. Hereafter, all the topics of interest followed. The first, second and third page contained demographic and (subsequently) organisational questions and questions about the schedule of the employee. The fourth page measured the employee satisfaction about various aspects of the working times and schedule. After this, the experienced comforts and discomforts from shift working were measured. The sixth page measured the employees' opinions about the different forms of compensation and alternative ways of compensation. On the final page, the employees were asked to fill in through which way they found the questionnaire and were given the opportunity to add any further comments or explanations.

For this research, it was essential to keep in mind the healthy worker effect (HWE). The HWE is a potential bias within occupational health research (Birkeland Nielsen & Knardahl, 2016). This effect means that participants of a survey often show a better health status and lower overall death rates than the general population, because the severely ill and disabled people are not participating (McMichael, 1976).

3.2 Sample & participants

The data for this research was gathered from different disability firms in the Netherlands. All types of employees involved in this sector, were of interest. Specifically, the employees were targeted because the study firstly aims to gather the employees' perceptions on the various aspects of shift working. Also, the variables in the model regard

employee outcomes. The intention was to receive a response on the questionnaire of 1000. The participants of interest were all employees, no matter in which position, working in a disability organisation. In total, 6552 employees completed the survey completely.

Table 3 shows the majority of the demographics of this sample. It stands out that, as one would expect in this sector, the sample consists of a rather large number of female respondents (n=5507, 84.1%). For anonymity purposes, only age categories were asked, so an average age cannot be calculated, but the table shows that most employees are in the 25 to 39 years age group, which is also the majority of the labour force. The next table presents the distribution of age and gender and shows that in the older age category, there are a little more men.

Table 3: Distribution age and gender (N=6552)

	Gender		
Age	Female	Male	Total
>55	78%	22%	15%
40-54	83%	17%	32%
25-39	86%	14%	44%
<25	89%	11%	9%
Total	84%	16%	

Continuing, Table 5 (next page) shows most of the demographic features of the sample. The majority of the sample is experienced in the sector, as 82.5% of them fall into the 5 to 15 years and more than 15 years tenure groups. Also, most employees work 24 hours per week or more. Of the respondents, 88% has a permanent contract, 8% has a temporary contract and the other types are limited. However, almost halve of the respondents says to work 2 to 8 hours overtime per week. Some personal circumstances of the employees were asked. For mantle care for example, most of the employees do not perform mantle care. The distribution of male and female within mantle care is in line with the overall gender distribution. The daily commuting time is for only 9% of the employees more than 1 hour, even 51% of them has a commuting time of under 30 minutes.

For the positions of the respondents (Table 4), the vast majority are the employees that actually attend the clients and therefore have to deal with the most irregular schedules. This regards the positions of (personal) mentor, assisted living and assistant mentor. In the same table, the working environments of the employees are presented. It shows that most of the respondents work in the housing care (85.2%), and especially the intensive housing care.

Table 4: Demographics of sample continued (position and work environment)

Position	Total N = 6552 (%)
Outpatient mentor	N = 146 (2.2)
Assisted living	N = 930 (14.2)
Assistent mentor	N = 559 (8.5)
(Personal) mentor	N = 3612 (55.1)
Senior/coordinating mentor	N = 396 (6.0)
Therapist	N = 42 (0.6)
Supervisor	N = 176 (2.7)
Office/staff	N = 102 (1.6)
Facilities	N = 44 (0.7)
Other	N = 545 (8.3)

Environment	Total N = 6552 (%)
Housing care: intensive	N = 3743 (57.1)
Housing care: slightly disabled	N = 1844 (28.1)
Outpatient facility	N = 266 (4.1)
Daycare	N = 258 (3.9)
Therapy	N = 224 (3.4)
Facilities/kitchen	N = 39 (0.6)
Office/staff	N = 178 (2.7)

Table 5: Demographics of sample

Demographic construct	Total *N* = 6552 (%)				
Gender	Female N = 5507 (84.1)		Male N = 1045 (15.9)		
Age	> 1962 N = 987 (15.1)	1961 - 1977 N = 2101 (32.1)	1976 - 1992 N = 2898 (44.2)	< 1992 N = 566 (8.6)	
Tenure (in disability sector)	< 1 year N = 164 (2.5)	1 = 5 years N = 980 (15.0)	5 - 15 years N = 2702 (41.2)	> 15 years N = 2706 (41.3)	
Working hours per week (average)	< 8 N = 65 (1.0)	8 - 16 N = 181 (2.8)	16 - 24 N = 1195 (18.2)	24 - 32 N = 3001 (45.8)	> 32 N = 2110 (32.2)
Type of contract	Permanent N = 5773 (88.1)	Temporary N = 537 (8.2)	Min-max N = 141 (2.2)	Reserve/on-call N = 94 (1,4)	Empl. agency N = 7 (0.1)
Household situation	Married, with children N = 2643 (40.3)	Married, without children N = 1569 (23.9)	Single parent N = 352 (5.4)	Single N = 1156 (17.6)	
Mantle care	No N = 4617 (70.5)	< 8 hours per week N = 1526 (23.3)	8 - 16 hours per week N = 305 (4.7)	> 16 hours per week N = 104 (1.6)	
Overtime	None N = 993 (15.2)	< 2 hours per week N = 1800 (27.5)	2 - 8 hours per week N = 3161 (48.2)	> 8 hours per week N = 598 (9.1)	
Daily commuting time	< 30 minutes N = 3343 (51.0)		30 - 60 minutes N = 2603 (39.7)		> 60 minutes N = 606 (9.2)
Organisation size	< 100 N = 193 (2.9)	100 - 500 N = 787 (12.0)	500 - 1500 N = 1964 (30.0)	1500 - 3000 N = 2005 (30.6)	> 3000 N = 1603 (24.5)

3.3 OPERATIONALISATION

This section describes the measures and operationalisation of the constructs used in the hypotheses of this study. The next table gives an overview of the measured constructs.

Table 6: Constructs

Constructs			
Independent variables	Moderating variables	Dependent variables	Control variables
Schedule variation	Financial compensation	Schedule satisfaction	Age
Schedule disturbances	Work-time control	Sleep quality	Contract hours
Schedule complexity		Work-life balance	Target group complexity
Working pattern 1 - 5			

The amount of schedule variation and schedule disturbances experienced by the employees, were measured both by a single item in the questionnaire on 4-point scales. The schedule complexity construct is a sum-variable of all the different types of shifts an employee indicated whether or not they worked. Thus, the higher the score on schedule complexity, the more complex the schedule is. The previously mentioned eleven various types of shift were in the questionnaire measured by a four-point Likert scale. As this does not indicate whether or not an employee works the type of shifts, it was decided that the scores “never” and “sometimes” would imply that an employee did not work that type of shift. “Sometimes” was included here, as those shifts are not really part of the structured

schedule of an employee. The scores "regularly" and "always" are counted as "yes". The intention was to view these three constructs as one single one. Thus, a factor analysis was performed which showed that they loaded on one factor. Unfortunately, this factor did not meet the reliability requirement of a Cronbach's Alpha of 0.7 or higher (Field, 2013). Therefore, the analysis was continued by using "schedule variation", "schedule disturbances" and "schedule complexity" as separate variables.

The five working patterns (Table 7) are based on the employees indicating for each of the seven days whether or not they work, as well as the eleven identified shift types the working patterns could be computed. Here also, the scores "never" and "sometimes" were counted as "no" and the scores "regularly" and "always" as "yes". Leaving the category "sometimes" out, was chosen because the research is interested in the actual schedules, and not in incidental shifts. This was a complicated process, as the intention was to produce variables that indicate that an employee exclusively works those kinds of shifts. Therefore, formulas were composed which excluded the one type of shift, but included the other. To explain this further, in Appendix 3 the SPSS syntaxes for the computation of these variables are given.

Table 7: Five working patterns, including occurrence

Types of shifts per working pattern		
		Occurrence
Working pattern 1	Exclusively on weekdays, during daytime (traditional office times)	8%
Working pattern 2	Exclusively on weekdays, during daytime and evenings	5%
Working pattern 3	Exclusively on weekdays and weekends, during daytime and evenings	42%
Working pattern 4	Exclusively on weekdays and weekends, during daytime, evenings and sleep shifts	21%
Working pattern 5	Exclusively on night shifts (active wait)	3%

These occurrence-percentages do not add up to 100%, this is due to the fact that the answer category "sometimes" is left out, as explained.

The first moderating variable is called "financial compensation" and is measured by the satisfaction of the employees about the financial compensation. The variable is computed using average of the four items that measure the satisfaction about the different aspects of compensation (the premium, and the compensation for stand-by, moved and sleep shifts). Here for, a factor analysis was performed which showed that these four items together indeed expressed the compensation satisfaction.

Table 8: Factor loadings for Principal Component Analysis for "compensation satisfaction"

Variables		
		Component 1
1.	Satisfaction about the current irregularity premium	0.830
2.	Satisfaction about the current compensation for stand by shifts	0.842
3.	Satisfaction about the current compensation for moved shifts	0.856
4.	Satisfaction about the current compensation for sleep shifts	0.862

This variable turned out to be a reliable scale, shown by the Cronbach's Alpha of 0.869. Lastly, the sum scores for the four items were created. Looking at the second moderating variable "work-time control", this was measured by one single item that indicated the satisfaction of the employee about the amount of work-time control in the schedule. This item had a five-point Likert scale.

The first dependent variable, "employee satisfaction", was measured by one single item, on a 5-point Likert scale. Employee health is, as mentioned before, indicated in the questionnaire by the sleep quality of the employees. For this, employees were asked to indicate their sleep quality after working certain shifts. Unfortunately, factor analysis of those six items showed that those did not measure sleep quality as one construct. Also, the extraction method or rotation did not change the outcome. Table 9 shows the results of the factor analysis for this construct.

Table 9: Factor loadings for Principal Component Analysis for "sleep quality"

Variables			
		Component 1	Component 2
1.	Quality of sleep after a day shift	0.569	0.521
2.	Quality of sleep after an evening shift	0.733	0.174
3.	Quality of sleep after a night shift (active wait)	0.839	-0.176
4.	Quality of sleep during a short sleep shift	0.893	-0.314
5.	Quality of sleep during a long sleep shift	0.891	-0.328
6.	Quality of sleep after a free day	0.393	0.756

Component 1 was labelled "sleep quality after work" and component 2 "sleep quality when free", for which the sum scores were created. The five items in component 1 are a reliable scale, as they have a Cronbach's Alpha of 0,857. Since the study is interested in the effect of shift working on sleep quality instead of the sleep quality when an employee does not work, in the further research the variable of "sleep quality after work" will be used. So, when "the sleep quality" is mentioned, it actually refers to the quality of an employees' sleep after they worked any kind of shift. As explained in the theoretical framework, work-life balance is an indicator of the wellbeing of an employee. The work-life balance of the employee was measured in the questionnaire by a single item, on a five-point Likert scale.

In the questionnaire, many control variables were included. Those were mainly used to be able to describe the sample. In the analysis, control variables can be used to test for confounding factors that might alter the outcome of the effect on the dependent variable. The control variables from the questionnaire that are used in the further analysis are: age, contract hours and target group complexity. Of which the latter one was computed by a sum-score of the number of target groups an employee works with.

3.4 DATA ANALYSIS

In order to gain the intended insights and results, the data will be further analysed. This is done on the basis of the Pearson's correlation coefficient and linear regression analysis. The Pearson's correlation coefficient is a measure of strength of a linear association between two variables. By using this, first insights can be gained in the cohesion between the different schedule characteristics and the employee outcomes. A linear regression analysis tests the linear dependency between a dependent variable and one or more independent variables. In this case it is a multiple regression analysis, because there are more than one independent variables. The regression predicts the change in a dependent variable caused by a change in the independent variable(s). Using regression analysis, the hypothesis can be tested, as the study is interested in the effect of some independent variables on three different dependent variables.

4 Results

After describing the current situation of shift working in the Dutch disability sector, the purpose of the research was twofold: on the one hand, the design of the shift work schedule was of interest, on the other hand the goal was to find out how shift work could best be compensated for. The first part of this chapter will present the current state of shift working in the Dutch disability sector and present the opinions and perceptions of the employees on how shift work should be compensated. The second part of this chapter will contain the testing of the hypotheses, using regression analyses. Lastly, also some further analysis was performed and thus will be reported here.

4.1 DESCRIPTIVES

Overall it became clear that the sample was relatively satisfied with their shift working. As Table 10 below shows, 70% of the respondents is satisfied with working shifts in general, resulting in an average satisfaction of 3.87 (on a five-point scale).

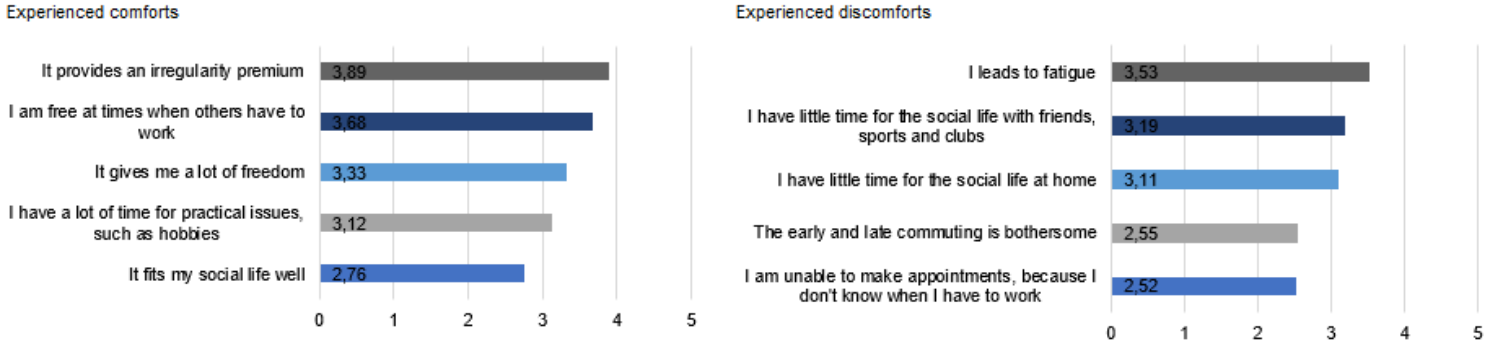
Table 10: Frequencies of shift work satisfaction

			N = 6552 (%)		
	Very unsatisfied	Unsatisfied	Neither, nor	Satisfied	Very satisfied
Shift work satisfaction	N = 281 (4.3)	N = 881 (13.4)	N = 748 (11.4)	N = 2112 (32.2)	N = 2494 (38.1)

The measure for the health of the employees was their experienced sleep quality, as mentioned in the method section. The average experienced sleep quality was 2.57 (on a four-point scale). The last dependent variable, is the work-life balance of the respondents. The average score on this item is 3.37 (on a five-point scale). When putting those in proportion, the shift working satisfaction is scored the highest (0.774), followed by the work-life balance (0.674) and lastly the sleep quality (0.643).

The respondents indicated the biggest comforts and discomforts from working shift work schedules. For both the comforts and discomforts, five types were selected, based on the previously mentioned case studies (Leede & Hilst, 2017). Figure 7 shows these results, the irregularity premium is the biggest comfort from shift working and the fatigue is the biggest discomfort.

Figure 7: Experienced comforts and discomforts from shift working (N=6552; five-point scale).



4.1.1 Shift work schedule design

In the theoretical framework, many characteristics of a shift work schedule were described. Many of those were also measured by the questionnaire. Firstly, the number of different shift types in the schedule, which in this research was called the schedule complexity. Table 11 shows that on average, an employee has 3.23 different types of shifts in his/her schedule.

Table 11: Descriptives of schedule complexity

	N = 6552	
	M	SD
Schedule compexity	3.23	1.50

On a 11-point scale: maximum of 11 types of shifts measured

As a second characteristic, the average number of shift changes within sequences was measured. Most of the employees experience these short-term disturbances only once per month. But, still 5% experiences disturbances on a daily basis.

Table 12: Frequencies of schedule disturbances

	N = 6552 (%)			
	Never	Once a month	Once a week	Daily
Schedule disturbances	N = 1113 (17.0)	N = 3325 (50.7)	N = 1762 (26.9)	N = 352 (5.4)

Next to this, also 27% of the respondents indicated that they had to return to work often on their days off. The results on the yearly working hours variation within the schedule are presented in Table 13 below. Almost halve of the respondents (45%) experiences a lot of variation throughout the year, without a fixed pattern. This means that an employee does not have often the same shifts and working days in his/her schedule, which requires a lot of adaptation from the employee.

Table 13: Frequencies of schedule variation

N = 6552 (%)	
	Yearly working hours variation
Almost always on the same days/times	N = 441 (6.7)
Some variation, with set pattern	N = 1620 (24.7)
Much variation, with set pattern	N = 1525 (23.3)
Much variation, without set pattern	N = 2966 (45.3)

Table 14 shows the current schedule duration of the respondents. For most of them, the current schedule runs for 1 to 3 months, which is not too short.

Table 14: Frequencies of schedule duration

N = 6552 (%)	
	Schedule duration
1 week	N = 154 (2.4)
2 to 4 weeks	N = 2119 (32.3)
1 to 3 months	N = 3461 (52.8)
3 months or longer	N = 818 (12.5)

Furthermore, the publication period of the schedule is of influence, see Table 15. This implies how long before the start of the schedule the schedule is published. Obviously, when the publication period is shorter, this requires more adaption capacity from the employee. However, for most of the respondents, the schedule is published between 1 month and 3 months prior to the start of the schedule (76%), which is very reasonable. However, the collective agreement for the Dutch disability sector states the schedule should be published at least 21 days before the start of that schedule (article 6.6, section 3). Still in 11.3% of the cases, this requirement is not met. This is sometimes

allowed, when due to the nature of the work it is not possible to publish the schedule that far ahead. It is questionable whether this is the case for all of this 11.3%.

Table 15: Frequencies of schedule publication period

N = 6552 (%)	
	Publication period
Less than a week prior	N = 167 (2.5)
At least 1 week prior	N = 170 (2.6)
At least 2 weeks prior	N = 409 (6.2)
At least 3 weeks prior	N = 826 (12.6)
At least 1 month prior	N = 2369 (36.2)
At least 2 months prior	N = 1655 (25.3)
At least 3 months prior	N = 956 (14.6)

Another characteristic of a shift work schedule is the proportion of various shifts types (e.g. early shift, morning, day, late, evening, night) and the proportion of shifts with different length (e.g. 4 hours, 8 hours, extended 9 hours), Table 16 shows that the long day shift, evening shift and late-early combination shift have a relative high occurrence.

Table 16: Frequencies of occurrence of type of shift

Type of shift	N = 6552 (%)			
	Never	Sometimes	Regularly	Always
Short day (≤ 4 hours)	N = 2621 (40.0)	N = 2440 (37.2)	N = 1401 (21.4)	N = 90 (1.4)
Long day (> 4 hours)	N = 348 (5.3)	N = 791 (12.1)	N = 3569 (54.5)	N = 1844 (28.1)
Early (start before 7:00 a.m.)	N = 3669 (56.0)	N = 1012 (15.4)	N = 1687 (25.7)	184 (2.8)
Evening	N = 593 (9.1)	N = 565 (8.6)	N = 4736 (72.3)	N = 658 (10.0)
Night	N = 5434 (82.9)	N = 618 (9.4)	N = 272 (4.2)	N = 228 (3.5)
Short sleep (in total ≤ 12 hours present)	N = 5274 (80.5)	N = 537 (8.2)	N = 642 (9.8)	N = 99 (1.5)
Long sleep (in total > 12 hours present)	N = 4202 (64.1)	N = 555 (8.5)	N = 1533 (23.4)	N = 262 (4.0)
One-hour	N = 3393 (51.8)	N = 2528 (38.6)	N = 597 (9.1)	N = 34 (0.5)
Stand by	N = 5497 (83.9)	N = 726 (11.1)	N = 265 (4.0)	N = 64 (1.0)
Late-early combination	N = 1774 (27.1)	N = 2232 (34.1)	N = 2384 (36.4)	N = 162 (2.5)
Broken	N = 4353 (66.4)	N = 1741 (26.6)	N = 413 (6.3)	N = 45 (0.7)

The average working time per week is presented in the next table. As already mentioned in the description of the sample, most respondents (78%) work more than 24 hours per week. Still, most employees are working part-time, but the very small contracts of only a few hours per week, are scarce.

Table 17: Frequencies of working hours per week

	N = 6552 (%)				
	< 8	8 - 16	16 - 24	24 - 32	> 32
Hours per week	N = 65 (1.0)	N = 181 (2.8)	N = 1195 (18.2)	N = 3001 (45.8)	N = 2110 (32.2)

Table 18 presents the satisfaction of the respondents about some schedule components. It is clear that overall, employees are quite satisfied about all of those components. Also, in general 70% of the respondents is satisfied about shift working. The table below also shows the results for two last characteristics of a schedule, the proportion of weekends off and proportion of weekends with a single day off. The proportion of weekends off scores a mean of 3.62 and the proportion of halve free weekend (one day off) a mean of 3.36. On a 5-point Likert scale, these are above average satisfied, indicating that the proportions are good as they are.

Table 18: Descriptives of satisfaction about schedule characteristics

Satisfaction about…	N	M	SD
Number of consecutive day shifts	5685	3.87	1.14
Number of consecutive late shifts	5649	3.81	1.17
Number of night shifts	1589	4.01	1.12
Number of short sleep shifts	1216	3.82	1.18
Number of long sleep shifts	2314	3.89	1.19
Number of stand by shifts	1083	3.65	1.23
Number of one-hour shifts	3149	3.12	1.24
Number of free weekends (both days)	6154	3.62	1.31
Number of halve free weekends (one day)	4400	3.36	1.30
Variation in (types of) shifts	6007	3.82	1.15
Publication period of the schedule	6296	3.77	1.38

On a 5-point scale, 0 = d.n.a., left out

The respondents were also asked to score some of the aspects of the schedule. Table 19 below presents these statements. Out of these statements, employees value (work-time) control the most, with 94% compared to 88.5% for the possibility to swap or exchange shifts.

Table 19: Frequencies aspects of schedule

		N = 6552 (%)				
Important in my schedule is:	M	Completely disagree	Disagree	Agree nor disagree	Agree	Completely agree
(Work-time) control	4.32	N = 40 (0.6)	N = 72 (1.1)	N = 279 (4.3)	N = 3508 (53.5)	N = 2653 (40.5)
Swap shifts	4.18	N = 59 (0.9)	N = 159 (2.4)	N = 535 (8.2)	N = 3595 (54.9)	N = 2204 (33.6)
Predictability	3.84	N = 120 (1.8)	N = 523 (8.0)	N = 1125 (17.2)	N = 3281 (50.1)	N = 1503 (22.9)
Regularity	3.67	N = 201 (3.1)	N = 809 (12.3)	N = 1386 (21.2)	N = 2724 (41.6)	N = 1432 (21.9)

4.1.2 Shift work compensation

This section will focus on the opinion of the respondents on the compensation for the shift work. Two kinds of compensation were distinguished: counter-weight and counter-value compensation. This first kind is about the financial compensation for shift working. The average satisfaction about the financial compensation (the irregularity premium) for shift working is 2.52 (on a five-point scale), this stands out compared to the average satisfaction on the work-time control satisfaction of 3,76 (also five-point scale). Furthermore, still focusing on the counter-weight compensation, the results from the questionnaire show that most components are valued below average. Only the current irregularity premium is scored above average.

Table 20: Descriptives and frequencies satisfaction compensation components

Satisfaction about the current…	N	M	SD	Very unsatisfied	Unsatisfied	Neither, nor	Satisfied	Very satisfied
Irregularity premium	6246	2.90	1.24	N = 900 (13.7)	N = 1800 (27.5)	N = 1171 (17.9)	N = 1759 (26.8)	N = 616 (9.4)
Compensation for stand by shifts	1219	2.36	1.20	N = 369 (5.6)	N = 354 (5.4)	N = 244 (3.7)	N = 194 (3.0)	N = 58 (0.9)
Compensation for moved shifts	4562	2.48	1.25	N = 1318 (20.1)	N = 1139 (17.4)	N = 988 (15.1)	N = 833 (12.7)	N = 284 (4.3)
Compensation for sleep shifts	2759	2.44	1.273	N = 838 (12.8)	N = 762 (11.6)	N = 420 (6.4)	N = 580 (8.9)	N = 159 (2.4)

Remainder: does not apply; measured on a 5-point scale

Looking at the satisfaction about counter-value compensation, measured by the work-time control satisfaction, the following table shows that 64.5% is satisfied with the current work-time control.

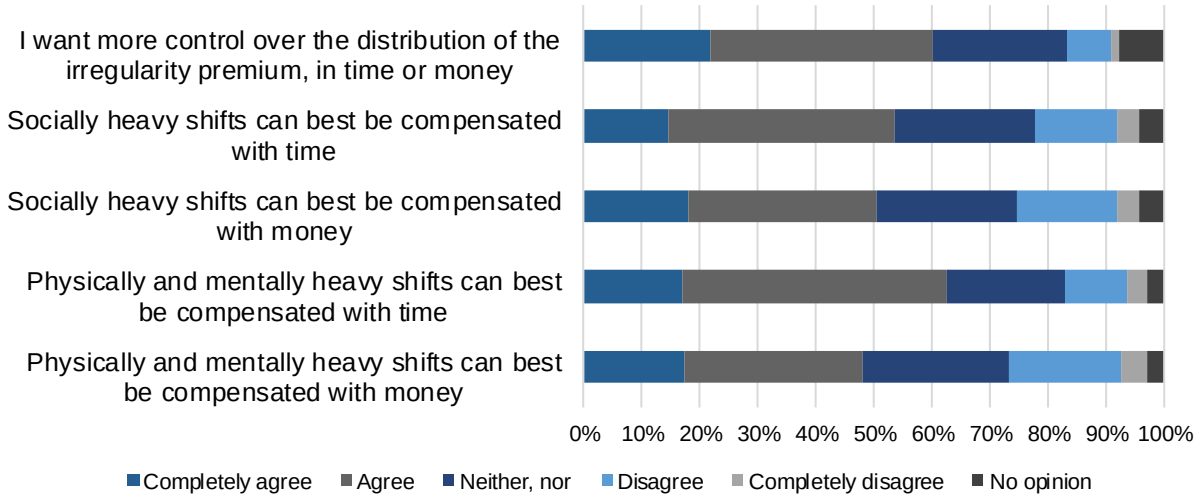
Table 21: Frequencies work-time control satisfaction

			N = 6329 (%)		
	Very unsatisfied	Unsatisfied	Neither, nor	Satisfied	Very satisfied
Work-time control satisfaction	N = 552 (8.4)	N = 855 (13.0)	N = 695 (10.6)	N = 1706 (26.0)	N = 2521 (38.5)

Remainder: does not apply

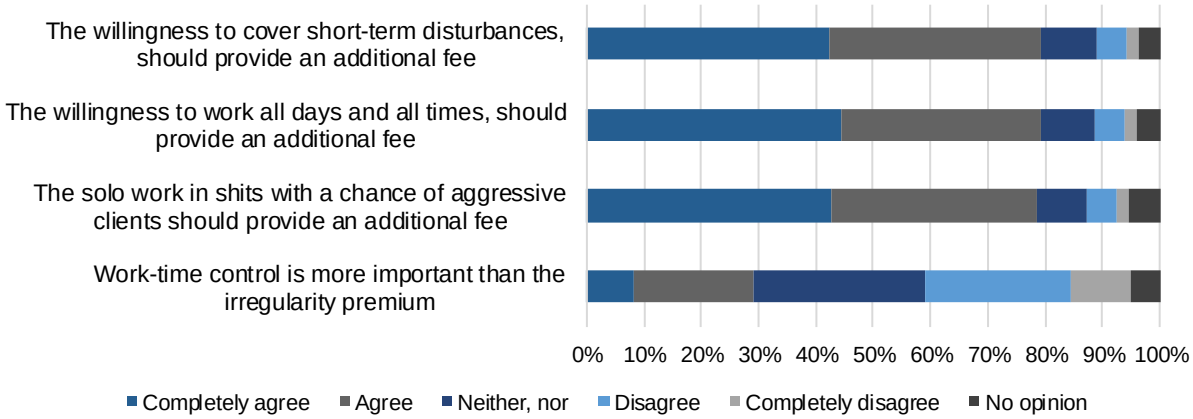
Also, some alternative forms of compensation were included in the questionnaire. The time-money conversion does not present a very clear image (Figure 8). There are almost as many respondents saying socially heavy shifts should be compensated with time as there are that say this should be done with money. For the physically heavy shifts the respondents are a little bit more distinct, in favour of compensation with time. Looking at the first statement, shows that a fast majority of the employees would want more control and say in how they would receive the irregularity premium,

Figure 8: Opinions about time-money as compensation



Some other statements about alternatives for compensation, regarded a few extra conditions under which an extra premium could be provided. Also, one statement about the consideration between work-time control or the irregularity premium was added. The next table presents the results on these.

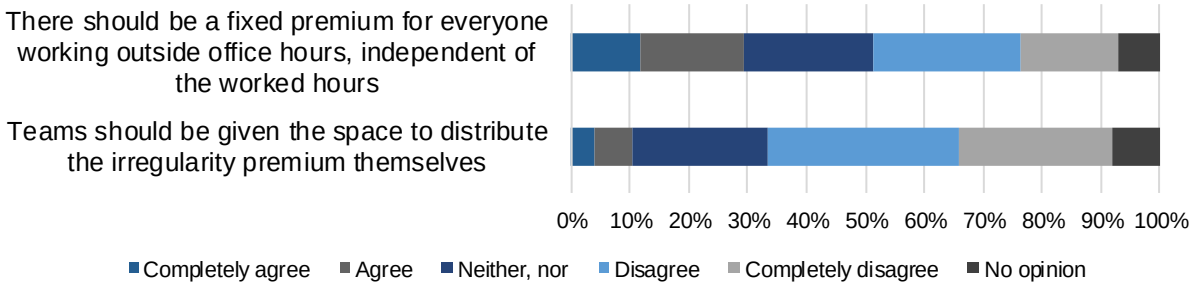
Figure 9: Opinions about alternative forms of compensation



A fast majority of the respondents is in favour of the three conditions under which an extra premium could be provided, the scores here are comparable. However, the employees do not want work-time control at the expense of the financial compensation, even though the previous figure showed that the employees value work-time control

highly. Only 30% of the respondents still wants more work-time control if that limits the financial compensation. Lastly, the employees were asked for their opinion about different distributions of the irregularity premium. Figure 10 below shows that most employees do not want a fixed premium for everyone working outside office hours. Like so, an even smaller minority is in favour of distributing the premium themselves within the teams.

Figure 10: Opinions about different distribution of irregularity premium



4.2 CORRELATIONS

In Table 22 (next page), the means, standard deviations and correlations for many variables are presented. Various significant correlations are found, which suggest certain relationships. However, there are also many significant but very weak correlations, which implies that these relationships are very weak in the dataset. Nevertheless, because a large sample of respondents was used, these correlations are likely to be indicators of true relationships among the variables. In this report, only the significant and most relevant correlations will be discussed. Up front, one note has to be made regarding the strong negative correlation between age and tenure, which might seem strange. Since age was measured in such a way that 1 presented the oldest employees, this correlation matches the expectations.

The most outstanding correlations are found within the independent variables and dependent variables. None of the control variables showed to have strong correlations with any of the dependent variables (or independent variables). This first section will look at the independent variables. The three characteristics of the schedule design (schedule complexity, schedule variation and schedule disturbances) all correlate negatively with the three dependent variables. However, not all of these are significant and some are close to zero, which implies that those correlations are weak. Still, for those where the correlation is significant, this means that when there is more complexity, variation and/or disturbances, the schedule satisfaction, sleep quality and work-life balance will decrease. This aligns with the expectations. Furthermore, the five working patterns do not show strong correlations with the three dependent variables. None of the correlations here with sleep quality are significant. The only possible conclusions are that, working pattern 1 and 5 correlate positively with schedule satisfaction and work-life balance and working pattern 3 negatively. This would mean that when employees work more schedules aligned with working pattern 1 and 5 are more satisfied and have a better work-life balance. Accordingly, employees that work more schedule such as working pattern 3 would experience a worse satisfaction and work-life balance.

Some other remarkable correlations are that satisfaction about the work-time control in the schedule correlates positively with work-life balance ($r=0.462$, $p<0.01$). This suggests that the more an employee is satisfied with their work-time control in the schedule, the better their work-life balance is. This of course makes sense, as employees then probably have more space to work at the moment it suites their private schedule. The satisfaction about the work-time control also correlated positively with the sleep quality ($r=0.328$, $p<0.01$).

Table 22: Means, standard deviations and correlations

Variables	N	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9a.	9b	10.	11.	12.	13.	14.	15a.	15b.	15c.	15d.	15e.	16.	17.
1. Tenure[a]	6552	3.21	.786	1.00																					
2. Age[a]	6552	2.46	.850	-.587***	1.00																				
3. Contract hours[b]	6552	4.05	.837	.027**	.013	1.00																			
4. Organisation size[b]	6552	3.62	1.069	.040***	.016	.135***	1.00																		
5. Target group complexity[c]	6552	2.99	1.766	.026**	.000	-.040***	-.002	1.00																	
6. Schedule satisfaction[b]	6516	3.87	1.187	.013	-.018	-.043***	-.020	.013	1.00																
7. Work-life balance[b]	6552	3.37	1.006	.062***	-.093***	-.078***	-.015	-.014	.497***	1.00															
8. Sleep quality[e]	399	12.85	3.726	-.016	0.008	.029	-.034	-.095*	.378***	.326***	1.00														
Comforts (experienced)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9a. - Financial[b]	6552	3.89	.958	-.064***	.104***	.005	.013	.015	.059***	.066***	.193***	1.00													
9b. - Practical[b]	6552	3.07	.864	.090***	-.126***	-072***	-.004	-.024*	.421***	.595***	.444***	.171***	1.00												
10. Discomforts (experienced)[b]	6552	2.98	.801	-.055***	.088***	.054***	.010	.022	-.425***	-.566**	-.518***	-.043***	-.636***	1.00											
11. Schedule complexity[d]	6552	3.23	1.499	-.070***	.114***	.051***	.004	-.024*	-.171***	-.194***	-.064	.101***	-.128***	.164***	1.00										
12. Working hours variation[a]	6552	3.07	.982	-.124***	.137***	.055***	.068***	-.014	-.212***	-.213***	-.019	.121***	-.140***	.175***	.263***	1.00									
13. Schedule disturbances[a]	6552	1.21	.782	0.012	.028**	.063***	.018	.038***	-.257***	-.219***	-.165***	-.029**	-.189***	.235***	.163***	.157***	1.00								
14. Late-Early combination[a]	6552	0.39	.487	-.060***	.120***	.060***	.017	.001	-.164***	-.197***	-.077	.071***	-.147***	.165***	.549***	.172***	.148***	1.00							
Working pattern	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15a. - 1. WkD	6552	0.08	.271	.044***	-.102***	.005	-.017	-.014	.136***	.191***	-.011	-.310***	.097***	-.138***	-.371***	-.336***	-.103***	-.220***	1.00						
15b. - 2. WkDE	6552	0.05	.209	-.007	-.001	.003	-.013	-.029**	.032**	.014	-.015	-.056***	.005	-.016	-.045***	-.041***	.009	-.029**	-.064***	1.00					
15c. - 3. WkWkndDE	6552	0.42	.493	-.041***	.091***	.020	.017	.008	-.111***	-.144***	.014	.066	-.137***	.117***	.094***	.110***	.094***	.306***	-.250***	-.186***	1.00				
15d. - 4. WkWkndDES	6552	0.21	.409	-.011	.014	.074***	.010	-.058***	-.020	-.014	.057	.086***	.019	0.16	.385***	.121***	-.006	-.015	-.153***	-.114***	-.440***	1.00			
15e. - 5. Night	6552	0.02	.138	.069***	-.083***	-.108***	-.023*	.238***	.075***	.064***	.056	.083***	.086***	-.058***	-.208***	-.095***	-.043***	-.110***	-.041***	-.031**	-.119***	-.073***	1.00		
16. Compensation satisfaction[e]	617	10.09	4.240	-.076**	.103**	-.043	-.055	-.123***	.238***	.238***	.311***	.187***	.296***	-.286***	-.084**	-.051	-.187***	-.118***	.091**	-.002	.003	-.083**	-.057	1.00	
17. WTC satisfaction[b]	6329	3.76	1.332	.028**	-.053***	-.041***	-.003	-.004	.624***	.462***	.328***	.064***	.393***	-.411***	-.171***	-.168***	-.216***	-.189***	.130***	.070***	-.112***	-.027**	.065***	.234***	1.00

Note: * *p < 0.1* ; ** *p < 0.05* ; *** *p < 0.01*

[a] Measured on a four-point scale

[b] Measured on a five-point scale

[c] Measured on a nine-point scale

[d] Measured on a eleven-point scale

[e] Measured on a twenty-point scale

Also, work-time control satisfaction correlates strongly with schedule satisfaction (r=0.624, p<0.01). This is in accordance to the expectations, as by means of work-time control the employee has the opportunity to influence his/her own schedule. Moreover, work-time control satisfaction correlates negatively with schedule complexity (r=-0.411, p<0.001), along the same line of thinking.

For the satisfaction about the financial compensation, this also correlates positively with schedule satisfaction (r=0.238, p<0.01) and work-life balance (r=0.238, p<0.01), but these correlations are not as strong.

4.2.1 Multicollinearity

Before continuing the regression analyses, the multicollinearity of the predictor variables was checked. Multicollinearity should be avoided, as this implies a strong linear relationship between the predictors in the model. This phenomenon can be measured by the variance inflation factor (VIF), which should not be over 10, with an average of around 1 (Field, 2013). The VIF's of the predictor variables for hypotheses 1 and 2 can be found in Table 23 and respectively Table 24. These tables show that for both, the VIF's meet the said criteria, meaning that there are no signs of excessive multicollinearity within the models.

Table 23: VIF of predictor variables hypothesis 1a, 1b and 1c

	Predictors	VIF
1.	Age	1.038
2.	Contract hours	1.011
3.	Target group complexity	1.026
4.	Schedule complexity	1.140
5.	Schedule variation	1.089
6.	Schedule disturbances	1.103
7.	Compensation satisfaction	1.111
8.	Influence/say satisfaction	1.213

Table 24: VIF of predictor variables hypothesis 2a, 2b and 2c

	Predictors	VIF
1.	Age	1.028
2.	Contract hours	1.022
3.	Target group complexity	1.067
4.	Working pattern 1	1.179
5.	Working pattern 2	1.127
6.	Working pattern 3	1.457
7.	Working pattern 4	1.547
8.	Working pattern 5	1.070
9.	Compensation satisfaction	1.101
10.	Influence/say satisfaction	1.104

4.3 HYPOTHESIS TESTING

In order to test the hypotheses, hierarchical regression analyses were performed. Each regression analysis consists of three models. Every time, only the control variables were entered first (model 1). Then, in model 2 the effects of the control variables in combination with the independent variables were entered. The hypotheses predicted a moderating effect on the relationship between the independent variables(s) and the outcome variables. Therefore, in the third model the interaction effects are entered together with the control and independent variables.

The first set of hypotheses regards the effect of the schedule design, moderated by financial compensation and work-time control on the dependent variables shift work satisfaction, work-life balance and sleep quality. Hypothesis 1a predicted that less disturbances, variations and complexity in the schedule design would improve the shift work satisfaction, a relationship that would be positively moderated by financial compensation and work-time control in the schedule. The results of this first regression are shown in Table 25, under Hypothesis 1a. Here, model 1 is not significant and hardly explains any of the variance in shift work satisfaction. The second model is significant and shows that those independent variables explain more of the variance in shift work satisfaction and that the explaining power of 47% is great. Schedule variation (β=-0.096, $p<0.05$) and schedule disturbances (β=-0.164, $p<0.01$) showed to have a direct negative effect on satisfaction, in line with the hypothesis. In according to theory, financial compensation satisfaction (β=0.020, $p<0.05$) and work-time control satisfaction (β=0.514, $p<0.01$) had also a direct positive effect. Looking at model 3, the proportion of variance in the schedule satisfaction even increased to 48%. Schedule disturbances has a direct and significant effect on the schedule satisfaction (β=-0.426, $p<0.01$), as does the satisfaction about the work-time control (β=0.578, $p<0.01$). However, the hypothesis predicted that compensation and work-time control would moderate the effect on satisfaction. For the effect of compensation on the relation between complexity, variation and disturbances on shift work satisfaction only the interaction between complexity and compensation interaction is significant, however the effect is very small (β=0.011, $p<0.01$). Figure 11 shows that when there is more complexity, high satisfaction about the compensation increases the overall satisfaction (slightly).

Figure 11: Hypothesis 1a, interaction between schedule complexity and compensation satisfaction

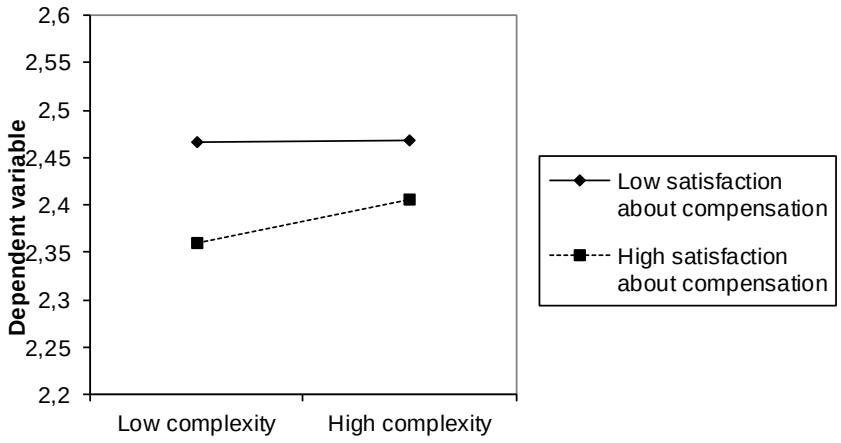


Table 25: Summary of multiple regression analyses for hypotheses 1a, 1b and 1c

Hypothesis 1a

Variables	Employee schedule satisfaction		
	Model 1	Model 2	Model 3
	B	B	B
Constant	3.492***	2.013***	2.425***
Control variables			
Age	0.016	0.041	0.048
Contract hours	0.109*	0.069	0.066
Target group complexity	-0.031	-0.001	-0.002
Independent variables			
Schedule complexity		-0.030	0.012
Schedule variation		-0.096**	-0.157
Schedule disturbances		-0.164***	-0.426***
Compensation satisfaction		0.020**	-0.043
WTC satisfaction		0.514***	0.578***
Interaction effects			
Complexity x Compensation			0.011**
Complexity x WTC			-0.042**
Variation x Compensation			0.007
Variation x WTC			-0.002
Disturbances x Compensation			0.001
Disturbances x WTC			0.067**
R^2	0.008	0.476***	0.488**
Adjusted R^2	0.003	0.469***	0.475**
R^2 change		0.468***	0.012***
F	1.505	66.231***	39,296***

*** p < 0.05 ; *** p < 0.01*
N = 593

Hypothesis 1b

Variables	Employee sleep quality		
	Model 1	Model 2	Model 3
	B	B	B
Constant	9.499***	5.169**	9.751**
Control variables			
Age	0.645	0.414	0.613
Contract hours	0.464	0.387	0.335
Target group complexity	-0.190	-0.116	-0.180
Independent variables			
Schedule complexity		-0.132	1.001**
Schedule variation		0.267	-2.448**
Schedule disturbances		0.079	-0.299
Compensation satisfaction		0.194**	0.327
WTC satisfaction		0.775***	-0.856
Interaction effects			
Complexity x Compensation			-0.066
Complexity x WTC			-0.132
Variation x Compensation			0.092
Variation x WTC			0.495
Disturbances x Compensation			-0.102
Disturbances x WTC			0.396
R^2	0.035	0.194***	0.275**
Adjusted R^2	0.015	0.150***	0.203**
R^2 change		0.159***	0.081**
F	1.803	4.388***	3.799***

*** p < 0.05 ; *** p < 0.01*
N = 155

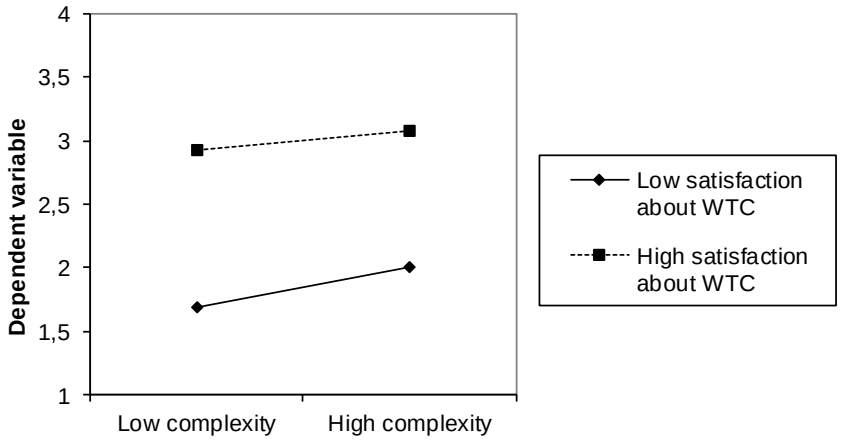
Hypothesis 1c

Variables	Employee work-life balance		
	Model 1	Model 2	Model 3
	B	B	B
Constant	3.415***	2.299***	2.908***
Control variables			
Age	0.032	0.047	0.032
Contract hours	-0.013	-0.031	-0.038
Target group complexity	-0.033	-0.010	-0.011
Independent variables			
Schedule complexity		-0.040	-0.167**
Schedule variation		-0.077**	-0.092
Schedule disturbances		-0.013	0.039
Compensation satisfaction		0.030**	0.050
WTC satisfaction		0.319***	0.130
Interaction effects			
Complexity x Compensation			0.009
Complexity x WTC			0.09
Variation x Compensation			-0.013
Variation x WTC			0.039
Disturbances x Compensation			-0.011
Disturbances x WTC			0.016
R^2	0.004	0.273***	0.284
Adjusted R^2	-0.001	0.264***	0.267
R^2 change		0.269***	0.010
F	0.804	27.574***	16.442***

*** p < 0.05 ; *** p < 0.01*
N = 595

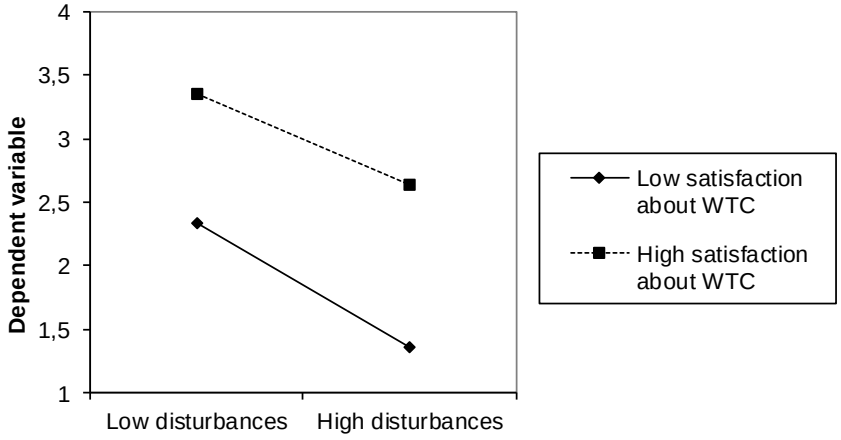
Looking at the moderating effect of the satisfaction about work-time control on the relation between complexity, variation and disturbances, the interaction between complexity and work-time control and disturbances and work-time control are significant, but again very small. Figure 12 shows that when the employee experiences more complexity, the better the satisfaction about the work-time control, the (slightly) better the overall satisfaction.

Figure 12: Hypothesis 1a, interaction between schedule complexity and work-time control satisfaction



Also, the moderating effect of work-time control satisfaction on the relation between disturbances and overall satisfaction is significant. This interaction is shown in Figure 13; as there are more disturbances, the satisfaction about the work-time control increases the overall satisfaction (slightly).

Figure 13: Hypothesis 1a, interaction between disturbances and work-time control satisfaction



Overall, hypothesis 1a cannot be completely accepted and thus will be rejected. Not on all three relations between the independent variables and schedule satisfaction, the moderating effects were significant.

Hypothesis 1b predicted that less disturbances, variation and complexity in the schedule design would improve the employee sleep quality, a relationship that would be positively moderated by the financial compensation and work-time control in the schedule. The results of this first regression are shown in Table 25, under Hypothesis 1b. Here, model 1 is not significant and hardly explains any of the variance in sleep quality. The second model is significant and shows that those independent variables explain more of the variance in sleep quality, 15%. This model shows that compensation satisfaction (β=0.194, $p<0.05$) and work-time control satisfaction (β=0.775, $p<0.01$) contribute significantly to the sleep quality, but that the schedule characteristics do

not. Despite the fine explaining power of model 3, none of the interaction terms in this model turned out to be significant at a sufficient level. The interactions did not significantly contribute to the increase of the total variance explained by the model. Therefore, no interaction effects took place in the relation between complexity, variation and disturbances and sleep quality. Thus, hypothesis 1b has to be rejected.

Hypothesis 1c predicted less disturbances, variation and complexity in the schedule design would improve the employees' work-life balance, a relationship that would be positively moderated by the financial compensation and work-time control in the schedule. The first model (Table 25, under Hypothesis 1c) is not significant and also hardly explains any of the variance in work-life balance. Model 2 is significant and shows that those independent variables explain more of the variance in work-life balance, with a fine explaining power of 27%. This model shows a significant direct effect of variation on work-life balance (β=-0.077, $p<0.05$). Schedule variation contributes negatively to the employees' work-life balance. Again, compensation (β=0.033, $p<0.05$) and work-time control (β=0.319, $p<0.01$) had a positive effect on the dependent variable. In model 3 the explained variance is highest of all three models, 28%. Unfortunately, here again, none of the moderating effects are significant. Leading to a rejection of hypothesis 1c as well.

The second set of hypotheses regards the effect of the working pattern and compensation of shift work satisfaction, work-life balance and sleep quality.

Hypothesis 2a predicted that the financial compensation and work-time control in the shift schedule, would have a positive effect on the relation between each of the five working patterns and the employee satisfaction. Table 26, under Hypothesis 2a, shows the results of this regression analysis. The first model is not significant and also does not explain much of the variance in shift work satisfaction. The second model is highly significant and explains much of the variance (46%). Once more, only the direct effects of compensation satisfaction (β=0.025, $p<0.01$) and work-time control satisfaction (β=0.550, $p<0.01$) were significant. Model 3 of this regression is significant, and explains more of the total variance. Many interaction effects were entered, however only one of them was significant and thus took place in explaining the variance. Figure 14 shows this interaction effect between working pattern 4 and work-time control satisfaction. This interaction shows, that for employees performing working pattern 4, the shift work satisfaction increases (slightly) more when they are satisfied with their work-time control. Overall, hypothesis 2a cannot fully be accepted, as apparently not for all working patterns, the satisfaction about the work-time control and financial compensation contributes to the shift work satisfaction. Therefore, there is also not a comparison for the five working patterns possible.

Table 26: Summary of multiple regression analyses for hypotheses 2a, 2b, and 2c

Hypothesis 2a

Variables	Employee schedule satisfaction		
	Model 1	Model 2	Model 3
	B	B	B
Constant	3.492***	1.303***	0.902**
Control variables			
Age	0.016	0.034	0.028
Contract hours	0.109*	0.051	0.067
Target group complexity	-0.031	-0.004	-0.013
Independent variables			
Working pattern 1		0.155	0.745
Working pattern 2		0.136	0.947
Working pattern 3		-0.152	0.120
Working pattern 4		0.039	0.732**
Working pattern 5		0.068	-1.370
Compensation satisfaction		0.025***	0.036**
WTC satisfaction		0.550***	0.618***
Interaction effects			
WP1 x Compensation			-0.019
WP2 x Compensation			-0.007
WP3 x Compensation			-0.036
WP4 x Compensation			-0.005
WP5 x Compensation			-0.014
WP1 x WTC			-0.098
WP2 x WTC			-0.180
WP3 x WTC			0.035
WP4 x WTC			-0.173**
WP5 x WTC			0.399
R^2	0.008	0.459***	0.475
Adjusted R^2	0.003	0.450***	0.456
R^2 change		0.452***	0.015
F	1.505	49.461***	25.848***

*** p < 0.05 ; *** p < 0.01*

N = 593

Hypothesis 2b

Variables	Employee sleep quality		
	Model 1	Model 2	Model 3
	B	B	B
Constant	9.499***	4.986**	6.246**
Control variables			
Age	0.645	0.439	0.475
Contract hours	0.464	0.342	0.213
Target group complexity	-0.190	-0.150	-0.164
Independent variables			
Working pattern 1		-0.164	-7.375
Working pattern 2		-0.247	-4.908
Working pattern 3		1.388	-0.136
Working pattern 4		1.406**	1.280
Working pattern 5	*Is constant or has missing correlation*		
Compensation satisfaction		0.192**	0.168
WTC satisfaction		0.783***	0.626
Interaction effects			
WP1 x Compensation			-0.405
WP2 x Compensation			0.453
WP3 x Compensation			0.199
WP4 x Compensation			-0.089
WP5 x Compensation	*Is constant or has missing correlation*		
WP1 x WTC			2.929
WP2 x WTC			0.123
WP3 x WTC			-0.148
WP4 x WTC			0.284
WP5 x WTC	*Is constant or has missing correlation*		
R^2	0.035	0.222***	0.259
Adjusted R^2	0.015	0.174***	0.167
R^2 change		0.187***	0.037
F	1.803***	4.596***	2.812***

*** p < 0.05 ; *** p < 0.01*

N = 155

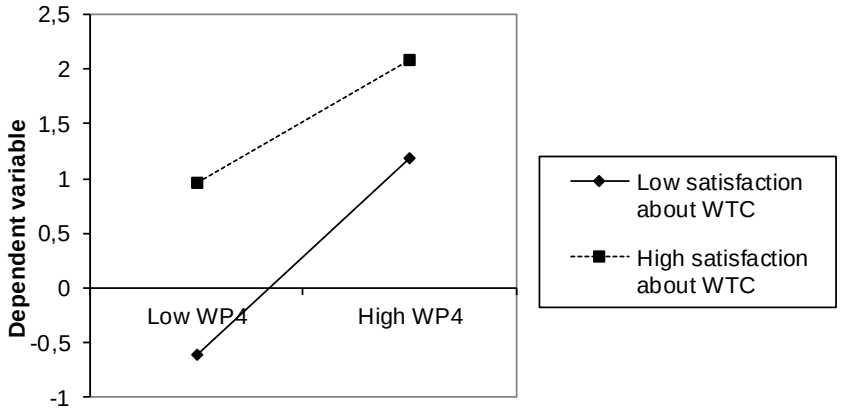
Hypothesis 2c

Variables	Employee work-life balance		
	Model 1	Model 2	Model 3
	B	B	B
Constant	3.415***	1.887***	1.335***
Control variables			
Age	0.032	0.025	0.024
Contract hours	-0.013	-0.048	-0.044
Target group complexity	-0.033	0.000	-0.003
Independent variables			
Working pattern 1		0.215	1.586**
Working pattern 2		0.013	0.010
Working pattern 3		-0.050	0.514
Working pattern 4		0.063	0.852***
Working pattern 5		-1.132***	-0.514
Compensation satisfaction		0.029**	0.022
WTC satisfaction		0.342***	0.503***
Interaction effects			
WP1 x Compensation			-0.034
WP2 x Compensation			0.011
WP3 x Compensation			-0.007
WP4 x Compensation			0.027
WP5 x Compensation			-0.061
WP1 x WTC			-0.247
WP2 x WTC			-0.042
WP3 x WTC			-0.126
WP4 x WTC			-0.280***
WP5 x WTC			-0.050
R^2	0.004	0.276***	0.303**
Adjusted R^2	-0.001	0.264***	0.278**
R^2 change		0.272***	0.026**
F	0.804	22.305***	12.450***

*** p < 0.05 ; *** p < 0.01*

N = 595

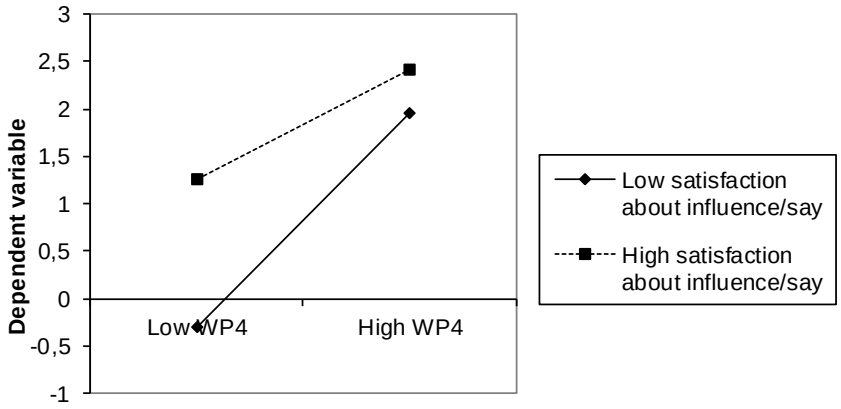
Figure 14: Hypothesis 2a, interaction between WP4 and work-time control satisfaction



Hypothesis 2b predicted the financial compensation and work-time control in the shift schedule, would have a positive effect on the relation between each of the five working patterns and sleep quality. The results of this regression are as well presented in Table 26, under Hypothesis 2b. Working pattern 5, which indicated employees that work exclusively during nights, turned out to be a constant in this regression on sleep quality, which is imaginable as those employees are the ones that work during sleeping times. Model 1 of this regression was not significant and explained only 3.5% of the variance in sleep quality. Model 2 explained a lot more of variance, namely 22% and was significant. In this model, working pattern 4 (exclusively working weekdays and weekends, during daytime, evenings and sleep shifts) turned out to have a significant contribution (β=1.406, $p<0.05$) to sleep quality. The fact that the broadest shift mix would contribute positively and a lot to sleep quality, is difficult to interpret. Again, compensation (β=0.192, $p<0.05$) and work-time control (β=0.783, $p<0.01$) had a positive effect on the dependent variable. In the third model, none of the interaction terms were significant. Leading to the conclusion that none of these interactions explain any of the variance in the sleep quality of employees. So, hypothesis 2b was rejected.

Lastly, hypothesis 2c predicted that the financial compensation and work-time control in the shift schedule, would have a positive effect on the relation between each of the five working patterns and the work-life balance of the employee. Model 1 (Table 26 under Hypothesis 2c), was not significant and explained only a fraction of the variation in the work-life balance. Model 2 explained way more of the total variance, 27%, Here, working pattern 5 (working exclusively at night (actively)) showed to be significant (β=-1.132, $p<0.01$), as did compensation (β=0.029, $p<0.05$) and work-time control (β=0.342, $p<0.01$) again. The third model, has an even higher explaining power of 30%. Only the interaction effect between working pattern 4 and work-time control was significant. Implying this was the only interaction that took place in explaining the variance in work-life balance. Figure 15 shows, just like in hypothesis 2a, that for employees performing this working pattern, the work-life balance increases (slightly) more when they are satisfied with their work-time control. Overall, hypothesis 2c also cannot fully be accepted, as apparently not all working patterns contribute to the work-life balance and thus a complete comparison was not possible.

Figure 15: Hypothesis 2c, interaction between WP4 and work-time control satisfaction



To sum up and clarify the previous section about the hypothesis testing, the following table shows which parts of the hypotheses eventually could be accepted. Hypothesis 1b, 1c and 2b were rejected completely. Within hypothesis 1a there were three of the proposed interaction effects in place, and within hypothesis 2a and 2c just one.

Table 27: Overview results hypothesis testing

	H1a: schedule satisfaction	H1b: sleep quality	H1c: work-life balance
Complexity x Compensation	✓		
Complexity x WTC	✓		
Variation x Compensation			
Variation x WTC			
Disturbances x Compensation			
Disturbances x WTC	✓		

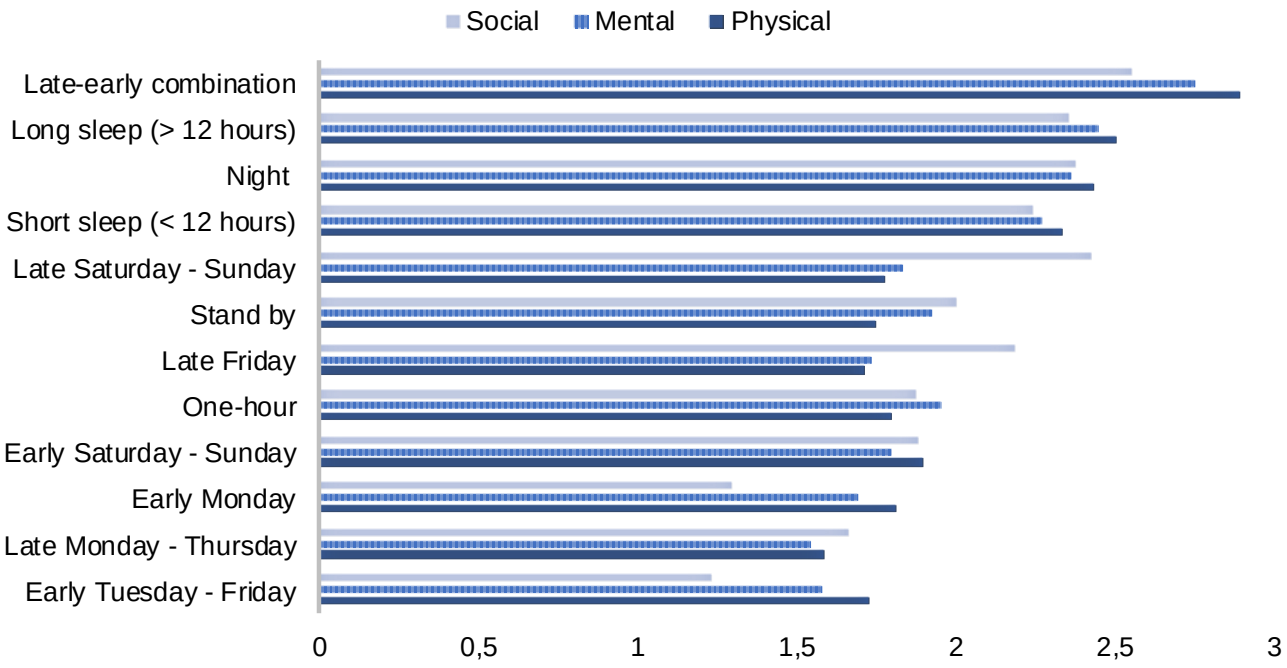
	H2a: schedule satisfaction	H2b: sleep quality	H2c: work-life balance
WP1 x Compensation			
WP1 x WTC			
WP2 x Compensation			
WP2 x WTC			
WP3 x Compensation			
WP3 x WTC			
WP4 x Compensation			
WP4 x WTC	✓		✓
WP5 x Compensation			
WP5 x WTC			

4.4 ADDITIONAL FINDINGS

Figure 16 below, presents the extent to which the employees experience the social, mental and physical heaviness of the various shift types. From this, it becomes clear that there is quite a strong cohesion between the three levels of heaviness. It stands out that especially the late-early combination shits are, on all levels, valued as tough. Together with the night and sleep shifts, these present the top 4 most heavy shift types. When mentioning the late-early combination, this is a combination of an evening shift and an early shift the next day. The Dutch Working Hours Law (Arbeidstijdenwet) prescribes a minimum down time of eleven hours in between, which is allowed to be shortened to eight hours once a week. The fact that only 24% of the respondents answered "does not apply" on this question, indicates that not many employees work this combination shift, and thus employers make frequent use of this exception.

Another remarkable finding from this figure is the experienced heaviness of the late shifts in the weekends, on Friday, Saturday and Sunday. Social heaviness is about the difficulties of being able to join (sports) associations and to spent time with family and friends. One would expect the pressure for clubs mostly during the weekdays. However, the social heaviness is most experienced in the weekends, indicating that the Dutch social life mostly takes places in the weekends, specifically in the afternoons and evenings.

Figure 16: Experienced heaviness per type of shifts



4.5 FURTHER ANALYSIS

In both the descriptive analysis and the hypothesis testing, the results showed that compensation and work time control were an important (mostly direct) factor in shift working. However, the results so far did not explain in which cases this was found the be important and in what form compensation and work-time control was wanted. Therefore, additional research was performed. In the section about descriptives of the compensation for shift working, some statements were mentioned regarding alternative modes of compensation. Based on their scores and the fact that they imply a change, the following five key variables were selected for further analysis:

- I want more control about the distribution of the irregularity premium, in time or money;
- Work-time control is more important than the irregularity premium;
- The solo work in shifts with a chance of aggressive clients, should provide an additional fee;
- The willingness to work all days and all times, should provide an additional fee and;
- The willingness to cover short-term disturbances, should provide an additional fee.

Next to those, also three key variables for about satisfaction were taken for further analysis, those include the satisfaction about the shift work in general, the financial compensation and the work-time control. The intention was to create profiles for those eight key variables, in order to get more insights.

The results of this process are presented in the two tables in Appendix 4. The main conclusions from this are as follows, only the most striking findings will be mentioned here. For the first statement about more control about the way in which to receive the premium, time or money, only the tenure, work environment and experienced heaviness in the schedule seem to influence this. The employees working shortest in the sector, are less in favour of this statement, but this can also be because they have less experience with the discomforts of shift working. Mainly employees working in the facilities and kitchen environment are less in favour of more control about the irregularity premium, however usually those employees do work less irregular as well. Moreover, there is a strong positive correlation between this statement and the experienced heaviness, indicating employees that experience more heaviness, want more control about getting compensated for shift work in time or money.

The seconds statement about work-time control being more important than the financial compensation, showed to be more favourable by the employees with shortest tenure. Possibly for the same reasons as the first statement. The position characteristic shows varying answers, but no possibility to identify a trend. Employees that are dealing with almost no working hours variation, are most positive towards work-time control instead of financial compensation.

Then for the issue whether solo working with a chance of aggressive clients should provide an additional fee, the shortest tenure group was least agreeing. However, the difference is small and this could also be due to the fact that they have experienced these situations least. In the quadrant with the positions of the employees, there is a clear division between the employees working with (aggressive) clients and the employees not working on that basis with clients. Still not offering much information for a profile. This division also, however less obvious, appears in the working environments. Here also, the experienced heaviness of shift working correlates positively.

The fourth statement about the willingness to work at all times and days also the shortest tenure group deviated from the others. Employees sensing the least variation in their schedule, also oppose most to the fact that the willingness to work all days and times should provide an additional premium, which is imaginable. And again, there is quite a strong positive correlation with the experienced heaviness.

With regard to the willingness to cover short-term disturbances, again the employees with a tenure shorter than one year are most pronounced. There is of course a positive correlation with the schedule disturbances characteristic. And also the experienced heaviness correlates once more positively.

Lastly, looking at the three types of satisfaction of the respondents, a division can be made for the positions of the employees. It seems that employees that are responsible for their own schedule and the ones working only office hours are slightly more satisfied, this regards the outpatient mentors, the therapists, the supervisors and the office/staff and facilities employees. Schedule disturbances appear to affect all types of satisfaction negatively, shown by the decent correlation coefficients. The table also shows that as the variation increases, the satisfaction

decreases. Thus, variation has a negative effect on employee satisfaction. Moreover, the experienced heaviness from shift working correlates negatively with satisfaction.

Overall, as can be seen in the demographic characteristics (age, household situation, tenure), these are not the factors that affect the outcome variables. Also, the position or working environment does not offer information which allows to create clear profiles, as they vary throughout the different statements. A factor that runs throughout all types of employees, the experienced heaviness, did turn out to be a factor of influence. However, still not everything can be explained by those. This together, implies that there must be hidden variables in play. On the other side, it also shows broad support and a trend through all groups, and thus much homogeneity within the sector. Is seems that in general, shift work is a very personal issue and therefore, personal fit is most important.

5 Discussion

The aim of this study was to get insights in the current situation of shift working in the Dutch disability sector and to test to what extent financial compensation and work-time control have a moderating effect on the relation between shift work schedules and employee outcomes. Also, the design of the schedules was of interest.

5.1 THEORETICAL IMPLICATIONS

This study contributes to the existing shift work literature, as it tested and quantified the effect of (financial) compensation and work-time control on the relationship between the schedule characteristics and the outcome variables. The moderating effect of compensation and work-time control on these relationships were of interest. Many interaction effects were hypothesised, and the study showed that in some instances these effects are in place. The results showed that in this dataset, in only five of the 48 instances this was actually the case. Therefore, unfortunately only part of the theoretically hypothesised relations could be confirmed by this study. Only for the interaction between schedule complexity and compensation, schedule complexity and work-time control and schedule disturbances and work-time control in the effect on shift work satisfaction were significant. Also, when an employee experiences much (short-term) schedule disturbances, offering appropriate work-time control can be a reason those are more accepted. In cases of very complex schedules with many short-term disturbances, the financial compensation and work-time control will slightly improve the employee outcome. However, these interaction effects are so small that in practice, it does not make a great difference in the outcomes. For the institutions in the disability sector this means that it is hard to cover for the complex and disturbance-heavy schedules by offering the employee a suitable compensation and enough work-time control. The interaction between working pattern 4 and work-time control had a significant effect on shift work satisfaction, as well as work-life balance. Working pattern 4 was the pattern with the broadest shift mix. The effect of work-time control is thus mainly applicable for employees working such patterns. Concluding, for only those five cases mentioned, the satisfaction, sleep quality or work-life balance would be better due to compensation or work-time control than the direct effect.

Instead of the interaction effects, the direct effects of the variables on the employee outcomes gave more significant insights. Working hours variation and schedule disturbances had a significant negative effect on shift work satisfaction. These findings confirm the results of Ingre et al. (2012), who also found that employees longing for more regularity and predictability are less satisfied with shift working. So, in line with this theory, this means that less working hours variation and less short-term schedule disturbances improve the satisfaction of the employees. Knauth and Hornberger (2003) agree that short-term disturbances should be avoided and suggest some preventive measures on this topic: have 'rules of the game' concerning the time of advance notice and compensation in place. Besides, they also advice for work-time control by stating that co-workers should fix their working time themselves and make themselves responsible for doing their tasks on time. The yearly working hours variation also negatively influences the work-life balance of the employees. An imaginable effect, as much yearly working hour variation means that an employee one period would be able to spend more time at home or with family and friends than other periods. Only the working pattern including solely the employees working at night had a direct effect on

the work-life balance of the employees. This also is familiar relation, for example also found by Smith-Coggins, Broderick and Marco (2014), who attribute this effect to not having enough time or energy.

Compensation and work-time control had a direct significant effect on all dependent variables, in all regression analyses. This indicates the importance of suitable (financial) compensation and work-time control in general. Especially work-time control explained much of the variance in the dependent variables, which once more emphasises that just a financial compensation for working irregular is not enough. Work-time control is also in literature often brought into contact with an employees' work-life balance as well as their sleep quality. The importance of work-time control was for example pointed out by Albertsen, Garde, Nabe-Nielsen, Hansen, Lund and Hvid (2014), who studied the effect of one form of work-time control, namely self-rostering, on work-life balance. Also, Salo, Ala-Myrsula, Rod, Tucker et al. (2014) saw the importance of work-time control in the design stage of the schedule. They concluded in their research that there would be a greater risk of sleep disturbances, and thus a decrease of the sleep quality, when an employee has few opportunities to influence to duration and positioning of work time.

5.2 PRACTICAL IMPLICATIONS

The results of the current thesis, have a wide range of practical implications. Thanks to the great number of respondents, the study is able to give a very comprehensive and reliable description of the current state of shift working in the Dutch disability sector. The following implications will be beneficial for the employee organisations, employers' organisations and the institutions in the disability sector. The results can serve as a basis for the upcoming collective agreement negotiations and might help the employers to design and compensate shift work in the best possible way.

First and foremost, the study shows that the employees in the sector overall are quite satisfied with working shift work schedules. However, there are some points of dissatisfaction as well. For a start, the study brought clarity in the comforts and discomforts from shift working. It became clear, that the biggest comforts are the irregularity premium and the freedom employees feel. The most important experienced discomforts, are the fact that employees suffer from fatigue and that they have less time for the social life, at home and with friends or clubs. These two are also represented by the sleep quality and work-life balance of the employees. The self-reported sleep quality scored just above insufficient, which aligns with the fact that employees experience this as the biggest discomfort. However, the work-life balance was not scored so badly. Implying, even though employees find this the toughest in shift working, the outcomes from this are not completely suffering from that. Still, when wanting to improve the satisfaction, health and work-life balance of the employees, fatigue and little time for social life should be focus points.

Looking at the schedule design, employees rate the late-early combination shifts and the night shifts (sleep shifts and active night shifts) the most bothersome. The results also showed that the late-early combination shift had a relative high occurrence. The fact that the late-early combination shift is frequently worked, together with the fact that employees find this very tough to work, is worrying. As the late-early combination causes a shorter down time, there can be many consequences that have to do with for example the sleep quality. Moreover, sleep quality correlates very strongly with the satisfaction and work-life balance of the employee. The heaviness of working night shifts, is also shown by the negative relation between the solely-night-working pattern and the work-life balance of

employees. On the other hand, the employees are currently quite satisfied with the number of consecutive (active) night shift. This possibly could be due to the Dutch Working Hours Law (Arbeidstijdenwet), which includes regulations for the number of night shift are allowed. In the design stage of shift working, the night shifts do not per se have to be a point to alter. Furthermore, for the schedule design, yearly working hour variation and schedule disturbances show a strong negative correlation with shift work satisfaction as well as work-life balance, meaning more variation and disturbances imply a decrease in the satisfaction and work-life balance. There is quite a lot of working hour variation and short-term disturbance also occurs often in the sector, which makes it an even more important issue. Predictability and regularity were found very important by the respondents. Another important finding for improving the shift work schedules, is that employees find the late shift in the weekend (Friday, Saturday and Sunday) very tough to work on a social level. In order to improve the shift work schedule design, those should also be taken into account. The average number of different shift types in an employees' schedule, turned out not to be that high. This is in line with the expectations within this sector as there are many specialist functions and often an employee is assigned to their own clients. However, the schedule complexity does correlate negatively with shift work satisfaction and work-life balance. Thus, it is still important to keep the number of different types of shifts in a schedule to a minimum.

With regard to the counter-weight compensation, the satisfaction about the irregularity premium is reasonable. The respondents do not want a fixed premium for all employees working outside office hours. It was found that financial compensation has a direct positive effect on the three dependent variables (shift work satisfaction, sleep quality and work-life balance). However, the current compensation also has its limitations, since not all important aspects are taken into account at the moment. This is indicated by the statements on alternative forms of compensation. These indicated that employees would want an additional financial compensation for working with aggressive clients, willingness to cover short-term disturbances and willingness to work at all days and times (being available all moments). For the additional (financial) premium for solo work with chance of aggressive clients, the question is whether or not this actually should be compensated with money. There is a good possibility that having an extra colleague present or camera surveillance will also help the employees. The discomforts of having to cover short-term disturbances, should possibly also be accounted for in the schedule design, by having more employees available for example, so this burden is more spread out. However, this statement is also related to the additional compensation for the willingness to work on all days and times, as it has to do with availability of the employee. Therefore, something as the following system could be an option. For example, three compensation-groups should be created:

Table 28: Suggested compensation system based on availability

Availability employee	Premium percentage
Basic	25%
Medium	50%
Full	100%

The 'basic' group would be limitedly available and have many demands with regard to the schedule, they would only receive 25% of the current premium. The 'medium' group is more available (for the harder shifts) and receive more premium and the last group is fully available at all times and days and therefore receives 100% of the current premium. Whether these percentages would be realistic and fair should be calculated and analysed in further research. Nonetheless, also the experienced heaviness of a shift plays a role in the desire for being compensated for

those three alternatives. The heavier the employee finds his/her schedule, the more they want to be (financially) compensated for those three items.

In line with this, counter-value compensation is found to be very important. Currently, 64,5% of the employees is satisfied about their work-time control. As shown by the results, the positive effect of work-time control on shift work satisfaction, sleep quality and work-life balance is even bigger than the effect of financial compensation. The theoretical implications also indicated that more opportunities for the employees to influence the design of the schedule could be beneficial. As mentioned in the theoretical framework, one of the *New Ways of Working* concepts is self-rostering. This concept gives employees more say in the design of the schedule and seen the currents results, it might be very useful to investigate to possibilities of self-rostering in the Dutch disability sector. Because of continuous staffing needs and interdependence between employees' schedule in shift working situations, individual worktime flexibility might be difficult to realise. However, Nijp (2016) provides some options: "indicating preferences to schedule-makers (…), shift swapping (…) or self-scheduling (teams of employees design work schedules themselves with the help of schedule software) (p. 12). Another form of control comes into play about more control about whether the irregularity premium is distributed in time or money, which a fast majority wants. Based on the strong correlation between experienced heaviness of shift working and wanting more control over the way in which to receive the premium, an alternative could also be to grant employees working the most tough shifts, the freedom to choose how they want to receive the premium. This would probably regard the late-early combination and night (active and asleep) shifts. It should be analysed in which way this would be feasible. The results also showed that employees dealing with the least amount of working hours variation, were most positive towards work-time control instead of financial compensation.

Overall, the (regression) results show that both the counter-weight as the counter-value compensation have a positive effect on the outcome variables. However, for many aspects of the compensation, still the question remains under which conditions which type of compensation would be best. The experienced heaviness of the shift is a recurring factor of influence. Therefore, it could be advisable to reconsider compensating the employees for working the heaviest experienced shifts. The results showed that these are the late shifts in the weekends, the late-early combination shift and the night shift (both actively and asleep). Currently, the irregularity premium percentages for late shift in the weekends consist in the following time frames:

Table 29: Current premium percentages for late weekend shifts

Day	Time frame	Premium percentage
Friday	Between 20:00h and 22:00h	22%
Friday	Between 22:00h and 24:00h	44%
Saturday	Between 22:00h and 24:00h	49%
Sunday	Between 18:00h and 24:00h	60%

It could be an option to displace the time frames to later times or increase to percentages, in order to have a higher premium on those most tough shifts. The high correlations indicate that more compensation should also lead to better satisfaction and work-life balance. Considering the late-early combination shift, there has to be a minimum of 11 hours of rest in between (Dutch Working Hours Law (Arbeidstijdenwet)), but it is allowed to shorten this once a week to 8 hours and once to 10 hours. Since employees are working very late or early in this instance, they are already getting the standard premium. However, it is questionable whether this is enough, since they experience it so difficultly. An additional compensation for this shift could be advisable, because of the missed free time this compensation could best be in time, as this is also indicated by the respondents. The respondents preferred

physically and mentally heavy shifts to be compensated more with time instead of money and the late-early combination shift is one of those. On the other hand, a reduction of the frequency or avoidance of the late-early combination shift would of course also be beneficial. Lastly, with regard to the night shift (both actively and asleep), there is already a counter-weight compensation in place. The collective agreement distinguished two types of compensation. First, when an employee has to perform work during the shift (and thus cannot sleep) for less than 120 minutes, the employee gets a compensation in time for 50% of the hours he/she was present. When the employee performs work during the shift (and thus cannot sleep) for more than 120 minutes, there is also a compensation in time, for 100% of the present hours. In both instances, the employee can choose to get this compensation in money along the formula: compensated hours multiplied by his/her current hourly wage. The results showed, that the long sleep shifts (in which an employee is in total more than 12 hours at work) are experienced approximately just as heavy as the night shifts, especially on a physical level. However, in such a sleep shift, an employee now only gets compensated for 50% of the hours he/she is there. This also perfectly aligns with the fact that the majority of the respondents that work sleep shifts, indicated that they are (very) unsatisfied with the current compensation for those shifts. It could be an option to make the financial compensation for both of these types of night shifts equal, as they are also experienced equally. On the other hand, the respondents indicated that they wanted physically and mentally heavy shifts more compensated with time instead of money and the long sleep shift is one of those most physically and mentally heavy shifts. From that point of view, maybe an additional premium should be implemented for the long sleep shift in the form of time.

Still, at the end of the results section, also the conclusion was made that, shift work showed to be a very personal issue and that personal fit was most important, because it was not possible to create generalised profiles based on e.g. position or tenure for each type of compensation. With this in mind, some form of freedom for individual employees to choose in when they want to receive which type of compensation, would possibly the best solution. However, this requires a lot of flexibility from the institutions in the disability sector. For now, it is unknown whether a system like that would be feasible.

5.3 LIMITATIONS AND FUTURE RESEARCH

Shift working is a very complex concept. As the literature section also mentions, there is a numerous list of schedule characteristics. Even though the three characteristics of interest in this research were based on the case studies in the sector, it is possible that some of the most influential characteristics were not included and studied. This could have led to regression models that were unable to explain the dependent variables fully. Therefore, for future research it would be recommended to include more schedule characteristics or search for a way to possibly combine the characteristics into one variable.

Moreover, it is very difficult to measure and depict an employees' schedule, especially for shift working schedules. These are varying a lot because of the irregularity and therefore, creating concrete variables is challenging. This study also showed that almost none of the created working pattern variables were significant in explaining the dependent variables. Thus, in future research it would be a great addition if the working patterns could be measured in a better way. For example, case studies could be performed on employees of which the exact schedule is known, to analyse how they score on the dependent variables.

Even though this cross-sectional survey managed to get great response scores and great insights into the current state of shift working in the Dutch disability sector, it remains a snapshot of one moment. In order to stay on top of the situation and be able to design the shift schedules and compensate the employees in the best way possible, it would be favourable to repeat a study like this one on a periodical basis.

Also, it is very possible that the current study suffered from the healthy worker effect. The respondents were able to fill the questionnaire out from home, this might have kept this effect to the minimum. However, it is still possible that the very poor employees, which might be suffering from shift working to most, did not participate in the research. Therefore, it is impossible to say if the found employee outcomes, especially health, might in practice be even worse. Getting insights in the absenteeism rates per organisation and also knowing in which institution a respondent works, could have helped with getting insight in this.

The current thesis mentions some options for improving the situation of the employees performing shift work in the Dutch disability sector, however these are not checked for feasibility. It would be very valuable for future research to calculate these alternative (financial) premium-systems and identify their (financial and practical) consequences for as well the employee as the organisations/institutions. This study also fails to find out the workability of self-rostering in this sector. However, both these results as previous studies show the beneficially of work-time control in the form of self-rostering on employee satisfaction, health and wellbeing, so it would be recommended to study this opportunity further.

6 Conclusion

To conclude, this study aimed to investigate to what extent financial compensation and work-time control influence the relation between shift work schedule characteristics and employee outcomes. The main conclusion of this thesis has to be that both financial compensation and work-time control do not substantially weaken the negative effects of shift work on employee outcomes. However, both compensation methods do have a fair direct positive effect on employee outcomes. Moreover, the results of this study provide interesting insights and many opportunities for improvement. Therefore, this thesis will conclude here with some practical recommendations for both the design of the shift schedule as well as the compensation.

Recommendations regarding the design of the shift work schedule.

- Limit the late-early combination shifts and active night shifts in an employees' schedule;
- Limit the number of late shift on Friday, Saturday and Sunday, dividing them well between the employees;
- Avoid too much yearly working hours variation in the schedule;
- Account for schedule short-term disturbances with more available employees;
- Minimise the number of different types of shifts an employee works.

Recommendations regarding the compensation of the shift work schedule.

- Implement a new compensation system, based on the availability of the employee;
- Explore the options of more work-time control for the schedule design stage (in the form of self-rostering), especially for employees working broad shift mixes and much short-term disturbances;
- Grant employees working late-early combination and night shifts, the freedom to choose how they want to receive the premium;
- Shift the irregularity premium more to the heavy-times of the schedule, apparently especially Friday, Saturday and Sunday night;
- Additional compensation for late-early combination shift in time;
- Equal financial compensation for active night shift and long sleep shifts, or additional compensation in time for the long sleep shift;

This is a complicated list of recommendations and there should definitely be further analysis whether they are practically feasible and also whether all of those will work when they would be implemented at the same time.

This research tried to contribute to the optimisation of shift working in the Dutch disability sector. Hopefully, this research, together with further research, will be able to achieve the optimum in the design and compensation of shift work, in order to accomplish the best employee satisfaction, health and work-life balance in the (hopefully near) future.

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Appendices

APPENDIX 1

Working time arrangements in the Dutch disability sector, at the job availability vs. on-call availability.

Table 30: WTAs in the Dutch disability sector

Type of shift	WTA	Explanation
Short day	At the job	Between 7:00h and 18:00h, for 4 hours or shorter
Long day	At the job	Between 7:00h and 18:00h, for 4 hours or longer
Early	At the job	Starting before 7:00h
Evening	At the job	Between 18:00h and 00:00h
Night	At the job	Between 00:00h and 06:00h, being active for at least 2 hours
Short sleep	At the job	Between 00:00h and 06:00h, being active for less than 2 hours and together with the included day shift maximum 12 hours present
Long sleep	At the job	Between 00:00h and 06:00h, being active for less than 2 hours and together with the included day shift more than 12 hours present
One-hour	At the job	Extra presence for work meetings for example, but very short
Stand-by	On-call	Could be every other kind of type of shift, being available at home if called
Late-early combination	At the job	When an evening shift is combined with an early day shift the consecutive day
Broken	At the job	When the shift is split up into separate periods, the employee returns home in the middle of the shift for one or more times

Source: CAO Gehandicaptenzorg 2016, ModernWorkx & BvHilst BV

APPENDIX 2

Vragenlijst Onregelmatig Werken in de Gehandicaptenzorg

Beste medewerker in de gehandicaptenzorg,

Hoe beleef jij het werken op onregelmatige uren en in wisselende diensten? Dat willen wij graag van je weten. Wil jij je stem ook laten horen?

Waarom is het belangrijk dat je mee doet?

De wereld verandert: we leven steeds meer in een 24-uurs maatschappij. Dat betekent ook iets voor je werk. De werkgevers- en werknemersorganisaties zijn benieuwd hoe jij hier tegenaan kijkt. Wat zijn de voor- en nadelen van onregelmatig werken? Wat is belangrijk voor een goede balans tussen werk en privé? We doen een landelijk onderzoek hiernaar. De uitkomsten van het onderzoek worden besproken door de CAO-partijen. Door de vragenlijst in te vullen, telt jouw mening ook mee

Goed om te weten

Het invullen van de digitale vragenlijst is volledig anoniem. We kunnen niet achterhalen wie welke antwoorden heeft gegeven en je naam en e-mailadres hoef je ook niet te delen. Wel een aantal persoonlijke gegevens, zoals leeftijd en geslacht. Dat is belangrijk om de uitkomsten goed weer te kunnen geven.

Het is heel belangrijk dat je alle vragen beantwoordt, want alleen volledig ingevulde vragenlijsten kunnen we verwerken. Neem dus even de tijd ervoor. Het invullen duurt ongeveer een kwartier. Je kunt de vragenlijst invullen tot 18 augustus 2017.

Heel erg bedankt voor je medewerking!

Met vriendelijke groet,

Namens de cao-partijen in de Gehandicaptenzorg,

Jan de Leede (ModernWorkx)

Demografische gegevens

[]Wanneer ben je geboren? *

Kies één van de volgende mogelijkheden:

- ○ Voor 1962
- ○ Tussen 1961 en 1977
- ○ Tussen 1976 en 1992
- ○ Na 1992

[]Wat is je geslacht? *

Kies één van de volgende mogelijkheden:

- ○ Vrouw
- ○ Man

[]Hoe lang werk je in de sector gehandicaptenzorg? *

Kies één van de volgende mogelijkheden:

- ○ Korter dan 1 jaar
- ○ 1 tot 5 jaar
- ○ 5 tot 15 jaar
- ○ Langer dan 15 jaar

[]Welke functie heb je? *

Kies één van de volgende mogelijkheden:

- ○ Ambulant begeleider
- ○ Medewerker begeleid wonen
- ○ Assistent begeleider
- ○ (Persoonlijk) begeleider
- ○ Senior/coördinerend begeleider
- ○ Behandelaar
- ○ Leidinggevende
- ○ Kantoor-/staffunctie
- ○ Facilitair
- ○ Anders, namelijk: [ ]

[]

Wat is de omvang van je vaste dienstverband?

Indien je meerdere contracten hebt, gelieve deze uren op te tellen.

*

Kies één van de volgende mogelijkheden:

- ○ Minder dan 8 uur per week
- ○ 8 uur of meer, maar minder dan 16 uur per week
- ○ 16 uur of meer, maar minder dan 24 uur per week
- ○ 24 uur of meer, maar minder dan 32 uur per week
- ○ 32 uur of meer per week

[]Hoe is je huishouden samengesteld? *

Kies één van de volgende mogelijkheden:

- ○ Gehuwd/samenwonend met thuiswonende kinderen, waarvan de jongste onder 13 jaar
- ○ Gehuwd/samenwonend met thuiswonende kinderen, waarvan de jongste boven 12 jaar
- ○ Gehuwd/samenwonend met thuiswonende kinderen, zonder thuiswonende kinderen
- ○ Eén-ouder huishouden
- ○ Alleenstaand
- ○ Anders, namelijk: [ ]

[]Doe je aan mantelzorg? *

Kies één van de volgende mogelijkheden:

- ○ Nee
- ○ Ja, gemiddeld minder dan 8 uur per week
- ○ Ja, gemiddeld tussen 8 en 16 uur per week
- ○ Ja, gemiddeld meer dan 16 uur per week

Hoeveel meer-uren (over-uren) heb je gemiddeld per week?

Bij min-max contracten: hoeveel uur werk je gemiddeld per week boven je maximum?

*

Kies één van de volgende mogelijkheden:

- ○ 0 uur per week
- ○ Minder dan 2 uur per week
- ○ 2 uur of meer, maar minder dan 8 uur per week
- ○ 8 uur of meer per week

[]Wat is de aard van je dienstverband? *

Kies één van de volgende mogelijkheden:

- ○ Ik heb een vast contract (voor onbepaalde tijd)
- ○ Ik heb een tijdelijk contract (voor bepaalde tijd)
- ○ Ik heb een min-max contract
- ○ Ik ben invalkracht/oproepkracht
- ○ Ik ben uitzendkracht

[]Hoeveel tijd besteed je op een gemiddelde werkdag aan woon-werkverkeer? *

Kies één van de volgende mogelijkheden:

- ○ Minder dan 30 minuten
- ○ Ongeveer 30 tot 60 minuten
- ○ Meer dan 60 minuten

Organisatiekenmerken

[]Hoeveel personen werken er in je organisatie? *

Kies één van de volgende mogelijkheden:

- ○ Minder dan 100
- ○ 100-500
- ○ 500-1500
- ○ 1500-3000
- ○ 3000 of meer

[]In welke omgeving werk je voornamelijk? *

Kies één van de volgende mogelijkheden:

- ○ Woonzorg: intensief
- ○ Woonzorg: licht gehandicapt
- ○ Ambulante voorziening
- ○ Dagbesteding
- ○ Behandeling
- ○ Facilitair/keuken
- ○ Kantoor/staf

[]Je bent voornamelijk werkzaam in de woonzorg, welke situatie is van toepassing? *

Beantwoord deze vraag alleen als aan de volgende voorwaarden is voldaan:
Antwoord was 'Woonzorg: intensief' *of* 'Woonzorg: licht gehandicapt' bij vraag '12 [D2Q12]' (In welke omgeving werk je voornamelijk?)

Kies één van de volgende mogelijkheden:

- ○ Onze cliënten gaan naar een dagbesteding/onderwijs en ik ga met ze mee als begeleider
- ○ Onze cliënten gaan naar een dagbesteding/onderwijs, maar ik ga niet met ze mee
- ○ Onze cliënten blijven op de woonvoorziening

[]Voor welke doelgroepen werk je voornamelijk (meerdere opties mogelijk)? *

Selecteer alle mogelijkheden:

- ☐ Kinderen
- ☐ Jongvolwassenen
- ☐ Volwassenen
- ☐ Ouderen
- ☐ Niet-aangeboren hersenafwijking (NAH)
- ☐ Ernstig meervoudig beperkt (EMB)
- ☐ Ernstig verstandelijk beperkt met specifieke zorg (EVB+)
- ☐ Autisme spectrum stoornis (ASS)
- ☐ Zintuiglijk beperkten
- ☐ Niet van toepassing

Werktijden

[]Op welke dagen werk je? *

Kies het toepasselijke antwoord voor elk onderdeel:

	Nooit	Soms	Regelmatig	Altijd
Maandag	○	○	○	○
Dinsdag	○	○	○	○
Woensdag	○	○	○	○
Donderdag	○	○	○	○
Vrijdag	○	○	○	○
Zaterdag	○	○	○	○
Zondag	○	○	○	○

[]Welke diensten werk je? *

Kies het toepasselijke antwoord voor elk onderdeel:

	Nooit	Soms	Regelmatig	Altijd
Korte dagdienst (4 uur of korter)	○	○	○	○
Lange dagdienst (langer dan 4 uur)	○	○	○	○
Vroege dienst (voor 07:00 uur starten)	○	○	○	○
Avonddienst	○	○	○	○
Nachtdienst (actieve wacht)	○	○	○	○
Nachtaanwezigheidsdienst (slaapdienst), in totaal maximaal 12 uur aanwezig	○	○	○	○
Nachtaanwezigheidsdienst (slaapdienst), in totaal meer dan 12 uur aanwezig	○	○	○	○
1-uursdiensten (bijvoorbeeld voor werkoverleg)	○	○	○	○
Bereikbaarheidsdienst	○	○	○	○
Laat-vroeg combinatie	○	○	○	○
Gebroken dienst	○	○	○	○

[]Wat is de publicatietermijn van je definitieve rooster (hoe lang van tevoren is je rooster bekend)? *

Kies één van de volgende mogelijkheden:

- ○ Korter dan 7 dagen van tevoren
- ○ Tenminste 7 dagen van tevoren
- ○ Tenminste 14 dagen van tevoren
- ○ Tenminste 21 dagen van tevoren
- ○ Tenminste 1 maand van tevoren
- ○ Tenminste 2 maanden van tevoren
- ○ Tenminste 3 maanden van tevoren

[]Hoe lang is de looptijd van je rooster? *

Kies één van de volgende mogelijkheden:

- ○ 1 week
- ○ 2 tot 4 weken
- ○ 1 tot 3 maanden
- ○ 3 maanden of langer

[]Hoe vaak komen roosterverstoringen voor je in gepubliceerde, definitieve rooster (anders dan door eigen toedoen)? *

Kies één van de volgende mogelijkheden:

- ○ Nooit
- ○ 1 keer per maand
- ○ 1 keer per week
- ○ Dagelijks

[]Hoeveel variatie ervaar je in je werktijden door het jaar heen? *

Kies één van de volgende mogelijkheden:

- ○ Ik werk eigenlijk altijd op dezelfde dagen/tijdstippen
- ○ Er is enige variatie, met een vast patroon
- ○ Er is veel variatie in dagen/tijdstippen, met een vast patroon
- ○ Er is veel variatie in dagen/tijdstippen, zonder vast patroon

[]Als je niet werkzaam bent op roosters, hoe komen je werktijden dan tot stand? *

Kies één van de volgende mogelijkheden:

- ○ Op basis van door mijzelf gemaakte afspraken
- ○ Op basis van een agenda/spreekuur
- ○ Op basis van onderlinge afspraken op mijn afdeling (of met mijn leidinggevende)
- ○ Niet van toepassing

[]Hoe word je doorgaans ingeroosterd? *

Selecteer alle mogelijkheden:

- ☐ Ik werk meer dagen dan naar rato van mijn contract
- ☐ Ik word ingeroosterd voor minder dan 100% van mijn contracturen
- ☐ Ik moet vaak terugkomen (invallen/overleggen) op mijn roostervrije dagen
- ☐ Geen van bovenstaande zijn op mij van toepassing

Tevredenheid over werktijden

[]Hoe tevreden ben je met: *

Kies het toepasselijke antwoord voor elk onderdeel:

	Zeer ontevreden	Een beetje ontevreden	Niet tevreden/ontevreden	Een beetje tevreden	Zeer tevreden	Niet van toepassing
...je rooster in het algemeen?	○	○	○	○	○	○
...het aantal dagdiensten achter elkaar?	○	○	○	○	○	○
...het aantal late diensten (avonddiensten) achter elkaar?	○	○	○	○	○	○
...het aantal nachtdiensten achter elkaar?	○	○	○	○	○	○
...het aantal nachtaanwezigheidsdiensten (slaapdiensten), waarbij in totaal maximaal 12 uur aanwezig?	○	○	○	○	○	○
...het aantal nachtaanwezigheidsdiensten (slaapdiensten), waarbij in totaal meer dan 12 uur aanwezig?	○	○	○	○	○	○
...het aantal bereikbaarheidsdiensten?	○	○	○	○	○	○
...het aantal 1-uursdiensten (bijvoorbeeld voor werkoverleg)?	○	○	○	○	○	○
...de variatie in diensten?	○	○	○	○	○	○
...het aantal hele vrije weekenden (zaterdag én zondag)?	○	○	○	○	○	○
...het aantal weekenden met één vrije weekenddag en één werkdag?	○	○	○	○	○	○
...de mogelijkheden om invloed te hebben op de totstandkoming van je eigen rooster?	○	○	○	○	○	○
...de publicatietermijn van je rooster?	○	○	○	○	○	○

Gemakken en ongemakken

[]Hoe ervaar je de volgende gemakken van het onregelmatig werken? *

Kies het toepasselijke antwoord voor elk onderdeel:

	Geheel mee oneens	Mee oneens	Eens noch oneens	Mee eens	Geheel mee eens
Ik ben vrij op tijden dat anderen moeten werken	○	○	○	○	○
Ik heb veel tijd voor praktische zaken, zoals hobby's	○	○	○	○	○
Het sluit goed aan bij mijn sociale leven	○	○	○	○	○
Het geeft mij veel vrijheid	○	○	○	○	○
Het geeft een ORT-vergoeding (toeslag)	○	○	○	○	○

[]Hoe ervaar je de volgende ongemakken van het onregelmatig werken? *

Kies het toepasselijke antwoord voor elk onderdeel:

	Geheel mee oneens	Mee oneens	Eens noch oneens	Mee eens	Geheel mee eens
Ik heb weinig tijd voor het sociale leven thuis	○	○	○	○	○
Ik heb weinig tijd voor het sociale leven met vrienden, sport en clubs	○	○	○	○	○
Ik kan geen afspraken maken, omdat ik niet weet wanneer ik moet werken	○	○	○	○	○
Het leidt tot vermoeidheid	○	○	○	○	○
Het reizen op vroege en late tijdstippen is vervelend	○	○	○	○	○

[]Enkele algemene stellingen over je rooster en werktijden: *

Kies het toepasselijke antwoord voor elk onderdeel:

	Geheel mee oneens	Mee oneens	Eens noch oneens	Mee eens	Geheel mee eens
Ik vind het belangrijk om diensten te kunnen ruilen	○	○	○	○	○
Ik vind regelmaat (vaste patronen) in mijn rooster belangrijk	○	○	○	○	○
Ik vind voorspelbaarheid (weinig verstoringen) in mijn rooster belangrijk	○	○	○	○	○
Ik vind het belangrijk om zeggenschap te hebben over mijn rooster	○	○	○	○	○
Ik kan werk en privé goed combineren in het huidige rooster	○	○	○	○	○

[]Hoe ervaar je de kwaliteit van je slaap in het algemeen? *

Kies het toepasselijke antwoord voor elk onderdeel:

	Heel slecht	Redelijk slecht	Redelijk goed	Heel goed	Niet van toepassing
Na een dagdienst	○	○	○	○	○
Na een avonddienst	○	○	○	○	○
Na een nachtdienst (actieve wacht)	○	○	○	○	○
In een nachtaanwezigheidsdienst (slaapdienst), waarbij in totaal maximaal 12 uur aanwezig	○	○	○	○	○
In een nachtaanwezigheidsdienst (slaapdienst), waarbij in totaal meer dan 12 uur aanwezig	○	○	○	○	○
Na een vrije dag	○	○	○	○	○

[]Geef aan in hoeverre onderstaande diensten voor jou fysiek bezwaarlijk zijn. *

Kies het toepasselijke antwoord voor elk onderdeel:

	niet zwaar	een beetje zwaar	zwaar	erg zwaar	niet van toepassing
Vroege dienst op maandag	○	○	○	○	○
Vroege dienst op dinsdag-vrijdag	○	○	○	○	○
Vroege dienst op zaterdag-zondag	○	○	○	○	○
Late dienst op maandag-donderdag	○	○	○	○	○
Late dienst op vrijdag	○	○	○	○	○
Late dienst op zaterdag-zondag	○	○	○	○	○
Nachtdienst (actieve wacht)	○	○	○	○	○
Nachtaanwezigheidsdienst (slaapdienst), waarbij in totaal maximaal 12 uur aanwezig	○	○	○	○	○
Nachtaanwezigheidsdienst (slaapdienst), waarbij in totaal meer dan 12 uur aanwezig	○	○	○	○	○
Bereikbaarheidsdienst	○	○	○	○	○
Laat-vroeg combinatie	○	○	○	○	○
1-uursdienst (bijvoorbeeld voor werkoverleg)	○	○	○	○	○

[]Geef aan in hoeverre onderstaande diensten voor jou mentaal bezwaarlijk zijn. *

Kies het toepasselijke antwoord voor elk onderdeel:

	niet zwaar	een beetje zwaar	zwaar	erg zwaar	niet van toepassing
Vroege dienst op maandag	○	○	○	○	○
Vroege dienst op dinsdag-vrijdag	○	○	○	○	○
Vroege dienst op zaterdag-zondag	○	○	○	○	○
Late dienst op maandag-donderdag	○	○	○	○	○
Late dienst op vrijdag	○	○	○	○	○
Late dienst op zaterdag-zondag	○	○	○	○	○
Nachtdienst (actieve wacht)	○	○	○	○	○
Nachtaanwezigheidsdienst (slaapdienst), waarbij in totaal maximaal 12 uur aanwezig	○	○	○	○	○
Nachtaanwezigheidsdienst (slaapdienst), waarbij in totaal meer dan 12 uur aanwezig	○	○	○	○	○
Bereikbaarheidsdienst	○	○	○	○	○
Laat-vroeg combinatie	○	○	○	○	○
1-uursdienst (bijvoorbeeld voor werkoverleg)	○	○	○	○	○

[]Geef aan in hoeverre onderstaande diensten voor jou sociaal bezwaarlijk zijn. *

Kies het toepasselijke antwoord voor elk onderdeel:

	niet zwaar	een beetje zwaar	zwaar	erg zwaar	niet van toepassing
Vroege dienst op maandag	○	○	○	○	○
Vroege dienst op dinsdag-vrijdag	○	○	○	○	○
Vroege dienst op zaterdag-zondag	○	○	○	○	○
Late dienst op maandag-donderdag	○	○	○	○	○
Late dienst op vrijdag	○	○	○	○	○
Late dienst op zaterdag-zondag	○	○	○	○	○
Nachtdienst (actieve wacht)	○	○	○	○	○
Nachtaanwezigheidsdienst (slaapdienst), waarbij in totaal maximaal 12 uur aanwezig	○	○	○	○	○
Nachtaanwezigheidsdienst (slaapdienst), waarbij in totaal meer dan 12 uur aanwezig	○	○	○	○	○
Bereikbaarheidsdienst	○	○	○	○	○
Laat-vroeg combinatie	○	○	○	○	○
1-uursdienst (bijvoorbeeld voor werkoverleg)	○	○	○	○	○

Compensatie

[]Hoe tevreden ben je met: *

Kies het toepasselijke antwoord voor elk onderdeel:

	Zeer ontevreden	Een beetje ontevreden	Niet tevreden/ontevreden	Een beetje tevreden	Zeer tevreden	Niet van toepassing
...de huidige vergoeding voor onregelmatig werken (de ORT)?	○	○	○	○	○	○
...de huidige vergoeding voor de bereikbaarheidsdienst?	○	○	○	○	○	○
...de huidige vergoeding voor de verschoven dienst?	○	○	○	○	○	○
...de huidige vergoeding voor de nachtaanwezigheidsdienst (slaapdienst)?	○	○	○	○	○	○

[]Geef aan in hoeverre je het eens bent met de volgende stellingen: *

Kies het toepasselijke antwoord voor elk onderdeel:

	Geheel mee oneens	Mee oneens	Eens noch oneens	Mee eens	Geheel mee eens	Geen mening
Fysiek en mentaal zware diensten kunnen het best gecompenseerd worden met geld	○	○	○	○	○	○
Fysiek en mentaal zware diensten kunnen het best gecompenseerd worden met tijd	○	○	○	○	○	○
Sociaal zware diensten kunnen het best gecompenseerd worden met geld	○	○	○	○	○	○
Sociaal zware diensten kunnen het best gecompenseerd worden met tijd	○	○	○	○	○	○
Ik wil meer zeggenschap over de verdeling van de compensatie voor onregelmatig werken in tijd of geld	○	○	○	○	○	○
Het solistisch werken (alleen werken) in diensten met een kans op agressie van cliënten moet extra toeslag opleveren	○	○	○	○	○	○
De bereidheid tot het werken van alle dagen van de week en alle tijdstippen moet in de toeslag worden meegenomen	○	○	○	○	○	○
Zeggenschap is belangrijker dan de toeslag (naarmate je meer invloed hebt op je rooster, kan de toeslag lager zijn)	○	○	○	○	○	○
De bereidheid om kortetermijnverstoringen in het rooster (door extra vraag of door uitval van collega's) op te vangen moet extra toeslag opleveren	○	○	○	○	○	○
De teams kunnen het best de ruimte krijgen om - zonder meerkosten - de ORT zelf onderling te verdelen	○	○	○	○	○	○
Er kan het best een vaste toeslag komen voor iedereen die buiten kantoortijden werkt, dus niet afhankelijk van de gelopen roosters	○	○	○	○	○	○

Afronding

[]Hoe ben je op deze vragenlijst geattendeerd? *

Kies één van de volgende mogelijkheden:

- ○ Via mijn werkgever
- ○ Via een vakbond / werknemersorganisatie
- ○ Via VGN
- ○ Via StAG
- ○ Anders

[]Wij stellen je graag in de gelegenheid om je antwoorden toe te lichten of zaken over je werktijden naar voren te brengen die niet in deze vragenlijst zijn opgenomen.

Vul uw antwoord hier in:

APPENDIX 3

In this appendix, the SPSS syntax for the computation of the variables of the five working patterns is shown.

Figure 17: SPSS syntax for computation working pattern variables

```
DO IF (Sche_WD_Weekdays > 0 AND Sche_TS_Daytime > 0 AND Sche_TS_Evening_dict = 0
AND Sche_WD_Saturday_dict = 0 AND Sche_WD_Sunday_dict = 0 AND Sche_TS_Night_dict = 0
AND Sche_TS_SleepShort_dict = 0 AND Sche_TS_SleepLong_dict = 0).
COMPUTE WP1_WeekDaytime = 1.
ELSE.
COMPUTE WP1_WeekDaytime = 0.
END IF.

DO IF (Sche_WD_Weekdays > 0 AND Sche_TS_Daytime > 0 AND Sche_TS_Evening_dict = 1
AND Sche_WD_Saturday_dict = 0 AND Sche_WD_Sunday_dict = 0 AND Sche_TS_Night_dict = 0
AND Sche_TS_SleepShort_dict = 0 AND Sche_TS_SleepLong_dict = 0).
COMPUTE WP2_WeekDaytimeEvening = 1.
ELSE.
COMPUTE WP2_WeekDaytimeEvening = 0.
END IF.

DO IF (Sche_WD_Weekdays > 0 AND Sche_TS_Daytime > 0 AND Sche_TS_Evening_dict = 1
AND Sche_WD_Weekend > 0 AND Sche_TS_Night_dict = 0 AND Sche_TS_SleepShort_dict = 0
AND Sche_TS_SleepLong_dict = 0).
COMPUTE WP3_WeekDaytimeEveningWeekend = 1.
ELSE.
COMPUTE WP3_WeekDaytimeEveningWeekend = 0.
END IF.

DO IF (Sche_WD_Weekdays > 0 AND Sche_TS_Daytime > 0 AND Sche_TS_Evening_dict = 1
AND Sche_WD_Weekend > 0 AND Sche_TS_Night_dict = 0 AND Sche_TS_Sleep > 0).
COMPUTE WP4_WeekDaytimeEveningWeekendSleep = 1.
ELSE.
COMPUTE WP4_WeekDaytimeEveningWeekendSleep = 0.
END IF.

DO IF (Sche_TS_Daytime = 0 AND Sche_TS_Evening_dict = 0 AND Sche_TS_Night_dict > 0
AND Sche_TS_Sleep = 0).
COMPUTE WP5_Night = 1.
ELSE.
COMPUTE WP5_Night = 0.
END IF.
```

APPENDIX 4

This appendix shows a (large) table with many profile characteristics for some of the key variables found in the main research. Those key variables are the five statements that indicate change in the field of compensation and the satisfaction about shift work in general, satisfaction about the financial compensation and satisfaction about the work time control. The purpose of this table is to obtain further insights is the profiles that want change and in that way, be able to give additional recommendations.

Table 31: Profile characteristics for key variables (counter-weight and counter-value) compensation

Profile characteristic	Variables indicating interest in change of (financial) compensation									
	More control about the distribution of the irregularity premium, in time or money		Work time control is more important than the irregularity premium		Solo work (with aggressive patients) should provide additional fee		Willingness to work at all times and days, should provide additional fee		Willingness to cover short-term disturbances should provide additional fee	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
Age										
Before 1962	63,7%	9,0%	33,5%	34,3%	79,9%	9,0%	81,0%	8,5%	86,5%	8,4%
Between 1961 and 1976	64,4%	9,2%	31,3%	38,0%	82,4%	7,9%	81,1%	7,6%	81,5%	7,7%
Between 1976 and 1992	66,9%	10,0%	29,6%	39,0%	84,7%	7,0%	83,8%	7,8%	83,3%	7,0%
After 1992	60,2%	11,1%	30,5%	37,4%	80,3%	8,2%	84,8%	6,9%	82,1%	8,4%
Average	***63,8%***	***9,8%***	***31,2%***	***37,2%***	***81,8%***	***8,0%***	***82,7%***	***7,7%***	***83,4%***	***7,9%***
Household situation										
Living together, with kids (<13 yr)	66,1%	10,5%	31,1%	38,6%	83,4%	8,4%	80,6%	10,2%	82,1%	8,0%
Living together, with kids (>12 yr)	63,0%	9,0%	31,8%	38,0%	84,4%	6,8%	81,0%	7,8%	83,0%	6,4%
Living together, without kids	64,4%	9,4%	31,7%	36,3%	81,5%	8,3%	83,6%	6,7%	82,0%	7,7%
Single parent	69,0%	8,4%	30,5%	37,9%	84,5%	5,2%	83,7%	7,2%	84,5%	6,7%
Single	66,8%	9,2%	30,1%	37,4%	83,0%	6,5%	83,7%	7,5%	81,7%	7,6%
Average	***65,9%***	***9,3%***	***31,0%***	***37,6%***	***83,4%***	***7,0%***	***82,5%***	***7,9%***	***82,7%***	***7,3%***

Tenure (in disability sector)										
Shorter than 1 year	54,8%	9,6%	40,5%	25,3%	76,1%	8,0%	76,4%	8,2%	70,5%	10,2%
1 to 5 years	66,4%	8,5%	29,5%	36,6%	84,7%	6,5%	86,5%	5,5%	81,7%	7,3%
5 to 15 years	66,5%	10,3%	29,4%	39,2%	84,6%	7,0%	83,6%	8,0%	83,5%	6,9%
Longer than 15 years	63,8%	9,6%	32,0%	37,7%	82,9%	8,8%	80,5%	8,3%	82,1%	8,2%
Average	***62,9%***	***9,5%***	***32,9%***	***34,7%***	***82,1%***	***7,6%***	***81,8%***	***7,5%***	***79,5%***	***8,2%***
Position										
Outpatient mentor	69,8%	4,3%	42,8%	26,7%	81,5%	8,1%	79,0%	10,2%	83,1%	7,0%
Assisted living	65,8%	8,6%	25,7%	37,9%	86,4%	7,1%	85,8%	7,1%	83,5%	8,1%
Assistent mentor	60,0%	11,1%	28,1%	36,7%	82,8%	7,8%	79,5%	9,2%	78,7%	9,8%
(Personal) mentor	66,3%	9,6%	30,2%	38,7%	84,1%	6,9%	83,3%	7,3%	83,8%	6,5%
Senior/coordinating mentor	65,7%	11,2%	34,1%	40,8%	80,3%	10,0%	82,5%	7,2%	85,1%	5,9%
Therapist	71,9%	18,8%	48,5%	22,9%	69,7%	6,0%	72,2%	13,9%	71,4%	20,0%
Supervisor	63,7%	11,2%	46,6%	30,3%	66,9%	16,3%	78,2%	11,2%	72,9%	11,7%
Office/staff	50,9%	9,4%	64,6%	16,9%	65,1%	14,2%	75,8%	10,6%	66,7%	13,6%
Facilitair	52,1%	0,0%	32,3%	9,7%	62,5%	8,3%	64,3%	0,0%	55,1%	6,8%
Average	**62,9%**	**9,4%**	**39,2%**	**29,0%**	**75,5%**	**9,4%**	**77,8%**	**8,5%**	**75,6%**	**9,9%**
Work environment										
Housing care: intensive	65,8%	9,4%	29,2%	39,0%	83,6%	7,3%	83,8%	7,7%	84,5%	6,9%
Housing care: slightly disabled	63,0%	10,5%	28,5%	38,8%	83,7%	7,5%	83,0%	6,8%	80,8%	7,9%
Outpatient facility	66,2%	7,4%	39,3%	32,6%	81,6%	7,8%	78,6%	10,1%	81,7%	8,3%
Daycare	67,5%	5,7%	45,5%	26,2%	82,2%	8,6%	75,0%	10,4%	73,5%	9,1%
Therapy	69,1%	13,0%	35,3%	39,1%	77,6%	10,5%	81,9%	9,3%	82,4%	9,6%
Facilitair/kitchen	47,8%	4,3%	31,0%	13,8%	62,5%	4,2%	62,9%	0,0%	51,7%	6,8%
Office/staff	61,3%	12,9%	53,7%	27,3%	68,3%	15,0%	71,7%	13,5%	69,3%	13,8%
Average	**63,0%**	**9,0%**	**37,5%**	**31,0%**	**77,1%**	**8,7%**	**76,7%**	**8,3%**	**74,8%**	**8,9%**

Working pattern										
Exclusively weekdays, during daytime	r = 0,016		r = 0,114 (p<0,01)		r = -0,046 (p<0,01)		r = -0,057 (p<0,01)		r = -0,080 (p<0,01)	
… plus evenings	r = 0,002		r = 0,034 (p<0,01)		r = -0,003		r = 0,009		r = -0,001	
… plus weekends	r = 0,035 (p<0,01)		r = '-0,018		r = 0,012		r = 0,048 (p<0,01)		r = 0,055 (p<0,01)	
… plus sleep shifts	r = -0,025 (p<0,1)		r = -0,011		r = 0,012		r = 0,009		r = -0,003	
Exclusively night shifts (active)	r = -0,033 (p<0,05)		r = -0,058 (p<0,01)		r = 0,013		r = -0,015		r = 0,003	
Schedule disturbances	r = 0,110 (p<0,01)		r = 0,005		r = 0,069 (p<0,01)		r = 0,099 (p<0,01)		r = 0,124 (p<0,01)	
Schedule (working hours) variation										
Almost always the same days/times	64,4%	9,7%	38,2%	35,2%	80,7%	8,9%	72,9%	12,5%	73,6%	11,5%
Some variation, with set pattern	65,2%	9,9%	30,4%	36,6%	82,6%	7,8%	79,0%	8,0%	80,0%	8,5%
Much variation, with set pattern	65,3%	9,0%	31,0%	36,6%	83,5%	7,1%	84,0%	7,1%	83,6%	6,8%
Much variation, without set pattern	64,9%	9,8%	30,0%	39,5%	83,0%	7,7%	85,1%	7,4%	84,1%	6,9%
Average	***65,0%***	***9,6%***	***32,4%***	***37,0%***	***82,5%***	***7,9%***	***80,3%***	***8,8%***	***80,3%***	***8,4%***
Schedule complexity	r = 0,041 (p<0,01)		r = -0,037 (p<0,01)		r = 0,040 (p<0,01)		r = 0,073 (p<0,01)		r = 0,055 (p<0,01)	
Experienced heaviness (general)	r=0,390 (p<0,01)		r = 0,030		r = 0,303 (p<0,01)		r = 0,256 (p<0,01)		r = 0,325 (p<0,01)	

Table 32: Profile characteristics for key variables satisfaction

	Satisfaction					
Profile characteristic	Shift work (general)		Financial compensation		Work time control	
	Satisfied	Unsatisfied	Satisfied	Unsatisfied	Satisfied	Unsatisfied
Age	r = -0,018		r = -0,114 (p<0,01)		r = -0,053 (p<0,01)	
Household situation	*F = 5.993 (p<0.001)*		*F = 1,053 (p=0,379)*		*F = 3.084 (p=0.015)*	
Living together, with kids (<13 yr)	69,6%	19,4%	46,1%	53,9%	66,0%	23,4%
Living together, with kids (>12 yr)	75,4%	14,0%	43,7%	56,4%	70,6%	20,2%
Living together, withoud kids	69,9%	18,4%	41,5%	58,5%	65,7%	23,2%
Single parent	70,6%	19,1%	48,5%	51,5%	69,6%	20,1%
Single	68,4%	18,9%	43,6%	56,4%	65,5%	22,4%
Average	***70,8%***	***18,0%***	***44,7%***	***55,3%***	***67,5%***	***21,9%***
Tenure (in disability sector)	r = 0,013		r = -0,086 (p<0,05)		r = 0,028 (p<0,05)	
Position	*F = 18.160 (p<0.001) rooster gemaakt door anderen / teamstructuur / zeggenschap*		*F = 2.623 (p=0,001); the group differs from:*		*F = 26.283 (p<0.01)*	
Outpatient mentor (1)	84,5%	9,1%	8		92,5%	6,7%
Assisted living (2)	67,1%	19,0%	7 & 8		62,2%	24,8%
Assistent mentor (3)	69,1%	17,2%	8		65,6%	21,1%
(Personal) mentor (4)	68,7%	19,5%	7 & 8		63,4%	24,8%
Senior/coordinating mentor (5)	72,0%	17,1%	7 & 8		72,7%	19,8%
Therapist (6)	97,4%	2,6%	d.n.a.		94,8%	2,6%
Supervisor (7)	86,2%	8,0%	2, 4 & 5		90,4%	6,0%
Office/staff (8)	92,0%	7,0%	All, except 6 & 7		93,9%	3,7%
Facilitair (9)	85,4%	12,2%	-		91,3%	8,7%
Average	***80,3%***	***12,4%***			***80,8%***	***13,1%***

Work environment	*F = 26.984 (p<0.01)*		*F = 3.969 (p=0,001); the group differs from:*	*F = 36.663 (p<0.001)*	
Housing care: intensive (1)	66,9%	20,3%	7	62,2%	25,8%
Housing care: slightly disabled (2)	73,7%	15,3%	7	70,6%	18,4%
Outpatient facility (3)	79,4%	10,1%	7	85,4%	9,1%
Daycare (4)	77,4%	14,1%	d.n.a.	66,1%	21,0%
Therapy (5)	74,0%	20,0%	7	72,1%	22,8%
Facilitair/kitchen (6)	81,1%	13,5%	-	87,5%	12,4%
Office/staff (7)	90,1%	6,4%	All, except 4	92,5%	2,7%
Average	***77,5%***	***14,2%***		***76,6%***	***16,0%***
Working pattern					
Exclusively weekdays, during daytime	r = 0,136 (p<0,01)		r = 0,091 (p<0,05)	r = 0,130 (p<0,01)	
… plus evenings	r = 0,032 (p<0,05)		r = -0,002	r = 0,070 (p<0,01)	
… plus weekends	r = -0,111 (p<0,01)		r = 0,003	r = -0,112 (p<0,01)	
… plus sleep shifts	r = -0,020		r = -0,083 (p<0,05)	r = -0,027 (p<0,05)	
Exclusively night shifts (active)	r = 0,075 (p<0,01)		r = -0,057	r = 0,065 (p<0,01)	
Schedule disturbances	r = -0,257 (p<0,01)		r = -0,187 (p<0,01)	r = -0,216 (p<0,01)	
Schedule (working hours) variation	*F = 102.890 (p<0.01)*		*F = 61,312 (p<0,001); the group differs from:*	*F = 61.312 (p<0.01)*	
Almost always the same days/times	85,2%	10,6%	All	79,9%	13,8%
Some variation, with set pattern	78,5%	13,1%	All	74,0%	15,9%
Much variation, with set pattern	72,8%	15,0%	All	68,3%	20,8%
Much variation, without set pattern	63,2%	22,9%	All	60,4%	27,5%
Average	***74,9%***	***15,4%***		***70,7%***	***19,5%***
Schedule complexity	r = -0,171 (p<0,01)		r = -0,079	r = -0,171 (p<0,01)	
Experienced heaviness (general)	r = -0,355 (p<0,01)		r = -0,197 (p<0,05)	r = -0,317 (p<0,01)	